

<b>Institution: The University of Edinburgh</b>								
<b>Unit of Assessment: 28B (Linguistics)</b>								
<p><b>a. Overview</b></p> <p>Research in linguistics at Edinburgh is centred on Linguistics and English Language (LEL), part of the School of Philosophy, Psychology and Languages Sciences (PPLS), although some researchers reported here are affiliated to the neighbouring School of Informatics, with which LEL has multiple long-standing collaborations and shared centres.</p> <p>Research is conducted within 8 self-organising research groups with overlapping membership, reflecting the interdisciplinary nature of linguistics at Edinburgh:</p> <table border="0"> <tr> <td>Centre for Speech Technology Research (CSTR)</td> <td>Developmental Linguistics</td> </tr> <tr> <td>English Language</td> <td>Meaning and Grammar</td> </tr> <tr> <td>Language in Context</td> <td>Language Evolution and Computation (LEC)</td> </tr> <tr> <td>Language Variation and Change (LVC)</td> <td>Phonetics and Phonology</td> </tr> </table>	Centre for Speech Technology Research (CSTR)	Developmental Linguistics	English Language	Meaning and Grammar	Language in Context	Language Evolution and Computation (LEC)	Language Variation and Change (LVC)	Phonetics and Phonology
Centre for Speech Technology Research (CSTR)	Developmental Linguistics							
English Language	Meaning and Grammar							
Language in Context	Language Evolution and Computation (LEC)							
Language Variation and Change (LVC)	Phonetics and Phonology							
<p><b>b. Research strategy</b></p> <p>Our broad aim since 2008 has been to exploit and develop our remarkable breadth and depth, in generating <b>original theoretical work</b> in all the main subfields of linguistics, supporting theory with <b>rigorous, innovative empirical research</b>, and building on and developing our strong tradition of <b>interdisciplinarity</b>.</p> <p>Our core strategy for achieving this tripartite aim is one of enablement, rather than direction from the centre. While radical research innovation cannot be planned, we aim to recognise and foster it. Our current research goals arise from initiatives by individuals, research groups, and interdisciplinary collaborations.</p> <p>Our strategy for enablement rests on three main pillars.</p> <p><b>People:</b> We recruit, retain, support and develop outstanding researchers. In this period we have increased the number of open-ended positions in the unit by 33% (24 in 2008; 32 in 2013), appointing both established senior figures and early career researchers to ensure the sustainability of research excellence across the full range of our work.</p> <p><b>Community:</b> Researchers in LEL are part of a vital community. Our horizontal networks—within and beyond academia—are crucial to the day-to-day conduct of our research, which is frequently collaborative and strongly interdisciplinary. We believe that long-term sustainability also requires maximizing the impact of our research by making it visible, salient and accessible to the more extended community. <i>Bilingualism Matters</i> brings the results of current research on the benefits of bilingualism to communities across Europe; CSTR has active collaborations with Orange, Toshiba, Yamaha, EADS; Pullum's regular contributions to the hugely popular <i>Language Log</i> blog have been accessed around 1 million times. It is not only ideas that we share: as described in (e), a key part of our contribution to the research community is making generally available the resources we develop: databases, open-source software, corpora. We also foster vertical connections: a vital and enduring community requires strong ties between junior and senior researchers. Research-led teaching includes students in research activity from the undergraduate programme on. Our large cohort of 10 early career researchers play a central role in all our research groups.</p> <p><b>Infrastructure:</b> We work to provide the best possible infrastructure for research, whether the support is concrete and direct (world-class technical facilities like the Edinburgh Speech Production Facility and the new PPLS Developmental Research Suite) or intangible and indirect (time freed up by specialist administrative support and good policies for research leave and work allocation). We aim to be proactive and flexible in supporting the huge range of different types of research in the unit: from works of individual scholarship on the history of linguistics to international, multi-partner projects on speech technology.</p> <p>A key development in this period has been our relocation to a new, purpose-designed building. LEL has been part of PPLS since 2002, but for the first six years the subject areas of the School remained physically dispersed, with LEL itself spread over three different buildings. In 2008 LEL and Philosophy moved, with Informatics, into a striking new complex (project cost £42M) close to</p>								

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the building housing Psychology. This move has facilitated our collaborations with these sister disciplines, and brought numerous other advantages discussed below.

Research plans in all areas of our research that were outlined in our 2008 RAE submission have led to major achievements across the board. Since 2008 LEL researchers have published over 15 monographs or edited volumes, 230 journal articles, 130 book chapters, 120 proceedings articles. Here we highlight some achievements and outline future strategic aims and goals, organised by the research groups, the main fora for the development and execution of research plans.

