Unit-level environment template (REF5b)

Institution: University of Sheffield
Unit of Assessment: D-33 Music, Drama, Dance, Performing Arts, Film and Screen Studies
1. Unit context and structure, research and impact strategy

1.1 Overview

This unit comprises the Department of Music within the Faculty of Arts and Humanities. Our mission is to develop a deep understanding of how music shapes identity, transforms society and reveals what it means to be human. The Department's breadth of individual and team specialisms, along with our commitment to collaborative and interdisciplinary research, has been key to achieving our REF2014 aims to 1) "foster specialism and excellence to inform major issues within our discipline" and 2) "increase research capacity in areas of existing strength and emerging opportunity".

We produced 19 books, 93 peer reviewed journal papers, 50 book chapters in edited collections, 32 instrumental and electroacoustic compositions, and four solo albums. We quadrupled our research funding, increased PhD awards by 38%, and employed 19 early career researchers (ECRs). This growth has been accompanied by increased success for postgraduates (PGRs) and ECRs in obtaining influential positions, e.g. Lecturer and Director of Black Studies at Nottingham; PI in Systematic Musicology at Graz; and winning international prizes in electroacoustic composition.

Across our four main areas of Composition, Ethnomusicology, Musicology and Psychology of Music, our distinctive blend of practice-based, empirical, and sociocultural approaches to music research has fostered wide-ranging contributions to the discipline, e.g. new biographies of major musical figures (Keefe: Mozart, McHugh: Cole Porter); Killick's *Global Notation* project proposing a new tool for cross-cultural and comparative analysis; compositions investigating extended string techniques (Ker, Nicholson); and making new interpretations of traditional songs (Hield).

Our engaged, interdisciplinary approach has supported our agility to respond to urgent local/national issues, e.g. through our UKRI COVID-19 rapid response fund project and AHRC Centre for Cultural Value, and to global challenges, e.g. GCRF projects in Colombia and Mexico. Through these initiatives, and by fostering strategic partnerships, e.g. with the Engineering faculty and the Healthy Lifespan Institute, and for industry-supported PGRs, we have demonstrated the ability of our research to influence policy and practice in urgent areas related to human flourishing.

1.2 Unit structure

Our 14 T&R staff comprise eight professors (four male, four female), a reader, four senior lecturers and a lecturer (total 13.2 FTE), complemented by nine teaching specialists (3.8 FTE) and support staff of 5.4 FTE. Located in the Faculty of Arts and Humanities, we draw on wider institutional support, including the Research Hub and shared infrastructure (§3). Our permanent T&R staff are distributed across Composition (4), Ethnomusicology (3), Musicology (3), and Psychology of Music (4); each area supports thriving PGT programmes and PGR cohorts yielding a total of 49 awards. Funding successes secured two prestigious postdoctoral fellowships (Vice-Chancellor's Fellowship and British Academy) held during the assessment period. We are home to three interdisciplinary research centres—Music Mind Machine **(**MMM), Sheffield Performer and Audience

Research Centre (SPARC), and Centre for New Music at Sheffield (CeNMaS**)**—while Shephard's membership of Sheffield Centre for Early Modern Studies (SCEMS) gives his research a home across the wider Faculty.

1.3 Research and knowledge exchange strategy since 2014

We have exceeded our REF2014 vision which embraced the need to "meet national priorities associated with the desire to support interdisciplinary and collaborative research; the need to increase external funding; respond to increased financial pressure on Home UG/PGT students; and communicate the value and benefits of our research to others", through:

1) **Support for individual research development:** Along with our principal staffing strategy to maintain a critical mass across music sub-disciplinary areas, our approach (see §2.2) has underpinned the success of our unit overall, manifest in high rates of career progression (§2.1), prominent roles in international research (§4.4) and funding successes.

2) **Fostering collaboration:** Collaboration has helped stimulate growth of interdisciplinary research, including through our ambitious interdisciplinary research centres (MMM and SPARC), which has been key to exceeding our ambitions for growth in research capacity and agility for responding to global challenges (§3.1.1).

3) **Intensive support for developing non-academic partnerships:** We have achieved concrete knowledge exchange (KE) and impact outcomes in areas where we identified specific potential - musicals, folk, audiences – each producing a viable impact case study; and wellbeing, which has been an area of particular growth. Moreover, as shown in §1.6 and §4.2, KE activity has flourished across our unit, through the range of mechanisms detailed in §2.2.

The integration of: i) theory, compositional practice and technology; and ii) composition and performance, highlighted in REF2014 as the other main area for focus, has been achieved through three key departmental initiatives: growth of Sound Junction (§4.2); instigation of the Centre for New Music at Sheffield (CeNMaS, 2018); and the Ligeti Quartet residency (§3.2).

1.4 Objectives for 2021-2026

Our vision for the coming period is shaped by the need to achieve the resilience and adaptability crucial for meeting the challenges of a rapidly changing world. We will do this through prioritising research themes for social impacts, while consolidating core strengths. Confirmed appointments will diversify coverage of global music cultures using systematic empirical approaches (Ponchione-Bailey, Leverhulme ECF), and realise the potential of music psychology applications for dementia support through assistive technologies (MacRitchie, UKRI FLF). Future appointments will extend periodic/regional coverage in musicology and ethnomusicology; increase research in performance; and consolidate our growing research potential in the field of music management and arts industries.

1) **Research leadership and funding:** To increase our sustainability and capacity for excellence, we will increase the proportion of our research that is funded, including through collaboration and interdisciplinary research. We will continue to take up positions of influence with external organisations and to lead and host prominent conferences across the full range of our research themes.

