



BASQUE EXCELLENCE RESEARCH CENTRES 2022-2025 PROGRAMME

**DIRECTION FOR RESEARCH
VICE-MINISTRY OF UNIVERSITIES AND RESEARCH**

Ekintza Plana | Plan de Acción | Action Plan

Zentroa | Centro | Centre

Donostia – San Sebastián 2021



**BASQUE CENTER
ON COGNITION, BRAIN
AND LANGUAGE**



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1. The Centre: Governance, infrastructures, management for excellence and contribution to the Basque Science System

1.1. General description, scientific field and main strategic objectives of the centre.

This section should include (Max. 3 pages):

Rationale of the creation and development of the centre. Mission and vision of the centre. Definition of medium to long-term strategies and areas of activity, including completion of the recommendations made by the evaluation board in both the previous BERC call and midterm follow-up.

BCBL, Understanding Language in the Brain.

Rationale of the creation and development of the centre

The BCBL—Basque Centre on Cognition, Brain and Language (www.bcbl.eu)—is a **world-class interdisciplinary research centre for the study of cognition, brain and language** founded in September 2008. It is one of the centres of the BERC network (Basque Excellent Research Centres). Its mission is to provide a platform for researchers and professionals to carry out **frontline research, development, innovation, training, education and knowledge and technology transfer** in the area of **language sciences**, complemented with science dissemination and outreach.

The main goal of the centre is the study of language from an experimental point of view. Language and reading are the most unique human abilities and involve complex cognitive processes. However, despite current impressive technological and scientific advances, we still do not understand the complexities of the cognitive processes involved, the causes of language disorders and reading disabilities and how to remedy them, or what would be the best way to learn a second language in our multilingual, globalised world. The BCBL carries out research using the most advanced techniques in these fascinating areas.

The BCBL is located in Donostia-San Sebastián, an **ideal and unique environment to study language**. It offers access to speakers with a wide range of linguistic profiles (monolinguals, early and late bilinguals) and a combination of languages that is very different from a typological point of view, such as Basque, Spanish, French, and English. As an isolated language, **Basque has unique characteristics** and therefore provides an unrivalled opportunity to unveil both the specific and the universal characteristics of language. Importantly, to pursue our aims, the centre uses a variety of methods, including **cutting-edge neuroimaging techniques**, behavioural methods and computational modelling in our different labs (see description below). In addition, since the moment we started operations, we opened calls to recruit the best scientists from all over the world (staff scientists, postdoctoral researchers, etc.) and hire **highly selective supporting personnel** (managers, technical staff, etc.). We managed to assemble **a unique combination** of outstanding researchers coming from many different labs, universities, **nationalities** (more than **29 different** ones since the birth of the centre, and **15 different nationalities currently working at the BCBL**) and backgrounds (linguists, engineers, psychologists, medical doctors, etc.), all chosen through a very competitive process, always under the principles of equity, transparency and concurrence. Every recruitment process is open, efficient, transparent, supportive and internationally comparable, as well as tailored to the type of positions advertised, being the EU's OTM-R (Open Transparent and Merit-based recruitment strategy) fully implemented. We have been using the best selection practices with selection committees with diverse expertise, competence, adequate gender balance, external expert assessment, and face-to-face interviews.

Thus, **the combination of a first-class centre equipped with the most advanced research techniques, a unique linguistic environment, and an exceptional combination of different human resources makes this excellence research centre unique in the world**. The International Scientific Advisory Board (ISAB), composed of international highly-reputed scientists led by Professor Mangun from the University of California at Davis (founding director of the Centre for Mind and Brain at UC Davis), is actively participating in shaping the Strategy and Scientific decisions of the Centre providing an independent vision of our activities from an international perspective. The last report from the ISAB dated November 2020 is attached as Annex 1.

To achieve the specific aim of our research, that is, understanding the neurocognitive mechanisms involved in the acquisition, comprehension and production of language, we designed three lines of research when the centre was founded: (1) **Language acquisition, representation, and processing**; (2) **Multilingualism**; and (3) **Neurodegeneration, language, and learning disorders**.

In addition, we were **committed to education, science dissemination, and knowledge and tech-transfer**, with the aim of **contributing to social welfare by applying the knowledge and technology derived from our**

research. Some examples are the Master in Cognitive Neuroscience of Language, the PhD programme in Linguistics in collaboration with the University of the Basque Country UPV/EHU, Neure Clinic—a clinic for advanced diagnosis of developmental disorders—or a collaboration with neurosurgeons from Hospital Cruces to assist them during surgery and previous presurgical mapping.

The centre was set up in December 2008, when we began recruiting personnel and creating the necessary research environment, including research equipment. After the planning and start-up phases, on-site research started in January 2010. Some activities carried out then, amongst others, included (1) recruiting personnel (researchers, technical and administrative personnel), (2) designing the working area and the laboratories, (3) deciding on and acquiring the equipment, (4) developing procedures for the functioning of the centre, (5) creating the webpage and the web *Participa* that allow us to advertise experiments and participants to book the experiments at a particular time, (6) launching procedures and campaigns to recruit participants with different profiles (undergraduates, patients, babies), (7) training research assistants to help create experimental materials in Spanish and Basque and run the experiments (8) creating, in collaboration with the UPV/EHU, a master's and a doctoral programme in Cognitive Neuroscience.

In 2015 the centre was granted with the “Centre of Excellence Severo Ochoa” Award, within the subprogramme of Institutional Strengthening of the Spanish Economy and Competitiveness Ministry (MINECO), initially for the 2016-2019 period, and it has been successfully renewed in 2021 for the 2022-2026 period, with a final score of 99.60 out of 100.

The Overall remarks on the final evaluation review, received in July 2021, indicate that:

The BCBL is a centre of excellence with a clear mission, high productivity, diversity, and evident projections for the future. The new Strategic Research Plan is promising, and its success is backed up by strategic hires, promotions, filling gaps (e.g. computational modelling) that will undoubtedly lead to more scientific success and national and international recognition. The centre is very active in building its reputation worldwide and already recognised as one of the most influential European centres for studying languages. It benefits from the peculiarities of its environment, particularly to study bilingualism in a region where the Spanish and the neighbouring French learn Basque and their mother tongue. The centre is also interested in issues related to language development and its disorders. The scientific output is exceptionally high quality, and publication impact patterns reflect high standards of stability and persistence.

The BCBL is now internationally recognised as a hub for exceptional young researchers that contribute to high-quality science and become leaders in their fields. Today, the BCBL comprises 80 Researchers (Professors, Post-doctoral fellows and PhD students) from 15 different countries with an average age under 35, supported by a Lab team (14 members), Tech-Transfer (5), IT (3), and a Management Department (9).

Mission, vision

The mission of the BCBL is to provide a platform for researchers and professionals from related areas to carry out frontline research, development and innovation in the field of Cognitive Neuroscience of Language. We are a multidisciplinary research centre, within the Basque Country Science Network, dedicated to pursuing excellence in research, training and knowledge transfer within this area.

Aim of our research: The specific aim of our research activity is to unravel the neurocognitive mechanisms involved in the acquisition, comprehension and production of language and language disorders, with particular emphasis on bilingualism and multilingualism. Some of the areas we study include the processes involved in normal child language acquisition and second language learning in adults, as well as language disorders, developmental disorders, and the language-related effects of brain surgery, brain damage, ageing and neurodegeneration, and language use in different social contexts.

Our commitment: Our commitment to education and knowledge transfer in the area of Cognitive Neuroscience extends across different contexts, including university, healthcare and social and business environments, with the aim of contributing to social welfare by applying the knowledge and technology derived from our research. To this end, we have forged links with institutions and organisations in both the local and wider communities, to provide expertise, consultancy and technology-development services, all to the highest international standards.

Research Agenda: Our research agenda also takes advantage of our centre's location in the bilingual Basque Country to study language processing in Basque and Spanish.

Definition of medium to long-term strategies and areas of activity

The BCBL Research Programme for the next term 2022-2025 is two-pronged: (1) Investigating the basic processes underpinning language and language impairments; (2) Translating knowledge of basic processes to applied uses in society. To do so, firstly, we have optimised our research lines to address new ground-breaking



directions on language research. The objective is to continue concentrating our efforts on addressing frontier research on language and language disorders. Secondly, we expect to grow, in terms of high-skilled researchers, incorporating new capabilities and more expertise on different and complementary areas to our current strengths, reinforcing multidisciplinary and combining theoretical depth in different areas of cognitive neuroscience with expertise in advanced neuroimaging and other methods. We will increase the depth and impact on the research done, spread the training capacities, and raise our international visibility. Thirdly, we need to improve and update our facilities, to keep improving our research and be appealing to young researchers. Fourthly, we would like to play a fundamental role contributing to more applied fields such as (1) Neuroscience and Education, bringing neuroscience to inform education in sensitive areas such as methods for learning to read, the time for introducing second language learning or reading in another language, detecting learning disabilities early, and developing software for learning a second language and diagnosis and remediation of language disorders, and (2) Neuroscience and Health, using neuroscience to improve brain surgery, improving perspectives of brain damage recovery and neurodegeneration, and developing software for training patients with aphasia and neurodegeneration.

Completion of the recommendations made by the evaluation board in both the previous BERC call and midterm follow-up.

All the recommendations made by the evaluation board, in both the previous BERC call and the midterm follow-up report, have been considered, and actions have been implemented as per this Strategic Plan. Throughout this document, we will address all these improvement suggestions one by one:

IMPROVEMENT AREAS according to INITIAL EVALUATION (January 2018):

- *New staff might be needed to develop the research line on neurodegeneration, stroke, ageing, and the neuroscience of education.*
- *The computation modelling on all research lines is not strongly developed.*
- *Some attention should be paid to publications as the distribution of publications across first-, second-, and third-tier journals display a rather lower number of high- impact journal successes in the last period.*
- *The organisational structure of the centre could be defined as hierarchical and this may be hindering adequate development of the potential of both senior and junior members of staff.*
- *While the BCBL attracts many young researchers, the representation of senior staff and senior researchers is generally still missing.*
- *The International Scientific Advisory Board lacks gender balance and some attention should be paid to this.*

IMPROVEMENT AREAS according to MID-TERM EVALUATION (March 2020):

- *Developing areas may need more short-term evaluation and follow up.*
- *Review whether the collaboration with external researchers being initiated in this period to include computational modelling expertise in the already existing research lines is working.*
- *The match between the research lines and the group organisation is difficult to see since many groups contribute to the three research lines in a transversal manner. While this might have the advantage of fostering between group collaboration, it might also introduce some difficulties in some decisions regarding the research lines. But this is something to evaluate and assess in the future, since the reorganisation of the decision structure and research lines is very recent.*
- *The groups' structure has been strengthened through the creation of a Directorial Executive Board composed of group leaders with monthly meetings with the director and manager to decide on scientific and managerial issues. Thanks to this, in general, the representation of senior staff or senior researchers has been strengthened.*
- *To specify that now we have more lines and that these lines now reflect more closely the group structure while still allowing for transversal collaborations.*

1.2. Governance and management

This section should include (Max. 4 pages):

Description of the legal entity of the centre and the partner institutions/persons and the agreements among them and the centre. Organisation of the centre. Systems or procedures for internal evaluation and quality assurance.

The BCBL was established as a non-profit association on November 19, 2008. The Association currently comprises the following **founding partners**:

Governing Bodies

The General Assembly is the Association's supreme governing body; it includes all members.

The Steering Committee is the body responsible for administering the Association; it ensures that the articles of the Association are complied with and that the agreements reached at the General Assembly are fulfilled.

The Chairman of the BCBL's General Assembly and Steering Committee for the 2018-2021 period has been Ikerbasque, the Basque Foundation for Science, represented by:

- Aldofo Morais Ezquerro, Viceconsejero de Universidades e Investigación del Gobierno Vasco (Basque Government Deputy Councilor for Universities and Research).

Governance

The BCBL is a non-profit institution. The structure and composition of the centre are based on the BERC (Basque Excellence Research Centre) model, developed by the Basque Government and Ikerbasque, the Basque Foundation for Science. The main Management Board is the **General Assembly**, in which all BCBL partners (the Basque Government through Ikerbasque, the University of the Basque Country UPV/EHU, Innobasque—the Basque Innovation Agency—, and the Diputación Foral de Gipuzkoa—Provincial Government—are represented. The General Assembly delegates a **Steering Committee**, which meets several times per year and ensures the proper management of the centre. Both the General Assembly and the Steering Committee are headed by the President of the BCBL, who is the Deputy Minister of Universities and Research of the Basque Government.

The International Scientific Advisory Board (ISAB) of the BCBL is an external strategic body consisting of renowned international researchers (Anne Cutler, Ron Mangun, Jay McClelland, William Marslen-Wilson, Cathy Price, Tim Shallice), all high-profile scientists with extensive experience in the management and evaluation of top-tier research centres. The main role of the International Advisory Board is to advise on the centre's orientation and overall strategy, providing an independent vision of our activities from an international perspective. Having incorporated Cathy Price to the ISAB in 2020, the composition of the ISAB is now better gender-balanced, according to the recommendation received from the BERC Evaluation Board.

Internal organisation

The **Scientific Director** provides scientific and management leadership in the BCBL by defining and coordinating the implementation of the overall strategy of the centre. The Scientific Director promotes a comfortable atmosphere that stimulates high-quality research production, efficient collaborative management, and technical support. As the main centre representative, the Director also designs and promotes alliances and relationships with partners and stakeholders to achieve BCBL's primary objectives. While the director of the centre provides leadership, responsibilities are highly distributed among researchers, fostering collegial strategic decisions.

The **Group Leader Committee**, which includes the Scientific Director, the General Manager and the Group Leaders, meets once per month to coordinate activities, recruitment and lab organisation as well as funding to establish priorities, follow the progress of research projects and support management and outreach structures at the centre.

The **Scientific Committee** evaluates all the projects to be carried out in the BCBL and is composed of three Group Leaders, currently, Dr. Martin, Dr. Molinaro and Dr. Paz Alonso.

Ikerbasque
Basque Foundation for Science
www.ikerbasque.net

ikerbasque
Basque Foundation for Science

Innobasque
Basque Innovation Agency
www.innobasque.eus

innobasque

Provincial Government of Gipuzkoa
www.gipuzkoa.eus



University of the Basque Country
www.ehu.eus



Basque Government
www.euskadi.eus





The **Ethics Committee** evaluates that all the projects comply with the ethical rules and is composed of three Group Leaders, currently Dr.Kalashnikova, Dr.Lallier and Dr.Mancini. When additional external advice is needed, we contact the Basque Ethics Committee (Comité de Ética de la Investigación con medicamentos de Euskadi—CEIm-E).

The **PhD Graduate Directors** in charge of running the PhD programmes are two Group Leaders, currently Dr.Soto and Dr.Samuel.

The **Headmasters** in charge of running our MSc programme are two Group Leaders, currently Dr.Caballero and Dr.Samuel.

The **Researchers** are grouped into research groups that dynamically change/increase as research programmes develop, new human resources are recruited or new grants are obtained. They are led by a Group Leader (see full list at www.bcbi.eu). The Group Leader provides expert guidance to PhD students and postdoctoral researchers and is also responsible for establishing the research goals of the group and for managing the group budget. Each group leader is independently responsible for establishing the research goals of their group, managing group members and handling their group budget. The BCBL provides each group with money for running costs, free access to lab resources and at least one postdoctoral fellow and one PhD student. Additional resources required by a group can be obtained through external grants.

The **Ombudsman Team** is made up of members of the Administrative and Research staff, who are elected to be part of the team based on proposals and consensus from the doctoral and postdoctoral researchers. The Team is currently composed of Dr. Costello and Dr. Samuel (Research), and A. Fernández (Admin). The Ombudsman Team has several functions, including providing conflict resolution, offering advice and support to BCBL staff, monitoring work practice issues and making recommendations for improvement. Over the last four years, the team has handled over 20 different cases, ranging from supervision issues and authorship resolution to pastoral care and mental health referrals.

The **Management Team** led by the General Manager supports all research activities, crossing the organisational chart transversally (See chart at Section 2.2). This includes support for departments such as Administration (finance control, projects and grants management, human resources, outreach), Information Technologies, Laboratories and Tech-Transfer. It is important to highlight that since many researchers are foreigners, the BCBL needs a group of trained research assistants in its four different laboratories to be able to run experiments in the local languages, Basque and Spanish.

See the research and support staff at the BCBL below:

<ul style="list-style-type: none"> • Director: Dr. Carreiras • Group Leaders: 12 • Staff scientists: 6 • Postdoctoral Researchers: 17 • Predoctoral Researchers: 44 • Affiliated Researchers: 9 	<ul style="list-style-type: none"> • General Manager: Dr. Arocena • Laboratories Department: 14 • Information Technologies & Technical: 3 • Administration: 8 • Tech-Transfer: 5
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Internal procedures

BCBL has standardised internal procedures which govern all relevant aspects of its operation. This helps clarify and simplify organisational processes and assure the quality, ethical nature and proper financial control of research. There are specified procedures for running experiments, hiring new researchers, assigning funds, joint scientific activities at BCBL, purchase of equipment and supplies, resource management, travel management, etc. We have also put in place the following resources for conducting research activities and training using our lab facilities: (1) Procedures and activities to carry out and communicate research projects, (2) Platforms based on web technology for management, (3) Working Processes and Key Policies, and (4) Procedures for internal evaluation, continuous improvement and quality assurance.

- 1) Procedures to support communication about research at the BCBL and other international labs, and procedures to carry out research at the BCBL:
 - a) The entire BCBL research community holds a weekly Lab Meeting. This Lab Meeting provides an opportunity for all research personnel to internally communicate and improve ongoing research. Each researcher has to present their findings at least once per year at the Lab Meeting.
 - b) The External Speakers Series are scheduled every other Thursday. The speaker is expected to deliver a talk and also participate in a Journal Club organised by the PhD students around a paper selected by



the external speaker. Moreover, speakers interact with members of the BCBL interested in their research.

- c) To run an experiment in any of the BCBL labs, researchers, with the approval of their Group Leader, must submit a project request form, including all the information necessary to access the data or re-run the experiment (similar to the process of pre-registration). They should also submit slides for a short presentation of the project. After clearance is granted by the Ethics Committee, each researcher will defend the project at the Project Presentation Meetings held on Wednesdays. All members of the BCBL are invited to participate in these meetings and encouraged to ask questions and suggest improvements. If, after this meeting, final approval is granted by the Scientific Committee, the researcher will send the request form and the slides to the lab managers, who will allocate all the needed resources to carry out the experiment and arrange for this information to be stored together with the collected data.
- 2) Platforms based on web technology for management: The BCBL has created several platforms, accessible from outside the BCBL to facilitate employee mobility and remote work. These include:
- a) An Enterprise Resource Planning (ERP) system. This is a system that integrates internal and external information management across an entire organisation, embracing finance/accounting, purchasing and services, customer relationship management, etc. ERP systems automate this activity with an integrated software application. The ERP contains an extensive list of procedures for purchases, accounting and financial control.
 - b) Resource-demanding statistical analyses: There are large capacity machines with either Windows or Linux server operating systems. Software packages for statistical computation include, amongst others, Matlab, SPSS and R, complemented with open-source toolboxes and well-known specific neuroimaging tools. Remote access to data and applications is enabled by a VPN SSL appliance. BCBL is connected to the Internet through RedIRIS and i2Basque, the Basque equivalent of RedIRIS, which can provide symmetric broadband of up to 1Gbps, thus covering any potential need.
 - c) Our wiki is continuously and collaboratively updated. It includes all kinds of information relevant for our employees, such as the employee handbook, experimental procedures, all meeting minutes, the repository of publications and conference proceedings, grants, resources, training courses, news and media and a FAQ.
 - d) The Participa website (www.bcbi.eu/participa): Laboratory management involves recruiting and managing a large number of voluntary participants. The Participa website is a very valuable asset for booking and managing participants. When the lab managers open an experiment on the website, all participants whose profile is compatible with the requirements specified in the experiment request form will automatically receive an email explaining the content and duration of the experiment, the techniques used (e.g., behavioural, MRI, EEG), etc. To be able to participate, they can go to the website and book a specific time slot available for this experiment. Researchers can obtain the complete linguistic profile of all registered users and can also filter potential candidates based on relevant variables in the database. Importantly, the BCBL does not treat participants merely as a resource to exploit, but as coequals in a bidirectional learning opportunity. In this way, participants themselves can gain knowledge about our scientific investigations and the role BCBL plays in society. For example, it is mandatory to give participants feedback about the research goals of all experiments run at the BCBL.
 - e) Our ticket system allows employees to request general and lab maintenance, travel, purchases, laptop loans, and any required IT support.
 - f) The main corporate website (www.bcbi.eu) provides information about the mission of the BCBL, our research lines, research output, human resources, job offers, recruitment processes (according to the OTM-R principles) facilities, infrastructure, equipment, events and conferences organised by the BCBL and news related to our activities. This is a portal for disseminating our research to other scientists but also to society at large. It is continually updated in English, Basque and Spanish.
 - g) Our Conference website allows us to self-manage all conferences organised by the BCBL.
- 3) Working Processes and Key Policies: This is a collection of processes covering practical and logistical aspects of the centre, which aims to provide a suitable framework for fulfilling legal requirements. The key policies established at the centre are:
- a) Personnel Policy.

- b) HRS4R Strategy: We received in 2017 the European Commission's HRS4R (Human Resources Strategy for Researchers) award.
 - c) We fully implemented the OTM-R process which includes the following steps: (1) Pre-advertising; (2) Advertising and Application; (3) Evaluation/Selection; (4) Appointment; (5) Negotiation; (6) Welcome Plan.
 - d) Open Access Policy. Following our "Open Access" policy, the results of publicly-funded research are disseminated more broadly and quickly for the benefit of all researchers, the general public and society. To this end, since January 2016 the BCBL has honoured an agreement with the UPV/EHU to use ADDI (Archivo Digital para la Docencia y la Investigación) as its official repository to register all the scientific production of the centre.
 - e) Health and Safety policy.
 - f) Personal Data Protection Policy. BCBL guarantees the confidentiality of personal data and protects personal freedom and the fundamental rights of physical persons, especially as regards their family, dignity, intimacy and privacy. These regulations apply to all BCBL personnel and all external personnel who collaborate with the centre.
 - g) Gender Equality and non-discrimination policy and Plan.
 - h) Work-life reconciliation policies and tools.
 - i) Procedure for preventing and managing workplace violence against any kind of harassment at work.
 - j) Internal Communication policy.
- 4) Procedures for internal evaluation, continuous improvement, and quality assurance: Existing processes for assessment are used as a basis for developing each employee's professional career. We have implemented an annual review process both for administration and technical staff and researchers, giving them a detailed description of the skills and capabilities required to further develop their careers, as well as necessary guidance, mentoring, career advice and training. PhD students and postdoctoral researchers are evaluated once per year by the Group Leaders. In addition, PhD students provide a progress report on their project at the BCBL Lab Meeting. Moreover, the PhD Graduate Director meets with all the group leaders to discuss the progress of each PhD student. Finally, we carry out an annual evaluation following the HRS4R protocol.

Evaluation and quality assurance: Existing processes for assessment are used as a basis for developing each employee's professional career. We have implemented an annual ongoing review process both for admin and technical staff and researchers, giving them a detailed description of those skills and capabilities required to develop their careers, the needed guidance, and training. A scheduled training plan and a professional development plan are outlined for each member.

For researchers, this will involve setting guidelines to suggest possible professional career paths within the BCBL goals, not only in terms of scientific expertise but also managerial skills to evaluate researchers' performance and development; we will follow the usual criteria used by the largest funding agencies in the world, for instance, NSF in the USA and the ERC in Europe. While it is unclear if current metrics are providing the expected knowledge regarding the real improvement of the scientist or research centre, we defined the following indicators considering (1) the scientific quality through the number of publications appearing in the Web of Science (WoS) or Scopus; (2) competitive fund-raising, such as ERC, Marie Skłodowska-Curie, and Plan Nacional grants; and (3) other indicators based in recruiting, training and technology transfer: theses, researchers recruited, agreements with sectorial entities and tech-transfer initiatives.

The BCBL also adopts **three pillars of Corporate Social Responsibility**, which include:

Economic and Social Responsibilities: The BCBL adheres to a culture of social responsibility, voluntarily assuming commitments that go further than regulatory obligations and accepting Corporate Social Responsibility (CSR) through a global focus from its own corporate strategy.

- To collaborate in the economic development of the community.
- To meet legal obligations.
- To be a non-profit entity and reinvest surplus into its own activities.
- To establish transparent corporate managerial criteria and transmission of values.
- To ensure equal opportunities.
- To provide personal, family, and work-life conciliation.
- To establish active ergonomic policies and occupational health and implement a balanced salary system.
- To promote communication channels between management and workers.
- To pay attention to training needs.
- To support and respect protection of human rights.
- To respect occupational rights.
- To establish an environmental policy.

1.3. Infrastructure and Equipment

This section should include (Max. 3 pages):

Detail of the current and future infrastructures to achieve the strategic objectives of the regional and the centre. Detailed justification of the need and opportunity of the equipment.

Today the BCBL has four laboratories. The headquarters (main laboratories and offices) are located in San Sebastián's Miramon Technological Park with a total surface area of 1,823 m² (1,170 m² for offices, meeting rooms, auditorium, library and lounge and 653 m² for labs). The second location is a 100 m² space located in the Jose M^a Korta building in the University of the Basque Country Campus. Finally, the BCBL extended its facilities with the Junior Lab in Vitoria (120 m²) and the Murcia Lab for Spanish monolinguals:

Laboratories (Miramón, Korta, Murcia & Junior Lab)

A full complement of neuroscience methodologies is available, including EEG/ERP, MEG, and fMRI. All facilities are connected to a high-speed local network that also supports communication between user workstations. As far as possible, the same stimulus presentation and data recording hardware and software are employed across the experimental facilities, to ensure comparable experimental setups across different experimental methods/platforms (Behavioural, MEG, MRI, EEG, Eye Tracking, BabyLab and NIRS).

Miramón	Miramon Bay Lab	Korta	Junior Lab	Murcia Lab
3 Behavioural 1 Production 1 MEG (includes EEG, Eye Tracking) 1 MRI (includes EEG, Eye Tracking) 3 EEG 2 Eye Tracking	1 Eye tracking, 1 Behavioural, 1 NIRS, 1 EEG	4 Behavioural 1 Production 1 Eye Tracking	2 Behavioural 1 Eye tracking 1 EEG	1 Behavioural 1 EEG

For special-purpose applications, a skilled technical group supports the installation and use of different hardware and software.

Research Facilities

Behavioural

Soundproof chambers are available to conduct behavioural experiments. Each chamber is equipped with a standardised, quality, experimental setup, which can collect reaction-time data such as push-button responses or naming latencies. Chambers can be used for individual testing sessions with one experimenter monitoring individual participants, as well as for testing up to 4 participants simultaneously.