[Researchers are listed in the group(s) where they have their principal affiliation. Targeted sources of funding are given in parentheses; dates indicate funding already secured; #n cross-refers to an output in REF2.]

**Meaning and Grammar** (Ackema, Bard, Cann, Cummins<sup>ECR</sup>, Gisborne, Heycock, Lascarides, Pullum, Rohde<sup>ECR</sup>, Sorace, Thoms<sup>ECR</sup>). The collective aim of this group is to develop theory on the basis of the richest possible set of empirical and formal results. A strategic goal in this period was to extend the expertise of the group—strong in morphology, syntax and semantics—to include pragmatics. This was achieved by the appointments of Cummins and Rohde.

*Selected research highlights:* • The first logical proof that the Gricean maxims of conversation are derivable from a game-theoretic model of human action and decision making [Lascarides #1]. • New arguments for the role of acquisition in syntactic change based on original empirical research in Scandinavian [Heycock #1,2,4]

*Indicative plans:* • Monographs on syntax (Cann, Gisborne, Pullum, Sorace). • Collaborative projects on diachronic change / typology [AHRC], transitivity alternations [Norwegian Research Council 2013–16: £670K total], morpho-syntax of agreement [Leverhulme 2013–15: £44K], formal semantics and pragmatics of non-cooperative conversation [ERC 2011-16: £390K].

**English Language** (Alcorn<sup>ECR</sup>, Giegerich, Gisborne, Hall-Lew<sup>ECR</sup>, Honeybone, Laing, Los, Maguire, Pullum, Trousdale, van Bergen): Important strategic aims for this group were to extend research strengths in English diachronic syntax and phonology, and to consolidate existing expertise in corpus-building and corpus-based research. These were achieved through the appointments of Los as Forbes Professor of English Language, and Alcorn as a Chancellor's Fellow. Both are centrally involved in developing the new Angus McIntosh Centre for Historical Linguistics (Director: Giegerich), the successor to the Institute for Historical Dialectology.

*Selected research highlights:* • The unique narrative approach to etymology of CoNE [AHRC 2010–13: £683K], creating a radical and dynamic re-shaping of the early history of English [Laing #1].

*Indicative plans:* • Monograph on the interaction between diachronic syntax and information structure • Monograph on representational historical phonology • Coordination of projects across research groups on the diachrony and synchrony of Scots.

**Language Variation and Change (LVC)** (Fruehwald<sup>ECR</sup>, Hall-Lew<sup>ECR</sup>, Honeybone, J. Kirby<sup>ECR</sup>, Maguire, Trousdale): Working in close contact with English Language, this lively new research group recently emerged from a successful reading group led by Hall-Lew and J. Kirby, and has been strengthened by the appointment of Fruehwald, a strategic hire to expand our capacity in quantitative sociolinguistics.

*Selected research highlights:* • First corpus of almost extinct Holy Island Dialect [BA 2012–14: £10K]. First unified account within diachronic construction grammar of grammaticalisation, lexicalisation and degrammaticalisation [Trousdale #1,3]

*Indicative plans:* • Study of variation in the speech of Scottish politicians [RSE 2013: £2K; BA 2013–14: £9K] • Collaborative project on Edinburgh English.

**Language in Context** (Gafaranga, Hall-Lew<sup>ECR</sup>, Joseph): This group has been the primary home of more than 20 PhD students since January 2008. Its work currently has two main foci: discourse analysis and the history of linguistics; there are plans for extending collaboration with researchers in psychology and education.

*Selected research highlights:* • “Massive, meticulous” (Silverstein—*London Review of Books*) biography of Saussure [Joseph #2]

*Indicative plans:* • Monographs on bilingualism as a conversational resource, and on the history and implications of the concepts of "abstract" and "concrete" in language. • Collaboration on project to publish all Saussure manuscripts on-line.

**Phonetics and Phonology** (Fruehwald<sup>ECR</sup>, Giegerich, Hall-Lew<sup>ECR</sup>, Honeybone, Iosad<sup>ECR</sup>, King, J. Kirby<sup>ECR</sup>, Maguire, Ota, Ramsammy<sup>ECR</sup>, Remijsen, Turk): We continue to develop the Edinburgh tradition of using quantitative and/or instrumental methods to elucidate questions of theory. Our strategic commitment to this area of research has resulted in four new open-ended appointments: two in phonetics (J. Kirby, Remijsen), and two in phonology (Iosad, Ramsammy); Ladd remains actively involved as a Professor Emeritus.