2) **Leading on inclusion, open access and reducing carbon emissions:** In order to fully engage with the questions at the heart of our research we recognise the urgency to: decolonise our research; increase inclusion within our research environment; and embrace wider constituencies with our research. A specific aim is to support research in low and middle-income countries (LMICs) by promoting visibility of their research and countering language and financial barriers (e.g. as part of ICMPC-ESCOM 2021 conference). To make our research more visible and discoverable, we will choose open access (OA) publication routes wherever possible. We will continue to actively promote carbon reduction by limiting flying, and through our research planning and leadership roles to promote alternatives.

3) **KE partnerships and impact:** We will optimise the value and benefits of our research locally, nationally, and globally. Building on mechanisms at individual, Department and Faculty levels, and through strategic use of funding, we will put our growing portfolio of external partnerships in the cultural and health sectors onto a more ambitious, productive, and well-evidenced footing, promoting infrastructure for collaboration and translational research.

1.5 Interdisciplinary research

Our commitment to interdisciplinary research has supported diverse areas of growth; we created the conditions for interdisciplinary research to flourish through support mechanisms at Department, Faculty and University levels. We have used major funded projects, e.g. Hield's *Modern Fairies* (+ English Literature) and Shephard's *Music in the Art of Renaissance Italy* (+ Art History) to support productive interdisciplinary collaborations leading to major research outputs, while making strategic use of internal funding to support interdisciplinary collaborations for advancing priority areas (§3.1).

The strategic leadership of our interdisciplinary research centres has fostered the realisation of ambitious interdisciplinary networks for tangible outcomes. For example, MMM (dir. Timmers) has cultivated a broad, global network that has facilitated staff collaborations and opportunities for PGR and postdoctoral projects oriented to prominent research challenges. MMM's collaboration within the new flagship Healthy Lifespan Institute shows how we are able to connect to broad interdisciplinary groupings to address major societal challenges. SPARC (dir. Pitts) takes a multidisciplinary approach beyond music psychology, addressing audiences from a range of art forms and disciplinary perspectives (see impact case study: Arts Audiences).

Reflecting this growth, our success in fostering interdisciplinary PGRs is manifest in the increasing number of cross-cutting supervisory teams for innovative doctoral research (§2.4).

1.6 Impact, KE and public engagement

We have exceeded our REF2014 aims to "bring the benefits of our research to a wide range and number of non-academic audiences and stakeholders in transformational ways at local, national and global levels". Our success in growing KE activity across research specialisms has been achieved through comprehensive support mechanisms (§2.2), by embedding KE in research planning and external funding applications, and through internal funding (including £77k of HEIF and other KE-related internal funding) to strategically support non-academic partnerships.

Our **selected case studies** exemplify the effectiveness of our strategies in benefiting regional and international stakeholders using our research: shaping major international productions of Broadway musicals using archival materials (Lerner & Loewe) and using qualitative data to change how arts organisations programme works and develop new audiences (Arts Audiences). They also showcase our wide-ranging support mechanisms for staff to develop platforms for creating impact:

Pitts was supported by internal IP Development and Commercialisation funding (IPDaC) to create the SPARC consultancy, used QR Policy funding to sustain and deepen impact activity at a national level, and used online multimedia to increase reach; McHugh used HEIF to develop partnerships across sectors and, supported by the University media team, used international press to access a global audience.

The Department's contribution to the cultural life of the University, City and beyond has flourished through research-led public events and performances reaching global and local audiences. Through our close partnership with the University Concert Series, we have brought new audiences to our research through, e.g. a multi-year partnership with Ligeti Quartet; numerous composition premieres, including previously unperformed Broadway songs (McHugh); and the international Sound Junction series of electronic music. Sound Junction reached new local audiences through satellite events in Sheffield, Leeds, York, Huddersfield, Leicester, and converted to a mixed live-virtual mode (making innovative use of 360° audio) during COVID-19 to reach a global audience.

Partnerships with local festivals, venues and heritage sites have helped us to reach more diverse audiences in and around Sheffield, e.g. with Furnace Park, Kelham Island Industrial Museum, The Hepworth Wakefield, and National Forest (Faculty initiatives for developing regional culture). We have been a key partner and contributor to Classical Sheffield and Sensoria (Sheffield festivals) and undertook a residency with Museums Sheffield. We have showcased our research through the University's *Off the Shelf*, *24 Hour Inspire* and *Festival of the Mind* (including several funded collaborations with external partners through a competitive process).

Innovative use of social media has kept audiences abreast of research developments, e.g. through Twitter: announcements of research-in-progress findings (SPARC); staged tweets to disseminate data through informatics (Williamson); and holding Facebook Live concerts (Sound Junction). Hield has built an international folk community (with followers and contributors in North America and Australia) as a platform for discussion of issues raised in her work through the Twitter handle @TradSongTues (1,900 followers, 20,000 impressions/week).

1.7 Open research and research integrity

The University has exemplary systems for open research, including a repository shared with the Universities of Leeds and York for maximum impact, a mediated deposit service ensuring compliance with copyright and other publisher stipulations, and a data repository built on the leading Figshare platform. Our strategy has been to build on this framework to foster open research processes and outputs. Open research is an item in Research Committee business, is part of new staff induction, and PGRs are encouraged to take training modules in open access, research data management and copyright and licensing and deposit their eTheses.

To ensure maximum discoverability of our research, we aim to put all short-form outputs in White Rose Research Online, our shared repository with Leeds and York (green route). The 127 outputs deposited over this assessment period were downloaded over 19,000 times. This is our preferred route, ensuring equity in publishing opportunities regardless of available funding; we also publish outputs in fully OA journals, or hybrid where required for funder compliance.

Our aim is to substantially increase this activity, making open data an integral part of research design and facilitating OA monographs. We have shown disciplinary leadership in open research: Keegan-Phipps is founding co-editor of the OA *International Journal of Traditional Arts; Empirical Musicology Review* (co-editors Dibben and Timmers) was the first free OA music journal championing transparency by publishing peer reviews alongside main articles.