The hardware for each chamber includes monitors (ViewSonic G90FB 19" CRT), soundcards (Soundblaster Titanium X-Fi, with ASIO support) and headsets (Sennheiser HMD 280 pro push-button response boxes). The standard software packages are DMDX and Presentation but the technical group can build and develop special-purpose hardware and software when the standard configuration does not provide the functionality for a particular study. Additionally, we have a special sound booth in order to prepare and run production and perception experiments.

MEG

Magnetoencephalography (MEG) provides a non-invasive method for recording cortical activity with exceptional temporal resolution and fine spatial resolution.

The MEG facility at the BCBL is a 306-sensor (204 planar gradiometers and 102 magnetometers; arranged in a helmet configuration) Elekta Neuromag® device with 16 digital trigger lines and 8 auxiliary analog input channels. The setup will allow for the delivery of both auditory and visual stimuli, and recordings can be performed in either supine or sitting position. The MEG device also includes an integrated 64-channel EEG system (60 single channel and 4 differential electrodes) for simultaneous MEG and EEG recordings that can be acquired at a sampling rate of up to 8 kHz (5 kHz standard) in either AC or DC. Throughout the experimental session, a participant's head position within the scanner is sampled so that the data can be linked to independently-acquired anatomical MRI images.

The facility at the BCBL includes passive shielding to reduce external noise, as well as MaxFilter™ software, which filters artifacts as well as internal and external noise sources. For data analysis, the Elekta Neuromag®



includes advanced analytical software, including powerful tools for visualisation and source modeling of the recorded data. We acquired some new Phantomics panel speakers and are presently evaluating the effect of the speakers as there is a long discussion thread on the MEGCOMMUNITY list about auditory stimulation. Most of the concerns relate to artifacts with a different system (Etymotic earplugs) and could be resolved with this system.

MRI

Since June 2016 BCBL houses a Siemens 3T MAGNETOM PRISMAfit MR scanner that allows BCBL researchers to perform functional MRI (BOLD and perfusion ASL), structural MRI, diffusion-weighted MRI and MR Spectroscopy studies. This system uses the Siemens Total Imaging Matrix (TIM) 4G technology including the TimTX TrueForm and TimTX TrueShape technologies for parallel transmission and selective RF excitation for better B1 homogeneity, reduced Specific Absorption Rate (SAR), and enabling zoomed imaging with the ZOOMit application. The Tim 4G technology with up to 64 independent channels available for parallel reception are exploited with two dedicated 20-channel head coil and a 64-channel head/neck coil. The fully digital transmission and reception design with the DirectRF technology integrates all components inside the magnet room, connected with fiberoptic cables with the equipment room, for reduced noise and improved stability. The Prismafit system offers a large anatomical coverage with a maximum field of view (FOV) of 50 cm. Decisively, it comprises a unique XR 80/200 gradient coil with a maximum amplitude of 80 mT/m and a slew rate of 200 T/m/s simultaneously on all three axes for increased SNR in the most demanding applications, enabling us to obtain higher spatial and temporal resolutions, reduced scan times and excellent workflow with subject's comfort in mind. The scanner also integrates real-time monitoring of cardiac pulse, ECG and respiration signals.

The PRISMAfit system includes a new generation of MRI protocols, for example, the CAIPIRINHA and MP2RAGE sequences for structural imaging, and the simultaneous multi-slice (SMS) sequences for highly-accelerated functional and diffusion-weighted imaging. The BCBL has a research agreement with Siemens Healthcare Spain for technological support and access to the latest MR sequences and protocols developed for MAGNETOM systems, as well as developing its own tailored MRI sequences with the Siemens IDEA and ICE programming environments. Furthermore, the BCBL has established agreements with international research centres (e.g. the Athinoula A. Martinos Centre in MGH/Harvard, the CMRR at the University of Minnesota, the Donders Institute in Nijmegen) to make the best imaging protocols available to our researchers.

In addition, the BCBL MRI lab is equipped with multiple stimulation and response MR-compatible peripherals for all types of fMRI studies, including 4-button optical response pads (Current Designs), response grips (Nordic Neurolab), a rear-projection video display (Panasonic SXGA+ 7000), an audio system comprising noise-cancelling headphones (MR Confon) and microphone (Optoacoustics), S14 insert earphones (Sensimetrics), an MR-compatible EyeLink 1000 Plus eye-tracking system (SR Research), and a MP-150 BIOPAC system for external monitoring of physiological signals (e.g. cardiac pulse, respiration, electromyography and skin conductance). For simultaneous EEG-fMRI experiments, an MR-compatible BrainAmp Plus system with up to 64 electrodes (Brain Products) is also available.

EEG

The centre is equipped with EEG systems that are installed in Faraday cage - soundproof chambers. Each chamber is equipped with a BrainAmp DC® amplifier. Using the recording software (Brain Recorder®) all the amplifier options, including the switch from DC to AC recording mode as well as selecting different filtering bandwidths, can be controlled. The BrainAmp DC® is more stable than older EEG systems in a variety of applications, and it supports simultaneous EEG/TMS and EEG/MEG input to the Brain Computer Interface and Neurofeedback.

Two chambers are equipped with a 64-channel system and the rest with 32-channel amplifiers. The BrainAmp DC® is a portable amplifier that connects to any laptop and can be powered with batteries. As a result, the 32-channel amplifiers can also be used for experiments outside the centre (e.g., in schools or hospitals).

Each chamber is also equipped with sets of electrodes that can be arranged on EasyCaps® in whatever pattern that may be needed for a given experiment. Each cap has 64 equidistant electrode positions (10%-System); several different sizes are available, including those suitable for children.

For off-line EEG/ERP analyses, Vision Analyzer® 2.1 software is available on each computer via a network key.

Our centre is equipped with the hardware and software resources to carry out and analyse a wide range of on-line reading experiments and experiments using the visual world paradigm.

An EEG fMRI compatible BrainAmp MR Plus (32 channels) is also available so that multimodal type experiments can be carried out.

EYETRACKING

Our centre is equipped with the hardware and software resources to carry out and analyse a wide range of on-line reading experiments and experiments using the visual world paradigm.

Our Lab has one of the latest and most complete systems for eye tracking: EyeLink 2K (SR Research Ltd.). EyeLink 2K provides an excellent sampling rate (2000 Hz) and is especially suitable for real-time data collection. EyeLink 2K can be used for monocular as well as binocular eye tracking, and the system is perfectly compatible with most contact lenses and eyeglasses. This system has a very high average accuracy, down to 0.15°. Many paradigms can be implemented in the EyeLink 2K, such as the visual world paradigm, the boundary technique (parafoveal previews) or silent sentence reading. The EyeLink2K system uses a remote desktop mounting, which allows participants to be liberated of any head-mounted cameras.

The EyeLink 2K is also portable, which enables fieldwork to be conducted in other locations than the centre, depending on the needs of the test population.

BABYLAB

In our state-of-the-art infant lab, a number of methods and techniques are available to discover the first steps of human language development. The behavioural set-up supports the Visual Habituation, Head-turn Preference, and Intermodal Preferential Looking procedures to assess preverbal infants' general language skills (from 3 to 12 months of age), and to investigate older infants' syntactic and lexical knowledge up to 28 months of age.

The behavioural set-up is supplemented with an electrocardiogram (ECG) system that collects heart rate recordings of the infant during behavioural tasks. ECG activity reflects how infants' attention is being modulated and regulated in the context of specific language experience.

In addition to the methods at the behavioural and physiological levels, we are also equipped with EEG/ERP systems suitable for infants and children. Electrophysiological recordings are advantageous in infancy as they provide a direct and online measurement of processing abilities; moreover, the same technique can be applied throughout the whole lifespan, making it possible to track language-related developmental changes. Our EEG/ERP systems can be integrated with the ECG system as well. The BCBL babyLAB offers a cutting-edge research venue within an exceptional environment for investigating monolingual and bilingual language development comprehensively.

NIRS

Near-infrared spectroscopy is a light-based imaging technique that may be of great value in our studies. In particular, our system, NIRScout, is an ultra-compact and scalable solution for applications where flexibility is the dominant concern. This system is ideally suited for longitudinal studies with children, combined EEG-functional NIRS studies and freely moving studies. For instance, it provides a flexible methodology for measuring cortical activity during overt speech production while avoiding some of the limitations of traditional imaging technologies. The BCBL Nirxcout has eight illumination points and sixteen sensors, can enlarge, is EEG-compatible and has three available caps for baby- to infant-studies.

COMPUTING FACILITIES

The BCBL Information System provides high degrees of performance, reliability and availability of both data and computing resources. High-performance computing clusters allow the execution of sophisticated data analyses. Network services facilitate secure data sharing within and between research teams. The extensive software resources include tools for the development and execution of experimental tasks, data processing, and production of scientific communications. Fast delivery of network services is guaranteed by a high-speed optical backbone network.

Eduroam (Educational Roaming) is an international project to provide a single Wi-Fi space in the member institutions. The objective is to deliver an Internet connection service most easily and transparently. The BCBL is integrated into the eduroam network, so the visitors/people from other institutions integrated in the eduroam network who are in transit at the BCBL are able to use our Wi-Fi service. In the same way, our staff members in transit can use the Wi-Fi service in the associated institutions.

The BCBL also has full access to the ATLAS High performance computing cluster located at the DIPIC.

Researchers thus have all the information technology that they need to design, execute, analyse, and report on an almost unlimited range of behavioural and neuroscientific investigations of language and cognition.

1.4. Financial planning: quantification and economic justification

1.4.1. Budget

This section should include (Max. 3 pages):

Include information on the expenses for the period 2018-2021. All the expenses must be justified by means of a detailed description of its specific destination.

Include the table supplied in the Excel file.

2018-2021 PERIOD

BUDGET	2018	%	2019	%	2020	%	2021	%	TOTAL 2018-2021
Personnel	3.167.182	68,15%	3.808.686	67,95%	3.468.128	62,16%	3.540.967	70,64%	13.984.963
Other costs	1.337.906	28,79%	1.671.264	29,82%	1.942.053	34,81%	1.390.000	27,73%	6.341.223
Investments (total)	142.555	3,07%	125.281	2,24%	169.568	3,04%	82.000	1,64%	519.404
TOTAL BUDGET	4.647.643	100,00%	5.605.231	100,00%	5.579.749	100,00%	5.012.967	100,00%	20.845.590

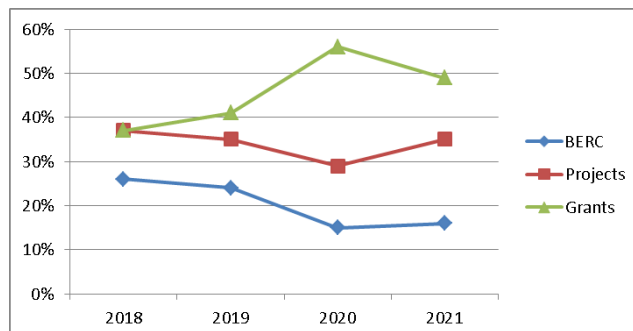
Personnel

The expenditure on the BCBL personnel has entailed, on average, a 69 % of the total annual budget of the centre. Thus, it has been the major expenditure item.

The BCBL personnel are distributed in 3 main departments: Research Personnel, Lab Personnel, and Admin and Technical Personnel. The total expenditure gets divided into these three items as follows:

	BERC	PROJECTS	GRANTS	TOTAL
	2018-2021	2018-2021	2018-2021	2018-2021
	Euros	Euros	Euros	Euros
RESEARCH PERSONNEL				
Staff Scientist	250.455	556.074	1.007.121	1.813.650
Postdoc	150.811	1.551.164	2.258.365	3.960.340
Predoc	140.260	454.357	3.103.429	3.698.046
LAB PERSONNEL				
	729.073	1.457.974	6.744	2.193.791
ADMINISTRATION				
Admin and Technical	1.692.695	593.290	33.151	2.319.136
TOTAL	2.963.294	4.612.859	6.408.810	13.984.963
Funding percentage	21%	33%	46%	100%

It is also relevant to outline the origin of the funds supporting the cost of the BCBL personnel. Funding derives from three different resources: Grants, Research Projects and General Budget of the BCBL (BERC programme). The average distribution of these three origins can also be seen in the chart.



Other management costs

This item includes all the BCBL costs that are not related to personnel or investments. Therefore, it is broad and varied in terms of the nature of the expenses. See below the items detailed for every year:

	2018	2019	2020	2021	Average	
OTHER COSTS						
Other management costs						<i>(estimated figures)</i>
Renting of facilities	289.709	268.501	256.601	259.443	268.564	17%
Other renting costs (venues, assets, etc.)	47.778	68.465	67.479	70.557	63.570	4%
Works, repair and maintenance	167.915	177.928	114.916	90.000	137.690	9%
Conference Proceedings Abroad	163.793	249.577	39.368	40.000	123.184	8%
Publications	18.453	18.344	24.609	45.000	26.601	2%
Social Expenses	28.379	30.345	24.691	25.000	27.104	2%
Participants, lab specific tools and Helium	160.304	170.607	78.069	120.000	132.245	8%
IT related expenses	64.571	38.944	23.039	32.000	39.638	3%
Other general costs (electricity, insurances, indirect costs, etc.)	397.004	648.553	499.605	708.000	563.291	36%
Tax Inspection			813.676		203.419	13%
TOTAL	1.337.906	1.671.264	1.942.053	1.390.000	1.585.306	100%
FUNDING SOURCE: BERC	41%	35%	76%	54%	51%	
FUNDING SOURCE: GRANTS AND RESEARCH PROJECTS	59%	65%	24%	46%	49%	

Importantly, the Operational Costs of the BCBL are supported by general funds (BERC grant), as well as other grants and research projects, both in direct and indirect expenditure items, depending on its nature. The evolution over the years has been towards increasing self-finance capability, considering this derives from sources unrelated to the BERC programme.

There has been an exception, in 2020, as a consequence of a tax inspection that overcharged BERC budget with a significant extra expense.

The most significant items are outlined in the following cost breakdown:

- Renting: See chapter 1.4.3. Cost of renting of premises.
- Work, repair, and maintenance: The BCBL subcontracts the maintenance work for the offices and lab building, and also for some technical and IT equipment. Depending on the budget available and the need for each year, the maintenance expense can vary significantly.
- Conference proceedings abroad: It has historically been a quite high expense item, normally covered by grants/projects' specific budget. During 2020 and 2021, the expense amount has decreased significantly as a consequence of the Covid19 Pandemic situation.
- Participants, lab-specific tools, and Helium: See chapter 1.4.4. Degree of lab-based practical work of the centre
- Other general costs: This item includes a great variety of expense categories. The main ones are detailed in the table below:



	2018	2019	2020	2021
Electricity	99.676	94.649	60.253	85.000
Telephony	13.563	14.240	12.672	14.000
Insurances	16.761	22.668	13.571	18.000
Consultancy	73.433	126.685	72.933	79.000
Outreach	53.506	62.071	34.972	9.000
Cleaning services	31.408	35.224	17.640	36.117
Taxes	24.870	107.466	80.205	103.553
Bank expenses	12.352	11.149	28.233	125.000
TOTAL	325.570	474.152	320.479	469.670
TOTAL CATEGORY	397.004	648.553	499.605	708.000
	82%	73%	64%	66%

- f) Tax Inspection: In early 2020 the BCBL finished a Tax Inspection that started in April 2018. In 2020 it meant an extraordinary expense of €813.676. The Tax Inspection finished with negotiation, due to the ambiguity of the criteria and the difficulty of the calculations.

Investments

Investments in fixed assets are a major item in the BCBL since the labs and technical equipment need to be kept abreast with the necessary updates and upgrades and get adapted to the growth of the centre, both in terms of the amount of personnel, as well as participants in the lab and data derived from the studies. Therefore, the investments made vary in nature, being the lab and IT facilities the most remarkable. See below the yearly breakdown by categories:

	2018	2019	2020	2021	TOTAL
INVESTMENTS					
				<i>estimated figures</i>	
SOFTWARE AND HARDWARE	106.576	90.400	84.054	62.000	343.030
LAB EQUIPMENT	19.293	32.860	84.900	17.000	154.053
GENERAL INVESTMENTS	16.686	2.021	614	3.000	22.321
TOTAL	142.555	125.281	169.568	82.000	519.404
FUNDING SOURCE: BERC	58%	32%	9%	49%	34%
FUNDING SOURCE: GRANTS AND RESEARCH PROJECTS	42%	68%	91%	51%	66%

As can be seen at the bottom of the table, funding of investments fluctuates yearly depending on the available grants.

1.4.2. Incomes

This section should include (Max. 3 pages):

Detail of all the financial sources obtained for the period 2018-2021.

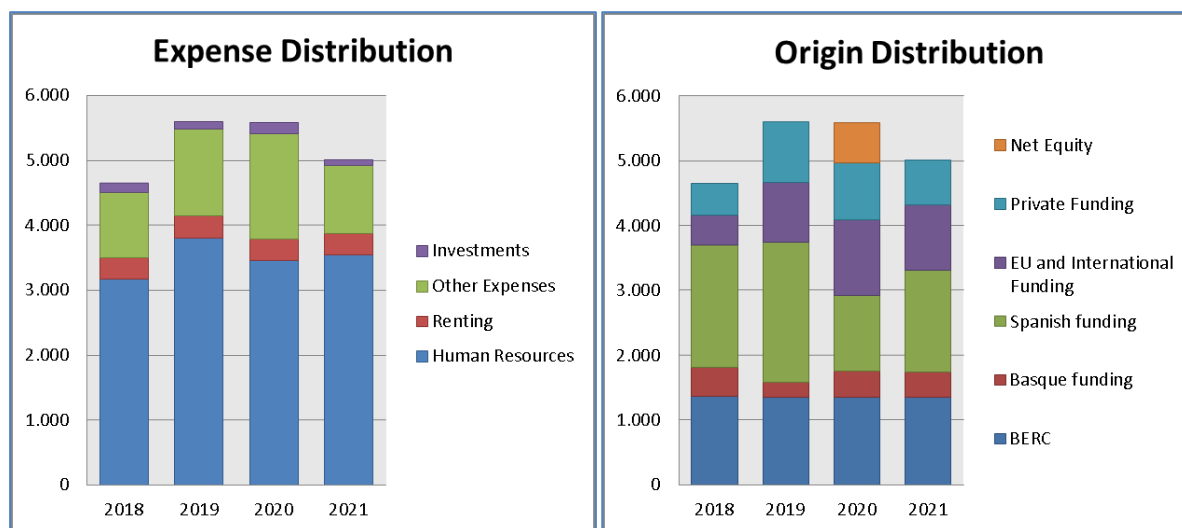
Justify the information provided and include the table supplied in the Excel file.

PERIOD 2018-2021

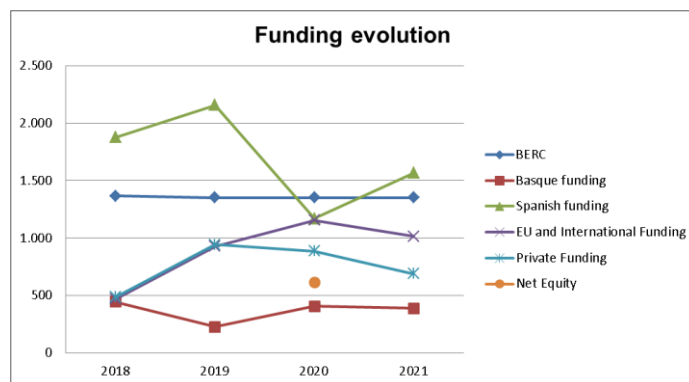
INCOMES (BERC only)	2018	%	2019	%	2020	%	2021	%	TOTAL	%
PUBLIC FUNDING	4.178.755	89,91%	4.662.134	83,17%	4.056.149	81,69%	4.323.593	86,25%	17.220.631	85,12%
BERC programme	1.367.868	29,43%	1.350.875	24,10%	1.350.875	27,21%	1.350.875	26,95%	5.420.493	26,79%
UPV/EHU funding	1.000	0,02%	1.000	0,02%	1.000	0,02%	1.000	0,02%	4.000	0,02%
IKUR funding	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
Other Basque funding	456.794	9,83%	225.401	4,02%	393.873	7,93%	386.613	7,71%	1.462.681	7,23%
CSIC funding	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
Other Spanish funding	1.873.449	40,31%	2.157.627	38,49%	1.155.042	23,26%	1.569.080	31,30%	6.755.198	33,39%
EU & International funding	469.806	10,11%	927.231	16,54%	1.155.359	23,27%	1.016.025	20,27%	3.568.421	17,64%
Other funding	9.838	0,21%	0	0,00%	0	0,00%	0	0,00%	9.838	0,05%
PRIVATE FUNDING	468.888	10,09%	943.097	16,83%	909.055	18,31%	689.374	13,75%	3.010.414	14,88%
R+D contracts	6.057	0,13%	61.644	1,10%	34.138	0,69%	16.177	0,32%	118.016	0,58%
patronage	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
donations	13.000	0,28%	12.000	0,21%	0	0,00%	0	0,00%	25.000	0,12%
returns via patents, licencing...	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
other private funding	449.831	9,68%	869.453	15,51%	874.917	17,62%	673.197	13,43%	2.867.398	14,17%
TOTAL INCOME (must match total budget)	4.647.643	100,00%	5.605.231	100,00%	4.965.204	100,00%	5.012.967	100,00%	20.231.045	100,00%

(*) In 2020 Expenses and Incomes do not match. This is because the BCBL needed to take part in the Net Equity to afford the extraordinary expense derived from a Tax Inspection which finished with negotiation, due to the ambiguity of the criteria and the difficulty of the calculations. The amount afforded by Net Equity has been €614.545.

The left chart below shows the budget distribution amongst the main expense families. Besides, the right chart shows an income distribution detail regarding the funding origin.



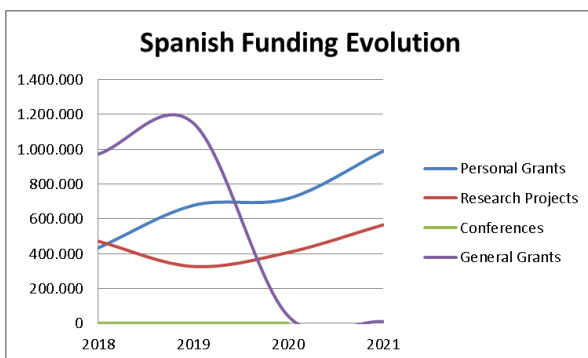
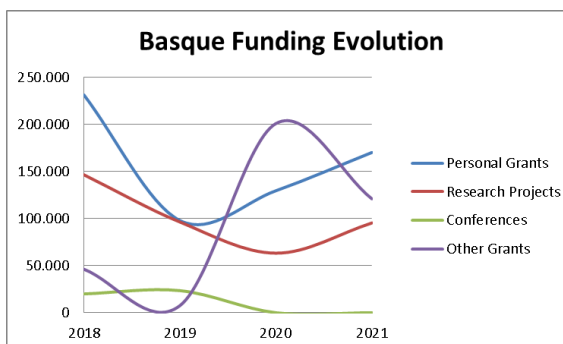
Concerning the origin distribution, the following chart shows the evolution of each funding item during the 2018-2021 period:



BERC grant has been the steadiest one during these four years, which gives the BCBL's budget consistency and security.

The rest of the Basque Funding family includes personal grants and competitive projects as well as some incomes related to conference organisation, and other specific general grants.

The "Basque Funding Evolution" chart displays the path that all these grants have followed during the last 4 years.

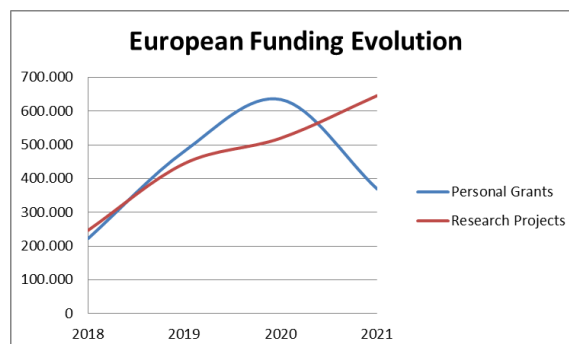


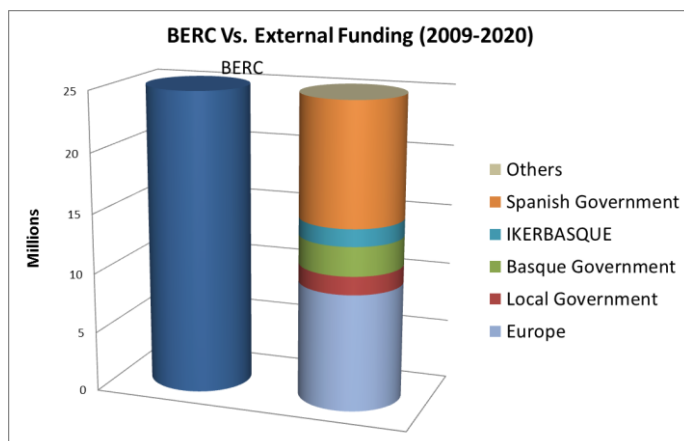
The Spanish funding item includes a wide variety of personnel grants and projects, which can change from one year to another. However, the substantial drop between 2019 and 2020 belongs to the funding derived from the Severo Ochoa programme which ended in the first months of 2020 (General Grant in the chart).

The "Spanish Funding Evolution" graph shows the details about the evolution of these funding sources.

EU and International Funding increased significantly from 2018 to 2021. Here, we can find mainly Marie Curie personal grants and ERC Research Projects.

This chart shows the evolution of personal grants and Research projects.





This chart shows the investment made by the Basque Government's BERC programme (direct support) for the years 2009-2020, as well as the competitive grants obtained during the same period. This indicates that the "investment" made by the BERC programme has a €1.33 per euro payback coming from external competitive support (profitability of 133 %).



1.4.3. Cost of renting of premises

This section should include (Max. 2 pages):

Please indicate the expenses in renting the premises or building for the period 2018-2021. Include documents (invoices) of the expenses in order to justify the cost and any comment or additional information that could be taken into consideration in this regard.

Justify the information provided and include the table supplied in the Excel file.

Additional information

BUDGET (BERC only)	2018	2019	2020	2021	TOTAL 2018-2021
Cost of renting of facilities	289.709	268.501	256.601	259.443	1.074.254

The renting cost of the buildings during the period 2018 - 2020 is detailed in the table above, and it is approximately 5 % of the total annual budget of the centre. Such cost is distributed amongst premises of the Technology Park of Miramón, where the offices (1st and 2nd floor) and lab (ground floor) are located, and an auxiliary lab in the Korta building, belonging to the UPV/EHU. The rental costs are divided as follows amongst the aforementioned premises:

Miramón building:



In 2020, the rental fee of the premises the BCBL uses inside building number 69 of the Technology Park of Miramón amounted to 252.622,92 euros (VAT incl.). Find outlined below the monthly invoices. Moreover, a copy of three of these invoices is attached to this document (Annex 2 – Finance Planning - Invoices). The offices and head lab of the BCBL are located in these premises, representing the main location of the centre.