*Selected research highlights:* • Development of the Smooth Signal Redundancy Hypothesis [Turk #3]. • Proof that human languages can develop a 3-level vowel length system [Remijsen #4] and use tonal alignment distinctively [Remijsen #1]

*Indicative plans:* • Further investigation of suprasegmental phenomena in Nilotic languages as part of an international collaboration [VW Foundation 2013–15, £29K (total funding €300K)] • Monograph evaluating theories of speech production with focus on speech timing; further testing of these theories using electromagnetic articulometry in the Edinburgh Speech Production Facility

**Developmental Linguistics** (Ota, Schutter<sup>ECR</sup>, Smith, Sorace): The twin, sometimes overlapping foci of work in this group are phonological and lexical representations in second language, and bilingualism across the lifespan. The group's research in this latter area underpins the public engagement programme *Bilingualism Matters*. PPLS has invested in the infrastructure supporting developmental linguistics with the construction in 2013 of what is now one of the best-equipped language development labs in the UK.

*Selected research highlights:* • Sorace's Interface Hypothesis (20+ plenary addresses, invited article with peer commentaries [Sorace #1,2]. • The application of survival analysis (a technique developed in actuarial science) to identify a longitudinal effect of lexical input frequency on children's acquisition of consonant clusters [Ota #1].

*Indicative plans:* • Investigation of the role of babytalk lexical items in phonological development [ESRC 2012–16: £446K] • Developing research on interactions between language and executive function in bilingualism.

**Centre for Speech Technology Research** (Carletta, Clark, King, Wester): A collaboration between LEL and Informatics, CSTR has operated for nearly three decades. Exploiting the interdisciplinary setting, the research of this group combines findings in speech science and theoretical linguistics with recent machine learning techniques to make advances in speech technology, and, conversely, uses speech technology to inform speech science.

*Selected research highlights:* • Major progress on building unified models for speech recognition and synthesis and developing language independent techniques [SCALE, Marie Curie 2009–12: £301K; Simple<sup>4</sup>All, EC FP7 2011–14: £1,059K]. • Pioneering development of unsupervised approaches enabling personalised synthetic voices based only on untranscribed speech samples [EMIME, EC FP7 2008–11: £606K].

*Indicative plans:* • Development of novel factored models for recognition and synthesis that will enable very rapid adaption in speech recognition and truly controllable models of speech for synthesis [NST, EPSRC programme grant 2011-16: £7,650K; Simple<sup>4</sup>All; SIWIS, Swiss NSF 2012–15: £74K]. • Extension of work on unsupervised learning from adapting acoustic models to learning new representations of text [Simple<sup>4</sup>All]. • Development of more sophisticated models of speech, underpinning clinical applications of speech synthesis [Simple<sup>4</sup>All; SIWIS; MRC+MNDA 2013–17: £92K].

**Language Evolution and Computation** (Dunn, Feher, S. Kirby, Smith): LEC is a world leader in the modern study of the evolution of language, a field pioneered by the founders of this group, Kirby and Hurford (Emeritus). Since 2008 it has attracted over 25 PhD students, and hosted 4 postdoctoral fellows and 8 visiting scholars; currently Feher, a leading researcher on birdsong, is participating in LEC as a Newton Fellow to do collaborative work with Smith. LEC's work has featured prominently in the media (e.g. Horizon programme (BBC 2009), Morgan Freeman's Through The Wormhole (Discovery Science Channel 2012), news article in *Science* (Science

336.6080)). In this period the strategy of LEC has been to focus on three main areas: theoretical research into iterated learning [AHRC 2008: £211K, ESRC 2009 £387K]; development of methods for studying language evolution in the laboratory [ESRC 2009, as above, BA: £302K]; mathematical modelling of interactions between biological and cultural evolution of language. Dunn has recently joined in a part-time position to participate in research, teaching and supervision of students, contributing his expertise in language typology and phylogenetics and establishing a unique bridge between research in language computation and detailed philological work in historical linguistics, both existing strengths at Edinburgh.

*Selected highlights:* • Development of a method for looking at language change/evolution experimentally (iterated artificial language learning) [S Kirby #3, Smith #2], now widely adopted in other groups. • Experimental demonstration that key design features of human language arise from basic properties of cultural transmission through iterated language learning [S Kirby #3].

*Indicative goals:* • Theoretical, experimental and modelling work on the hypothesis that a range of structural properties of language arise from a trade-off between compressibility and expressivity [ESRC/AHRC/BAPDF]. • Investigation of how the operation of cultural evolution can be affected by population structure and dynamics. • Further work on the iterated learning of unpredictable languages [ESRC 2013-16 £266K, BA 2013-16 £240K] • Using modelling to raise questions for standard Evolutionary Psychology and accounts of linguistic nativism. Extend experimental techniques to cultural evolution of systematically structured behaviour in other species.