Our research integrity policies and practices reflect best practice, including responsible use of metrics in recruitment/promotion (DORA signatory), data management and GDPR. Our training opportunities reflect disciplinary-specific considerations. For example, guidance governs the collection, use and re-use, storage and analysis of recorded media data gathered through fieldwork, laboratory and online, for a broad range of contexts and participants, including vulnerable groups and high-risk environments. All staff and PGRs receive mandatory training in research ethics and integrity, and there are ethics and data management checkpoints at confirmation review. Research ethics applications are peer-reviewed by at least two staff members; all research staff are therefore involved in regular evaluation of ethical research practice. A Departmental Ethics Coordinator oversees this process, and disseminates new policy and good practice.

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2. People

2.1 Staffing and recruitment strategy

Our recruitment strategy aims to preserve the Department's research and teaching base by maintaining a critical mass of 3-4 permanent staff in each of our four research areas; and to increase staffing through ECR fellowship appointments. We achieved this through external funding successes:

- Two 3-year postdoctoral research fellows (Floridou; Williamson, leading to a permanent T&R post);

- Nine research associates (RAs) on research grants, with contracts between 1-3 years;

- 10 RAs funded from smaller grants e.g. GCRF QR, HEIF, on shorter contracts (1-6 months).

Notably, we secured our strengths in music and wellbeing, and with LMICs, via two postdoctoral appointments starting 2021, one of which becomes a permanent T&R post.

One way we addressed the urgent priority to diversify our staffing was by replacing a departing T&R colleague specialising in contemporary music (2015) with three performance teaching specialists in contemporary, historical and popular music. We broadened the range of applicants to posts by advertising widely and through targeted headhunting, and hosted visits to support application development.

2.2 Staff support and development

Our strategy to enable each colleague to reach their full research potential led to high levels of career advancement: in 2013 we had two professors, three readers, one senior lecturer, seven lecturers, and one researcher; by this census date, the level of seniority had increased to eight professors, a reader, four senior lecturers, and a lecturer. All staff are part of supportive research groupings (clusters, centres, networks) and are encouraged to apply for funding and engage in KE activities through a comprehensive range of support mechanisms.

Research leadership is rewarded through academic promotions, accelerated increments, and internal awards. The Academic Career Pathways (ACP) makes explicit the career stage expectations, mapping research achievements flexibly across criteria (outputs, funding &

supervision, impact), allowing specialisation in specific research leadership strengths, and ensuring evaluations use metrics responsibly.

Individual research objectives are defined in annual research support meetings (RSM) with the Departmental Director of Research, and progress meetings (SRDS) with the Head. Research clusters meet regularly to define and review objectives. These individual and cluster objectives feed into the Department's research strategy, ensuring overall priorities are shaped by individual and group ambition.

Research time (40%, applied flexibly over the academic year) is protected in workload allocations. A schedule of research leave enables all T&R staff to dedicate every seventh semester (inclusive of parental leave) to research activity, including crucial international mobility (§4), e.g. Stanović's 2018 leave enabled him to undertake three international composition residencies, complete four compositions and three publications (including his solo CD), give 15 research presentations, and attend seven performances of his work. Research leave has been granted to all applications. Periods of intense administrative load (e.g. Head) are compensated with a full year's leave, enabling completion of major projects such as Keefe's monograph and Pitts' audience research. Staff make use of internal research stimulation funds, and an array of operational infrastructure to achieve their goals (§3.1.1 and §3.2).

University mentoring schemes support staff in career transitions or taking on new responsibilities (Keegan-Phipps: first-time PI; Dibben, Ker: career development), such as co-writing the successful bid for WRoCAH DTP2 (White Rose College of the Arts & Humanities) (Dibben).

2.3 PGR overview, recruitment and funding

The growth in PhD awards by 38% (to 49 over the assessment period) reflects increased high-quality applications combined with excellent progression (on-time completion rates > 80%). Our objective to achieve the best possible outcomes for PGRs has been realised through a combination of increased/diversified opportunities for financial support, tailored supervision and training (§2.4.1), and building an inclusive research environment (§2.4.2). Our successful approach is also reflected in excellent career prospects (§2.4.3) and very high student satisfaction: experience survey results (PRES) showed that 90% of students in 2019 are satisfied with their experience (up from 71% in 2013).

We successfully coach PGR applicants to strengthen the competitiveness of their proposals for University, WRoCAH, and overseas research council schemes. We further diversified our sources of funding by recruiting to staff-led research projects (McHugh: Loewe Foundation; Shephard: Leverhulme; Timmers: WRoCAH network), and collaborative studentships with external partners (McHugh: British Library; Pitts: AHRC CDA with CBSO and concert venues in Sheffield and Doncaster; Timmers: EPSRC with SleepCogni; WRoCAH with NHS Audiology unit). A total of 24 new PGR registrants were funded, while 10 partially-funded places were enabled through department-administered charitable awards. The 2017 bid for WRoCAH DTP2 (co-written by Dibben) secured £14.2m plus matched funding for c.265 PGR studentships over 5 years.

Our PGR body reflects the Department's sub-disciplinary make-up, with researchers working in our four main areas (§1.1). PGRs work towards the submission of a thesis, thesis by publication, or a thesis plus practice-based research. PGR projects are central to the Department's engaged and cross-disciplinary approach to research, offering important channels for innovation. Our students have integrated methods and theories from social sciences (incl. climate activism, education, management), computational sciences, and psychology as well as arts & humanities disciplines

(history, film/media studies, gender studies), facilitated by interdisciplinary co-supervision (since 2017-18, six out of 16 new PhD students received co-supervision from outside the Department).

PGRs are admitted based on quality of proposal and applicant, fit with staff expertise and supervision capacity. Specific areas of capacity and growth are highlighted in advertising, whilst our specialist PGT programmes form an important pipeline of PGRs. This PGR recruitment strategy sustains a thriving community across our sub-disciplines, whilst balancing workload of supervisors.