Renting Expenses: Miramón	Euros VAT Excl.	Euros VAT Incl.	Vendor	Invoice Number	Invoice Date
January	17.398,27	21.051,91	Parke Gipuzkoa	FV20/0018	21/01/2020
February	17.398,27	21.051,91	Parke Gipuzkoa	FV20/0189	03/02/2020
March	17.398,27	21.051,91	Parke Gipuzkoa	FV20/0380	02/03/2020
April	17.398,27	21.051,91	Parke Gipuzkoa	FV20/0660	21/04/2020
May	17.398,27	21.051,91	Parke Gipuzkoa	FV20/0757	04/05/2020
June	17.398,27	21.051,91	Parke Gipuzkoa	FV20/0934	01/06/2020
July	17.398,27	21.051,91	Parke Gipuzkoa	FV20/1123	02/07/2020
August	17.398,27	21.051,91	Parke Gipuzkoa	FV20/1287	07/08/2020
September	17.398,27	21.051,91	Parke Gipuzkoa	FV20/1598	08/09/2020
October	17.398,27	21.051,91	Parke Gipuzkoa	FV20/1616	02/10/2020
November	17.398,27	21.051,91	Parke Gipuzkoa	FV20/1784	02/11/2020
December	17.398,27	21.051,91	Parke Gipuzkoa	FV20/1940	02/12/2020
TOTAL	208.779,24	252.622,92			

**Korta building:**

The premises rented by the BCBL in the Korta building, belonging to the UPV/EHU, houses a small but highly-valued and necessary auxiliary lab to be close to the university community, which is of great importance in the research area at issue. See below the invoices of the rental fees in detail:

Renting Expenses: Korta	Euros VAT Excl.	Vendor	Invoice Number	Invoice Date
January - March	1.705,05	UPV/EHU	Liquidación nº 1/2020	16/01/2020
September	568,35	UPV/EHU	Liquidación nº 2/2020	16/09/2020
October	568,35	UPV/EHU	Liquidación nº 3/2020	13/10/2020
November - December	1.136,70	UPV/EHU	Liquidación nº 4/2020	03/11/2020
TOTAL	3.978,45			

In this case, invoices are VAT-free and amount to 1.705,05 euros per quarter. In 2020, the UPV/EHU considered leaving the renting for free from April to August as a consequence of the COVID19 crisis. That can be seen in the Invoicing table. A copy of one of these quarterly settlements is annexed to this document (Annex 2 – Finance Planning - Invoices).

TOTAL 2018-2021:**Additional information**

BUDGET (BERC only)	2018	2019	2020	2021	TOTAL 2018-2021
Cost of renting of facilities	289.709	268.501	256.601	259.443	1.074.254

1.4.4. Degree of lab-based practical work of the centre

This section should include (Max. 3 pages):

Please indicate the expenses undertaken for research-related tasks such as equipment, reagents, specific tools or similar, needed to carry out experiments, for the period 2018-2021. Include documents (invoices) of the expenses in order to justify the cost and any comment or additional information that could be taken into consideration in this regard.

Justify the information provided and include the table supplied in the Excel file.

The activity of the BCBL lab is the basis of the research work performed at the centre. The table below shows the main expenses related to the work of the BCBL lab by item and year:

Additional information					
BUDGET (BERC only)	2018	2019	2020	2021	TOTAL 2018-2021
Cost of renting of facilities	289.709	268.501	256.601	259.443	1.074.254
Cost of the lab-based practical work of the BERC	834.523	1.033.215	574.298	647.157	3.089.193
equipment	610	32.860	84.900	10.000	128.370
reagents	0	0	0	0	0
specific tools	55.549	25.648	5.357	24.000	110.555
maintenance of facilities	69.058	74.579	22.041	3.000	168.679
Participants	56.181	87.615	30.952	92.374	267.123
Personnel	604.551	755.170	389.287	444.783	2.193.791
Helium	48.573	57.343	41.760	73.000	220.676

Maintenance of facilities

The cost included in this section corresponds to the maintenance expense for the Magnetoencephalography (MEG).

This service has been very important for the correct running of the machine in previous years, but in 2020 and 2021 the BCBL's budget has been quite short, and keeping the full maintenance service was not affordable. That is why the expense has decreased significantly in 2020 and 2021.

Equipment

The highest investment in the BCBL lab has been carried on in 2020, and was the purchase of the PROPixx projector, the Eye tracker and all the accessories needed for the system, such as screen, lens, illuminator, etc. The cost of the whole system amounted to 73.308 euros.



This investment was funded by two "Plan Nacional" projects: trainSynchro and OSC-PAD, by PreSpeech Marie Curie Grant, and by Piermatteo Morucci's La Caixa Inphinit Grant.

A copy of the invoices is annexed to this document (Annex 2 – Finance Planning - Invoices).

Another significant investment was made in 2018, for a total amount of 40,600 euros. It is the online platform for the management of Neure software, for the diagnosis of specific language disorders.

This investment was funded by the Severo Ochoa program, and by a direct funding from Gipuzkoa Local Government.

A copy of the invoices is annexed to this document (Annex 2 – Finance Planning - Invoices).

Specific Tools



Within this section, many costs associated with the daily running of the lab are included: lab material (syringes, gel, adaptors, towels, etc.), small replacements for the different techniques (e.g., bulbs), specific materials to carry out particular tests, etc.

The centre has selected the items of higher value and outlines its concepts in the chart below:

Vendor	Invoice	Date	Concept	Total Euros
Cambridge Research Systems	9412	07/30/2018	fORP 4 Button Bimanual.	1.020
Asociación Instituto Biodonostia	2018/8/324	09/21/2018	Microarray Processing. Genotyping for project PCIN-2015-061 Multilateral.	44.865
Bionic Iberica, SA	18/2232	11/25/2018	32 Electrodes Set. 64 positions cap.	5.370
Nesplora SL	VEN/2018/0739	11/09/2018	Virtual Reality Kit.	1.160
A-2 Alquiler Audiovisual SL	2019/A/102	04/02/2019	Panasonic Lamps.	2.112
Abyntek Biopharma SL	1 001240	02/21/2019	Saliva Self collection kit (OG-500).	4.730
Bioef	2019/1/55	04/17/2019	Preservation of 4068 DNA samples from saliva, during 2018 year.	1.220
Bioef	2019/1/170	12/31/2019	Preservation of 4068 DNA samples from saliva, during 2019 year.	1.220
Bionic Iberica, SA	19/866	04/30/2019	CAC-32-X16: 12 Spare caps for Nirs. Syringes. Gel applicators.	2.423
Bionic Iberica, SA	19/1074	05/28/2019	AbraLyti 2000-Gel. Medium washer. Cotton buds.	870
Bionic Iberica, SA	19/1450	07/24/2019	AbraLyti 2000-Gel. Medium washer. Cotton buds.	904
Bionic Iberica, SA	20/455	03/03/2020	AbraLyti 2000-Gel. Medium washer. Cotton buds.	860
Bionic Iberica, SA	20/1756	11/24/2020	AbraLyti 2000-Gel. Medium washer. Cotton buds.	866

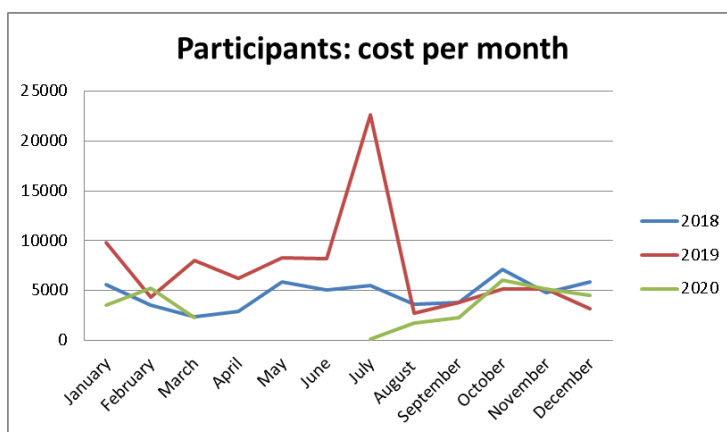
A copy of three of these invoices is annexed to this document (Annex 2 – Finance Planning - Invoices).

Participants

The BCBL needs to obtain data of participants coming to the lab in order to carry out the research developed in the centre. Participants of all ages and social groups turn to our premises, and the amount has risen exponentially year after year since the BCBL opened in 2009.

The cost of participants that the BCBL defrays is a small compensation payment that is offered in turn for the time and effort they devote to science.

The monthly distribution of the expense during the period 2018-2020 it is shown in the following graph.



In July 2019 the graph shows an abrupt growth of the amount spent. The reason is that, at the end of July, there was a significant payment related to a whole project participation expense. It corresponded to the Adinberri project and there were 78 gratified participants.

In 2020, during the period between March–July, the lab was closed and the activity stopped. That is why there is no green line in the graph for those months. In July some online studies started to run, and the online participation procedure was set.

In order to manage adequately payments to participants, all transactions are duly registered in a book at the lab, including relevant information such as the name of the study, the date, the principal investigator, name and ID of the participant, the payable amount, and signature corresponding to the payment made.

Recently, there is also online participation which is compensated through Paypal or bank transfer. However, all the previously detailed data are also registered in these cases.

Sometimes, besides the monetary compensation, the BCBL offers a small present (voucher for spa, little toy for children, T-shirts, etc.) to participants. This cost is also included in the previous figures.



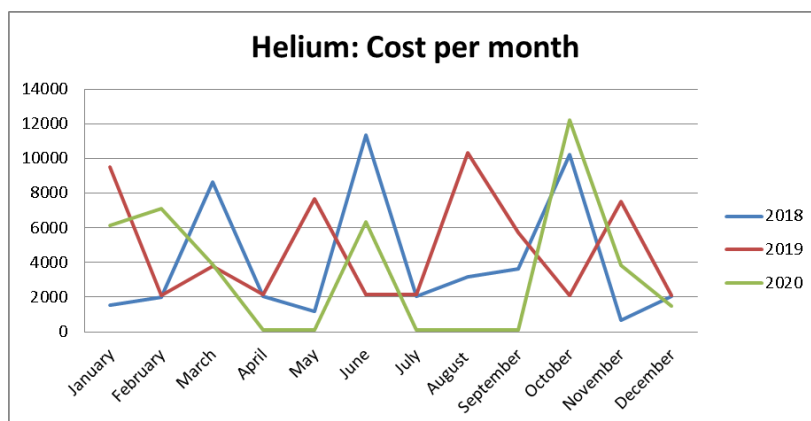
Personnel

The personnel related to the activity performed in the lab comprises the staff members in charge (Lab Managers) the coordinators of each technique (Lab Coordinators) and the team of Research Assistants, whose duties are to help the research team to prepare and carry out the experiments at the centre.

The cadre of personnel below shows the total expenditure on BCBL personnel for the last audited year (2020). Out of that total amount, 11,22 % was designated to Lab Personnel, that is, **389.287 euros**. Detailed cost in euros by category is also included.

	BERC		PROJECTS		GRANTS		TOTAL	
	2020		2020		2020		2020	
	Euros	Nº	Euros	Nº	Euros	Nº	Euros	Nº
RESEARCH STAFF								
Staff Scientist	0	0,0	102.311	2,6	317.570	5,7	419.881	8,3
Postdoc	38.186	0,7	291.191	8,7	741.524	14,0	1.070.901	23,4
Predoc	38.730	1,0	63.849	4,0	870.510	35,0	973.089	40,0
Research Assistant	0	0,0	304.998	18,1	0	0,0	304.998	18,1
ADMINISTRATION STAFF								
Administration	215.664	5,8	155.012	5,5	0	0	370.676	11,2
Labs	84.289	3,0	0	0	0	0	84.289	3,0
IT	148.760	3,0	16.686	1	0	0	165.446	3,8
Neure	0	0,0	78.848	3,0	0	0	78.848	3,0
TOTAL SALARY COSTS	525.629	13,5	1.012.895	42,6	1.929.604	54,7	3.468.128	110,8
	15%		29%		56%		100%	
Other Personnel expenses	13.206		0		11.485		24.691	
TOTAL PERSONNEL EXPENSES	538.835		1.012.895		1.941.089		3.492.819	

Helium



Helium supply is of vital importance for the BCBL lab since both MEG and MRI use it for operating.

The Magnetic Resonance machine gets filled with helium approximately every three months, whereas the MEG gets filled almost weekly. In the previous graph, the expense peaks can be seen for the months in which the resonance machine gets the fill.

In 2020, there have been some months where the Helium expense has decreased significantly. It was due to the Covid19 pandemics, which forced the labs to close.

A copy of three of these invoices is annexed to this document (Annex 2 – Finance Planning - Invoices)

1.5. Future development of the centre

This section should include (Max. 2 pages):

A view on the next steps of the centre after 2025.

The BCBL, on the horizon of 2025, is determined to become:

1. A world reference point and hub for multidisciplinary research in Cognitive Neuroscience of Language, where research excellence goes hand in hand with the versatile capacity to develop innovative projects with a high impact in Education and Health. Following the advice from the ISAB and the BERC Evaluation committee, we expect to consolidate the current 12 research groups and create 2 to 5 additional groups to strengthen the research lines described in this report, including ageing, stroke, computational modelling and advanced methods for cognitive neuroscience as our initial priorities. We expect that each research team will focus primarily on a research line, but we also expect researchers from different groups to collaborate with members of other groups and other research institutions, since one of the strengths of the BCBL is its interdisciplinary character. One of the keys for consolidating the research lines will be the capacity to attract and retain talent. In addition, in order to reach our goals, we foresee stronger collaborations with other high-profile international entities as well as entities of the Basque network for science and technology, thanks mainly to the IKUR programme. Finally, to reach and maintain this goal, we will continue attracting resources by participating in different calls at various levels, including the Basque Government, the Spanish Government, the EU and other international agencies. In addition, in line with our commitment to communicate science at different levels, we will continue organising scientific events and events for the general public.
2. A field leader in terms of how to adapt, advance and transform the outcome of fundamental research into products and services to society, through collaboration with diverse educational and health institutions. For instance, in order to find an outlet for the knowledge generated by the basic research of the centre, and offer **added value, more services and products to society through innovation**. The BCBL will be present in three fields that are essential to the welfare state and the future of the country: Biosciences, Health Care and Education. In Health Care specifically, apart from the projects that are already in place with leading bodies in the research and treatment of the elderly, we will continue collaborating with the neurosurgeons of Hospital Cruces to provide presurgical, surgical and postsurgical mapping, helping to increase the quality of life of patients that need brain surgery. This is a very innovative project that combines basic research and assistance to patients. In addition, we will continue developing cognitive tools to remediate neurodegeneration and brain damage (e.g., aphasia,).



Another pillar of society is Education. The BCBL, given its mission and its lines of research, will be actively present in studies related to learning (e.g., learning a second language) and learning disabilities (e.g., SLI, dyslexia, dyscalculia), especially in a bilingual environment. We are already collaborating with various schools both in Donostia and Vitoria. Moreover, in the Sagrado Corazón School of the Carmelite order in Vitoria, we will continue running experiments in our permanent **Junior Lab** in order to perform longitudinal experiments on the children attending the school more conveniently. In addition, we keep a close relationship with Dislebi (Basque association for dyslexia) among other associations. It is quite likely that the BCBL will produce knowledge that can be transferred to the educational area, including information regarding typical processes and how these can be improved (e.g., when a foreign language will best be assimilated), as well as knowledge regarding individual differences and learning disabilities and how these can be helped. In addition, the BCBL is providing assessment tools for the diagnosis of several learning disabilities (dyslexia and SLI) both in Spanish and Basque, a current demand from society and professionals. Additionally, the BCBL will provide software for diagnosis and intervention in developmental disorders, and also through "Neure Clinic", specialised diagnosis for developmental disorders, based on behavioural and neuroimaging data. This initiative is based on the experience acquired throughout years of research and, in view of the opportunity provided by the availability of a first-rate human team and scientific equipment, we have the opportunity to **combine the existing capacities and new technologies to transfer part of the scientific advances of the BCBL to society** (2nd axis of Basque Government's Euskadi 2020 programme) in the form of a product and a service.



3. A driving force and catalyst for important projects in the Research Development and Innovation (R+D+i) system within the HORIZON EUROPE framework. These types of projects should also help to create synergies that in turn lead to a more comprehensive restructuring of the country. This, in turn, will contribute to building bridges and common projects among the general public and private bodies belonging to the



R+D+i system, within the Spanish Strategy of Science and innovation and also aligned to HORIZON EUROPE programme and Basque Government's science strategies such as the Technology and Science Plan—PCTI Euskadi 2030—, the RIS3 Basque Strategy and the IKUR programme. The added value provided by the BCBL regarding knowledge transfer can contribute to the achievement of the societal challenges of these programmes, by means of breakthrough solutions from multi-disciplinary collaborations.

4. An environment that provides young people in the postdoctoral stages of their careers, highly qualified and specialised international researchers and administrative and technical staff with the opportunity to develop unusual and ambitious projects in excellent conditions. It is vital for the BCBL to be attractive in this regard. Nevertheless, we should also take into account that competition in Europe is very intense, so agile adaptations to changing interests in the field, the development of new techniques, and to available funding schemes are paramount.
5. A centre that provides an optimal work atmosphere with an international and multicultural environment for research; this will help promote the creation of hard-working international and interdisciplinary teams, summarised in the next points:
 - a. Team (Human Resources): People are the key success factor of our strategy. The BCBL is a whole, where researchers, managers and support personnel work together on a team-based and collaborative way. We look for polyvalent (e.g., combination of different methods or one method to different theoretical questions) and complementary (e.g., diverse theoretical backgrounds and expertise in advanced methods) profiles so that each individual can develop a successful career.
 - b. Innovation (Processes): Innovation and creativity are the soul of our activity. We yearn for excellence in everything we do, fostering people participation. To that end, we recruit personnel from a wide range of areas who are experts in their particular domain.
 - c. Coherence (Excellence): The human resources are aware of the aims established by our governing bodies, so our infrastructures, equipment and working habits are consistent with the objectives of excellence.
 - d. Knowledge (Transfer): The way to connect our human resources, innovation and excellence to society by the educational, health and social entities.

The support from the BERC action will be an opportunity to place the BCBL at the forefront of Cognitive Neuroscience with outstanding research facilities competing for the best human resources with the best centres worldwide. The BCBL has a remarkable trajectory since it was founded, leading to its current status as a top research institute in the world. That can then lead to how getting the highest support from the BERC framework will provide a major new push upward, accelerating what is already a really impressive trajectory. BCBL is very competitive in attracting young researchers. In overall terms, we are optimistic about the chances of success in the planned prospective activities. Updating our facilities will help us to continue to produce frontier research and keep being attractive to recruit new research personnel. Additionally, the support from the BERC initiative will help to increase our human resources to strengthen some of our strategic research lines.

The BCBL has rapidly evolved in the first term of its academic life and, at present, its management schemes and international reputation allow us to be much more effective on the attraction and recruitment processes. Undoubtedly, the highest support from the BERC schema will strengthen our position in the world. In this sense, this funding scheme is expected to create a chain reaction. This initial funding would greatly enhance our ability to secure additional major funding sources, excellent researchers, and new and updated equipment to continue our work far into the future.

Finally, the actions described in the document to be taken to achieve the goals of the centre developed through the research lines with the increased human resources and research facilities will have a tremendous impact on the quality and quantity of our research and the generation of new knowledge for not only the scientific community but for society at large. This is because language is so inherently central to our everyday lives, education, health, and overall well-being. Consequently, deepening our understanding of language and using that knowledge for the benefit of society is expected to be an equally-central line of scientific inquiry. We have a trajectory in mind to accomplish precisely this with the critical help from the BERC framework.

1.6. Contribution and integration in the Basque Science System

1.6.1. Alignment with the Basque Science Policy

This section should include (Max. 2 pages):

Description of the Alignment with Basque Science Policy, the Research and Innovation Strategies for Smart Specialisation RIS3 Euskadi and with the PCTI Euskadi 2030. Impact in the Basque Country of the research carried out in the centre.

Alignment with Basque Science Policy and Regional Research and Innovation Strategies for Smart Specialisation

The Basque Government, in its Strategic Priority Action Plan for Smart Specialisation of Euskadi RIS3, has defined 3 priorities of smart specialisation related to advanced manufacturing, energy and **bioscience**, in its bid for diversifying the economy of Euskadi towards areas of great development potential, and to respond to the major challenges our society will face in the future, including those linked to health and population ageing. The BCBL's strategy fits perfectly in the Bioscience field, since it is an active part of the scientific and technological network of high-level competences existing in Euskadi, focusing on the human-health segment, including healthy ageing, health and education. Furthermore, the BCBL endeavours to cover the actual gap between fundamental research and the market with technology transfer initiatives, like the aforementioned in the 1.5.2 subsection of the present report, following the recommendations of the RIS3 priorities classification as the basis for defining the way to address their development within the Strategy for Smart Specialisation of Euskadi 2030, in which one of the priorities with evidence of scientific strengths, but limited business capability, is human health.

Amongst the ongoing BCBL research projects, it is worth mentioning here a couple of innovative ones as an example of our alignment with the RIS3 priorities, strategies for smart specialisation and PCTI Euskadi 2030 objectives: i) Presurgical mapping. Project in which we have designed and tested individualised protocol for presurgical mapping using MRI and MEG that provide useful information to the Hospital Universitario Cruces neurosurgeons for their interventions with each specific patient with low-grade gliomas involving language areas in the brain. These individualised mappings can be implemented in other health centres at the local, national and international levels treating this type of brain tumour. ii) In a large project focused on dyslexia, we are developing and adapting a new protocol for the diagnosis of this developmental disorder in Basque and mapping the reading circuitry at different ages based on typical and atypical readers in the province of Gipuzkoa. This project will not only allow evaluating dyslexia reliably and validly in Basque-speaking populations, but also will help to elucidate the neural markers associated with developmental dyslexia, which in the mid-term may help us to develop new intervention programmes for the 5-10% of the population suffering this language disorder.

In this ambitious long-term programme (2030), the Basque Government aspires to position the Basque Country as a scientific pole of international reference with opportunities for development in the scientific-technological areas to be promoted. BCBL collaborates actively in these areas of Neurosciences and High Performance Computing and will contribute to achieving the objectives of the Basque Government by promoting our scientific capacity. We will do so by generating and attracting talent and providing ourselves with infrastructures that reinforce our research lines as well as collaboration with the other BERCs associated with each IKUR, as well as and with the other agents of the Basque Science and Technology Network, generating value from basic research.

1.6.2. Collaboration with Basque entities

This section should include (Max. 2 pages):

Description of the collaboration frameworks or agreements with other public and private Basque entities.

Our collaboration framework is fundamentally focused on the fields of basic research, health and education.

Basic Research

The Basque Government has made an important effort over the last 10 years to support R&D through different programmes and initiatives. Ikerbasque and the CIC/BERC programmes, both of which the BCBL is involved in, are just a few examples of such initiatives. In order to reach our aforementioned goals, we foresee stronger collaborations with other entities of the Basque network for science and technology, such as the Achucarro Basque Centre for Neuroscience, BCMaterials and the BCAM (Basque Centre for Applied Mathematics). These collaborations will facilitate the development of improved computational tools to investigate, for instance, brain connectivity.

Health Care

In **Health Care** specifically, apart from the projects that are already in place with leading bodies in the research and treatment of the elderly, such as the **Donostia Hospital**, **BioCruces** and **Biodonostia**, we aim to promote new bonds and joint projects with these and other centres dedicated to aging. In particular, we will build on our

initial collaboration with the Hospital Donostia in San Sebastián to research neurodegeneration, Parkinson, aphasia and children with hearing loss. Furthermore, for the aphasia project we have started collaborating with Aita Menni, a health centre focused on brain damage.

In addition, we will continue collaborating with the neurosurgeons of **Hospital de Cruces** to provide pre-surgical, surgical (via brain stimulation) and post-surgical mapping, helping to increase the quality of life of patients that have a certain brain tumour in the language area. In the near future, we will also extend our collaborations to ECoG (electrocorticography) for patients with epilepsy that need resection of brain tissue, as we have gained expertise in this method.

Education



Another fundamental pillar of society is **Education**. The BCBL, given its mission and its lines of research, is and will be actively present in studies related to learning (e.g., learning a second language) and learning disabilities (e.g., specific language impairment, dyslexia, dyscalculia), especially in a bilingual environment. Furthermore, during these years the

BCBL has set up additional collaborations with several institutions of the Basque Science and Education System.

We are already collaborating with **various schools** both in Donostia and Vitoria. Moreover, in the **Sagrado Corazón School of the Carmelite order in Vitoria**, we agreed to install a permanent BCBL Junior Lab laboratory that is running since 2011 in order to more conveniently perform longitudinal experiments on the children attending the school. In addition, we keep a close relationship with **Dislebi** (Basque association for dyslexia) and **TEL Euskadi** (Basque association for Specific Language Impairment) among other associations.

The BCBL is generating knowledge that can be transferred to the educational area, including information regarding typical processes and how these can be improved (e.g., when a foreign language will best be assimilated), as well as knowledge regarding individual differences and learning disabilities and how these can be helped. In addition, the BCBL is in the final process to provide assessment tools for the diagnosis of several learning disabilities (dyslexia, dyscalculia and SLI) both in Spanish and Basque, currently demanded by society and professionals.

The **Euskampus Campus of International Excellence** (CEI Euskampus) is a project that aims to place the Basque Country in a position of global leadership regarding education, research activities and its capacity for innovation and knowledge transfer. The CEI Euskampus has been conceived with a long-term commitment and with the aim of becoming a key element for the achievement and development of relevant social and economic values for the Basque Country, showing it to be an internationally competitive alliance that brings dynamism to the research, the innovation and the economy of its surroundings. In March 2012, the BCBL signed a collaboration agreement with Euskampus that includes the general collaboration framework between EUSKAMPUS FUNDAZIOA and the BCBL. It defines the relations within the structure of the EUSKAMPUS Project and through the EUSKAMPUS FUNDAZIOA that will be maintained between UPV/EHU and the BCBL for the promotion of training, research and knowledge transfer, innovation and dissemination.

This partnership also provides support for the development of a high-quality postgraduate studies programme in the **UPV/EHU** and the deployment of the Master's and Doctorate School of the UPV/EHU within the context of the International Excellence Campus.