### c. People, including:

#### i. Staffing strategy and staff development

LEL continually renews its research strength through the recruitment and development of new generations of researchers. In the reporting period LEL has recruited 14 outstanding researchers, 11 to open-ended posts or tenure-track posts, and many at an early point in their careers (currently 10 are Early Career Researchers). Consistent with the nature of the unit, we seek to appoint researchers who are future leaders in their fields, but who can also build or strengthen connections beyond their immediate group. Some examples (among many): Smith in the LEC has active collaborations with physics and ethology; Hall-Lew, a founder of the LVC group, contributes to new ties with Phonetics and Phonology; Rohde builds on existing cross-disciplinary ties with Psychology, both by her own collaborations and by acting as co-Director for the new (2012) MSc in Cognition in Science and Society, run jointly by Linguistics, Philosophy, and Psychology.

A university initiative in 2012–13 made it possible for Alcorn, Cummins and Remijsen to be appointed to Chancellor's Fellowships, tenure-track positions structured to begin with a year almost entirely reserved for research, with teaching responsibilities accruing gradually toward a regular balance of research and teaching after 5 years. New lecturers are all given reduced loads of teaching and administration in their first year, and may also apply for accelerated sabbatical entitlement. Additional investment from the School has provided for significant start-up funds for all new lecturers and professors for expenses such as equipment and participant fees.

All new academic staff take part in a mentoring scheme, as well as receiving more general academic support from peers and senior researchers through the structure provided by the research groups. Early career researchers are particularly encouraged and guided by their mentors to take advantage of the PPLS internal research funds described below, as well as funds for conference attendance; all have taken up one or both from their first year on. All staff participate in a School-wide annual review process, which involves the updating of CVs and research plans. These are then the basis for a formal meeting with a senior colleague to review progress and goals, and to explore what support might be necessary to implement the plans for the future.

LEL aims to provide the kind of stimulating and supportive environment that can attract postdoctoral fellows as part of its research community, and in this period has benefitted from the contribution of a significant number: K. Smith (BA 2006–09), Truswell (BA 2008–11), Montgomery (ESRC 2008–09), Mills (ESRC 2009–10), Bonacina (ESRC 2010–11), Scott-Phillips (ESRC 2009–10), Leverhulme Early Career 2010–11), Nao (ESRC 2010–11), Cornish (BA 2011–13), Thoms (BA 2011–14), Feher (Newton 2012–14), Lochbihler (SSHRC 2012–14). In addition we host on average a dozen international visitors a year (Fulbright Fellows, Leverhulme Visiting Professors, and others) staying for periods of one month to over two years: visitors in this period have included

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Ingo Plag, Didier Demolin, Luciana Storto, Ans van Kemenade, Nikolaus Ritt.

All research-only staff are fully integrated into the department. They play a central, often leading, role in the research groups and numerous affiliated reading and study groups (in a typical month there are over 30 research seminars/talks on topics in linguistics advertised to the community of staff and students), and have equal access to internal research funds (see (d)). The University provides support for research staff through the Institute for Academic Development (IAD), which, together with HR, organises workshops on various aspects of career development, some specifically for research-only staff. The School Research Office regularly advises on available support and training. The work of the University in implementing the principles of the Concordat to Support the Career Development of Researchers (of which the setting up of IAD in 2010 was a part) was recognised in 2010 by an HR Excellence in Research award.

LEL staff have taken advantage of activities organised by HR and IAD that include a 4-day leadership programme, time-management workshops, and Equality and Diversity training. Information Services (IS) provide courses for staff and students on topics in computing and use of databases. Additional training in specialist areas is provided within the School (e.g. a regularly-offered course in the statistical package R and sessions on the use of our eye-tracking equipment).

The University's policies on equality and diversity, and on supporting staff with family responsibilities, are set out clearly and publicly; in recent years a number of LEL staff have taken advantage of the flexibility offered to tailor their working hours. The University has a transparent policy on career progression at all levels: guidance and criteria are available on the HR website and individual guidance is provided via a School-level committee with representatives from all subject areas, via annual review, and, for early career staff, via the mentoring process. Since January 2008, there have been 7 promotions (1 to Senior Lecturer, 1 to Reader, 5 to Personal Chairs). Of the 11 professorial staff on open-ended contracts, 5 (45%) are women.