2.4 PGR support and outcomes

2.4.1 Support and training

All PGRs are assigned two supervisors according to expertise and a personal tutor for pastoral support. High quality supervision is assured by setting a minimum number of expected supervision meetings, making detailed meeting notes, regular progress reporting, and clearly communicating expectations and key milestones. Staff new to PGR supervision receive training through the University and continued professional development is fostered through collaborative supervision and thematic workshops focussed on best practices.

Training needs for PGRs are identified at an individual level to meet the demands of the project and career aspirations of the researcher and are reviewed annually. Training provision takes various forms including study days (§2.4.2), masterclasses, courses and conferences, and support is offered for placements and research visits, which contribute to internationalisation and employability. 22 PGRs were involved in research visits or employability placements (e.g. at Department of Culture, Media and Sport; Starkey USA; Australian Chamber Orchestra; Universities in Greece, Italy, Japan, Netherlands, Norway, USA), receiving financial support from learned societies, the University and its consortia, ERASMUS and Worldwide Universities Network (WUN). 30 PGRs gained paid teaching experience, and 31 were involved in outreach or KE.

2.4.2. PGR research environment

Our improved satisfaction rates (90% in PRES2019) reflect our strategy to further integrate PGRs into our research environment and enhance inclusivity. All PGRs are connected to a research cluster or centre, present their research to staff and peers for feedback, and actively participate in and contribute to formative activities such as study days, reading groups, concerts, and events, including taking up organising roles. Five graduate study days (GSDs) per year feature presentations, research cafés, and opportunities for PGRs to deliver and receive training on publishing, careers, funding applications, KE and teaching.

We enhanced inclusivity by ensuring that GSD programmes and research seminars are scheduled to accommodate parenting needs and part-time working, and by enabling remote participation to in-person events. PGRs are represented at the staff-student and research committee of the Department and Faculty, and are consulted in developing GSD programmes. Alongside studios, practice rooms and lab facilities, PGRs have access to dedicated desk space, which helps to build a PGR community.

PGR (and RA) career transition is supported through a six-month affiliate researcher status (on application) granting access to library and other facilities to develop and publish their research. We appoint honorary research fellowships of 1-3 years for longer-term collaborations with individuals, Sheffield PGR graduates, teaching-specialist staff, including international scholars and external partners.

Our research environment is rich in 'vertical' interactions. PGRs work closely with staff to produce collaborative research, including co-publication (19 journal articles, five chapters, and three co-edited books/proceedings), and KE activities: e.g. *Sound Teaching* workshops (2018, 2019); *Colourama* exhibition for Festival of the Mind (2018); podcasts; and co-production of musicals disseminating McHugh's/PGR research. The high level of interaction and collaboration amongst staff, students, postdocs, and visiting students, scholars and musicians, enhances development and facilitates career transitions. It is supported through: Sheffield Undergraduate Research Experience (SURE) and OnCampus placements; paid RA work for staff projects (e.g. SPARC employed an MA graduate and 4 PGRs); composer commissions (e.g. Stanovic's Furnace Park project at Kelham Island Museum; and as part of Shephard's *Feedback Loops* residency at Museums Sheffield).

2.4.3 Outcomes

Our investments in our postgraduate community have resulted in excellent research outcomes. PGRs are empowered to submit within the expected time-window, they feel better prepared for a future career as a result of the programme (90%, PRES2019), they have gained valuable training and experience, and advanced their research area, including generating impact, e.g. by producing critical editions of music, new music technology, and supporting organisations in attracting audiences or educating the next generation of musicians. Excellence is recognised through international prizes for PGR compositions (9), public performances of work (70), publications in peer-reviewed journals (51) and edited books (18), and a substantial number of conference contributions (>190), organised events (>12) and media outputs (14). Our graduates find doctoral level employment within and outside academia and become influencers in their field, as postdoctoral research specialists (10, incl. three overseas), T&R lecturers (3), HE teaching specialists (3), influential professional musicians (3), and in governmental or non-governmental organisations (2), including the V&A (1).

2.5 EDI

Equality, diversity, and inclusion is an important strategic objective for the Department, reflected in the presence of an EDI Lead on the Executive Committee, and structured approaches to staff and PGR recruitment and development.

T&R staffing remained stable, so we used other opportunities to increase diversity and inclusion. We ensured gender balanced appointment and promotion panels, with external input where otherwise impossible; reviewed job specifications to avoid career trajectory biases; and launched a BAME PGT scholarship (2019-). Consequently, we improved gender balances of research staff (now 43% of staff are female, 8 of 10 appointments (>1 year) were female) and in sub-disciplinary clusters (e.g. male appointments in psychology of music and a female appointment in musicology); and racial diversity, with the appointment of RA Robbins. Previously a Sheffield UG and PGR, Robbins moved directly to an open-ended T&R contract at Nottingham, demonstrating how we support the pipeline to diversification of music studies.

Diversity in PGR recruitment benefits from our pioneering offer in distance-learning, where we have a long-standing tradition of supporting mature, remote-location postgraduates from a variety of backgrounds and nationalities. Our PGRs are diverse in age (50% are aged 30 or older), nationality (43% are non-UK), gender (41% are male) and ethnicity (20% identified as BAME in PRES2019), and 30% study part-time or live away from Sheffield (28%). The success of our approach is shown by PRES results: 100% of respondents indicated they have established contacts or a professional network during their programme (2019).

A key aspect of our strategy is full inclusivity in a research community, irrespective of circumstances. At their request, three of six female staff moved to fractional contracts, and have been proactively supported to prioritise research and impact activities. Pitts has been supported to maintain a full research day in term time within a four-day working week, which has been crucial to delivering her AHRC-funded book and impact. Female staff fulfilled key roles for the first time, e.g. Departmental and Faculty Directors of Research, Director of Postgraduate Research and Head (2014-18). We also tailor support for researchers who declare disabilities, e.g. one staff member (Type 1 diabetic) received support through a training session for colleagues with a nurse, provision for medication storage, and flexibility in working hours; this has supported them to flourish, delivering a high volume of quality research outputs, impact of international reach, and promotion to professor. Our income strategy (§3.1.1) is specifically tailored to achieve EDI objectives.