The BCBL has also signed several agreements with different Basque faculties for the development of internship programmes and practicum: **Faculty of Psychology, Faculty of Philosophy and Educational Sciences, Faculty of Arts (Letras), Faculty of Business EHU/UPV. University of Deusto, ESTE, Polytechnical Institute of Easo, ISSA Universidad de Navarra.**

Other collaboration agreements with Basque Science system entities

The BCBL has a very active and close collaboration with **Ikerbasque**, the Basque foundation for science.



Adhered to i2Basque. **i2BASQUE** is a "Plan Euskadi en la Sociedad de la Información" programme, developed by the Basque Government Education, Universities and Research Department. It focuses on supporting the RDI community in the Basque Country, providing telecom and ICT service infrastructures to Basque Science and Technology Network players.

There are also several research agreements and programmes ongoing with UPV/EHU research groups, like IXA Taldea and ELEKIN.

1.7. Composition and role of the International Scientific Advisory Committee (ISAC).

This section should include (Max. 2 pages):

Description of the composition of the ISAC, role and activities, including information on the evaluations, follow-up and proofs of completion of the recommendations for the improvement of the centre.

The **International Scientific Advisory Board (ISAB)** of the BCBL, established in 2009, is an external strategic body composed of renowned international researchers, all high-profile scientists with extensive experience in the management and evaluation of top-tier research centres. The main role of the ISAB is to advise on the centre's orientation and overall strategy, providing an independent vision to guide our activities from an international perspective. The fact that these high-profile scientists who were/are directors of international research centres agreed to be on our ISAB speaks to the BCBL's potential and drive to play a leading role in the international area. The most recent reviews were received in September 2017 (full report), October 2019 (interim report) and November 2020 (interim report). These are the current members of the ISAB:

George R. Mangun, Ph.D. (Chair)

Distinguished Professor of Psychology and Neurology
Director, Centre for Mind and Brain
Dean Emeritus of Social Sciences
University of California, Davis, U.S.A.

Anne Cutler, Ph.D.

Distinguished Professor, The MARCS Institute, Western Sydney University, Australia
Director Emeritus, Max Planck Institute for Psycholinguistics, The Netherlands

William Marslen-Wilson, Ph.D.

Honorary Professor of Language & Cognition, Department of Experimental Psychology
Director Emeritus, MRC Cognition & Brain Sciences Unit, University of Cambridge, U.K.

James L. McClelland, Ph.D.

Lucie Stern Professor in the Social Sciences, Department of Psychology
Director, Centre for Mind, Brain and Computation, Stanford University, U.S.A.

Cathy J. Price, Ph.D.

Professor of Cognitive Neuroscience,
Director, Wellcome Centre for Human Neuroimaging
Queen Square Institute of Neurology
University College London, U.K.

Timothy Shallice, Ph.D.

Professor and Director Emeritus, Institute for Cognitive Neuroscience,
University College London, U.K.
Professor Emeritus, Scuola Internazionale Superiore di Studi Avanzati, Italy

These are the recommendations and conclusions according to the last report from the ISAB, dated November 2020 (all the recommendations made by the ISAB have been considered and actions implemented, as can be read along this Strategic Plan):

III. Recommendations of the Scientific Advisory Committee

The Board offers the following specific recommendations and observations:

1. As the new Ph.D. programme grows, it will be important to gather specific and detailed information on the outcomes of the graduates. This should include long-term follow up, such as whether they obtain postdocs in leading labs, how they are funded in those training positions (individual fellowships, etc.). If they go instead to industry or public sector positions, efforts should be made to find out whether they remain in cognitive brain research. Over the long term, their success in obtaining independent positions in academia or research institutes should also be tracked. This information should also be tracked for the master's students (e.g., do they pursue a Ph.D., etc.) and postdoctoral fellows.

2. The Impact of the Severo Ochoa grant has been of great importance for the development and success of the BCBL, most notably in improving the research infrastructure (e.g., upgrade of the MRI), which is critical for supporting the recruitment, success and retention of the best researchers. The Severo Ochoa funding is one of the pillars upon which the BCBL has built its current truly excellent twelve research groups. In addition, the Severo Ochoa support provided doctoral and postdoctoral scholars that



additionally fuelled the research efforts at the BCBL, and this has had a major impact. We previously recommended that the Director develop a strategic plan for continuing centre-wide support of this type, which has been produced for 2021-2024. Without such support, many important projects might not be possible, and the success of the BCBL as a whole might be slowed.

3. We applaud the Director and his colleagues for their commitment to and success in advancing diversity and equity, but also encourage continued progress. Over time, there should be an increase in the percentage of more senior researchers at the BCBL (e.g., full professors) who enhance diversity and equity, including in gender diversity. It is praiseworthy that gender diversity is strong among the trainees and early-career researchers, but it is equally important that the senior faculty members reflect this diversity. With this in mind, the Board recommends planning that considers not only recruitment but importantly retention of women and those contributing to diversity. It will be important to continue to prepare early-career scientists for leadership roles. In this regard, the Director's actions to create leadership committees, and to distribute decision-making formally with the Group Leaders follow a very positive direction.

4. The exceptionally successful programmes in outreach to both the scientific and non-scientific communities are laudable, and these should be continued as a high priority of the BCBL. These are noted in the Centre Strategic Plan 2021-2024, but the Board would recommend developing plans to deal with the issues arising from the global pandemic with respect to hosting scientific meetings, and urges the Director and faculty to consider how to advance novel means to continue the scientific outreach under the current (and likely future) limitations in physical gathering.

5. Joint international grants, including with scientific agencies in the United States are encouraged, and the ISAB believes that as stated in the new scientific plan, that US National Science Foundation, National Institutes of Health, and private sources could provide additional research funding. Although this is not usually the case for non-US entities, because two of the Group Leaders are US scientists who maintain research capability at US universities, this opens the door for properly structured applications for new awards.

6. The ISAB encourages the Director to advance scientific collaboration with the international vendors (e.g., Siemens, Philips, Brain Products, etc.) that support the technology used at the BCBL for research. We appreciate that the BCBL does pursue such collaborations, but suggest that widening those might lead to advantages in upgrading existing infrastructure and/or replacing it with next-generation equipment, software and options; for example, upgrades to the MEG or MRI systems.

IV. Conclusions

The ISAB finds that the BCBL has continued a high rate of productivity and successfully advanced its mission since the full review in 2017. The Board was pleased with the responses to the 2017 recommendations, noting that in many cases the BCBL has gone beyond what was recommended. Similarly, the new Centre Strategic Plan 2021-2024 is promising for guiding the BCBL forward. The high quality of the faculty is evident in their continued career advancement, scientific success, and national and international recognition. The ISAB supports the latest recruitments to the BCBL, as well as the rapid progress of the training programmes. The Board also notes the international leadership shown by the BCBL in sponsoring international meetings, and hosting popular scientific events that advance critical theory in the field of language research. Outreach, technology transfer and societal impact are all progressing well. The Director is to be congratulated for his continued focus on achievement, while also championing diversity and equity. The BCBL has established itself as a vibrant international centre for research and training in human language and brain function, and in so doing, provides impactful service to society locally, nationally and internationally.



2. Scientific Excellence and Research Quality: recent main activities and achievements for 2018-2021

2.1. Research Programme(s)

This section should include (Max. 7 pages):

Main research objective(s) and description of the research activities, projects, lines deployed to meet that/those objective(s). Results achieved: scientific publications, patents, licences... Social impact of the research programmes carried out.

Main research objectives

The BCBL **research objectives** are the following:

- To unravel the neurocognitive mechanisms involved in the acquisition, comprehension and production of language.
- To uncover the cognitive and brain mechanisms of reading and reading disabilities.
- To develop research and innovation in Cognitive Neuroscience with particular emphasis on language processing in multilingualism and second language learning.
- To investigate language processing and language disorders in connection to brain surgery, brain damage, and neurodegeneration.

To achieve these major research goals we (1) promote scientific research and national and international scientific relations within the field of Cognitive Neuroscience and transfer the results of this research to the wider socioeconomic community; (2) promote the transfer and dissemination of knowledge about Cognitive Neuroscience of Language by means of organising courses, seminars, national and international conferences and by other appropriate general communication means; (3) participate in undergraduate and postgraduate education and training programmes and encourage the incorporation of young researchers to this field; (4) facilitate the training and development of the BCBL personnel and to promote their collaboration across different lines of research; (5) forge collaborative links and common interest areas with public and private institutions, centres and industries, with the aim of providing research, training, technological and consultancy services to use the work developed in the BCBL to the fullest economic and social advantage.

There are three major scientific discoveries (see full references below), together with their impact on society:

1. Speech production may be bad for learning speech sounds (Baese-Berk & Samuel. 2016, JML). Impact: Teaching a second language should avoid the production of foreign sounds by trainees.
2. People with dyslexia have a specific synchronization deficit in the delta frequency band (Molinero et al. 2016, HBM). Impact: Potential use of neurofeedback to improve reading targeting the delta frequency band.
3. Two ventral occipital temporal areas with different structural connections are involved in visual word processing and their functional activation predicted reading behaviour (Lerma-Usabiaga, et al. 2018, PNAS). Impact: Potential neuroanatomical markers for dyslexia

Description of the research lines

During the 2018-2021 period, the BCBL has developed activities and achieved key goals in each of its three research lines to better understand how language works, what fails in language-related disorders, and ultimately improve our theoretical models and the translational applications of language research. In particular, we have made exciting translational advances by developing important tools for diagnosis and intervention. Below, we briefly describe the main theoretical and empirical developments within these research lines, which have been reinforced and reshaped following both BERC Evaluation Board's improvement suggestions and the recommendations from the ISAB:

1.1.1 LINE 1: Language, Reading and Developmental Disorders

A. Language laterality in the brain

Left-right lateralisation is an important organising principle of the human brain. Specific lateralisation phenotypes have been linked to susceptibility to neurocognitive disorders including language impairment, dyslexia, autism and schizophrenia. We worked with the University of Bordeaux and the Max Planck Institute for Psycholinguistics to make important progress in defining these language-related functional lateralisation phenotypes in bilinguals, using structural MRI as well as resting-state and task-related fMRI.

B. How language comprehension and production take place in the human brain

We have made significant advances in understanding how humans communicate using spoken language. Our research examines production of speech, perception of speech, contextual factors that support speech perception, how bilingualism affects spoken language processing and how words are represented and activated in a “mental lexicon”. With respect to speech production, we have advanced our capacity to non-invasively image and map brain activation during speech using novel MRI (Magnetic Resonance Imaging) protocols in collaboration with the Beckman Institute, Chicago, USA. This technique provides sufficient spatial resolution to show how the individual speech organs and their inherent dependencies critical to fluent speech are controlled. Using this novel protocol, we have been investigating natural variations in speech gestures by combining two levels of empirical observation—kinematic and neural—to reveal the neuro-mechanical links underlying speech production and associated disorders.

C. Combining words into sentences: Agreement mechanisms

Our work has advanced towards a fully-fledged account of the mechanisms for combining words into sentences, by focusing on agreement between two words. Our data have highlighted a clear functional, temporal and neuroanatomical dissociation between two cognitive mechanisms that underpin agreement processing that are respectively responsible for early checking and later interpretation. This work has provided the basis for investigating such brain mechanisms in impaired (e.g., brain-damaged) and developing (e.g., second language learner) linguistic systems.

D. The role of our expectations in language processing

Our brain is a statistical machine constantly estimating upcoming (future) events. Predictive processes, alongside prediction errors, are of paramount importance for learning. We have provided robust and replicable evidence for language predictions. We have shown that the oscillatory activity (~4-8 Hz) in the auditory cortical regions carries information about the phonological form of expected upcoming words. The motor system and, more specifically, the language articulatory network are also involved in supporting anticipatory processes. In addition, in the first language, we are exposed to leaves an indelible mark on our language prediction system. Nonetheless, if an interlocutor is associated with a specific language, the language prediction system is sensitive enough to incorporate this information and adapt accordingly.

E. How brain dynamics change with learning to read

We have performed cross-sectional and longitudinal behavioural, MEG (Magnetoencephalography) and fMRI studies to better define how brain dynamics change during the acquisition of reading in children and adults. We have shown that learning to read in children and illiterate adults has an impact on cognition beyond language processing, including effects on visual object recognition. The data from illiterate adults were collected in collaboration with the National Brain Research Centre in Delhi, India. In addition, we have shown that the speech and reading networks are mostly universal, showing a very high proportion of overlap between languages with very different characteristics, such as Chinese, English, Hebrew and Spanish.

F. How phonemic representations change with learning to read in different orthographies

We have developed a large-scale project to explore phonemic representations in individuals before and after learning to read. We have shown that the way we perceive and produce speech sounds is modulated by literacy acquisition and depends on the complexity of language-specific orthographic rules. This project is being extended to children at risk for dyslexia and to children with cochlear implants to explore the links between speech sound processing impairments, speech production, and reading acquisition. This research also supports the creation of early detection and remediation tools based on speech sound processing for at-risk populations.

G. How reading is mastered by deaf individuals

Deaf individuals struggle with reading and lag behind their hearing peers in performance. We used behavioural and EEG (Electroencephalography) measures to probe the mechanisms and strategies that skilled deaf readers use to read in the absence of well-formed phonological representations. Our results revealed that skilled deaf readers can achieve lexical access without phonological encoding, and their agreement processing is comparable to that of hearing controls. These findings provide a framework for developing novel interventions to support reading acquisition in deaf individuals.

H. How brain oscillations entrain to external rhythms and their implication in (a)typical reading acquisition



During speech perception, the brain's oscillatory activity simultaneously synchronises with multiple components of the external input, exhibiting temporal patterns of different grain-size: phrases in speech alternate at a relatively low-frequency rate (< 2 Hz), syllables at a higher rate (4-8 Hz), and phonemes even faster (> 30 Hz). We found that the speech envelope between 0 and 8 Hz provides critical information for speech intelligibility and contributes to reading skills in typically developing children. In addition, we showed that people with dyslexia have a specific synchronisation deficit in the lowest frequency band (< 2 Hz). This last study was the first in which such evidence was collected using natural speech. These findings have been summarised and integrated in a review paper in which we propose a neurophysiologically grounded model accounting for different neural sources of this widespread learning disorder.

1.1.2 LINE 2: Multilingualism and Second Language Learning

A. Cognitive and neural mechanisms underlying language processing in multilingual individuals

For decades, it has been widely assumed that speech production and speech perception are two sides of the same coin and play mutually supportive roles. Repeating foreign sounds is a standard second language teaching procedure, reflecting this common assumption; it is thought that by repeatedly producing sounds, the student will learn to hear novel speech-sound distinctions. We demonstrated that this positive relationship does not always hold. When learning a distinction between sounds that is not relevant to their first language, participants failed to learn the distinction when they had to repeat the sounds themselves. This standard teaching procedure of getting students to repeat foreign sounds reflects the common assumption that production and perception are mutually supportive so that saying the sounds will help the student to learn to hear the distinction. In fact, in our study, those who just listened (and did not repeat) learned the distinction. These findings challenge conventional wisdom about the theoretical relationship of speech production and speech perception and indicate that standard classroom practices for teaching a non-native language are likely to be suboptimal.

B. Understanding non-native speech

We investigated how native speakers process non-native speech by examining different levels of sentence comprehension: syntactic, semantic and pragmatic processing. We showed that the way the brain reacts to grammatical errors depends on the linguistic status (native/non-native) of the speaker and listener. Listeners process dialectal synonyms and cognates as well as ironic statements differently when listening to native or non-native speakers. Sentence comprehension is recalibrated on-line depending on external cues such as the speaker's accent.

C. Second Language learning: providing feedback to shape pronunciation

We have implemented an altered auditory feedback procedure that induces speakers to implicitly adapt their speech production. We are now testing this technique as a means to improve foreign speech sound production, including both children and adults with cochlear implants or specific language impairments. The aim is to apply this method as a remediation tool for impairments in speech perception and production. In a parallel line of work on how feedback affects pronunciation, we have also started to develop training strategies using visual feedback during speech sound production.

D. Monolingual and bilingual reading as a function of orthographic depth

We have developed strong collaborations with the Spanish and French public educational systems in the Basque country to carry out large-scale projects to compare speech and reading skills in children exposed to bilingual (Spanish-Basque and French-Basque) versus monolingual (only Spanish or French) teaching strategies. At the neural level, we have shown that monolinguals engaged similar functional networks for reading and speech across four highly contrastive languages with different orthographic depths (Spanish, English, Hebrew, Chinese), pointing to a universal signature of proficient reading. However, we have also found that the functional dynamics during reading processes differ as a function of the orthographic depth (transparent versus opaque) of their second language. The outcomes of these projects will be highly relevant to education and teaching strategies, showing how speech and reading skills vary depending on whether learners are in a mono- or bi-lingual environment both before and during reading acquisition.

E. Bilingual effects in cognitive control

Several studies have suggested that being bilingual, and the resulting need for language control improves general cognitive control capacities. We conducted a series of behavioural and neuroimaging experiments but found no empirical evidence to sustain the claim of a "bilingual advantage". A review of previous evidence showed that in most cases reported differences could have been produced by uncontrolled factors such as socioeconomic status or immigration. We also investigated the role of bilingualism in cognitive decline in an MRI study: we found no



solid empirical support for the claim that bilingualism delays dementia and no difference between bilingual and monolingual patients with Parkinson disease. This is not to say that bilingualism has no effect on the brain: we have shown plasticity effects related to bilingualism in the language circuit, just not in the executive control circuit.

F. How is meaning represented in the brain?

We investigated whether and how the neural representations of semantic knowledge generalise across languages. Using machine learning classifiers applied to fMRI data during reading, we found that the meaning of words could be decoded within each language but the decoder did not generalise across different languages unless the depth of processing during reading was high. These results have helped to improve our models of semantic processing and may be critical for future approaches to language learning and language deficits in multilingual societies.

G. How are languages from different modalities represented in the brain?

Research on sign language processing provides novel insights into language representations and a new testing ground for theories describing how the brain instantiates language. Our work has focused on the neurological underpinnings of sign language processing, bimodal bilingualism and the development of a lexical database of Spanish Sign Language (LSE). We brought together expertise in sign language, cognition and neuroimaging to create a unique research programme that would only be possible in a few other research centres in the world. This programme is already producing ground-breaking results. An fMRI study that looked at LSE processing in hearing bimodal bilinguals revealed that sign language processing mostly recruits the classic left perisylvian language network. In addition, using behavioural and eye-tracking methods to examine interactions between signed and spoken language, we showed parallel lexical activation of the two languages (signed and spoken) in bimodal bilinguals.

1.1.3 LINE 3 Neurodegeneration, Brain Damage and Healthy Ageing: Language and Cognition

A. Presurgical mapping and brain plasticity

Low-grade gliomas—tumours that grow slowly enough to allow the brain to make gradual adaptations—may trigger functional reorganisation of the brain, giving rise to different compensatory mechanisms that "move" linguistic functions from damaged to healthy areas. In surgical contexts, this potential reorganisation of linguistic function needs to be mapped in order to carefully plan an efficient and personalised strategy for tumour removal. In collaboration with the Hospital Universitario Cruces (Bilbao), we have designed and tested a new protocol for presurgical mapping which tests several combinations of languages. The protocol's novelty resides in using a combination of different behavioural and neuroimaging tasks (MEG, MRI and fMRI) to target specific aspects of brain processing: temporal and oscillatory dynamics, anatomical and functional localisation and connectivity. The protocol consists of three phases that allow us to characterise plastic changes associated with different cognitive functions, including language: 1) Pre-surgery, 2) Awake craniotomy and intra-operative mapping and 3) Post-surgery. During the pre-surgery stage, a set of behavioural, MEG and fMRI tasks are used to map language eloquent areas. This information is used to anticipate findings during the awake craniotomy, plan the surgical intervention, test plasticity changes and predict surgery outcomes. During the second stage, we functionally characterise the causal relationships within and between brain regions, and map the cognitive functions associated with specific brain areas, including in cortical, subcortical and white matter structures.

B. Cognitive and Brain changes in Stroke and Parkinson's disease

We have investigated differences in inhibitory control processes comparing Parkinson's Disease (PD) patients with impulse control disorders, PD patients without impulse control deficits and healthy controls. We have collected fMRI data to examine the functional dynamics of the striatal-PFC network involved in inhibitory control during impulse control tasks and resting state fMRI data to detect differences in spontaneous functional fluctuations between these three groups. Additionally, an ongoing longitudinal study examines whether intensive cognitive training can help reduce the cognitive decline observed in PD patients with mild cognitive impairment. A computerised programme provides training in the five main cognitive functions that are most vulnerable in mild cognitive impairment: language, memory, visual processing, executive functioning and working memory. This training study may pave the road for promising non-invasive interventions to slow cognitive decline in PD patients.

C. Conscious/non-conscious brain mechanisms that support semantic processing

We have developed novel neuroimaging protocols to investigate how the brain encodes and maintains memory representations of semantic knowledge across distinct states of conscious awareness. We record the fMRI activity of participants while words are presented for tens of milliseconds, below the level of conscious perception. We then apply standard machine learning algorithms to fMRI signals in canonical brain regions associated with



semantic processing (e.g., precuneus, fusiform, lateral temporal cortex). The results show that the meaning of non-consciously perceived words can be decoded from the patterns of fMRI signals. We are developing analytical pipelines that exploit recent developments in deep learning algorithms to further explore the links between semantic representations across different states of awareness. Further, we are developing better machine learning algorithms to address these questions in collaboration with the team of Prof. José Lozano at the Basque Centre for Applied Mathematics (BCAM), with PhD students jointly co-supervised by the BCBL and BCAM scientists. This has created a highly productive relationship between the two centres, both supported by the S.O. program. Moreover, we apply this line of work to neurodegenerative diseases. We are particularly interested in developing novel biomarkers based on neural patterns identified in the aging semantic system that will help to predict the onset of dementia.

D. Conscious/non-conscious brain mechanisms that support statistical learning

We have tested the scope of non-conscious information processing in the healthy human brain. Our results show that high-level statistical learning can operate on non-conscious items and is mediated by a neural circuit involving primary visual areas and the hippocampus. We are also investigating how individual capacities for statistical learning interact with the statistical properties of writing systems to predict the ease or difficulty any individual will have acquiring reading proficiency in a first and second language. The project leverages a combination of behavioural experimentation, computational modeling and state-of-the-art imaging methods.

E. Metacognition and educational neuroscience

Metacognition includes the ability of an individual to reflect on the correctness of their own thoughts and behaviours and enables learning across multiple task domains. We have shown that metacognition involves the reactivation of brain systems during reflection that are similar to those engaged during task performance. We are now investigating the role of metacognition in the development of learning and reading skills in children, in particular, testing the hypothesis that metacognitive ability at early critical points during development will predict future learning achievement. This ongoing study is a within-subject longitudinal study in which children are evaluated on their metacognitive confidence in the context of different tasks involving reading, visual attention and statistical learning. This focus on the role of metacognition is an innovative research line in educational neuroscience, with important translational implications for developing better strategies to treat learning disabilities, support learning and memory in healthy aging and reduce the impact of neurodegenerative diseases.

Across these three research lines, we actively promote expertise in advanced research methods, which have fuelled and enabled many recent theoretical advances. One example that we are carrying out is the development of new algorithms to investigate the connectivity between specific brain areas for some language disorders. Another current example to advance research in the BCBL is the development of a high-resolution atlas of several nuclei of the thalamus, needed to relate the fMRI signal to the connectivity of specific brain areas (e.g., pulvinar; MGB) of the thalamus with other brain regions. This is not possible with current methods, but accomplishing this aim will have a tremendous impact on the neuroimaging community.

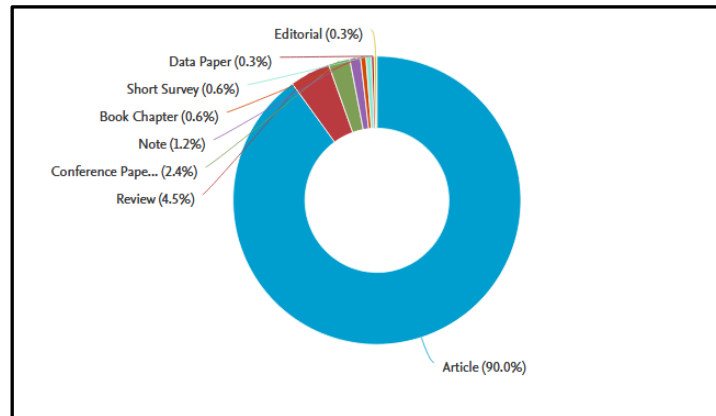
As in the past, the BCBL proactively develops new activities and research teams that complement and extend our three main research lines as the interdisciplinary study of language continues to advance. Currently, researchers are grouped into research teams led by senior and staff scientists. To achieve this objective, we take advantage of international calls to attract new talented researchers, allowing them to develop their research agendas in the BCBL. As the BCBL matures, these efforts concentrate on specific areas that have the greatest benefit for the entire community and that yield the highest impact on science at the international level. Always, we emphasise combining deep theoretical groundbreaking questions with advanced methodological expertise and acting as a hub for world-leading skills in particular areas rather than spreading research lines, overly dispersing the BCBL's resources. To consolidate the BCBL's position as an international leader in language research we analysed our current strengths and weaknesses, as well as anticipated opportunities and areas of concern that are described in the section devoted to the strategic plan 2022-2025)

Research projects

According to the objectives and the research lines, we developed several research projects funded by different research agencies. The results of these research projects that addressed questions that stem from the research lines just described were presented in international conferences and published in papers in high-impact journals. In addition, different members of the BCBL organised several international conferences and workshops on topics described in the different research lines. In Annex 3, we present the titles and relevant information about the different projects that are currently running and have been awarded along the 2018-2021 period.

Publications 2018-2021

This graph shows the percentage of documents by type during the period 2018-2021.



See the Benchmarking of the Centre in Annex 4, the full list of publications in Annex 5, the full list of Conference Proceedings in Annex 6 and, in Annex 7, the top 20 Q1 journals 2018-2021 ranked by the number of publications in the source and the top 20 most cited journals ranked by citations received.

Selected scientific contributions

The ten scientific publications described below conducted by researchers at our centre published in the most important journals of Social Sciences and Humanities show the excellence achieved during the 2018-2021 period.