Time is a researcher's most basic need. Teaching and administrative workload is monitored both at subject area and School level, and is adjusted to allow for time allocated to funded research projects. Funds from such "buyout" are pooled to employ teaching fellows and tutors. All academic staff whose normal duties include research, teaching and administration are entitled, and encouraged, to apply for a semester of research leave to be taken after completing 6 semesters of normal teaching and administrative duties (possibly earlier in the case of newly appointed lecturers—see above). All such applications from LEL staff in the reporting period have been granted. Applications for external funding for research leave are supported, including (after a review process) schemes where the University commits to part-funding the post.

PPLS has two Knowledge Exchange promoters (one—King—within LEL), who provide subject-specific guidance and liaise with the College KE team, who run regular "learning lunches" and give advice and funding for innovative schemes (£13K awarded to LEL projects). The team have been advising Sorace's public outreach work on *Bilingualism Matters*, also supported in 2009–10 by a Fellowship from the Edinburgh Beltane, one of the Beacons for Public Engagement. PPLS supports KE activities through a School fund that supplements the university-wide provision.

## ii. Research students

LEL has a thriving postgraduate programme, with an average of 57 PhD and Research MSc students registered each year, coming from over 25 different countries. Students are supported by a dedicated PPLS PG Office with three full-time administrative staff, liaising with the Postgraduate Director and all academics involved in supervision and training. Reflecting the extraordinary breadth of our department, and its emphasis on interdisciplinarity, recent research topics range from code-mixing in Sri Lankan popular music to the nature of the phonological deficit in dyslexia, from a dynamic syntax account of argument realisation in Chinese to unsupervised learning for text-to-speech synthesis. A significant number of students (e.g. 15 in 2013) are jointly supervised by staff in LEL and other areas including Celtic Studies, Divinity, Education, Informatics, Philosophy, Physics, and Psychology.

An integral goal of the design of our new building was to provide first-class facilities for research students that would foster their full integration into the intellectual life of the unit. As a result, we now offer all our research students office space, with 24-hour access, in purpose-designed shared offices in the closest proximity to staff, to the PG Office, to bookable meeting rooms and well-

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equipped kitchens. All postgraduates have unlimited photocopying, exclusive use of a MacBook laptop, and specialised computing support from the PPLS computing staff, as well as general-purpose computing support from University Information Services [IS].

Students have the opportunity either to enter the PhD programme directly if they have sufficient prior qualifications, or to follow a 1+3 programme, completing one of our 7 MScs. Funding includes studentships from EPSRC and from AHRC—LEL was very successful in the last round of the Block Grant Partnership with an initial allocation of 3 PhD studentship each year of the 5-year grant starting in 2009–10; AHRC funding will continue up to 2019 following our participation in a successful Scotland-wide consortium bid. Funding is also available via two pathways (Language Sciences, and Social and Applied Investigations in Language (SAIL)) that form part of the ESRC Scottish Doctoral Training Centre. Students in this period have also been supported by Carnegie, Commonwealth, and China Scholarships, and by a range of University funding, including the Principal's Career Development Scholarships, an innovative scheme integrating research, training and career development that has its origins in a PPLS pilot.

All research students have at least two supervisors, who themselves take part in regular training for this role, provided by the Institute for Academic Development (IAD). One-to-one meetings of students and supervisors are held several times each semester, with special emphasis on frequent and regular meetings during the first year of study. There are reviews at the end of each academic year, involving at a minimum the student and all supervisors, but with an "outside" member also participating in the end-of-first-year review and in the subsequent feedback.

In addition to individual advice from their supervisory team, students attend research methodology courses (including specific guidance on research ethics), academic courses pertinent to their research project, and skills training courses offered by IAD and IS. The Careers Service provides services and advice specific to postgraduate students, and joint workshops with IAD on preparation for the workplace. As part of their training and development, students are given the opportunity to undertake paid undergraduate teaching, on the basis of a fair and open system for allocation of such opportunities. Training and support for this teaching are offered by the School as well as IAD. Students' teaching activities are monitored by staff and they are provided with individual feedback and advice.

Most importantly, our students are full members of our research community. All postgraduate students belong to a research group (or more than one—as with the staff, the research interests of students often span more than one area), and play an active part, presenting their own work, joining in discussion, and organising the groups' programmes of activities. Many also belong to the numerous reading and study groups, most jointly organised by staff and students. We encourage and enable student-led initiatives. The School's PG Training and Development Fund has in recent years been used by students to run for each other's benefit a course in LaTeX for linguists, a monthly interdisciplinary *Language at Edinburgh* lunch where students from LEL, Philosophy, Psychology and Informatics present posters, the annual LEL Postgraduate conference, and three retreats where LEL students have organised a weekend built around training sessions and research presentations.