Guided by the UK Concordat to Support the Career Development of Researchers, we ensure ECRs are embedded in our research environment, attending Departmental boards, and have representation on Departmental and Faculty Research Committees. ECRs are included in the SRDS and RSM schemes, have a mentor, and are supported to conduct research with collaborators in and beyond Sheffield. This enabled ECRs to gain competitive CVs, publish their research, build research networks, and develop professional skills. For example, Price gained extensive experience in working with external cultural organisations as PGR then postdoc with SPARC, which positioned her strongly for a subsequent postdoc in the School of English.

The University is a sector leader in EDI (see REF5a) and the principles of the Concordat to Support Research Integrity are embedded through mandatory ethics and integrity training, procedures, and a culture of openness and support. All members of REF Committee undertook REF-specific EDI training including material on recognising and countering implicit bias. Our REF team is representative in gender, sub-discipline and as inclusive as possible. Guided by the Code of Practice outputs were selected on the basis of ranked quality. When the cut-off was reached for the number to be submitted, we considered the protected characteristics of the output authors at that particular star rating. The University equality impact assessment of our output scoring and attribution, and on our independent researcher decision-making, found no evidence of bias. We included research from British Academy Postdoctoral Fellow Floridou as an independent researcher, and 45% of outputs (double weighting included) are from female staff, which equates to the staff appointment division (43% female). The institutional process for disclosing equality-related circumstances was highlighted to staff to ensure awareness of the support available.

3. Income, infrastructure and facilities

3.1 Income and Strategy

3.1.1 Income strategy

Our strategy is founded on a shared understanding that funding provides the resources that enable world-leading research and impact. This shapes individual researchers' planning, supported by structures outlined in §2.2. The success of our strategy is manifest in major projects producing high-quality outputs, impact, and networks of scholars and practitioners. For example, *Understanding Audiences for the Contemporary Arts* (AHRC Research Grant) brought new insights on audience engagement, and led to larger-scale funding success (AHRC *Centre for Cultural Value*, 2019-2024). Such awards enabled us to embed impact in our research. For example, *Music in the Art of Renaissance Italy* (Leverhulme Research Grant) included collaborations on exhibitions with the Isabella Stewart Gardner Museum and the Orlando Consort, and an Academic Residency

(Museums Sheffield, 2019), as well as producing two doctorates, co-authored monograph, and seven co-authored papers/book chapters. Partnerships with external organisations provided an important source of funding for production of scholarly editions (*Frederick Loewe Critical Editions,* Loewe Foundation). We were able to expand strengths in digital culture (*Digital Folk*, AHRC ECR Research Grant) and forge new disciplinary pathways (*Modern Fairies*, AHRC ECR Research Grant) which established Hield (PI) as an artist-researcher via performances at Sage Gateshead, an album release and journal articles.

Non-UKRI funding sources helped achieve our goals for Composition. Arts Council funding of £8k supported our leadership of a professional development programme for emerging composers with resident ensemble Ligeti Quartet, resulting in recordings of six new works, and a further £13k contributed to City cultural life through contemporary music performance, including of staff compositions.

Our strategy helped us achieve four additional objectives:

1) We used GCRF and industrial strategy funding to extend the scope and reach of our research in music and health, and digital culture. Research into the social and wellbeing impacts of music-making in Colombia (HEFCE Newton ODA Fund, Academy of Medical Sciences GCRF Network, and QR Policy funding), Mexico and Sheffield (QR GCRF funding and QR Policy funding) resulted in new practitioner-academic networks, co-developed training resources, and established music and social impacts overseas as a new research area for the psychology of music cluster. We used industrial strategy funding to broaden our emerging strength in digital culture (HEFCE, *Immersive Services for Driverless Cars*).

2) We used ECFs to increase our research capacity, and train the next generation of researchers. For example, we decided to build capacity in music and health to align with challenge-led research agendas. We headhunted Williamson for the competitive Vice-Chancellor's Fellowship (2014), mentored Floridou's successful application for a British Academy Postdoctoral Fellow (2017) and developed a successful bid for a UKRI Future Leader Fellow starting 2021.

3) We targeted mobility funding to foster international excellence. For example, Timmers conducted research at MARCS Institute, Western Sydney University (Leverhulme International Fellowship, 2016) using a novel application of transcranial magnetic stimulation to investigate neural processes when synchronising with a co-performer, and engaged in a data exchange at Rochester, NY and re-analysed data using a Bayesian approach to model perception of emotion and colour in music (WUN, 2019).

4) We maximised opportunities for doctoral funding by including these as part of larger externally funded projects, creating nine studentships this way (§2.3).

Our use of competitive internal research stimulation funds has been key to our success since virtually all our externally funded projects first received internal funding that we used to:

- increase the scope and reach of impact via £77k of KE-related funding, including 20 HEIF awards totalling £36k;

- enable two-way mobility between Sheffield and partners (e.g. WUN, Erasmus+ Mobility Programme, HEIF), as manifest in McHugh's work with the Library of Congress;

- develop fellowship applications with postdoctoral candidates (e.g. the Visiting Postdoctoral Bursary Scheme, initiated by Music and adopted by the Faculty, resulting in a Leverhulme Trust ECF on the Orchestra in Afghanistan);

- scope projects, and provide additional time for writing more complex funding applications (5 awards totalling £14k).

In addition, staff and PGRs have accessed Departmental and Learned Societies Funds (up to £900 annually each) to attend and present research at conferences, composition premieres and residencies, based on strength of alignment with research strategy. We have mitigated EDI impacts of increasingly short funder-imposed timescales by providing affected colleagues with additional support with grant application writing.