1. Amoruso, L., Finisguerra, A., & Urgesi, C. (2020). **Spatial frequency tuning of motor responses reveals differential contribution of dorsal and ventral systems to action comprehension.** *Proceedings of the National Academy of Sciences of the United States of America*, 117(23), 13151-13161. Doi:10.1073/pnas.1921512117 **Citescore 2020: 16,2, Quartile 1, Decile 1**
2. Ordin, M., Polyanskaya, L., & Soto, D. (2020). **Neural bases of learning and recognition of statistical regularities.** *Annals of the New York Academy of Sciences*, 1467(1), 60-76. Doi:10.1111/nyas.14299 **Citescore 2020: 9,1, Quartile 1, Decile 1**
3. Caballero-Gaudes, C., Moia, S., Panwar, P., Bandettini, P. A., & Gonzalez-Castillo, J. (2019). **A deconvolution algorithm for multi-echo functional MRI: Multi-echo sparse paradigm free mapping.** *NeuroImage*, 202:116081. Doi:10.1016/j.neuroimage.2019.116081 **Citescore 2019: 10,2, Quartile 1, Decile 1**
4. Kalashnikova, M., Goswami, U., & Burnham, D. (2019). **Sensitivity to amplitude envelope rise time in infancy and vocabulary development at 3 years: A significant relationship.** *Developmental Science*, 22(6): e12836. Doi:10.1111/desc.12836 **Citescore 2019: 6,9, Quartile 1, Decile 1**
5. Lizarazu, M., Lallier, M., & Molinaro, N. (2019). **Phase-amplitude coupling between theta and gamma oscillations adapts to speech rate.** *Annals of the New York Academy of Sciences*, 1453(1), 140-152. Doi:10.1111/nyas.14099 **Citescore 2019: 8,2, Quartile 1, Decile 1**
6. de Bruin, A., Samuel, A. G., & Duñabeitia, J. A. (2018). **Voluntary language switching: When and why do bilinguals switch between their languages?** *Journal of Memory and Language*, 103, 28-43. Doi:10.1016/j.jml.2018.07.005 **Citescore 2018: 5,7, Quartile 1, Decile 1**
7. Lallier, M., & Carreiras, M. (2018). **Cross-linguistic transfer in bilinguals reading in two alphabetic orthographies: The grain size accommodation hypothesis.** *Psychonomic Bulletin and Review*, 25(1), 386-401. Doi:10.3758/s13423-017-1273-0 **Citescore 2018: 6,0, Quartile 1, Decile 1**
8. Lerma-Usabiaga, G., Carreiras, M., & Paz-Alonso, P. M. (2018). **Converging evidence for functional and structural segregation within the left ventral occipitotemporal cortex in reading.** *Proceedings of the National Academy of Sciences of the United States of America*, 115(42), E9981-E9990. Doi:10.1073/pnas.1803003115 **Citescore 2018: 16,1, Quartile 1, Decile 1**
9. Martin, C. D., Branzi, F. M., & Bar, M. (2018). **Prediction is production: The missing link between language production and comprehension.** *Scientific Reports*, 8(1):1079. Doi:10.1038/s41598-018-19499-4 **Citescore 2018: 6,4, Quartile 1, Decile 1**
10. Monsalve, I. F., Bourguignon, M., & Molinaro, N. (2018). **Theta oscillations mediate pre-activation of highly expected word initial phonemes.** *Scientific Reports*, 8(1): 9503. Doi:10.1038/s41598-018-27898-w **Citescore 2018: 6,4, Quartile 1, Decile 1**



Patents, Licences, knowledge transfer

The BCBL has developed several databases that can be used for free by the world scientific community, and any others interested in language research. They are available at our webpage <https://www.bcbl.eu/en/research/transferencia-conocimiento-tecnologia/database>. See the full list of databases in Annex 8.

Chronset: An automated tool for detecting speech onset.

Roux, F., Armstrong, B.C., & Carreiras, M. (2017). Chronset: An automated tool for detecting speech onset. *Behavior Research Methods*, 49: 1864–1881. Doi:10.3758/s13428-016-0830-1 Citescor 2017: 5,8, Quartile 1, Decile 1

LSE-Sign: A database of 2,400 LSE (Spanish Sign Language) signs and 2,500 pseudo signs.

Gutierrez, E., Costello, B., Baus, C. & Carreiras, M. (2016). LSE-Sign: A Lexical Database for Spanish Sign Language. *Behavior Research Methods*, 48:950–962. Doi:10.3758/s13428-014-0560-1 Citescor 2016: 5,6, Quartile 1, Decile 1

The eDom.

Armstrong, B. C., Zugarramurdi, C., Alvaro, C., Valle Lisboa, J., & Plaut, D. C. (2016). Relative meaning frequencies for 578 homonyms in two Spanish dialects: A cross-linguistic extension of the English eDom norms. *Behavior Research Methods*, 48:950–962. Doi:10.3758/s13428-015-0639-3. Citescor 2016: 5,6, Quartile 1, Decile 1

ESPAL

Duchon, A., Perea, M., Sebastián-Gallés, N., Martí, A., Carreiras, M. (2013). EsPal: One-stop Shopping for Spanish Word Properties. *Behavior Research Methods*, 45: 1246-1258. Doi:10.3758/s13428-013-0326-1 Citescor 2013: 4,4, Quartile 1, Decile 2

The centre has not registered any patents during this period, although it is worth noting that it has signed an exploitation licence with the French company HAPPYNEURON SAS, so that, in exchange for royalties, they can market the MULTIMAP package (multilingual picture naming test for mapping eloquent areas during awake brain surgery).

Some major research outcomes from this period are:

- 308 articles and reviews published in high-impact journals (83% Q1). (In Scival on August 26th, 2021).
- 400 presentations in conferences and workshops.
- 150 outreach activities (conferences, external speakers, visiting scholars, dissemination activities, talks, etc.)
- 10 international conferences and workshops organised and hosted.
- 36 projects totalling 4.900.000 EUR
- 90 individual fellowships totalling 8.900.000 EUR.
- 2 grants for scientific equipment at a cost of 330.000 EUR
- 10 grants for scientific conferences and outreach activities at a cost of 50.000 EUR.
- 45 students enrolled in the Master on Cognitive Neuroscience of Language conducted by the BCBL.
- 24 PhD theses defended.
- 5 open-source tools/databases and 1 exploitation licence.
- More than 20.000 experimental sessions involving more than 10.000 participants.
- More than 1.500 visiting scholars.

In sum, at the end of the 2018-2021 period, the BCBL was considered one of the best places in the world to carry out advanced studies on language, our most unique human capacity. We have made great strides towards a better understanding of how language critically shapes an individual's social, economic and physical wellbeing.

2.2. Research Groups

This section should include (Max. 3 pages):

Definition of research structure or organisation of the centre. Strategies and activities carried out to support the attraction and retention of research talent.

Internal Organisation

The **Scientific Director** provides scientific and management leadership in the BCBL by defining and coordinating the implementation of the overall strategy of the centre. The Scientific Director promotes a comfortable atmosphere that stimulates high-quality research production, efficient collaborative management and technical support. As the main centre representative, the Director also designs and promotes alliances and relationships with partners and stakeholders to achieve BCBL's primary objectives. While the director of the centre provides leadership, responsibilities are highly distributed among researchers, fostering collegial strategic decisions.

The **Group Leader Committee**, which includes the Scientific Director, the General Manager and the Group Leaders, meets once per month to coordinate activities, recruitment and lab organisation as well as funding to establish priorities, follow the progress of research projects and support management and outreach structures at the centre.

The **Scientific Committee** evaluates all the projects to be carried out in the BCBL and is composed of three Group Leaders, currently, Dr. Martin, Dr. Molinaro and Dr. Paz Alonso.

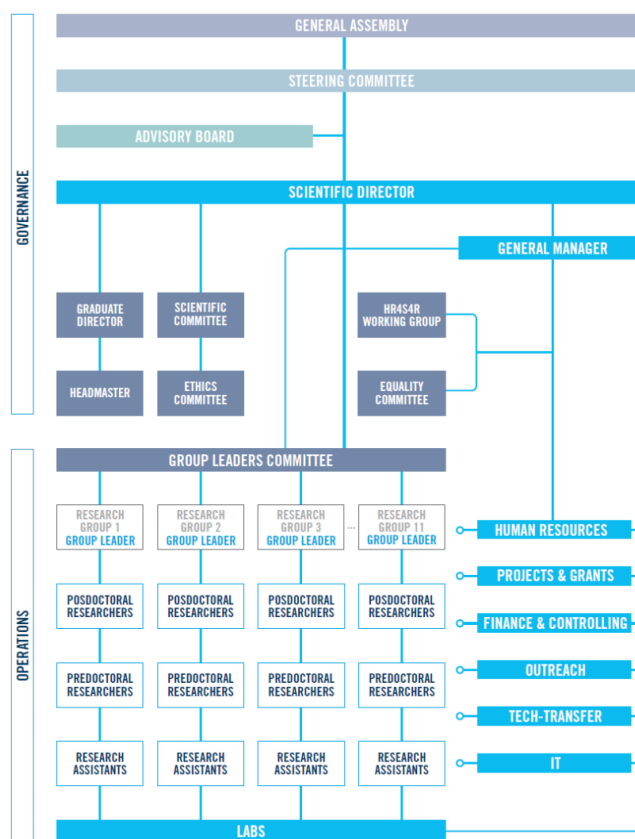
The **Ethics Committee** evaluates that all the projects comply with the ethical rules and is composed of three Group Leaders, currently Dr. Kalashnikova, Dr. Lallier and Dr. Mancini. When additional external advice is needed, we contact the Basque Ethics Committee (Comité de Ética de la Investigación con medicamentos de Euskadi - CEIm-E).

The **PhD Graduate Directors** in charge of running the PhD programmes are two Group Leaders, currently Dr. Soto and Dr. Samuel.

The **Headmasters** in charge of running our MSc programme are two Group Leaders, currently Dr. Caballero and Dr. Samuel.

The **Researchers** are grouped into research groups that dynamically change/increase as research programmes develop, new human resources are recruited or new grants are obtained. They are led by a Group Leader (see full list at www.bcbl.eu/en/research/research-groups). The Group Leader provides expert guidance to PhD students and postdoctoral researchers and is also responsible for establishing the research goals of the group and for managing the group budget. Each group leader is independently responsible for establishing the research goals of their group, for managing group members and handling their group budget. The BCBL provides each group with money for running costs, free access to lab resources and at least one postdoctoral fellow and one PhD student. Additional resources required by a group can be obtained through external grants.

The **Ombudsman Team** is made up of members of the Administrative and Research staff, who are elected to form part of the team based on proposals and consensus from the doctoral and postdoctoral researchers. The Team is currently composed of Dr. Costello and Dr. Samuel (Research) and A. Fernández (Admin). The Ombudsman Team has several functions, including providing conflict resolution, offering advice and support to BCBL staff, monitoring work practice issues and making recommendations for improvement. Over the last four years, the team has handled over 20 different cases, ranging from supervision issues and authorship resolution to pastoral care and mental health referrals.





The **Management Team** led by the General Manager supports all research activities, crossing the organisational chart transversally (See 2.2). This includes support for departments such as Administration (finance control, projects and grants management, human resources, outreach), Information Technologies, Laboratories and Tech-Transfer. It is important to highlight that since many researchers are foreigners, the BCBL needs a group of trained research assistants in its four different laboratories to be able to run experiments in the local languages, Basque and Spanish.

The research and support staff at the BCBL is:

- Director: Dr. Carreiras
- Group Leaders: 10
- Staff scientists: 6
- Post-doctoral Researchers: 17
- Pre-doctoral Researchers: 44
- Affiliated Researchers: 9
- General Manager: Dr. Arocena
- Laboratories Department: 14
- Information Technologies & Technical: 3
- Administration: 8
- Technical Transfer: 5

Composition of research groups

Following the advice from the ISAB and the BERC Evaluation committee, a major reorganisation of BCBL's research divisions was carried out to improve the performance of the centre and distribute governance and decision-making among PIs. Researchers were grouped into research teams led by group leaders. Each group specialises in one of the research lines but also engages with other research lines. There is a clear matrix of alignments, such that the "whole is greater than the sum of the parts".

Group 1: Brain Rhythms and Cognition – Group Leader, Dr. Molinaro, ORCID 0000-0002-7549-6042. Research lines 1 and 2.

Group 2: Consciousness – Group Leader, Prof. Soto, ORCID 0000-0003-0205-7513. Research line 3.

Group 3: Developmental Language Disorders – Group Leader, Dr. Lallier, ORCID 0000-0003- 4340-1296. Research lines 1 and 2.

Group 4: Language and Memory Control – Group Leader, Dr. Paz-Alonso, ORCID 0000- 0002-0325-9304. Research lines 1, 2 and 3.

Group 5: Neurobiology of Language – Group Leader, Prof. Carreiras, ORCID 0000-0001- 6726-7613. Research lines 1, 2 and 3.

Group 6: Neurolinguistics and Aphasia – Group Leader, Dr. Mancini, ORCID 0000-0001- 9514-7862. Research line 3.

Group 7: Parkinson Disease and Neurodegeneration – Group Leader, Prof. Rodríguez-Oroz, ORCID 0000-0001- 5962-772X. Research line 3.

Group 8: Speech and Bilingualism – Group Leader, Prof. Martin ORCID 0000-0003-2701-5045. Research lines 1 and 2.

Group 9: Spoken language – Group Leader, Prof. Samuel, ORCID 0000-0001-8552-2710. Research lines 1 and 2.

Group 10: Statistical Learning – Group Leader, Prof. Frost, ORCID 0000-0002-5625-0813. Research line 3.

Strategies and activities to support the attraction and retention of research talent

TALENT ATTRACTION: In 2016, the board of trustees of the BCBL endorsed the “European Charter & Code for Researchers” and the European Commission's HRS4R strategy. In January 2017, the BCBL was granted the “HR Excellence in Research” award and the award was renewed in 2019. Additionally, in 2016 the BCBL put its Gender Action Plan in place. This plan facilitates a flexible environment in which both men and women can combine family time and research. The objective is to create a workplace where the best talent can flourish, in line with the Strategic Vision of the European Research Area. Currently, 56% of the BCBL research community is female. However, there is a gender imbalance in the percentage of female professors. However, this trend will change in the next few years thanks to the new policies described in Section 3.5. (e.g., Senior staff members will formally mentor younger staff members through preparing applications for external funding to ensure that they have the opportunity to stay at the BCBL and progress their careers).

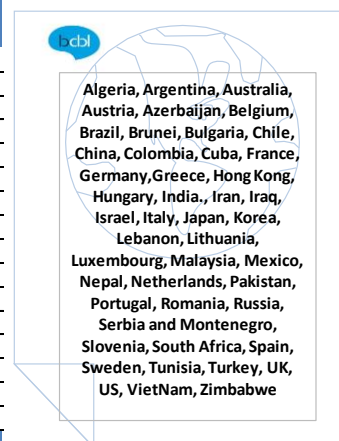
Out of the eight current tenure track positions, six are held by women.

Access to positions and promotion at the BCBL is purely based on academic merit. We adhere to an Open, Transparent and Merit based recruitment policy (OTM-R), guaranteeing equal opportunities for all candidates. The BCBL has been actively recruiting, promoting, and retaining talent with both internally and externally funded fellowships through several calls, in line with our commitment to recruit the most outstanding personnel in order to become an international benchmark centre in the field.

- Ikerbasque: Very competitive calls for Research Professors and Fellows evaluated by a panel of external experts followed by a subsequent evaluation at the BCBL
- AEI (Ramón y Cajal: 5 years tenure track; Juan de la Cierva postdocs: 2-3 years)
- Marie Skłodowska-Curie
- International BCBL calls for recruiting staff scientists, postdoctoral researchers and PhD Students. Staff Scientists are offered a 5-year contract with the possibility of tenure track. Postdocs are offered a 2-year contract with the possibility of a 2-year renewal. PhD Students are offered up to 4 year contracts. The evaluation process includes a first evaluation by group leaders and at least two external reviewers. This generates a shortlist of candidates who are invited to come to the BCBL for a job talk and interview
- All the calls are published on the websites of Ikerbasque, BCBL and the websites of other research societies in the field, as well as some of the main job databases (e.g., Science careers, Euraxess), ensuring that BCBL calls are seen around the world

The table below displays the calls within the 2018-2021 period as well as some relevant data that shows the BCBL attraction of talent capability and international visibility:

Year	Call	Applications	Selected applicants	% selected female	Nationalities
2018	Postdoc Computational skills	2	0	0%	1
2018	Signal Processing Engineer	14	2	50%	10
2018	Postdoctoral for Severo Ochoa	33	1	100%	18
2019	Postdoc EEG/EEG skills	11	0	0%	9
2019	Postdoc ReadCalibration Project	14	1	100%	7
2019	Postdoc L2STAT Project	5	1	0%	4
2020	Postdoc ReadCalibration Project	11	1	100%	7
2019	PhD ReadCalibration Project	9	1	0%	6
2019	PhD Severo Ochoa	26	3	75%	14
2019	PhD Dysthal Project	8	1	0%	5
2019	PhD Dysthal Project	9	1	0%	6
2020	PhD Consciousness group 2020	16	1	100%	11
2020	PhD Infant Language and Cognition group 2020	42	1	100%	22
2021	PhD Bilingualage Project	20	1	100%	9
2021	PhD Dysthal Project	13	1	100%	6
2021	PhD Manuel LangConn Project	13	1	0%	6
Total		246	17	52%	47



TALENT RETENTION: Researchers at any stage of their career, regardless of their contractual situation, are given an opportunity for professional development and for improving their employability through access to a Personal Career Development Plan which includes (1) Training through individually personalised research projects under senior supervision, (2) Knowledge exchange with the scientific community and the general public, (3) Network-wide training in theory and methods, (4) Complementary training courses, (5) Involvement in proposal writing, task coordination and (6) Development of skills for the organisation of training and scientific events.

To resolve any conflicts, the BCBL has an Ombudsman team. In addition, every year a satisfaction survey is completed. All results and the resulting Action Plan is shared with all employees during the annual retreat.

Finally, we have designed a welcome plan for every researcher who comes to BCBL for the first time. It includes explanations and a thorough description of the city, local administration, introduction to all new colleagues, help in the search for housing, Spanish/Basque lessons. Each newcomer also receives the employee handbook, which includes all aspects of the BCBL organisation, such as the mission, vision and values, legal structure, International Scientific Advisory Board (ISAB), research lines, platforms and techniques, internal organisation, procedures, key policies, confidentiality and data protection, rules for participation in conferences and research trips, IT procedures, purchasing conditions, health care, tax system, education system, nearby universities, and general information about the city and surrounding area. Furthermore, most of the researchers coming from abroad are hosted through the BCBL at the Talent House, a residence for researchers coordinated by the Donostia Town Hall, with which the BCBL has an agreement. <http://fomentosansebastian.eus/donostiainn/en/>



2.3. Internationalisation strategy

This section should include (Max. 3 pages):

Agreements and collaboration frameworks with European and international entities that help in the internationalisation of the centre. Highlight European and International projects/networks the centre coordinates or in which it takes part. Detail the research outputs of these collaborations: publications, patents, licences...

Visiting researchers, hosted or going abroad.

Specify the leadership and/or role of the centre on the activities carried out.

Agreements and collaboration frameworks with international entities

Find below a summary of the most important research collaborations the BCBL has undertaken in the last few years, many of which are still active:

- ATHEME, Advancing the European Multilingual Experience. FP7-SSH-2013-1-613465. European Union. (2013-2019)
- ENRICH "Enriched communication across the lifespan". H2020-MSCA-ITN-2015-GA-675324. (2016-2020)
- "Examining variability in the native language and its influence on second language learning" NSF-National Science Foundation (USA), Award number 1749143 together with the University of Kansas. (2018-2021)
- "Statistical learning and L2 literacy acquisition: Towards a neurobiological theory of assimilating novel writing systems" ERC Advanced grant together with the Hebrew University of Jerusalem, Israel. ERC Advanced Grant, ERC-2015-AdG_692502, L2STAT. (2016-2021)
- "Reading across Orthographies" Consortium with Haskins Laboratories (USA), Academia Sinica (Taiwan), and the Hebrew University of Jerusalem (Israel). We recently published a major paper in PNAS about brain correlates of reading in four different orthographies, made possible through our international collaboration network.

The BCBL continues to actively collaborate with many international bodies: CNRS (France), University of Modena (Italy), University of Magdeburg (Germany), Max Planck Institute for Psycholinguistics in Nijmegen (Netherlands), Donders Institute for Brain, Cognition and Behavior (Netherlands), Tufts University (USA), University of Massachusetts (USA), University of California (USA), University College London (UK), Universiteit Utrecht (Netherlands), Vrije University (Amsterdam), Macquarie Centre for Cognitive Science (Australia), Netherlands Organisation for Scientific Research (Netherlands), Fondation Fyssen (France), University of Bordeaux (France), Haskins Laboratories (USA), Academia Sinica (Taiwan), University of San Francisco (USA), University of Connecticut (USA), and Yale University (USA), among others.

Another important goal of the BCBL has been to promote cooperation with developing countries in the spheres of higher education and research in the Social Sciences and Humanities and its applications. The BCBL cooperates regularly with the "Organización de Estados Iberoamericanos para la Educación, la Ciencia y la Cultura (OEI)".

Two collaboration agreements between Siemens Healthcare S.L.U. and BCBL: (1) Master Agreement on Collaboration to foster the exchange of software developments, sequences and any other innovative improvement focused on the development of the Siemens 3T PRISMAfit MRI scanner owned by the BCBL. (2) Agreement with BCBL as Siemens Reference Customer: BCBL is committed to accepting visits from and provide training to medical professionals, technicians and Siemens employees.

Many of the BCBL researchers, including the PI and S.O. trustees, are members of the following renowned international research societies, among others:

- | | |
|---|--|
| • Association for the Scientific Study of Consciousness | • Society for Magnetic Resonance in Medicine |
| • Cognitive Neuroscience Society | • Organisation for Human Brain Mapping |
| • Cognitive Science Society | • Psychonomic Society |
| • European Society for Cognitive Psychology | • Society for Neuroscience |
| • Experimental Psychology Society | • Society for the Neurobiology of Language |
| • International Congress of Infant Studies | • Vision Sciences Society |

BCBL ALUMNI

Following the recommendations of our International Scientific Advisory Board (ISAB), we have implemented a BCBL ALUMNI process to gather specific and detailed information on the outcomes of our Master graduates and former researchers. This includes a long-term follow up, in order to track whether they obtain positions in leading labs, how they are funded in those positions (individual fellowships, etc.), if they stay in academia or go to industry or public sector positions. Some relevant data:



Researchers	Master Students
80 former BCBL Researchers	97 former BCBL Master Students
85% stay in Academia	75% pursue a PhD
85% joined labs located in Europe	71% joined European Universities/Labs
15% joined labs located in US	29% joined International Universities/Labs
33% obtained prestigious competitive grants	33% joined the BCBL for a PhD, 78% obtained a grant

Visitors programme

The BCBL carries out several scientific activities and mobility programmes to strengthen the links of its researchers with external researchers and research centres, thus fostering long-term and high-impact internationalisation.

- In 2011, the BCBL launched an initiative—the **Affiliated Research position**—to develop a stable international co-operation scheme that helps maintain and strengthen links with specific researchers who have actively collaborated with the BCBL and want to continue working in close collaboration and visit the BCBL on a regular basis. At the moment agreements with 9 researchers have already been signed.
- World-leading **external speakers** are regularly invited to present their research at the BCBL and interact with researchers. Seminars are open to the scientific community. During the 2018-2021 period, the BCBL organised 48 external speaker seminars (Annex 9).
- The BCBL hosted along 2018-2021 period, 24 **visiting researchers** for short stays, and 39 visiting researchers for stays longer than one month. These visiting researchers came from Universities and research institutions around the world, such as: University of Thessaloniki (Greece), Università degli studi di Padova, Universidad Purdue, Universidad de Oviedo, Universidad de Santiago de Compostela, Universidad de Illinois (USA), Pontificia Universidad Católica de Chile/ UC, Rice University in Houston, Technische Universität Kaiserslautern, Universidad de Connecticut, Johns Hopkins University, la Universidad Complutense de Madrid, San Raffaele university in Milan, University of Milano-Bicocca, Tilburg University, Laboratoire de Cartographie Fonctionnelle du Cerveau, Universidad de Burdeos, Universidad de Trento, Universidad de Buenos Aires, Universidad de Groningen, Universidad de Maastricht, Universidad de la Laguna, University of Cambridge, Sidney University, Universidad de Bath, Universidad Carl Von Ossietzky, Jinan University, Federal Institute of Technology (EPFL), Universidad de Ottawa, EHU/UPV, Universidad URJC (Alcorcón), Universidad de Valencia, Universidad Jorge Tadeo Lozano y La Universidad Central (Colombia) (Annex 10).
- More than 100 researchers from abroad have visited the BCBL.
- The **Internship/stays programme** at the BCBL within the national or international scope is designed to provide research training to students at all levels that may later join the centre as PhD students or Postdocs. It is worth highlighting that 63 international researchers benefited from this program. Apart from these academic visiting researchers, BCBL has hosted and trained 24 students from various universities and higher education schools in the national scope.
- The BCBL hosts and sends young PhD students from/to other institutions around the world for **short stays** from one month up to one year to carry out some collaborative research with researchers at the BCBL. The BCBL researchers performing international short visits with external funding are shown in the table. It is mandatory for PhD students to spend at least 3 months in a foreign lab.

Year	Funding Agency	BCBL Researcher	Institution	Country
2018	EUROPEAN COMMISSION	Garikoitz Lerma	Berkeley University, California	USA
2018	BASQUE GOVERNMENT	Bojana Ristic	University of Massachusetts Amherst	USA
2018	SPANISH MINISTRY	Sanjeev Nara	Laboratoire Cartographie Fonctionnelle Cerveau	Belgium
2019	FUNDACION LA CAIXA	Maria Borrigan	Lancaster University	UK
2019	SPANISH MINISTRY	Candice Frances	Bangor University	UK
2019	SPANISH MINISTRY	Jose Javier Perez Navarro	University of Cambridge	UK
2019	SPANISH MINISTRY	Sandra Gisbert	University of California	USA
2019	SPANISH MINISTRY	Carlos Pérez Serrano	University of Cambridge	UK
2019	BASQUE GOVERNMENT	Borja Blanco	University College London	UK
2019	EUROPEAN COMMISSION	Sendy Caffarra	Stanford University, California	USA
2020	FUNDACION LA CAIXA	Jose Aguasvivas	Università di Padova	Italy
2020	FUNDACION LA CAIXA	Kshipra Gurunandan	Monash University	Australia
2020	FUNDACION LA CAIXA	Stefano Moia	Northwestern University, Chicago	USA
2021	EUROPEAN COMMISSION	Sara Guediche	University of Geneva	Switzerland
2021	BASQUE GOVERNMENT	Pavlina Heinzova	The City University of New York	USA
2021	BASQUE GOVERNMENT	Trisha Thomas	University of California, Irvine	USA

2.4. Training activities

This section should include (Max. 1 page):

Training activities for researchers and support staff in all the different career stages, designed to recruit, strengthen and retain the talent and personnel.