Students are encouraged to communicate their research findings widely, and given guidance and support to do so. Research groups provide opportunities for brainstorming new ideas and (together with the annual PG conference) a venue for dry-runs for talks at national and international conferences; funding comes from the School's PG Research Support Fund (approx £8,800 awarded annually to LEL students for travel, conference attendance and other research support). Students engage with the wider public from the earliest stages of their careers: the thriving undergraduate linguistic society (LangSoc) has organised a system of undergraduate tutors to work with schoolchildren preparing for the Linguistics Olympiad; postgraduate students have devised and run activities at the Edinburgh International Science Festival (one of the largest science festivals in Europe), and postgraduate volunteers are an integral part of the *Bilingualism Matters* team providing advice and support for bilingual families.

Some indication of the vitality of student-led research in LEL comes from the early achievements of our students. In the 5 years that the Richard Hogg prize for English Language / English Linguistics has been awarded, it has been awarded 4 times to work done by Edinburgh students: Alcorn (2008, paper based on MSc dissertation), Weir (2009, paper based on UG dissertation), Soskuthy

(2010, paper written in course of PhD study), Edelstein (2013, paper based on PhD dissertation), all subsequently published in *English Language & Linguistics*. The first Richard Pemberton Prize for the best student presentation at the Annual Meeting of BAAL (2012) was jointly won by an Edinburgh PhD student, Daniel Lam. Scott-Phillips won the British Psychological Society's award for Outstanding Doctoral Research in 2010, and as a postdoctoral fellow in 2011 he won the European Human Behaviour and Evolution Association's New Investigator Award. As an MSc student, Tatiana Reid wrote the first ever study on the grammar of the Nilo-Saharan language Thok Reel, funded by an award from the Endangered Languages Documentation Programme. Christine Cuskley's work featured on the front page of *New Scientist* (2821: 2011). Students have published single-authored and co-authored papers in (among others) *IEEE Transactions*, *Proceedings of Interspeech*, *PNAS*, *Trends in Cognitive Sciences*, and *Nature*. Several PhD dissertations have appeared as monographs (Koshiishi, Patten, Rodriguez Vasquez, Arakaki).

#### d. Income, infrastructure and facilities

LEL has continued to be highly successful in securing funding to support the full range of our research, with research spend averaging over £1.3M each year in this period. Despite the challenging environment, we expect to continue this success: with over £1.07M of additional income already secured for research beginning after July 2013.

The operational infrastructure that makes this possible is provided both at University and at School level. Advice on the identification of suitable funding sources (via a comprehensive website, regular events on particular themes, some specifically aimed at Early Career Researchers, and individual consultation) and on the process of writing grant applications, is provided at the University level by Edinburgh Research and Innovation (ERI), a wholly owned subsidiary of the University.

Researchers in LEL are further supported by the PPLS Research Office, with three full-time staff, and the School Administrative Officer for Finance—all housed within the PPLS building. The PPLS Research Office provides local support and one-to-one advice, at all stages of application and subsequently during the life of a grant or fellowship. The assistance provided in the construction and monitoring of budgets and other logistics frees up research time for grant applicants and grant holders. CSTR in particular also takes advantage of the expertise of the Informatics Research Office in administering large multi-site EU grants.

The PPLS Research Office provides support for the Research Committee, made up of academic Research Advisors for the three subject areas of the School, and headed by the School Research Director. The Committee develops and monitors School research initiatives and policies; it coordinates a system of internal peer review of proposed funding applications—this is in addition to the cycle of presentation and feedback that takes place within research groups—and reviews applications for research leave and for travel/conference funding. This funding—currently up to £1,000 per year per individual—is available to all academic staff, including those in research-only posts. A “PI Bank” additionally puts a proportion of overheads directly under the control of researchers; as a side-benefit further incentivising application for external funding.

In 2009 the Committee instigated—and now manages—a strategic initiative that provides internal funding (up to £4000 per project) for pilot projects, visits for the purpose of research collaboration, and knowledge exchange. These funds are in addition to other University funds for these purposes. Both Ota's £446K ESRC project and Smith's joint project with Wonnacott [ESRC: £266K], among others in this period, build on pilots funded by this internal scheme.

The scholarly and physical infrastructure that supports research is also provided and managed at both School and University level. As well as the nearby Scottish National Library, researchers in LEL can draw on the resources of the University Library, one of the largest research libraries in the UK, with over 3.5M printed items, 22K unique serial titles (mostly available as e-journals), 0.5M e-books. The Main Library, the most relevant to researchers in LEL, is situated within a few hundred metres, and has just completed a major redevelopment, with much improved facilities for researchers and students. The close collaboration between LEL, Psychology and Informatics includes sharing of an extensive range of corpus materials and tools, including those produced in Edinburgh (see also Section e).