3.1.2 Income overview

As a result of these strategies we achieved our REF2014 aim to increase and diversify our research income thereby growing research capacity and interdisciplinary collaboration. Research income quadrupled from £242k (2008-13) to over £1.3 million (2014-20), with annual income on a consistently rising trajectory (£70k in 2013-14 to £363k in 2018-19), and more of our staff as PI on externally funded projects (43% in 2008-13 to 60% in 2014-20). While the majority of our funding is from UKRI Research Councils (73%), our increased focus on social challenges was supported by greater diversity of funding: the number of funders doubled compared to the previous REF period; we succeeded in new schemes (GCRF, UKRI FLF, AHRC COVID-19 funding), with new funders (e.g. Academy of Medical Sciences) and first-time awards from charities and external partners (e.g. Loewe Foundation). We were also successful in our bid to create a commercial consultancy in audience research (£22k IPDaC funding) — the first in the Faculty and a model by which to develop consultancy in our other domains.

Our strategy enabled us to respond rapidly to opportunities, as demonstrated most recently by our successful bid for UKRI COVID-19 funding, which tackles the impact of the pandemic on Sheffield's cultural ecology. This project is an excellent example of the success of our strategy to integrate KE into research projects, sustain mutually beneficial relationships with external partners (it builds on stakeholder relationships developed through 15 years of successive projects by our staff) and leverage funding to benefit local and regional cultural lives and economies. While the future funding landscape may change due to impacts of the pandemic, Brexit, and government spending reviews, we are well placed to thrive.

3.2 Infrastructure and facilities

Our funding strategy success has been enabled by an effective operational infrastructure. Submission of high-quality funding applications has been supported through a combination of: comprehensive staff support mechanisms (§2); robust peer review of funding applications; specialist training, e.g. from Sheffield Institute for International Development for researching in LMICs; and support from professional services teams which benefited from transformational investment in 2019. Our Faculty Research Hub (2.9 FTE; 3.4 FTE from 2020) and Faculty Research Services (1.8 FTE) provide intelligence about funding opportunities, application design including impact, costings, writing, submission, and due diligence. The Faculty KE team was similarly expanded from 1 to 6 FTE in response to increased activity. This support has been critical to our agility.

The bespoke £9.3m facilities (the 2009 renovated listed Jessop Building and the SoundHouse studio/practice facilities) place us near other disciplines and institutional support, and enable

integration of all researchers into the wider research environment. Two shared PGR study spaces, bookable workstations, kitchen, printing, and specialist music-making opportunities (including instrumental collections from a range of global music traditions) mean that all researchers use these spaces for work, networking and peer-support. The adjacent Humanities Research Institute provides collaborative research spaces, and the £81m Diamond building (2014) enables us to extend our research and dissemination activities: the Virtual and Augmented Reality lab facilitated our emerging expertise in music in digital culture, and the video editing suite enabled creation of the MMM podcast series. All facilities have technicians with whom we work closely to realise specific research goals.

In 2016 we joined with the School of Languages and Culture to develop the £212k HumLab for technically-advanced experimental research, incorporating a soundproof booth, high-quality playback facilities, and equipment to measure neurophysiology, muscle tension, reaction times, and eye-movements. Combined with our expertise, these facilities make Sheffield a priority destination for researchers: it has hosted visitors from six countries, resulting in several co-authored publications.

Our facilities enable our success in collaborative networks, e.g. the WRoCAH PhD network investigating timing and communication in musical ensembles, a WRoCAH PhD project on perception of emotion in music and speech in cochlear implant users, and an EPSRC doctoral project, collaborating with local company BrainTrain2020, on a musical biofeedback loop to facilitate sleep. We loan specialist equipment to staff and students to enable field research and flexible working.

We augmented our scientific provision and technical skills through the use of specialist facilities elsewhere, including: virtual reality (Stanford, USA), transcranial magnetic stimulation (MARCS, WSU, AU; funded by £22k Leverhulme Visiting Fellowship, 2016), magnetic resonance imaging (Greensboro, USA), training in motion tracking (Vienna and Oslo) and neuroscience techniques (Helsinki; Petri Watson Fund). This includes adoption of specialist software and modelling techniques: behavioural pattern detection (THEME, Reykjavik, Iceland; WRoCAH travel funding), hearing impairment modelling (Starkey, Minnesota, USA; WRoCAH REP), analysis of galvanic skin response, time-series analysis and signal processing of audio and laryngography data from singing (WRoCAH network).

Our strength in electroacoustic composition is supported by the University's Sound Studios, which feature state-of-the-art composition and diffusion facilities. These are maintained to top specification, e.g. alumni funding of £4k was awarded in 2018 to maintain the highest quality performance standards at Sound Junction, and purchase of specialist microphones, including Ambisonics, to enable the best spatial recordings. Composition also benefited from investment of £25k in the wider research environment of the northern region for participation in the RNCM 'Ensemble +' closed partner network launched early 2020, and employment of new music specialists the Ligeti Quartet as artists in residence (2013-20). We also ran numerous masterclasses and workshops via the concert series and departmental funding, and invested up to £2k each year in our research seminar series, ensuring exposure to cutting edge research.

The University invested £400k in improving the acoustics of our main concert venue, Firth Hall, while other University and City venues provide a variety of spaces, such as use of the Octagon for larger events, Drama Studio for music theatre and smaller ensembles, and City locations such as the Winter Garden and Upper Chapel to reach wider audiences.

The University Library includes dedicated disciplinary contacts, physical books, scores and recordings housed across three sites, supplemented by a growing number of online resources

including *Naxos Music Library, Alexander Street, Digital Concert Hall*, and *Ethnomusicology: Global Field Recordings* and special collections of national importance (e.g. Sir Thomas Beecham Music Library). Since 2014 we have expanded collections in strategic areas, e.g. critical editions of musicals and facsimiles of Mozart's major operas.