As an excellence research centre, the BCBL cares for the **permanent learning and quality training** of its members and cares about the long-term learning and quality training of **researchers and support team**. Training is a key point of success, as the BCBL team needs to be aware of recent theoretical and methodological developments and also of new ideas that could challenge and/or reinforce theoretical developments. In addition, training is critical to expanding and staying at the forefront of methodological knowledge related to a particular technique. This is why it is important to allocate a significant part of the budget to the development, implementation, and organisation of training events.

Research Team oriented training: the BCBL facilitates the training and ongoing development of the BCBL researchers to promote their collaboration across different lines of research and to create links and exchanges with researchers from other reference centres. A Personal Career Development Plan is designed for all researchers in the centre that includes (1) Training through individually personalised research projects under senior supervision, (2) Exchanging knowledge to the scientific community and the general public, (3) Network-wide training in theory and methods, (4) Complementary training courses, (5) Involvement in proposal writing, task coordination and (6) Development of skills for the organisation of training and scientific events. Our agenda for training in-house is mainly organised around the following axes and consolidated initiatives such as:

- **Conferences:** The BCBL has organised 10 international scientific meetings and conferences in the period involving the most influential researchers in the field of “cognitive neuroscience of language”. These events are a great opportunity for the BCBL researchers to attend lectures, to discuss their work with other attendees and, of course, to expand its network (more information in section 2.7.).
- **Workshops and Summer Schools:** We are promoting the organisation of two thematic workshops per year. This way, the BCBL researchers can obtain updated information of the particular field and can present their work to researchers coming from all over the world, including the invited speakers who represent the top-tier of that area, as well as offer an opportunity to informally interact with them, promoting the exchange of new ideas.
- **External speakers series:** World-leading external speakers are invited every other week to present their latest research at the BCBL or online. During their stay at the BCBL, the possibility for all researchers to discuss their work with the speakers in individual and/or interactive meetings is offered at the journal club. During the period 2018-2021, the BCBL has organised 48 seminars, inviting external speakers from the most prestigious research groups and centres all over the world (see Annex 9).
- **Weekly lab meetings:** Each researcher should present their findings at least once per year in the lab meeting. In addition, at the beginning of the meeting, we allow the first 5 to 10 minutes for raising questions related with the functioning of labs or any other relevant operational issue.
- **Specific training courses** on several tools (Matlab, Presentation, Fieldtrip Presentation, Mendeley, linguistic course, stats course on coursera, Python) and methods (MEG, Qualified User on the MEG, fMRI, Safety Users on the fMRI, Qualified User on the fMRI eye tracking)
- **Internal working groups** such as those led by the group leaders (BCBL research groups: Neurobiology of Language, Spoken Language, Consciousness, Speech and Bilingualism, Brain Rhythms and Cognition, Language and Memory Control, Neurolinguistics and Aphasia, Infant Language and Cognition, Signal Processing in Neuroimaging, etc.) or those led by the predocs (linguistics group, stats group, python group, Deep Learning group and external speaker journal club).
- **Official Postgraduate Teaching:** Concerning training, the BCBL runs two official programmes in collaboration with the UPV/EHU (University of the Basque Country). The master programme “Cognitive Neuroscience of Language” and the PhD programme in Cognitive Neuroscience (more information in section 2.7.).
- The centre also offers both **Spanish and Basque language free courses** for our researchers to integrate them with the local community and facilitate research involving those languages.

Finally, all researchers in the BCBL have travel money provided by the BCBL and managed by Group Leaders to attend, at least, one international and one national conference per year. These are major training opportunities for young researchers.

Support Team oriented training: In order to seek for the growth and improvement of our top-tier administration, laboratory and IT team and keep it highly motivated a Personal Career Development Plan is individually designed for each of them that includes (1) Personalised training activities, (2) Network-wide training, (4) Complementary training courses under request. The BCBL allocates a training budget for the support team and the participation in training actions can take place because of the active request of the employee or as a consequence of the Personal Career Development Plan summary.



2.5. Gender equality plan

This section should include (Max. 2 pages):

Describe the measures carried out in order to promote gender equality in the centre, including activities either organised or participated.

The BCBL Gender Action plan is managed directly by the General Manager of the centre in coordination with the HRS4R Working Group and, as a result of this plan, the current situation is that 56% of the BCBL employees are female and 44% are men. This derives from the strategy which seeks the two main pillars of equity to balance the proper proportion of male/female:

1. Salary: no distinction in gender concerning salary. Salary comes from the responsibility and/or research level, regardless of gender.
2. Promotion: promotion is always achieved on a performance basis, no matter the gender of the employee.

Measures intended to promote gender equality in the centre

The BCBL has developed a Plan for Equal Opportunities and Conciliation in order to achieve a favourable environment that may facilitate the conciliation of the personal and work lives of the team, in the sense established by law and the BCBL internal policies.

The BCBL promotes the following basic principles of action:

1. To respect diversity, promoting non-discrimination due to reasons of race, colour, age, sex, marital status, ideology, political opinions, nationality, religion, sexual orientation, or any other personal, physical or social conditions among its professionals.
2. To develop the principle of equal opportunities. This principle is one of the essential pillars of professional development, entails the commitment to practise and demonstrate a fair treatment that may further the personal and professional progression of the BCBL team in the following areas:
 - Promotion, professional development and compensation: to value the knowledge and skills necessary to perform their work, through the evaluation process and the personal development plan.
 - Hiring: not to establish any salary differences due to any personal, physical or social conditions, such as sex, race, marital status or ideology, political opinions, nationality, religion, or any other personal, physical or social conditions.
 - Recruitment and selection: to choose the best professionals by means of selection criteria based on merit and the capabilities of candidates (OTM-R standards).
 - Training: to ensure the training of each professional, in the knowledge and skills that are required for the correct performance of their work.
 - Support for workers with different capabilities, promoting their effective occupation.
 - Promotion of transparent communication, encouraging innovation and granting professionals the necessary autonomy to exercise their functions.
3. To promote effective equality between women and men within the company in relation to access to employment, training, professional promotion and working conditions, promoting in this way gender diversity as a sign of social and cultural reality, and, in particular:
 - To commit to effective equality of opportunities between women and men both within the organisation.
 - To guarantee the professional development of women, removing any obstacles that may impede or limit their careers.
 - To potentiate mechanisms and procedures for selection and professional development that may facilitate the presence of women with the necessary qualifications in all of the areas of the organisation.
 - To promote the organisation of working conditions with gender perspective, allowing for the conciliation of the personal, working and family lives of the women and men who work in the company, ensuring the elimination of any discrimination due to gender.
4. To implement measures of conciliation and welfare that may promote respect for the personal and family lives of its professionals and facilitate the best balance between the latter and the work-related responsibilities of women and men. Some of the implemented actions and policies are:

Calendar, timetable, and flexibility in the workday

- European workday of 35 hours per week
- Assessment of the possibility to adapt the worker's timetable/calendar depending on personal situation
- Morning timetable on Fridays



- Summer period with morning schedule (3 months)
- Morning schedule on public holiday eves
- Possibility of teleworking days in most job vacancies
- Flexibility in workday start and finish times
- Not limited lunch period and breaks
- Possibility of exchanging overtime (performed during special task periods) for rest hours

Maternity/Parenthood

- Modification of meetings to fulfil the convened worker's personal needs
- Flexibility to attend school meetings and celebrations
- Flexibility to attend prenatal exams and childbirth preparation techniques

Sustainability

- Replacement of paper bins for recycling points on each floor
- Purified water on all floors

Celebrations, Team Building

- Informal celebrations when the centre has been awarded
- Annual retreat: annual meeting outside the working environment and activities or trips
- Spoon Awards: workers' awards related to the daily anecdotes at work

Complaint channels for employees

- Anti-bullying protocols
- Ombudsman
- Suggestion box

Promotion of interculturality

- Corporate language in the company: English
- Spanish and Basque classes for foreign staff
- Support in the management of visas and other bureaucratic procedures for staff and their families
- Arrival manual for foreign staff

Leadership and management style

- Open Transparent and Merit based Recruitment system
- staff satisfaction surveys
- Participation of staff in action and strategy measures
- Seal of Human Resources Strategy For Researches HRS4R
- Voluntary participation of the research community in science dissemination activities

Other benefits

- Office with a free supply of coffee, oil, salt, soy, infusions, milk, etc.
- Possibility of eating at work
- Free parking in the company area

In conclusion, the BCBL has implemented an effective Gender and Equality Plan promoting an environment that ensures that the best employees are in the best positions, in terms of efficiency and equity. The criteria used by the centre to choose and promote employees are strictly technical and merit-based, having achieved a proportion of female engaged in research that exceeds the international statistics.

Activities either organised or participated

The General Manager and the HRS4R Working Group agenda comprises the active participation in the following Gender Equality related Discussion Groups:

- Diputación Foral de Gipuzkoa – Iniciativa Erantzunkide <https://www.gipuzkoa.eus/es/-/erantzunkide-sarea-6-562-langilerengana-iritsi-da-jada>
- Fundación Más Familia <https://www.masfamilia.org/>
- Somma Alliance <https://www.somma.es/articles/ii-event-gender-equality-somm-alliance>

2.6. Dissemination and transfer of knowledge, outreach activities

This section should include (Max. 2 pages):

Technology surveillance, knowledge transfer activities carried out. Include all the measures and actions carried out for research communication and dissemination, at a scientific level and to the general public.

Knowledge and Tech-transfer initiatives

One goal for the 2018-2021 period was to launch to the market three initiatives to transfer knowledge generated by the basic research of the centre and offer added value services and products to society through innovation. We have the opportunity to combine the existing capacities and new technologies to transfer part of the scientific advances of the BCBL to society in the form of products and services:

- (1) The first initiative is a **clinic for the diagnosis, treatment and monitoring of learning disorders, focused primarily on school children.**



The clinic capitalises on the research knowledge of the BCBL regarding learning disabilities using neuroimaging techniques. The aim is to provide early diagnosis of learning disabilities (specifically, SLI, dyslexia and dyscalculia) in children at risk, as well as a more complete diagnosis of children already having learning disabilities, by providing a detailed assessment of different cognitive processes.

This is an opportunity for establishing collaboration with professionals in the field to set up a way of providing a detailed and well-informed diagnosis.

The characteristics of the first initiative are similar to those of a clinic with two important strategies:

1. ASSISTANCE: The clinic will be a valued complement for the diagnosis of learning and development disorders.
2. RESEARCH: The clinic will supply the database of the Basque Centre on Cognition Brain and Language (BCBL), transforming it into win-win cooperation between both bodies.. The BCBL's expertise will benefit the clinic, while the collection of clinical histories in the database will benefit the BCBL's research.

The clinic is successfully running and started giving diagnoses and support to therapists back in 2018.

- (2) In the second stage, we continue **developing and will market educational software and software for valid early diagnosis** of learning disorders such as dyslexia or specific language impairment disorders.



The software will consist of tools for early diagnosis of learning disorders with multimedia support, previously tested in a large sample. It will be presented as a user-friendly suite supported by findings obtained from the basic and excellence research by the BCBL. It will be distributed through the marketing channels appropriate for these advanced diagnosis programmes.

These software tools will be oriented towards the world of education. Given its multimedia support, the software will permit automation of the process, interaction with the child, and the possibility of evaluating results quickly against a growing, aggregated database, allowing for increasing adjustment of the diagnosis discrimination factor, while increasing the research database of the BCBL.

During recent years, we have started designing the materials and the underlying software for stimulus presentation. The final software will be a valuable tool for early diagnosis and training with multimedia support. It will be presented as a user-friendly suite supported by findings obtained from the basic and excellence research by the BCBL. It will be distributed through the marketing channels appropriate for these advanced diagnosis programmes.

So far, the BCBL is working on two software packages, (one for dyslexia, and other for Specific Language Impairment -SLI).

These products will distinguish themselves from other diagnostic suites in the market by the following:

- Digital support
- Scientific quality and nature
- Support: User-friendly. Interactive. Recreation-oriented
- Discrimination factor: diagnostic accuracy

- (3) Third, we are developing the **Presurgical mapping project**. One of the recent research avenues we

have been exploring is the presurgical mapping of patients with brain tumours and epileptic focus in areas related to language functions. This initiative pertains to the health and medical domain. In collaboration with the neurosurgery department of the Cruces hospital in Bilbao we are carrying out at the BCBL the presurgical and postsurgical mapping of language in patients that go into brain surgery, and provide support for mapping language during the surgical operation as well.

In addition, **other priority lines to be developed** in methods and tech transfer are:

- Construction of an atlas for neuroimaging: initially focusing on thalamic nuclei
- Software development for education and health for:
 - Diagnosis and remediation of language disorders
 - Second language learning.
 - Rehabilitation aphasic patients
 - Cognitive training in the elderly and in patients with neurodegeneration
- Identification of individuals through electrophysiological biometrics

Management of Intellectual Property Rights (IPR)

The BCBL ensures that researchers at all career stages reap the benefits of the exploitation (if any) of their R&D results through legal protection and, in particular, through appropriate protection of Intellectual Property Rights, including copyrights. Policies and practices should specify what rights belong to researchers and/or, where applicable, to their employers or other parties, including external commercial or industrial organisations, as possibly provided for under specific collaboration agreements or other types of agreement.

All these transfer actions are managed: (a) to guarantee the rights of our researchers as “inventors” (b) to ensure the “return” as scientific benefits in the sense of new contracts for researchers (c) to transfer real new knowledge into technology for the education and health sectors (d) to guarantee the open access for the essential results achieved to the medical and research communities.

Science Communication and Outreach

The BCBL has performed several dissemination activities i) for the scientific community through conferences, seminars and congresses, and ii) for society at large through various media outlets.

In this second level, our communication activities pursue the following main objectives:

To publicise the existence of the BCBL and position it at the local, national and international levels as the Research Centre of Excellence in Cognitive Neuroscience and Language.

To make the knowledge generated in the BCBL available to society by disseminating to society at large the scientific advances achieved.

The BCBL actively promotes initiatives to create awareness of the research work it performs and the implications this research has for citizens. Outreach activities include introducing students from schools and universities to science, research, and innovation. Following the BCBL’s philosophy, researchers receive specific training in “transfer and dissemination of research results”, and share their research results with the general public via activities such as “Brain Awareness Week”, “Pint of Science”, “Elhuyar Zientzia Azoka”, “SOMMA 100xCiencia”, “Zientzia Astea UPV-EHU”, etc.

One of the most remarkable events during this period is the “Brain Awareness Week”. This science week has held four editions during this period, with remarkable success and a very high participation rate. The aim of these events is to popularise Cognitive Neuroscience of Language and make it more comprehensive to society at large, using less scientific jargon than in regular conferences.

Moreover, throughout the 2018-2021 period, the BCBL has consolidated an open-doors policy specially designed for visiting school groups. During those visits, secondary, high school or university students benefit from a masterclass on Neuroscience, get the opportunity to learn about the specific projects of our researchers, visit the labs and understand the academic trajectory required to work in the research field.



2.7. Other activities

This section should include (Max. 3 pages):

Include any other activity carried out during the period 2018-2021 that should be considered for the evaluation of the centre.

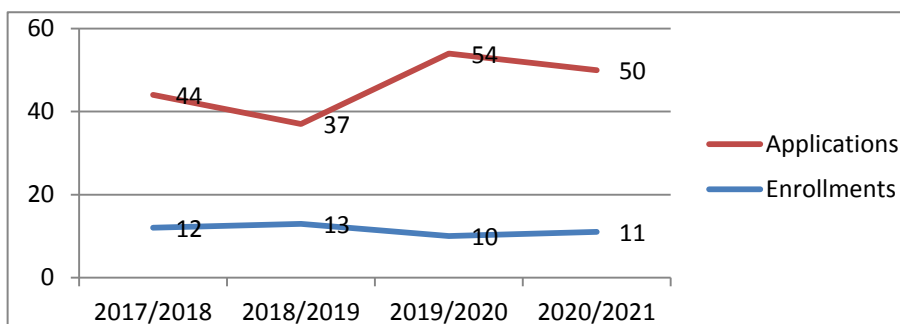
In this section, we will describe some relevant activities that have not been included in the previous sections, despite being relevant to the BCBL:

University Teaching: Master's Programme and PhD programme

(1) The **Master's in Cognitive Neuroscience of Language** has been taught since the academic year 2011-2012. One of the aims of this graduate programme is to train interdisciplinary researchers in the Cognitive Neuroscience of Language to advance further and transfer this knowledge to the areas of Health and Education. The programme allows the degree holder to pursue a research career by developing a PhD thesis.

The duration of the programme is one academic year, with 60 ECTS credits. The students develop research skills through the mentorship of experts and by completing the Master's Research Project at the end of the programme.

The graph shows the evolution of the applications and enrollments to the Master's, in which the interest for the programme at the international level is reflected. There is always a maximum number of 16 enrollments for students with the best academic records, therefore ensuring the teaching quality through personalised attention.



So far, 120 students from 30 different countries have participated in this Master's throughout its 10 editions, 32 of whom have joined the BCBL to complete their doctoral training. Others have joined a wide range of international centres such as New York University, Saarland University, Donders, Max Planck Institute for Psycholinguistics or University of Jyväskylä among others. We would like to highlight that some of the former students have followed a brilliant academic career standing out in universities as prestigious as UCSF and Harvard.

(2) In 2018, together with the UPV/EHU, the BCBL launched a **PhD programme in Cognitive Neuroscience** approved by the ANECA (Spanish National Agency for quality and accreditation). The BCBL's new PhD students are enrolled in this programme. As in the Master's programme, PhD students enrolled in this programme are based in the BCBL, mentored by two advisors.

Throughout the 2018-2021 period, 25 theses have been defended (see Annex 11). From these 25 PhD students, 18 belong to the University of the Basque Country, one of our main collaborators and partners; 11 of these theses were defended within the Linguistics programme, 1 within the Molecular Biology and Biomedicine programme, and 6 will be defended in our new Cognitive Neuroscience programme. We have 2 more successful PhD students that were enrolled in other PhD programmes within the national scope that were supervised by our researchers and/or other collaborators who have developed their thesis at the BCBL. Apart from these 20 PhD students in Spanish universities, 5 were supervised by BCBL researchers at international universities, such as Western Sydney University, Hebrew University, or Stony Brook University.

Organisation of International Conferences

From its inception, the BCBL has played an active role in the promotion of research in cognitive neuroscience and language starting with the organisation of international conferences and workshops that annually attract the most influential researchers in the cognitive neuroscience of language field:

The BCBL organised and hosted 10 international conferences and workshops during the period 2018-2021.

These conferences are a natural environment for excellent research, the first step to internationalisation, and the best opportunity for young researchers to learn and interact with world leaders in the field.

These events are a great opportunity for the BCBL's researchers to attend lectures, discuss their work with other attendees and, of course, expand their network.

During the 2018 and 2019, we have continued with the consecutive editions of “IWorDD” and “Statistical Learning” and we have also launched two new series of conferences: “WoRLD” and “International Workshop on Predictive Processing”. However, because of the Covid19 we stopped these workshops. Additionally, we have joined a global event named “Brain Hack”. We are nowadays planning two conferences (Statistical learning and WILD) for 2022.

2018

- Brain Hack (2 Keynotes, 15 Oral presentations, 12 Poster presentations, 50 Attendees)
- 1st International Workshop on Predictive Processing (3 Keynotes, 21 Oral presentations, 63 Poster presentations, 128 Attendees)
- WoRLD, Workshop on Reading, Language and Deafness (7 Keynotes, 9 Oral presentations, 42 Poster presentations, 108 Attendees)
- WoRLD: From theory to practice (10 Keynotes, 123 Attendees)

2019

- Brain Hack (5 Keynotes, 15 Oral presentations, 70 Attendees)
- ICIASL 2019 (8 Keynotes, 31 Oral presentations, 88 Poster presentations, 186 Attendees)
- IWorDD (4 Keynotes, 18 Oral presentations, 40 Poster presentations, 113 Attendees)
- IWorDD: From theory to practice (6 Keynotes, 91 Attendees)

2020

- Brain Hack Donostia 2020. Online edition (4 keynotes, 12 Oral presentations, 251 Attendees)

2021

- Brain Hack Donostia 2021. Online edition. November 22-24

Citizen participation in our studies

The studies and scientific publications carried out by BCBL have been possible thanks to the voluntary participants, the majority of whom live in Gipuzkoa.

It is necessary to have a comprehensive database to be able to carry out our studies. To this end, the BCBL has developed numerous initiatives, previously mentioned in this document, highlighting the creation of a web system for the management of research studies.

The bulk of participants of our website, www.bcbl.eu/participa, is made up of more than 10.000 users aged between 18 and 95 years old, who, according to their linguistic profile, can enroll in BCBL studies.

Between 2018-2021, the BCBL has completed more than 20.000 experimental sessions involving more than 10.000 participants, thus providing an important grass-roots group in the local community for learning about and developing an appreciation for our research and scientific research more generally. Since the BCBL opened, the number of participants has increased, indicating that our efforts to interact with the local community and involve them actively in our mission have a very optimistic future trajectory.

In order to carry out all the experiments developed at the BCBL, the active participation of infants, children and adults —between 18 and 35 years old—and elderly participants is required.

These participants take part in tests using different techniques, such as behavioural techniques, Electroencephalography, Magnetoencephalography, Magnetic Resonance Imaging, and Eye Tracking.

As for our Babylab, we have a collaboration agreement with Hospital Donostia. Under this agreement, the BCBL has a research assistant on site at Hospital Donostia for 10 hours a week, introducing the BCBL babyLAB to parents in the Maternal Infant Unit. The collaboration with Hospital Donostia continues to be a very important source of baby participants, both monolingual and bilingual. During the 2018-2021 period, we have added 1780 new families to our database who have provided us with the information to participate in studies that fit their profile.

In addition, BCBL has several projects in collaboration with schools all over the country. Throughout this period, the research assistants have collected data from the participation of children in Primary and Secondary School.

In addition, studies were carried out with groups of deaf people, sign language experts, chefs, children with Dyslexia, children with Specific Language Impairment, as well as a project in collaboration with Hospital de Cruces for oncology patients.

BCBL in the media

Besides, to disseminate the knowledge generated in the BCBL, the BCBL made a qualitative leap in 2018-2021 thanks to its presence in the national media and its entry into the social networks. The dissemination and communication benchmarks achieved by the BCBL are as follows:

After starting with sporadic appearances in local media, a fortnightly presence in the local and national communication media has been achieved during this period.

In addition to achieving certain public recognition in the media thanks to the milestones attained by the centre, the BCBL is regularly consulted by different media as an expert adviser in cognitive neuroscience, management in the scientific field and promotion of scientific vocation among the youth.

In this sense, the 2018-2021 period has had a significant presence, both in national and international media, totaling more than 1416 impacts and generating audiovisual material on research results.

During 2020, the media related to health and science has been filled with news about the coronavirus and, although we have maintained our commitment to publicise our findings and research milestones, it has been more difficult for us. Even so, we obtained very significant impacts.

The dissemination and communication milestones achieved by the BCBL during this period are:

Conventional channels: On the other hand, regarding online media, print media, radio and television, the BCBL had 1416 impacts over the 2018-2020 period.

Social media:

The BCBL is also very active in national communication media and social network sites.

Generally speaking, we could say that the centre's activity on social media follows a positive trend, both in the number of followers and the interactions achieved. Having a growing community on social media is positive for the centre, as it allows for the message to reach more people.

Social media provides us with an alternative option to be present on the media in order to inform society of the centre's activity. Given the statistics on the shared content, the strategy based on disseminating content to others has been a resounding success; this has enlarged our follower base, which is beneficial when publishing content about the centre or searching for participants for our studies.

Social network sites: below are some information that provide information about the activity and evolution of our follower figures on Facebook, Youtube and Twitter. In general terms, the results are positive and confirm the existence of a digital community that follows the centre's activity on social media.



Nowadays, the BCBL's Twitter account has **3450 followers**.



The BCBL's Facebook account currently has **5400** followers. The BCBL's Facebook account shares information about neuroscience daily and is always reviewed by experts from our centre, thus becoming a reference account in the field of Neuroscience.



The BCBL has a Youtube channel in which it stores a total of **97 videos** that have **generated 40.880 views** since its creation.



During this period, we have created an Instagram channel aiming at approaching the younger segment of our followers and offer more dynamic and visual content; nowadays, this channel has 550 followers.

It mainly shares **informative content** that is divided into the BCBL's researchers' content and talks or presentations on topics related to the centre.

3. Strategic Plan for 2022-2025

3.1. Research Programme(s)

This section should include (Max. 7 pages):

Main research objective(s) and description of the research activities, projects, lines deployed to meet that/those objective(s). Outcomes foreseen: publications, patents... Social impact of the research programmes to be developed.

Research objective(s) and description of the research activities

The quintessentially human capacity for language is central to the development of civilisation. Learning to speak or sign, read, and write are also major developmental milestones, involving complex cognitive processes that fundamentally impact individuals' interactions in monolingual and multilingual environments. High proficiency in these skills provides new opportunities for knowledge acquisition, generation and dissemination; low proficiency can limit an individual's intellectual, social and economic potential. Despite impressive technological and theoretical advances in the study of language, the cognitive processes involved in mastering and using one (monolingualism) or several languages (bilingualism), and our understanding of the underlying brain mechanisms that serve these capacities in typical or impaired development are insufficiently understood, limiting our understanding of many language disorders and our ability to remediate them.

To tackle these fascinating topics, the BCBL proposes a two-pronged Research Programme for 2021-2024 that will: (1) advance neural and behavioural models and theories of language processing; (2) translate this knowledge into clinical and educational applications that benefit society. These twin goals will be accomplished as follows: First, by optimizing our research lines to tackle new challenges at the frontiers of language research. Second, by attracting highly skilled researchers whose expertise complements our current strengths, building theoretical depth and multidisciplinary alongside expertise in neuroimaging, computational modeling and other advanced methods. Third, by continuing to upgrade and update our facilities to assure increased research output and attract young talent. Fourth, by making fundamental contributions in applied neuroscience: i) **Educational Neuroscience** - exploiting the latest advances in neuroscience to inform educational approaches in critical areas such as native and foreign language-reading, second language learning, early detection of learning disabilities, and development of software for the diagnosis and remediation of language disorders; ii) **Neuroscience and Health** - translating neuroscientific advances to develop better therapeutic avenues for language and cognitive rehabilitation following neurological disease, with special attention to the bilingual brain. This includes: improving brain surgery outcomes and recovery in patients operated for epilepsy or tumours in language areas; developing software for rehabilitation of patients with aphasia and neurodegeneration.

The optimised research lines:

1. Language development across the lifespan
2. Speech perception, production and disorders
3. Reading and dyslexia
4. Multilingualism
5. Neurodegeneration, brain damage and rehabilitation
6. Language and other cognitive systems
7. Advanced methods in cognitive neuroscience

The BCBL will continue to foster new projects and research teams to complement and extend our seven main research lines, taking advantage of international calls to attract new research talent and top international scientists. We will concentrate our scientific efforts on projects with the greatest regional educational and translational benefits and the highest impact on science at the international level. We will leverage our role as an international hub, emphasizing the importance of combining deep theoretical inquiry with advanced methodological expertise.