Much of our research requires dedicated computing infrastructure, specialised equipment and software, and—crucially—staff with the knowledge to support it. The move to our new building has

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brought major benefits here too, not only because of improvements in the physical plant (new purpose-built laboratories) but also because the increased interdisciplinary collaboration has made possible a strategy of developing facilities to be available to all researchers (staff and students), rather than the more typical pattern of distributed individual labs. The Edinburgh Speech Production Facility and the PPLS Developmental Research Suite are excellent recent examples of this strategy. Our School-wide technical provision, overseen by an Equipment Committee with Turk as convenor, gives us the opportunity for within- and cross-disciplinary sharing of techniques and equipment, and provides long-term knowledge continuity. The team of 8 computing support staff based within the School and working in close liaison with the academic members of the Equipment Committee not only support research teams, but provide training sessions for staff and students. This enables us to sustain cutting-edge research and to offer research-led teaching, with undergraduates being introduced to the use of these facilities from the second year on. A new full-time programmer was hired in 2013 to provide coding expertise and to teach transferrable skills to students. Our technical research facilities include

- 2 computing labs for teaching and training postgraduates and undergraduates in the use of research hardware and software
- multiple suites of well-equipped experiment booths, 12 sound-deadened
- 5 sound-recording studios, one near-anechoic
- 2 eye-tracking facilities, each with 2 eye-trackers, accessible for staff, postgraduate and (one lab only) undergraduate research
- EEG/ERP facility
- Electromagnetic Articulometry and Palatography facilities (Edinburgh Speech Production Facility, set up as an EPSRC-funded joint project [2007–10] with Queen Margaret University); the first facility in the world to have two synchronized articulometers [Geng et al 2013]
- PPLS developmental research suite, a new (2013) purpose-designed suite with multiple rooms, equipment including a remote eye-tracker and a preferential looking set-up, a child-friendly reception/waiting area and a lift for buggy access.

#### e. Collaboration or contribution to the discipline or research base

Fundamental to LEL's strategic vision is a commitment to building resources that can be used for research not only within the unit, but by the entire academic—and wider—community. CSTR continues maintenance and support for our internationally-renowned Festival speech synthesis system, and has added releases of other major tools for statistical parametric speech synthesis (the HTS toolkit, in collaboration with Nagoya Institute of Technology, Nara Institute of Science & Technology, Carnegie Mellon), for sub-space GMM speech recognition (the Kaldi toolkit with Microsoft Research and several others), plus numerous data sets and other tools (see also REF3). The Edinburgh Speech Production Facility described above is shared with Queen Margaret University, a good example of our close collaboration with Speech and Language Sciences at QMU. It is publicly available for researcher use, as is a recorded corpus of synchronous acoustic+articulatory recordings of 6 dialogue sessions. Adding to the previous online release of the Linguistic Atlas of Early Middle English and the Linguistic Atlas of Older Scots, in 2011 we released the AHRC-funded online Linguistic Atlas of Late Middle English (eLALME), and in 2013 the Corpus of Narrative Etymologies from Primitive Old English to early Middle English.

All members of LEL are involved in international collaborations and/or joint projects and networks beyond the University, and all contribute to the discipline through refereeing for journals and book publishers, research funding bodies, and conferences. Here we can only single out a very small subset of highlights not already mentioned.

**International and interdisciplinary collaborations.** Highlights include Bard: one of the two founders of RefNet (interdisciplinary network on reference [EPSRC 2012–15]. Gafaranga: joint project 'Language Policy and Practices at the Rwandan Parliament' with members of the Kigali Institute of Education [Nuffield 2009]. King: collaborations with Toshiba Research Europe Ltd, Nokia Corporation, and the external collaborators in the Simple<sup>4</sup>All project. Rohde: collaboration and co-authorship with over 15 researchers in linguistics, psychology and cognitive neuroscience in the US and Germany. Lascarides: PI on JAMES project (FP7 2011–14) involving 5 European institutions in the UK, France, Germany and Greece. Smith: collaboration and co-authorship with researchers in English, psychology, cognitive science and physics in the UK, US and Australia.

## Environment Template (REF5)

Sorace: bilateral UK-Netherlands project on early child bilingualism, with collaborators in Amsterdam, Meertens Institute, Utrecht, Thessaloniki [NWO 2008–10].