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4. Collaboration and contribution to the research base, economy and society

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4.1 Collaborative research

Collaboration is central to our strategy for research excellence. Staff draw on a range of funding, and flexible research time allocations, to support collaborations and the development of networks and partnerships that enable them. We use international collaborations to advance research by drawing on facilities and complementary expertise located abroad, e.g. Ker developed instrumental techniques with cellist Lucas Fels (Germany) and guzheng player Xia Jing (China), while Willamson worked with Canadian and UK neuroscientists to investigate amusia. Through international partnerships, we realise joint events and publications that develop knowledge in specific areas, e.g. the 2018 KOSMOS workshop on music and mind wandering (Floridou); and ICMEM 2015 conference on multimodal experience (Timmers); staff have co-published work (including edited special issues) with researchers based in 14 countries across five continents.

National and regional collaborations are developed through learned societies (e.g. RMA, BFE), networks (e.g. Northern Network of Empirical Music Research), and consortia (e.g. White Rose: Moore/Stanović led the *3x3* network for electroacoustic music performance, supported by White Rose collaboration fund; Timmers' created the WRoCAH *Expressive Nonverbal Communication in Ensemble Performance* network, which supported two joint conferences, knowledge exchange, training, and multiple publications including a forthcoming edited book). National networks supporting funded research include Hield's collaboration with 13 British artists resulting in four shows at Sage Gateshead (2019); Keegan-Phipps' *Digital Folk* network with peers at Greenwich and Dublin; and SPARC's *Understanding Audiences* network with 20 contemporary arts organisations across four UK cities (see impact case study).

Locally, we foster strategic interdisciplinary collaborations across the University. We take leadership roles, e.g. Dibben's Directorship (2015-17) of the Humanities Research Institute (the Faculty's centre for collaborative research), and we establish innovative research networks, such as Ker's leadership of the *Virtual Performer* robotics research group, and Timmers' co-founding of the *BioHybrid* PhD network.

Our links in Sheffield, with arts venues and organisations, schools, charities, businesses, council, are strengthened through membership of advisory boards and invitations of partners to speak or attend events. These networks have resulted in performances, exhibitions and publications, including multiple collaborations for Festival of the Mind, and research projects (e.g. CDAs). Moreover, they are integral to staff and PGR research, impact, and funding bids (e.g. the successful UKRI FLF, UKRI COVID-19) (§4.2).

4.2 KE and impact

Our vision to make impactful contributions to society through our research has been realised through strategic partnerships, events and funded research. A range of initiatives with diverse communities enabled us to:

Enrich cultural life. Our strengths in composition mean we make significant contributions as a cultural provider, e.g. since 2014 Moore/Stanović led Sound Junction biannual mini-festivals featuring over 192 electroacoustic works by >100 composers (staff, students and guests). Initially a physical-only series aimed at a regional audience for contemporary music, its online event-hosting since 2020 extended reach internationally. We used University Concerts Series to host research events, including: 22 performances/14 programmes of Broadway musicals, 2014-20 (McHugh); premieres by Fidelio Trio (Ker, 2017), Lucas Fels (Ker, 2018), and Ligeti Quartet (Ker, 2018; Nicholson, 2014, 2016, 2017); and Hield's *Old Adam* songs (2016). We also contributed to festivals such as Being Human, Off the Shelf, Sensoria and Classical Sheffield, and have curated film festivals at the Showroom Cinema (McHugh, 2014 and 2019).

Influence artistic programming. We use our musicological research to inform leading performers (Shephard - Orlando Consort) and organisations (McHugh - Opera Australia/Lincoln Center/Liverpool Everyman; Keefe - San Francisco Opera).

Inform broadcast media. Keefe was advisor on BBC2 documentary *Mozart in Prague*; Keegan-Phipps advised on *Singing Together with Jarvis Cocker* on BBC R4; Shephard contributed to script and delivery of 10-episode series *La Musica del Rinascimento: una mostra in dieci oggetti* on RAI Radio 3.

Influence exhibition and archive curation. Our expertise benefits major museums through processing archives (McHugh, Library of Congress, 2016), curating exhibitions (Dibben, MoMA, 2014) and enhancing visitor experience through events (Shephard, Isabella Stewart Gardner, Boston, 2019-).

Increase music education, participation and inclusion. Killick's OA *Global Notation* method (website 39,948 views) has been adopted by other institutions (e.g. University of Colorado); Moore's *Sonic Art* book/OA tools has been widely distributed internationally; and Dibben's work on *Biophilia* (2011) was incorporated into the Nordic Council *Biophilia Educational Project* in 33 schools across eight countries with >4,000 children. We shared insights from our research in psychology of performance through workshops with practitioners (Timmers, Pitts, PGRs). Hield's archival and creative research in traditional music is shared with participants through Soundpost, the Sheffield-based organisation she founded in 2011, and through @TradSongTues (since 2017, >1,900 followers) with a weekly Zoom 'singaround' since 2020.

Create partnerships for social impact. Our music psychology researchers co-create research and impact in music for wellbeing, locally and overseas: with care homes, homeless, dementia and arts in health charities in the UK (Timmers, Williamson); and with charities, social workers and musicians in Colombia and Mexico (Dibben, Timmers).

Strategic use of media/social media has enabled us to escalate the reach of our research and shape discussions around music in wider society through a range of mechanisms, including international media coverage following press releases (e.g. Williamson's work on mental health and Christmas music covered by BBC World Service, *Cosmopolitan,* BBC Radio 1, 3 and 4, *Quartz, CBS News, Scientific American, Times, Huffington Post*; McHugh's on Cole Porter by *Washington Post*, *Wall Street Journal*, *New Yorker, Boston Globe*) and timely commentary on newsworthy events (Keegan-Phipps: Last Night of the Proms/Brexit, *The Conversation*; Pitts: impact of COVID-19 on the Arts, *Express*).