Description of the research lines

BCBL's seven research lines offer a multi-faceted approach to understanding human language and create strong synergies between the current twelve research groups. Our goal is to offer a novel perspective on how the human brain can plastically adapt and efficiently navigate language experience in a globalised multilingual society, leveraging our access to a multilingual community and technological capacity.

Line 1: Language development across the lifespan: The study of language learning offers exceptional opportunities to examine brain plasticity. We will trace the trajectory of language development from infancy through adulthood, using longitudinal designs to identify endogenous and environmental factors that foster language acquisition in the first months of life, promote the consolidation of language abilities in childhood and adolescence, and prevent their decline in old age. By combining functional MRI and MEG with state-of-the-art



computational modelling and machine learning, we investigate how language is represented in the brain at the cortical and sub-cortical levels, expanding existing neurocognitive models of language, which have largely focused on cortical mechanisms. Our unique bilingual environment and excellent community relations provide an exceptional platform to address these questions and develop novel computerised language training tools that help minimise language deficits across the lifespan.

Line 2: Speech perception, production and disorders: Speech is a unique evolutionary achievement that has played a critical role in human development. Mastering two languages adds further complexity but provides a unique window for language research, leading us to take a bilingual perspective in this research line. We aim to: constrain existing theories by assessing the role of inter-subject variation in hemispheric asymmetries in speech perception and production in bilinguals with a range of proficiencies and different ages of acquisition; examine unimodal and cross-modal relations between speech perception and production and consider how early speech perception skills predict later language abilities; investigate speech perception and production at the word and sentence levels and speech-brain synchronisation in specific language impairment; investigate the brain's ability to respond to reactivation of impaired auditory sensory inputs to better understand the high variability in language outcomes in infants with cochlear implants. These findings will inform the development of models of language perception and production in natural settings and novel pathways for the diagnosis and remediation of speech disorders and help develop measures to predict language outcomes for infants before cochlear implantation surgery.

Line 3: Reading and dyslexia: Reading is an essential skill in modern societies, yet 10% of the population has difficulties learning to read. This barrier is even more challenging when a learner has to acquire literacy skills in more than one language in parallel. We will investigate to what extent the orthographies of bilinguals' languages affect reading acquisition and compare reading skills in typical and atypical (e.g., illiterate, deaf, dyslexic, bilingual) populations using a range of neuroimaging methods to uncover the brain's reading circuit. This research will help us discern the causes and consequences of reading disabilities and develop tools for an earlier, more accurate diagnosis of dyslexia. We will investigate the contribution of speech rhythms to reading acquisition, employing longitudinal designs to identify reliable early neural markers of reading disorders both within and across languages. This research will help us develop novel neurofeedback tools that improve speech-brain synchronisation in children at risk of dyslexia. At the theoretical level, we aim to develop a mechanistic model of the role of subcortical-cortical connections in typical reading and dyslexia and build computational models based on deep neural networks to predict reading behaviour from brain measures, allowing us to estimate a child's future reading behaviour from their pre-reading neural profile.

Line 4: Multilingualism: Half of the world's population speaks more than one language, yet we know little about how multilingualism affects brain plasticity and neurocognitive architecture. We will investigate brain mechanisms in unimodal and bimodal bilinguals and trilinguals, both within and across modalities (signed, spoken and written language). We are one of a very select number of labs worldwide with the capacity and access to successfully undertake such studies. We will explore how the interplay between semantic, syntactic, orthographic and phonological similarity across languages supports flexibility in second language processing, and whether input diversity improves second language learning at the lexical and syntactic levels. This research will make a significant impact on theories and models of speech perception, speech production and our understanding of how the bilingual mind negotiates two languages. A further theoretical challenge is modeling second language learning and bilingual processing. We will compare models trained on a second language after the first language is stable or on two languages at once, to test the notion of 'complementary learning systems'. This may provide solutions to vexing problems in modelling, such as catastrophic interference. This scientific endeavor will serve as a major anchor point for implementing educational practices that maximise language learning outcomes.

Line 5: Neurodegeneration, brain damage and rehabilitation: Language deficits are a common consequence of traumatic brain injury, stroke, epilepsy, tumours, and neurodegenerative diseases and constitute a primary cause of disability worldwide with often drastic social implications. We will investigate brain biomarkers for both the early detection of neurodegenerative disease and the potential for language recovery through brain plasticity, translating this knowledge to develop rehabilitation paradigms. By mapping language function with MRI and MEG before and after tumour resection in patients with low-grade gliomas, we will define the mechanisms that support neuroplasticity and identify biomarkers for language recovery in bilingual and monolingual patients. To achieve this goal, we will develop personalised cognitive tasks and use them in combination with direct electrical stimulation during surgery to determine individual-specific functional boundaries of language-relevant tissue and investigate how multilingual variability interacts with neurofunctional brain plasticity, neurodegeneration, recovery and rehabilitation. These findings will translate to daily neuro-oncological practice, helping neurosurgeons optimise patient-specific surgical strategies that spare language functionality and minimise the risk of post-operative language deficits, thereby improving patients' quality of life.

Line 6: Language and other cognitive systems: Language processing requires interactions with other cognitive systems. We will (i) define the extent to which semantic and episodic memories share the same neural circuitry; (ii) ascertain if the neural mechanisms for speech processing track the acoustics of the auditory signal or reflect



abstract knowledge of the perceived language; (iii) unravel the general learning mechanisms that underlie the human ability to detect regularities (e.g., statistical learning) and how these support acquisition of specific elements in a new language; (iv) pinpoint the role of metacognition (the capacity to reflect on one's own cognition), that is, how metacognitive abilities relate to language learning ability; and (v) investigate the relationship between motor and language systems and their joint contribution to human communication. All of these issues will be enriched by our bilingual perspective, contributing to a better understanding of the interface between language and cognition.

Line 7: Advanced methods in cognitive neuroscience: Research at the frontiers of the science of language will be supported by the most recent technical advances. We will develop new imaging methods in four key areas: (i) novel algorithms for cleaning fMRI data that leverage the phase of the complex MRI signal or multi-echo acquisitions to reduce artefacts and physiological noise; (ii) empowering data analyses through advanced signal processing and machine learning techniques to enhance measures of brain connectivity at the single-subject level, and also between subjects during hyper-scanning sessions designed to study personal interactions and communication; (iii) new methods for quantification of functional MRI patterns in terms of cerebral metabolic rate of oxygen (CMRO₂; a close proxy for neuronal activation), arterial spin labelling and BOLD data; and (iv) implementing new approaches for neurofeedback and neural entrainment based on fMRI and M/EEG to investigate and modulate language learning and metacognitive abilities in real time. This research line will produce tools and protocols that will serve the international research community and provide a framework for multicentre neuroimaging initiatives.

- In sum, these seven research lines, bolstered by our advanced technical platforms, outstanding human resources, and groundbreaking research agenda, will generate new knowledge, improve our models of language, and boost translational applications in two areas essential for the welfare of society and the future of the country: Health Care and Education

Based on the strategic development of these lines of investigation, and in order to improve the competitive position of the centre, a SWOT analysis has been performed (strengths, weaknesses, opportunities, and threats) in order to consolidate the BCBL's position as an international leader in language research we analysed our current strengths and weaknesses, as well as anticipated opportunities and areas of concern:

Strengths:

- Excellent reputation in the field, despite the relative youth of the centre
- Exceptional facilities for conducting cutting-edge behavioural and neuroscientific research on language and cognition across the lifespan
- Unrivalled opportunities to unveil the specific and universal characteristics of language in a bilingual environment with Spanish and Basque, a typologically unique language
- Organisational structure with highly motivated human resources (researchers, top-tier administration, laboratory, IT team) aligned with the mission of the centre
- World-class international research team with excellent theoretical and technical expertise
- Excellent procedures for attracting, recruiting and training new talent (HRS4R, OTM-R)
- Comprehensive management procedures, management of human and material resources, outreach, science dissemination, and structures to ensure continuous improvement
- High success rates in highly competitive European calls (e.g., Marie Skłodowska-Curie Actions)
- Participation in international research networks and consortia
- Number of internal and local collaborations
- Quantity and quality of scientific production
- High-impact transfer activities and dissemination actions in society
- Neure Clinic for language learning disorders (e.g., dyslexia)
- Collaborations with neuroanatomists on brain atlases for neuroimaging
- Alliances with local hospitals and neurosurgeons for access to patients with brain damage and neurodegenerative diseases allows language and cognitive function testing during intracranial stimulation with deep electrodes and awake patient surgeries for brain tumours and epilepsy
- Local population keen to collaborate with BCBL as experimental participants.

Weaknesses:

- Spanish salaries not competitive with salaries in other developed nations
- Relatively undeveloped culture of science in Spain
- Funding shortfalls for periodic costs of maintaining advanced equipment to avoid rapid obsolescence

**Opportunities:**

- Language environment provides access to monolingual, bilingual and multilingual speakers of typologically dissimilar languages (Basque, Spanish, French, English, Spanish Sign Language)
- ERC and other provincial, national and international funding agencies
- European commitment to Science
- Human Brain Project and Brain Initiative
- High social value and positive perception of science and innovation in Basque Country
- Ikerbasque policy of promoting Fellows to Associate and Full Professors
- Basque Government's IKUR program, with its two flagships where BCBL is active: NeuroBioscience and AI HPC
- International alliances with centres with complementary expertise
- Alliances with local research centres and schools to foster research and innovation in educational neuroscience and language learning

Threats:

- Funding situation for research in Spain
- Covid-19
- Best researchers may be offered better salaries at other international centres/universities
- Shortage and fluctuating market price of liquid helium for cooling MEG and MRI systems

Based on this analysis, we aim to: (1) Promote groundbreaking research in the seven research lines aimed at "understanding language in the brain"; (2) Take advantage of our unique bilingual environment to investigate multilingual representation in the mind/brain and the impact of bilingualism on language disorders, recovery from brain damage and education; (3) Encourage interdisciplinary collaborations among researchers with diverse scientific and technical expertise (computer science, linguistics, psychology, neuroscience, engineering, mathematics, etc.); (4) Upgrade technical facilities to support cutting-edge research and innovation; (5) Further alliances with top-tier international and national research bodies; (6) Further our extensive research and transfer collaborations with local education and health sectors; (7) Expand collaborations with companies and professionals with expertise to develop computerised tools for language learning and training as well as diagnosis and treatment of language disorders.

In addition, as a result of this analysis, the centre has designed a supplementary expansion and improvement plan:

Future expansion plans

Moving beyond consolidating our research lines and our existing internal and international networks of researchers, the proposed expansion that the centre would achieve would allow for major new expansions into relatively untapped areas.

The BCBL currently has a strong track record in the international arena. We will meet our strategic targets by improving the centre's equipment, hiring new researchers, promoting new synergies among BCBL groups, and increasing BCBL's international collaboration network. We will also pay close attention to training, recruitment and transfer of knowledge. Below we describe the action plans to meet our strategic objectives:

- 1) Advanced methodology and computational models: BERC funding will allow further development of cutting-edge fMRI methodology and analytical pipelines for advanced computational modelling. By attracting new talent and collaborations we will also target novel approaches to brain connectivity, machine learning and deep neural networks to provide better explanatory and predictive models of brain function.
- 2) Language acquisition: There are only a few laboratories in the world investigating language acquisition in bilingual infants. We enjoy a uniquely favorable environment to further our global leadership in this area of research: (1) typologically distinct local languages (Basque and Spanish) and a large monolingual and bilingual infant population; (2) a well-equipped baby lab with capacity for behavioural, EEG, and NIRS research; and (3) a database of over 4000 families from the Donostia/San Sebastián community who are committed to bringing their babies and children to the lab. BERC funding will allow us to expand our research capabilities in this line of research by hiring more personnel to carry out not only transversal but also critical longitudinal studies from infancy to early middle childhood and allow us to build a baby lab hospital extension for newborn neuroimaging research using NIRS technology in collaboration with the Hospital Donostia. This research will provide the first systematic measures of language in infants who were exposed to one versus two languages in utero, informing widely debated models of early neural specialisation for language and the environmental impact of early bilingualism on linguistic and cognitive development. Furthermore, we will

continue organizing workshops related to language acquisition, such as WILD (Workshop on Infant Language Development), which the BCBL started in 2013, establishing an important European forum for this area of research.

- 3) **Developmental language disorders:** Our research on the oscillatory correlates (using MEG methods) and functional and structural correlates (using MRI methods) of developmental dyslexia and specific language impairment has had a high impact in the field. We will study infant and early childhood populations at risk of developing language disorders and will test the oscillatory cortical markers for dyslexia we recently proposed. In addition, to investigate neurodevelopmental activity associated with several forms of language production (typing or speaking). Results from this research will impact the design implementation of software for learning, diagnosis and rehabilitation. Additional funding will be allocated to hire researchers and assistants working in schools for testing the implemented software. We will continue to host IWORDD every three years, a workshop focused on dyslexia established by the BCBL. So far, three editions have been hosted by the BCBL (2013, 2016, 2019).
- 4) **Second language learning:** Understanding language learning and reading/writing in bilingual contexts is essential for current theoretical models in the neurobiology of language but and also allows us to make informed recommendations to educational professionals and institutions. Currently, we have a small kit for computer-based testing and a few portable EEG units that can be sent to schools. However, to set up flexible and portable procedures for our novel neurofeedback training protocols, we will need to purchase portable dry EEG systems that can be taken to schools for quick and easy testing of children. This is particularly important in the context of our unique multilingual population of Basque and Spanish speakers and will confirm the BCBL's role as a world leader in establishing meaningful interactions between scientific research and educational applications. We also aim to expand the BCBL's expertise in educational neuroscience and cross-modal perception-production interactions by hiring talented researchers in this area.
- 5) **Functional brain mapping and brain stimulation:** This research area is critical for addressing relevant basic science and clinical questions. One aim is to expand the group of researchers working on this research topic to address not only patients with tumours, but also patients with epilepsy who have deep electrodes implanted to record brain activity before surgery. We are currently working on a suitable configuration with Quián Quiroga, a world expert in this technique. Working with both types of patients will allow us to further address relevant questions regarding brain plasticity associated with language and to improve the accuracy and depth of information we can provide to neurosurgeons regarding the mapping of language networks at the individual patient level.
- 6) **Neurodegeneration and brain damage:** Identifying neural markers for neurodegeneration, cognitive interventions and rehabilitation remains a priority in the clinical neurosciences. We are working on developing advanced methods to characterise early markers linked to language processes in Alzheimer's and Parkinson's diseases and applied protocols for cognitive training programmes and interventions in clinical populations and healthy aging. In addition, we will develop computerised training protocols and other rehabilitation procedures for aphasia based on music exposure and music training shown to improve cognitive and language recovery. We have great potential to make outstanding contributions in terms of establishing early markers for disease detection and prognosis as well as training and rehabilitation related to language function. Here, it will be important to increase the number of researchers.
- 7) **Software development.** The BCBL will develop software for language training across relevant populations. BERC funding will allow us to work on standardizing a new test for diagnosis of dyslexia in Spanish and in Basque, complete the development of software for cognitive and language training for children with developmental disorders and second language learners, and design cognitive rehabilitation software for brain-damaged patients. Importantly, BERC would provide the funding we need to expand our software development and strengthen existing as well as foster new collaborations with partners interested in the development and transfer of this work, bringing further applications for education and health settings to the market. We are currently working very closely with a French company (SBT - HUMAN(S) MATTER) to bring Multimap, a multilingual picture naming test for mapping eloquent areas during awake surgeries, to a global market. Multimap is currently being implemented in French, Spanish and Basque and will continue to be extended to include many other combinations of languages.
- 8) **IKUR Program. NeuroBiosciences. Aims:**
 - To improve our models of brain functioning in both health (healthy aging) and disease conditions (neurodegeneration diseases), moving beyond purely correlational models to predictive models, which will need to incorporate advances in machine learning and artificial intelligence.



- To develop new protocols for non-invasive modulation of brain functioning by means of brain-machine interfaces and neurofeedback protocols, so that we can generate adaptive changes in populations with specific needs, as well as create new marketable interfaces and patents.
- To address these two challenges in a personalised way, with highly accurate protocols to predict the individual's behaviour and adjust neurofeedback protocols to optimise their efficacy at patient/individual level.
- To develop analytical tools to predict patterns of recovery and decline based on neuroanatomical and functional data in relation to various disorders, such as aphasia or neurodegenerative diseases, as well as to search for early markers of language disorders, such as dyslexia or Specific Language Disorder. Finding early markers would have an immediate impact on the people who may suffer from the disorder and on society in general.
- To consolidate relationships and activities between the institutions associated with this IKUR.

9) IKUR Programme. AI and High Performance Computing. Aims:

- To increase our capabilities of computing and data storage of neuroimaging data
- To develop new algorithms and analysis methods based on machine learning, deep learning or evolutionary computing to improve the analysis of magnetic resonance, electrophysiology and/or behavioural data.
- In the future, it is envisaged that these algorithms will consider biophysical models of neuronal conductivity as well as structural connectivity in their formulation.
- To apply machine learning and evolutionary computing techniques to estimate the large number of parameters of these models, extract characteristic patterns from the data, and generalise their performance.
- To consolidate relations and activities among the institutions associated with this IKUR.



Publications 2022-2025

We expect to maintain the same number, quality and impact of publications every year throughout the next period (See Annexes 4, 5, 6 and 7)

Patents, Licences, knowledge and tech-transfer

During the 2022-2025 period, the BCBL will continue focusing on **technological transfer to society**. It is important to note that translational research takes some time, especially for a centre created from scratch with the main mission of carrying out excellent basic research. Thus, we expect that our production in this domain will be accelerating in the next period. Thus, as the centre matures, in addition to carrying out basic research intended to increase knowledge, we will also intend to provide knowledge that can be applied to other bodies that, in the near future, can be transformed into products and services, while making this process as efficient as possible. In order to reach this goal, the BCBL Management will ensure that the research results undergo continuous evaluation with regard to their potential application and rapid transfer to their specific field of development. The BCBL Management will also continue promoting cooperation with the rest of the actors in the science and research system in order to increase the prospect for the transfer of knowledge and results between organisations.

Tech-transfer is one of the long-term pillars for the BCBL, thus **strengthening the Basque Science System by transferring knowledge, technology and research results to society**.

Research projects (active for the 2022-2025 period and expected applications)

PRIVATE FUNDING

Running grants	PI	Grant	Amount	Period
1	Carreiras, Manuel	LA CAIXA FOUNDATION, HEALTH RESEARCH-Dyslexia and the thalamus: Integrating anatomy and function in a mechanistic account of the reading brain	500,000 €	2019-2022
2	Carreiras, Manuel	FUNDACION CIENTIFICA AECC-Biomarcadores de recuperación cognitiva postquirúrgica en tumores cerebrales	300,000 €	2020-2023
3	Arocena, Miguel Angel	FUNDACION KUTXABANK-Burmuinaren Txokoa	18,600 €	2021-2022
Expected applications	PI	Grant	Amount	Period
4	BCBL Researchers	4 Proyectos de Investigación Básica	n/a	2018-2021



EUROPEAN RESEARCH COUNCIL



Running grants	PI	Grant	Amount	Period
1	Martin, Clara	GA 819093 - ERC CoG - READCALIBRATION	1.875.000 €	2019-2024
Expected applications	PI	Grant	Amount	Period
8	BCBL Researchers	1 ERC Advanced Grants 3 ERC Consolidator Grants 4 ERC Starting Grants	n/a	2022-2025

EUROPEAN INNOVATION COUNCIL



Expected applications	PI	Grant	Amount	Period
2	BCBL Researchers	2 EIC applications	n/a	2022-2025

EUROPEAN COMMISSION Marie Skłodowska-Curie Programme



Running grants	PI	Grant	Amount	Period
1	Cespón, Jesús	H2020-MSCA-IF-2018-GA- 838536-BILINGUALPLAS	185.721 €	2020-2022
2	Stoehr, Antje	H2020-MSCA-IF-2018-GA- 843533-LIPPS-	173.721 €	2020-2022
3	Amoruso, Lucia	H2020-MSCA-GF-2020-GA- 101025814-MULTILAND	224.496 €	2020-2023
4	Carrión, Amaia	H2020-MSCA-IF-2020-GA- 101027016-READING BIG	172.932 €	2021-2023
5	Biondo, Nicoletta	H2020-MSCA-GF-2020-GA- 101028370-TIME	245.732 €	2021-2024
6	Pinet, Svetlana	H2020-MSCA-IF-2019-GA- 843533-OWLI	160.932 €	2021-2023
Expected applications	PI	Grant	Amount	Period
32	BCBL Researchers, Potential newcomers	1 European Training Network 1 Cofund Grant 30 MSC Individual Grants	n/a	2022-2025

MINISTERIO DE CIENCIA E INNOVACIÓN



Running grants	PI	Grant	Amount	Period
1	Soto, David	PID2019-105494GB-BRAINMETALLOOP		2020-2024
2	Caballero, Cesar	PID2019-105520GB-qRSFMRI		2020-2023
3	Kalashnikova, Marina	PID2019-105528GA-CONTUR		2020-2023
4	Cespon, Jesús	PID2019-105538RA-BILINGUALAGE		2020-2023
5	Costello, B; Giezen, B.	PID2019-107325GB-BITRI		2020-2023
6	Mancini, Simona	PID2020-113945RB-100 TENL.ESP		2021-2025
7	Kapnola, E; Samuel, A.	PID2020-113348GB-100 CO-LEXI		2021-2024
8	Martin, C.; Pinet, S.	PID2020-113926GB-100 CROSSPOD		2021-2024
9	Ruzzoli, M.	PID2020-114717RA-100 SweetC		2021-2024
10	Magnuson, J.	PID2020-119131GB-100 BLIS		2021-2024
Expected applications	PI	Grant	Amount	Period
20	BCBL Researchers	20 Plan Nacional Excelencia/Retos Projects	n/a	2022-2025

GOBIERNO VASCO – EUSKO JAURLARITZA



Running grants	PI	Grant	Amount	Period
1	Mancini, Simona	PIBA-2020-1-0024 ACS.eus (APHASIA COGNITIVE SCREENING IN BASQUE): FILLING GAPS AND OVERCOMING BIAS IN CURRENT APHASIA ASSESSMENT	48.340 €	2020-2022
2	Paz-Alonso, Kepa	PIBA_2021_1_0003 CONTRIBUTION OF MAGNOCELLULAR AND PARVOCELLULAR VISUAL SYSTEMS TO NORMAL READING AND DYSLLEXIA	50.000 €	2021-2024
Expected applications	PI	Grant	Amount	Period
8	BCBL Researchers	8 Proyectos de Investigación Básica	n/a	2022-2025

DIPUTACIÓN FORAL DE GIPUZKOA – GIPUZKOAKO FORU ALDUNDIA



Expected applications	PI	Grant	Amount	Period
4	BCBL Researchers	4 Proyectos de Investigación Básica	n/a	2022-2025

3.2. Research Groups

This section should include (Max. 3 pages):

Definition of research structure or organisation of the centre. Strategies and activities to support the attraction and retention of research talent. Expected evolution of the structure of personnel to achieve the strategic objectives of the centre.

Internal Organisation

BCBL researchers (see <https://www.bcbl.eu/en/research/research-groups>) currently belong to 12 research groups (names, group leaders, and associated research lines listed below). The number of groups has increased from the 10 described in section 2.2 to the current 12 described below.

Group 1: Brain Rhythms and Cognition – Group Leader, Prof. Nicola Molinaro, ORCID 0000-0002-7549-6042. 1 Postdoctoral Researcher, 5 PhD students. Lines L2, L3, L6.

Group 2: Computational Neuroscience – Group Leader, Prof. James Magnuson, ORCID 0000-0003-0158-2367. 1 Postdoctoral Researcher, 2 PhD students. Lines L1, L2, L3, L4.

Group 3: Consciousness – Group Leader, Prof. David Soto, ORCID 0000-0003-0205-7513. 1 Postdoctoral Researcher, 4 PhD students. Lines L1, L4, L6, L7.

Group 4: Educational Neuroscience and Developmental Language Disorders – Group Leader, Dr. Marie Lallier, ORCID 0000-0003-4340-1296. 1 Postdoctoral Researcher, 4 PhD students. Lines L1, L2, L3, L4.

Group 5: Infant Language and Cognition – Group Leader, Dr. Marina Kalashnikova, ORCID 0000-0002-7924-8687. 1 Postdoctoral Researcher, 3 PhD students. Lines L1, L2, L4.

Group 6: Language and Memory Control – Group Leader, Prof. Pedro M. Paz-Alonso, ORCID 0000-0002-0325-9304. 2 Postdoctoral Researchers, 7 PhD students. Lines L1, L3, L4, L6.

Group 7: Neurobiology of Language – Group Leader, Prof. Manuel Carreiras, ORCID 0000-0001-6726-7613. 4 Postdoctoral Researchers, 5 PhD students. Lines L3, L4, L5.

Group 8: Neurolinguistics and Aphasia – Group Leader, Dr. Simona Mancini, ORCID 0000-0001-9514-7862. 1 Postdoctoral Researcher, 3 PhD students. Lines L2, L4, L5.

Group 9: Speech and Bilingualism – Group Leader, Prof. Clara Martin ORCID 0000-0003-2701-5045. 3 Postdoctoral Researchers, 6 PhD students. Lines L2, L4.

Group 10: Spoken language – Group Leader, Prof. Arthur Samuel, ORCID 0000-0001-8552-2710. 4 Postdoctoral Researchers, 1 PhD student. Lines L2, L4.

Group 11: Signal Processing – Group Leader, Dr. Cesar Caballero, ORCID 0000-0002-9068-5810. 1 Postdoctoral Researcher, 4 PhD students. Lines L5, L7.

Group 12: Statistical Learning – Group Leader, Prof. Ram Frost, ORCID 0000-0002-5625-0813. 3 Postdoctoral Researchers, 1 PhD student. Lines L3, L6.

These 12 research groups include:

- 5 Ikerbasque Full Professors
- 2 Ikerbasque Research Associates
- 12 Staff Scientists and Group Leaders (5 Ramón y Cajal Fellow, 2 Ikerbasque Fellow, 1 MSCA Fellow, 1 Juan de la Cierva Fellow)
- 17 Postdoctoral Researchers (8 MSCA Fellows, 2 Ikerbasque Fellows, 2 Juan de la Cierva Fellows)
- 9 Affiliated Researchers
- 44 PhD students (26 FPI, 7 BFI, 10 La Caixa INPhINIT)

The Human Resources team comprises the Management, labs, IT and Administration teams, led by Dr. Miguel Arocena (PhD and MBA).