Since 2008 LEL staff and research students have (co-)organised over 15 **conferences**, both at Edinburgh and elsewhere in the UK and abroad. Significant meetings hosted at Edinburgh include the 11<sup>th</sup> Congress of the International Association of the Study of Child Language (IASCL) 2008, 23<sup>rd</sup> Comparative Germanic Syntax Workshop 2008, 50<sup>th</sup> Anniversary Jubilee Meeting of the LAGB 2009, 5<sup>th</sup> Inter-Varietal Applied Corpus Studies conference 2010, international workshop on Language as an Evolutionary System; a Multidisciplinary Approach 2010, 5<sup>th</sup> New Reflections on Grammaticalization conference 2012, Listening Talker Interdisciplinary Workshop 2012. Also to be mentioned here is the contribution of King as organiser of “Blizzard,” the international evaluation campaign for speech synthesis, with its annual workshop, 2006–present. Looking forward, the Phonetics and Phonology research group forms a core part of the Scottish Consortium who will host the 2015 International Congress of Phonetic Sciences, to be held in Glasgow.

LEL researchers at all levels of seniority have given over 80 invited talks at international academic meetings since 2008. Of these, **plenaries** included, among many others: 11<sup>th</sup> Conference on Laboratory Phonology, Wellington 2008 (Turk), Sinn und Bedeutung, Stuttgart 2008 (Lascarides), 50<sup>th</sup> anniversary LAGB meeting, Edinburgh 2009 (Heycock, Cann (delivered by co-author)), 7<sup>th</sup> Speech Synthesis Workshop, Kyoto 2010 (King), Henry Sweet Society for the History of Linguistic Ideas, Sheffield 2010 (Joseph), 32<sup>nd</sup> ICAME Conference, Oslo 2011 (Laing), 11<sup>th</sup> Computability in Europe Conference, Bulgaria 2011 (Pullum), Racing Language, Languaging Race, Stanford 2012 (Hall-Lew), Auxiliary Selection: Gradience and Gradualness, Freiburg 2012 (Sorace, whose work was the basis for the conference), Bilingualistics, Barcelona 2012 (S. Kirby).

Since 2008, members of LEL have been on the **editorial boards** of over 10 book series and over 25 journals—including *Applied Linguistics*, *Brain and Behavioral Sciences*, *Cognitive Science*, *Computer Speech and Language*, *Discourse & Dialogue*, *English Language and Linguistics*, *Journal of Phonological Analysis*, *Journal of Comparative Germanic Linguistics*, *Journal of Multilingual and Multicultural Development*, *Language and Computation*, *Language and Communication*, *Language Sciences*, *Lingua*, *Linguistic Analysis*, *Linguistic Inquiry*, *Linguistics & Philosophy*, *Semantics & Pragmatics*.

Many have also held, or hold, **editorships of journals and book series**. Members of LEL have acted as editors of special issues of *Cognitive Linguistics*, *Computer Speech and Language*, *English Language & Linguistics*, *IEE Journal of Selective Topics in Signal Processing*; have founded and edited 5 book series published by Edinburgh University Press, which Giegerich & Joseph (EUP Committee members) have guided to become a major player in linguistics publishing; act as series editor for Oxford Studies in Typology and Linguistic Theory (Cann), Associate Editor of *Historiographia Linguistica* and co-Editor of *Language and Communication* (Joseph), co-Editor-in-Chief and Review Editor of *Journal of Linguistics* (Heycock, Ackema), Associate Editor of *IEEE Transactions on Audio, Speech and Language Processing* 2006–09 (King), Associate Editor of *Journal of Phonetics* 2005–09 (Turk); founding and current co-Editor of *Word Structure* (Giegerich).

Members of LEL, from ECRs to senior researchers, are active in **research councils, national and international committees**, holding positions during the reporting period in, among many others, the AHRC Peer Review College, AHRC Panel on Languages and Literatures, AHRC Postgraduate Committee, EPSRC Peer Review College, Cercle Ferdinand de Saussure, Executive Committee of the Henry Sweet Society, International Association for the Study of Child Language (IASCL), IEEE Speech and Language Processing Technical Committee, International Society for the Linguistics of English (ISLE), and grant/postdoctoral funding review panels in Canada, Ireland, Finland.

Contributions to the field have been recognised by a number of **awards**. Student awards have already been mentioned. King was elected a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) in 2008, Pullum a Fellow of the BA in 2009, S. Kirby a Fellow of the Royal Society of Edinburgh (RSE) in 2011, joining Giegerich and Sorace. Smith was elected to the RSE Young Academy in 2012. Other awards and fellowships won by members of LEL include an AHRC award to Joseph in 2008, for his essay on *The Value of Humanities Research*, and the award of a Senior Research Fellowship to J. Kirby by the Center for Khmer Studies (2011).