4.4 Wider influence and contribution to the sustainability of the discipline

Our researchers received international recognition for their contribution to the discipline: conferment of an honorary doctorate on Dibben (University of Oslo, announced March 2020); Ker's Composers Association of New Zealand Trust Fund Award for compositional achievements (2015); Shephard's honorary appointment as Associate Professor of Art History at the University of Toronto. Timmers' co-edited Routledge Companion won the SMT *Citation of Merit Award* for setting 'a sophisticated standard for future research'; Keefe won 'Outstanding Academic Title' (American Library Association, 2019) for *Mozart in Context*, and Hield won 'Best Album' in BBC Radio 2 Folk Awards 2014. Our electronic composers have been particularly prominent in international competitions: Stanović was 3x winner of *degree II, >SYNC*, Russia (2018, 2017 and 2015); received placings or mentions in seven other competitions (Czech Republic, China, Portugal, and Argentina); and has held residencies in Australia, Mexico, USA (x2), and UK, plus the coveted GRM commission (announced 2020). Moore won 1st Prize, *Concurso Internacional de Composição Electroacústica Música Viva 2015, Parede* (Portugal); and Honorable Mention, *Métamorphoses* 2016 (Belgium).

Our influence is also manifest in our contributions to the discipline through:

Conference organisation and contributions, keynotes and invited lectures

- We hosted national/international conference series, e.g. Medieval and Renaissance Music conference (2016), EMS2015, RMA/BFE student conference (2019), *Stagestruck*! (2014, 2016; 2018).

- We organised an additional >14 conferences developing research across our themes, including *Music and Visual Culture in Renaissance Italy* (2019); *English Rising symposium, Digital Folk* (2014); *Family and Music, Mexico* (2019), and *Sound Agendas* conference (2018).

- Staff have served on programming committees (e.g. ESCOM, ICMPC, Performance Science, SMC, SMPC, RMA, Mozart Society of America), and have convened themed sessions (e.g. Shephard: conferences in Basel, Chicago, London, Maynooth).

- Eight members of staff have given keynotes (e.g. Timmers gave seven keynotes, five overseas), while all staff have delivered invited presentations and seminars (e.g. Keefe Visiting Fellow, Oxford, 2016) (sometimes >20), and numerous conference presentations.

Service on international committees

- We shape international research via advisory board roles spanning music cognition (Dibben: RITMO Centre of Excellence, University of Oslo, 2018-; Timmers: EarOpen, Radboud University Nijmegen); audience research (Pitts: Maastricht Centre for Research in Orchestral Innovation and Experimental Concert Research project at Max Planck Institute, 2019-); musicals and popular music (McHugh: Collections Committee, American Songbook Foundation (2020-) and juror, Kurt Weill Prize, 2019; Dibben: International Advisory Board, *Popular Music*).

- We influence the wider research environment through leading roles on subject association councils (Shephard: Society for Renaissance Studies; Keefe: RMA) and composition juries (Nicholson: BASCA/The Ivors Academy 2006-18; juror, British Composer Awards, 2014-16). Timmers' presidencies of ESCOM (2015-21) removed obstacles to participation for

global regions that had not previously been actively engaged internationally in the discipline.

Editorship of journals and publications

- Staff have peer reviewed articles/monographs for 68 journals and 10 publishers.

- Those on editorial teams include: McHugh (*Studies in Musical Theatre*); Nicholson (University of York Music Press); Dibben and Timmers (*Empirical Musicology Review*); Timmers (*Psychomusicology: Music, Mind & Brain; Frontiers; Journal of New Music Research*); Dibben (White Rose University Press). Series editorships include Shephard (*Music and Visual Culture*, Routledge); McHugh (*Guides to Film Musicals*, OUP); Keefe (RMA Monographs; CUP's *Elements*, 1750-1850; also Chair of the Publications Committee, RMA).

- Our staff use these positions of influence, and their own edited collections, to foster ECRs and diversity: e.g. Dibben's co-edited volume *Sounds Icelandic* deliberately comprised both native Icelandic and international scholars as a means to decolonise area-based popular music research, and more than a third of contributors to McHugh's *Oxford Handbook* were ECRs.

Reviewing for research councils

Our researchers influence research funding decisions as:

- members of national peer review colleges: UK AHRC and UKRI International Development Peer Review Colleges (Dibben, Keefe); AHRC Technical reviewer (Moore);

- committee members of Learned Societies: Society for Renaissance Studies Post-Doctoral Fellowship/Museums and Galleries Award (Shephard);

- panel members and peer reviewers for national funding councils and charities in the UK (AHRC, ESRC, British Academy, Leverhulme Trust), and overseas (Austria, Belgium, Canada, Czech Republic, Finland, France, Germany, Ireland, Israel, The Netherlands, Norway, Switzerland).

Shaping institutional strategy elsewhere

Our researchers shape strategic decision making at other institutions via:

- promotions and appointments committees: >13 appointments at eight institutions;

- advising institutions on major internal funding allocations (Dibben: University of Oslo Life Sciences 'Convergence Environments');

- expert review of four UK institutional music research strategies, and subpanel member on REF2014 and 2021 (Dibben).

External examining (doctorates):

Staff regularly examine PGR submissions, including on over 20 occasions overseas.

Developing a global community for music research

Further to our vision for the next five years, we aim to continue leading on initiatives to internationalise, decolonise and increase access to music research. We have already hosted (prior to the pandemic restrictions) multi-location academic meetings, e.g. shared seminars with the Universities of Amsterdam and Jyväskylä, and the *Global Arts and Psychology Symposium* (2017), which connected four continents. In 2021 we will host the Cross-European Winter School and world-wide ICMPC-ESCOM: of the nine contributing countries, six are LMICs.