Administration staff: Project Manager, Financial Controller, Director's Personal Assistant, 5 Management Assistants

Information Technologies & Technical staff: IT Manager, Helpdesk, System and Network Administrator

Laboratory staff: 2 Lab Managers, 5 Lab Section Coordinators, 7 Research Assistants

Tech-transfer staff: Neure Clinic: 2 Neuropsychologists, 1 Software Developer, 2 Research Assistants

Therefore, the research programmes of each of the research groups are aligned with the three main research foci of the BCBL.

Strategies and activities to support the attraction and retention of research talent

Human resources and especially young researchers (predoctoral and postdoctoral) are the main assets of a knowledge-intensive centre such as the BCBL. Since the centre was created, the Scientific Director and the General Manager have devoted much energy and time to creating a shared culture and the values of the centre, integrating people, as this is a key factor to success. This task is even more complex in a multicultural centre with people from more than 15 different countries, but where diversity is considered an opportunity and a unique resource.

To date, we have recruited researchers from more than 29 countries. We consider diversity an opportunity. We will launch several calls for the recruitment of international researchers across academic levels:

- Ikerbasque Research Associates and Professors (permanent)
- Ikerbasque Research Fellows (5-year tenure track)
- RyC (5-year tenure track)
- JdC Formación (2-year postdoctoral)
- JdC Incorporación (3-year postdoctoral)
- MSCA (2/3-year postdoctoral)
- FPU/FPI (4-year PhD)
- Basque Government BFI (4-year PhD)
- Internal BCBL calls will depend on the budget and new fundraising through competitive grants

These calls are announced on several web portals, including the Euraxess, Ikerbasque, Neurobiology of Language, ESCOP, and BCBL websites and on many distribution lists, including Linguist List, CUNY, AMLaP, Human Brain Mapping, Cognitive Neuroscience Society.



Today, the BCBL is working in the new context established by the HR Excellence in Research. We have already implemented an Open, Transparent and Merit-based recruitment policy and process for hiring researchers (OTM-R). OTM-R of researchers improves the effectiveness of BCBL research systems and guarantees equal opportunities. This process sets out the various steps of the recruitment process, from the job advertising/application phase through to the appointment phase.

World-class research experience is essential, with a PhD degree in areas related to Cognitive Neuroscience, and the ability to apply for funding through competitive calls. Candidates must meet international evaluation standards, have a very good record of publications in top journals and be eligible to obtain an ERC Starting or Consolidator Grant.

To attract, retain and enhance talent we will continue to launch very competitive calls and offer hired researchers the best possible working conditions with access to outstanding research facilities, continuous training, a rich intellectual atmosphere, access to international conferences that the BCBL organises every year and budget allocations to travel to international meetings anywhere in the world.

MENTORSHIP

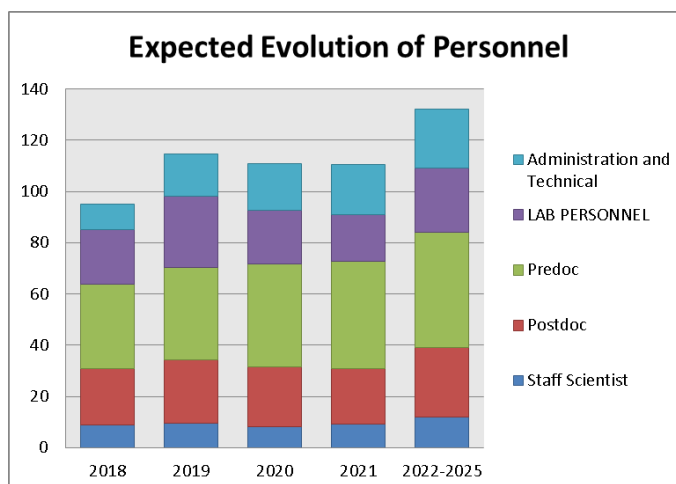
Current BCBL staff and the newly recruited R2-R3 researchers and PhD students will benefit from two formal mentoring programmes. The first, currently already implemented at the BCBL, consists in continuous mentorship regarding research activities and career progression. The Research Group structure at the BCBL makes this programme more effective, since each researcher receives vertical mentorship from their Group Leader and transversal mentorship from Group members. Moreover, collective activities such as the Project Presentation Meeting are important mentoring actions specially aimed at predoctoral and postdoctoral researchers. All BCBL researchers, including group leaders, attend the Project Presentation Meetings and give feedback on the scientific projects of each researcher. By combining traditional and group mentoring, we ensure wider representation between mentors and mentees. The second programme consists in training and promoting opportunities that offer researchers opportunities to secure external funding from national and international sources. Each Early and Mid-Career Researchers at the BCBL (postdoctoral fellows and staff members on the tenure track) are assigned two

senior members to review and provide feedback on all grant applications. PhD students have two supervisors who guide them to acquire the appropriate theoretical, methodological and transversal skills. Finally, the BCBL has an established Ombudsman programme in which three staff members (two scientific and one administrative) are available to help other members resolve confidential and sensitive matters and provide conflict resolution. More informally, the BCBL also provides a vibrant and communal environment in which all researchers are actively involved in the day-to-day scientific activities of the centre. This provides junior members with ample opportunities to seek advice and support at all stages of laboratory work and scientific levels.

- We will run annual 360° feedback meetings with all BCBL employees.

Expected evolution of the structure of personnel to achieve the strategic objectives of the centre

We plan (1) to continue strengthening our capabilities for addressing frontier research on language and (2) transfer newly generated knowledge to the areas of education and health. To do so, we expect (a) to slightly grow, hiring new high-skilled researchers, incorporating new capabilities and more expertise, reinforcing multidisciplinary, spreading the training capacities and raise our international visibility; (b) improve and update our facilities, to keep improving our research and to be an attractor for young researchers; and (c) to work more closely with software developers to create applications for diagnosis of disorders, learning and training, based on new knowledge generated from our lab and others.



Within the next four years, we will create at least two more groups and, if enough resources and strategically important, to reach a maximum of 15 research groups led by experts in other new areas of language, with special attention to high profile basic but also to translational research. In addition, we will strengthen the current groups. Currently, each research group gets allocated 1 postdoc and 1 PhD student, plus some money for traveling and some special running costs since we have a policy of open lab. It would be desirable, if budget permits, to allocate more internal resources to the groups (2 postdocs and 2 PhD students) regardless of additional external funding they can obtain. In addition, we expect to increase our research personnel (both predoctoral and postdoctoral researchers) through individual grants obtained in competitive calls (Ikerbasque Fellows, Ramón y Cajal Fellows, Marie Curie, Juan de la Cierva, La Caixa grants, etc.)

- We expect to hire 2 R4 researchers, 32 R2-R3 researchers and 40 R1 PhD students during the 2022-2025 period.



3.3. Internationalisation strategy

This section should include (Max. 3 pages):

Agreements and collaboration frameworks with international entities that help in the internationalisation of the centre. Highlight European and International projects/networks the centre aims to coordinate or take part in. Detail the research outputs expected for these collaborations: publications, patents, licences...

Visiting researchers, hosted or going abroad.

Specify the leadership and/or role of the centre on the activities to be developed.

Agreements and collaboration frameworks with international entities


Currently, the BCBL has a strong track record with respect to internationalisation. The range of countries represented by the researchers the BCBL has had, and still has, is remarkable, as 15 different nationalities are represented right now within the BCBL staff. This shows how international the BCBL personnel is and how international networks are established. Through improvement of the centre's equipment, broadening of its research lines, and hiring of new researchers to work on existing research lines, it is clear that one of our objectives will be to strengthen these lines, more fully integrating the BCBL not only into individual projects with other research groups, but as part of their core international collaboration network and as part of long-term international grants (e.g., NIH and NSF grants in the USA, ERC advanced grants in the EU, etc.).



Moreover, additional collaborations and strategies are followed towards internationalisation of the BCBL as described below:

- We will continue organising **international conferences**, workshops and seminars to help promote the BCBL as a knowledge hub for language research. This external promotion of the centre will continue, since it has been very successful so far, and we already have agreements in place for new conferences to be hosted by the BCBL.
- **External speakers series**: every other week we invite an external speaker to deliver a talk at the BCBL, hold a journal club with PhD students, and meet with researchers of the BCBL. This way, outstanding researchers from different areas in the field get to know the centre and the researchers get to know the external researcher. This will promote international collaborations and will lead to partnerships for grant proposals.
- Our **Visitor programme** is aimed at bringing the top researchers to spend some days at the BCBL so that they can collaborate with our researchers, participate in the daily life of the centre, and explore the prospect of new interactions and cooperation in the future.
- **Internship/stays programme** at the BCBL is designed to provide research training to students at all levels that may later join the centre as PhD students or postdocs. It also provides researchers with an opportunity to select and hire interns to help with their research, if they have funding available. This help can relate to a paper, a collaborative project, a master thesis, a part of a PhD thesis, or a way of establishing contacts/collaboration with other research groups and institutions. Furthermore, it is a good way to exploit the relationships and agreements with other centres for student exchanges. It is worth highlighting that 76 students have benefited from this programme in the period 18-21.
- **Visits to international institutions**: As part of internationalisation activities, the BCBL not only fosters the incoming of students but also facilitates visits to international research institutions. In addition to the planned stays abroad of the senior researchers and staff scientists, many of the staff researchers at the BCBL will apply for grants to visit international universities and/or excellence research centres. These grants are designed to strengthen the internationalisation of scientific training and technical capacity by incorporating the awarded student/staff into an outstanding research group for some months.
- We will also continue with the current programmes that we are using to **receive students** and **researchers** funded by foreign research agencies such as the Fyssen Foundation, the NOW (Nederlandse Organisatie voor Wetenschappelijk Onderzoek) and the Brazil Ministerio Da Educaçao (Brazil), and the Fundación Carolina.
- **Presentations in international conferences and workshops**. Apart from the budget provided in individual research projects, the BCBL allocates 1000 euros per year to each research member of the BCBL to present their work in international conferences and workshops so the world knows about the research and findings of the BCBL. This way we stimulate and support the presence of members of the BCBL in international forums, given that international collaboration comes about largely from the collaborations established by the researchers.
- **Administration, IT, Labs team improvement**: We will continue to encourage and finance our support staff (administrative, IT, lab staff) to attend several courses or meetings to improve their skills (e.g., courses for improving conformity with new grant accounting standards recently introduced by the EU).

To sum up, the BCBL continues collaborating actively with the following international bodies:



	INSTITUTION OF COLLABORATION	COUNTRY		INSTITUTION OF COLLABORATION	COUNTRY
	Academia Sinica	Taiwan		Stockholm University (Centre for Research on Bilingualism)	Sweden
	Aston University	UK		Syddansk Universitet	Denmark
	Bangor University	UK		Technical University of Eindhoven	Netherlands
	Bar-Ilan University	Israel		The Hebrew University of Jerusalem	Israel
	British Dyslexia Association	UK		The University of Nottingham	UK
	Brussel University	Belgium		Trinity College Dublin	Ireland
	Carnegie Mellon University, Pittsburgh	USA		UC Berkeley	USA
	Cleveland Clinic	USA		UC Davis	USA
	Clinica Universitaria de Navarra	Spain		UC San Francisco	USA
	CNRS	France		Universidad Complutense (Instituto Pluridisciplinar)	Spain
	Danish Autism Association	Denmark		Universidad Complutense de Madrid	Spain
	Donders Institute	Netherlands		Universidad de Navarra	Spain
	École normale supérieure	France		Universidad del Desarrollo	Chile
	École polytechnique fédérale de Lausanne	Switzerland		Universitat Pompeu Fabra	Spain
	European Dyslexia Association	Belgium		Université Paris Descartes	France
	Federação Nacional de Cooperativas Solidariedade Social	Portugal		University College of London	UK
	Free University of Berlin	Germany		University Medical Centre Utrecht	Netherlands
	Georgia Tech University	USA		University of Bruxelles	Belgium
	Haskins Laboratories	USA		University of Cadiz	Spain
	Haskins, Yale University	USA		University of Cambridge	UK
	Imperial College London	UK		University of Castilla- La Mancha	Spain

	INSTITUTION OF COLLABORATION	COUNTRY		INSTITUTION OF COLLABORATION	COUNTRY
	KU Leuven	Belgium		University of Chicago	USA
	Laboratoire de Psychology et Neurocognition	France		University de la Republica	Uruguay
	Macquarie University	Australia		University of East Anglia	UK
	Max Planck institute for empirical Esthetics	Germany		University of Exeter	UK
	Max Planck Institute for Human Cognition & Brain Sciences	Germany		University of Geneva	Switzerland
	Max Planck Institute for psycholinguistics	Netherlands		University of Granada	Spain
	Münster University	Germany		University of Kaiserslautern	Germany
	National Institute of Mental Health	USA		University of Leiden	Netherlands
	National University of Singapore	Singapore		University of Magdeburg	Germany
	National Yang-Ming University	Taiwan		University of Oslo	Norway
	Norges Teknisk-Naturvitenskapelige Universitet	Norway		University of Oxford	UK
	Northwestern University	USA		University of Padova	Italy
	Professor Emeritus	UK		University of Rochester	USA
	Purdue University	USA		University of San Francisco	USA
	Qatar University	Qatar		University of Toronto	Canada
	RIKEN Institute	Japan		University of York	UK
	SCALAB	France		UPV/EHU	Spain
	Siemens Healthineers	Spain		Western Sydney University	Australia
	Stanford University	USA			

- We expect that the 20% of our annual budget will come from International sources along the 2022-2025 period.

3.4. Training activities

This section should include (Max. 1 page):

Training activities for researchers and support staff in all the different career stages, designed to recruit, strengthen and retain the talent and personnel.

The BCBL considers people are the most important resource and the only guarantee of success for its global project. Our **personnel policy** is and will continue to be based on the following strategies:

- To build research teams that are highly qualified, motivated, resourceful, willing to work in teams and open to the world.
- To incorporate excellent research personnel at national and international levels.
- To set up mechanisms for recruiting and maintaining researchers from early levels of training.
- To facilitate the incorporation of new professional bodies with a multidisciplinary focus to guarantee the transversality of scientific activities.
- To build a flexible and efficient system of student and researcher exchange.
- To stimulate programmes of collaboration with researchers of excellence from other centres.
- To define and develop an ongoing career development and training plan for each individual.
- To allocate a personal training allowance for every member of the BCBL research and support team.

Research Team oriented training: Young researchers are the soul of the Centre. Thus, one of our primary goals is to attract the best students in the world and provide them with world-class training so that they can successfully develop their future careers. From the very beginning, we combined a highly competitive process of selection for researchers with processes for continued learning and training on all of the available theories and techniques. We will continue offering the researchers in the BCBL access to the best research facilities and the best training of advanced research techniques both via internal training mechanisms and by recruiting (on either a short-term or long-term basis) highly qualified researchers from other institutions with knowledge of new techniques that are of interest to the centre.

Following the HRS4R aligned internal policy a **brand new draft classification** aims to communicate the various characteristics, personal and technical key skills that researchers may have throughout their careers. It describes four broad profiles that apply to all researchers and helps to identify the training gap they may have at every stage of their career.

- **Group Leader (R4-Leading Researcher):** The leading researcher is a principal investigator or professor who, apart from being a lead expert in a certain field, has strong managerial skills. One of his/her main duties will be to lead and supervise a group of researchers at different stages working on the same field. Also, embedding each researcher's work on the group's research line. These researchers will co-work with other group leaders, scientific director and general manager in order to follow the same working path and aligned with the centre's vision, mission and values.
- **Staff Scientist (R3-Established Researcher):** Researchers at this stage have a large degree of autonomy, typically holding the status of Principal Investigator or Professor. Their considerable expertise in the field enables them to conduct their own experiments but still need to co-work under the supervision of the Group Leader in order to follow the research lines of their group colleagues.
- **Postdoctoral Researchers (R2-Recognised Researcher):** Postdoctoral researchers who recently obtained their PhD and even though they are able to work under a significant level of independence they still need to progress in their expertise level, under the supervision of a Group Leader.
- **PhD Students/Predocctoral Researchers (R1-First Stage Researchers):** Are doctorate candidates at different stages and will be considered of this group until the completion of their PhD. This profile includes individuals doing research under the supervision of at least one Established Researcher (R3) and being part of a certain research group generally supervised by a Leading Researcher or Group Leader (R4)



Existing BCBL Postgraduate Courses: the master programme in Cognitive Neuroscience of Language and the PhD programme in Cognitive Neuroscience will continue, being both official degrees and fully managed by the BCBL.

Support Team oriented training: The BCBL firmly believes that training Improves employee performance, employee satisfaction, addresses weaknesses and increases productivity and adherence to quality standards. This is the reason to keep the training actions that have been performed until today and continue investing in it allocating part of the budget to this particular purpose.

3.5. Gender equality plan

This section should include (Max. 2 pages):

Include an analysis of the personnel of the centre, by gender and category. Define any measure intended to promote gender equality in the centre, including activities either organised or participated.

Analysis of the personnel of the centre by gender and category

The BCBL is conscious that research centres can be competitive only if they develop, attract and retain the best talent, both male and female. Consequently, since its beginning, the BCBL has promoted the equality of opportunities between men and women. In this sense, access to BCBL positions and promotion are based on purely academic merits, seeking an Open, Transparent and Merit based recruitment policy (OTM-R). In fact, attracting talent is based on the evaluation of the merits of each submitted candidacy, guaranteeing the same opportunities for all candidates, and trying to keep gender balance. These principles are also applicable to the selection of the staff team.



Apart from that, as a key point of its Gender Action Plan, the BCBL facilitates a flexible environment in which both men and women can combine their family and research lives (e.g., by requiring all researchers to be at the centre for only certain “core hours” of the day, and offering as much flexibility as possible). The objective is to create a workplace where the best talent can flourish, in line with the Strategic Vision of the European Research Area (adopted in 2010), that points out the objective for the year 2030 in which half of all scientific personnel in all disciplines and at all levels of the scientific system should be women. In fact, 56 % of the BCBL full community are female, while 50 % are male scientists (PhD students: 46 % female; 54 % male; Postdoctoral: 67 % female; 33 % male; Staff Scientists & Group Leaders: 41 % female; 59 % male).

The BCBL also encourages researchers (both men and women with equal rights) to present their candidacy for postdoctoral calls such as the Ramon y Cajal or Juan de la Cierva (where on average only about 15 % of the grants are awarded to women; 62 % however, in the case of the BCBL, our internal track record shows that women are awarded double this rate: 76 % of our grants have been to women), Ikerbasque fellows, Marie Skłodowska-Curie, etc. In this respect, communications on promotion and job opportunities are distributed to all the members so as to guarantee the same opportunities. Some studies indicate that individuals who are not given information on their readiness for a certain call, or who are not directly approached and encouraged to apply for promotion, might assume they were either not eligible, or not yet ready. So, at the BCBL, after general communication, personalised recommendations are done so as to encourage researchers to apply for all calls for which they would be competitive, with a special emphasis on encouraging women.

Also, not only from the administration point of view but also from the academic perspective, the BCBL has been participating in a European project, under the VII Framework programme that focused on how language influences and forms the cognitive representations of women and men. We hope that this project will ultimately help address issues of inequality across Europe.

Measures intended to promote gender equality in the centre

BCBL pursues the objective is to create a workplace where the best talent can flourish in line with the Strategic Vision of the European Research Area, which aims to ensure that half of the scientific personnel in all disciplines and at all levels of the scientific system are women by 2030.

The BCBL Gender Action plan is managed directly by the General Manager of the centre in coordination with the HRS4R Working Group and, as a result of this plan, the current situation is that 56% of BCBL employees and 50% of BCBL researchers are female. This balance in the proportion of female/male employees comes as a result of a strategy that is based on two main pillars:

- (1) No distinction in gender for salary. Salary level depends on responsibility and/or research level, regardless of gender
- (2) Promotion is always achieved based on performance, regardless of the gender of the employee.



There is still some gender imbalance at the more senior level (Full and Associate Professors). However, we are committed to rectifying this imbalance in the coming years by supporting the career progression of the eight researchers currently on the tenure track, seven of whom are women (Ikerbasque and Ramón y Cajal fellows: Marie Lallier, Simona Mancini, Marina Kalashnikova, Lucía Amoruso, Efthymia Kapnoula, Svetlana Pinet and Manuela Ruzzoli). In addition, we consider this senior-level imbalance when recruiting new research staff.

- We expect to develop and track annually at least 3 actions focused on Gender balance and Equality during the 2022-2025 period.

3.6. Strategy for dissemination and transfer of knowledge, outreach activities

This section should include (Max. 2 pages):

Technology surveillance, knowledge transfer activities to be carried out. Include all the measures and actions intended to be implemented for research communication and dissemination, at a scientific level and to the general public. Detail the actions to be carried out.

Since it was created, the BCBL has identified the need to develop and implement a comprehensive outreach plan. The main objective of the dissemination plan is to continue with our previous strategy: (1) Publish the results in highly-regarded **scientific journals; organise conferences, workshops and seminars** in order to disseminate to the scientific community our scientific findings, and (2) organise **BCBL events and tech-transfer** oriented to professionals in education and health; with our website and social media acting as channels for accomplishing both of these goals.

(1) Our programme will contribute to excellence and societal change strategy based on our work to advance knowledge and methods of research in the field of Cognitive Neuroscience of Language, and by transforming the outcome of fundamental research into products and services to society (e.g., software, protocols), through the collaboration with other agents. In order to optimise the impact of publicly-funded research both at European and national levels, since it is essential to enhance economic returns and improve competitiveness through knowledge, the BCBL follows its “**Open Access**” policy so that results of publicly-funded research get disseminated broader and faster in the benefit of researchers, the innovation field and society in general. The added value provided by the BCBL regarding knowledge transfer can contribute to the achievement of the societal challenges of Horizon 2020, by means of breakthrough solutions in at least two general objectives through social sciences and humanities research:

Health, demographic change and well-being: BCBL research will contribute to the topics by understanding health and improved health information and data exploitation, thus providing longer term support to topics in the areas of prevention, diagnosis, treatment and rehabilitation.

Europe in a changing world - inclusive, innovative and reflective societies: The BCBL will contribute to increasing employment in the R&D sector (e.g., via language training to build international groups of workers in the technology fields) that must be a key to get out of the crisis, making its contribution to the challenge of inclusive, innovative and reflective societies.

(2) **Organising and presenting results in specialised workshops, seminars and courses** for researchers and/or for the stakeholders and the general public. The BCBL will actively promote the dissemination of BCBL researchers' scientific activities and their contributions and achievements. The BCBL will continue to have a wide programme of workshops, seminars and courses that are led by BCBL researchers. The Centre will reinforce the promotion of these activities motivating researchers to lead them and supporting the organisation. Interestingly, in some workshops we have had notable success by combining two days dedicated to the scientific community and one day for stakeholders and the general public, thus linking basic research to applications in education and health. Another format we have used, and will continue using in the future, are the “brain talks” offered to the general public scheduled before each scientific conference or workshop organised by the BCBL.

(3) **Communication activities for the general public.** The BCBL will actively promote initiatives to create awareness about the research work performed and its implications for citizens. Outreach activities should also introduce students from schools and universities to science, research and innovation. Following the BCBL's philosophy, the researchers will receive specific training in ‘transfer and dissemination of research results’, and will share the research done with the general public via different outreach activities such as:

- The ‘ZIENTZIASTEIA’ (Science, Technology and Innovation Week, <http://www.zientzia-astea.org/>), which attracts thousands of visitors across the Basque Country. The researchers will participate in organising and managing one of the exhibition booths and will present research results in an interactive fashion.
- The Brain Awareness Week is an international campaign aimed to raise awareness about the progress and advantages of research related to the brain, and it is coordinated by “Dana Alliance for Brain Initiatives” and “European Dana Alliance for the Brain”.
- Events to thank the audience. These kinds of scientific meetings are especially relevant since they manage to bring together the PI of the projects with participants and create a collaboration network between both parts, in which participants realise of the usefulness of volunteering.
- Pint of Science It is a platform that allows people to discuss about science with the researchers who carry experiments out. It is a non-profit organisation, managed by volunteers, created by a community of postgraduate and postdoctoral researchers. The annual festival lasts 3 days and it is held simultaneously in different bars and pubs worldwide.



- We are developing an information space on our website aiming at disseminating neuroscience and language research among the population in a more visual and appealing way. This **VIRTUAL DISSEMINATION SPACE** will bring neuroscientific research closer to the general public and especially to the educational community. BCBL is constantly generating knowledge that is published in scientific journals. We strongly believe that this content could be very useful to support the school science curriculum, thus increasing the interest of schoolchildren in science and their vocation for a scientific career. Offering updated, novel knowledge supported by the latest research techniques could motivate students and spur interest in new areas of knowledge. Since the main research line is related to bilingualism and multilingualism and, considering that all schools teach in more than one language, it could also be a focus of interest for students and teachers. The aim of this action is to make a complex subject, such as the brain, accessible to the public. To be ready by the end of 2021.
- BCBL is generating informative videos that will enrich our website and serve to explain our research lines, as well as the strategic projects of our centre
- In addition to its **off-line media** presence (press, TV and radio), the BCBL will improve its presence in the already created corporate channels in the main **social networks**: Facebook, Twitter, Instagram and Youtube. Using these channels, the BCBL sends a bi-weekly communication related to cognitive neuroscience and language, which is followed and forwarded by the followers of these channels.
- Finally, the BCBL is playing a very active role in collaborating with Frontiers for Young Minds. Frontiers for Young Minds (kids.frontiersin.org) provides a collection of freely available scientific articles by distinguished scientists that are shaped for younger audiences by the input of their own young peers. This website is spreading science edited for kids, by kids, but only in English so far. The goal is to be an international and multilingual platform to bring science to kids in an understandable way. BCBL is collaborating actively in this enterprise by translating the papers on understanding neuroscience into Spanish and has been acknowledged as a sponsor (<https://kids.frontiersin.org/sponsors>).



3.7. Other activities

This section should include (Max. 3 pages):

Include any other activity to be developed during the period 2022-2025 that should be considered for the evaluation of the centre.

In this section, we will describe some relevant activities that have not been included in the previous sections despite being relevant to the BCBL:

University Teaching: Master Programme and PhD programme

The **Master Programme in Cognitive Neuroscience of Language** continues to adapt to the new techniques and methodologies developed at the centre. There seems to be a need to attract students with a more engineering background, although all sorts of profiles are being assessed and selected. We expect to maintain the number of final master thesis defended, as the number of slots are and will remain the same.

The new **PhD programme in Cognitive Neuroscience** is having great acceptance in the field. We anticipate that this programme will allow us to expand the pool of excellent students that will enrol in our programme, coming from different fields (e.g., linguistics, psychology, physics, engineering, etc.).

- We estimate that we will defend 22 PhD theses and 48 Master theses within the next 4 years.

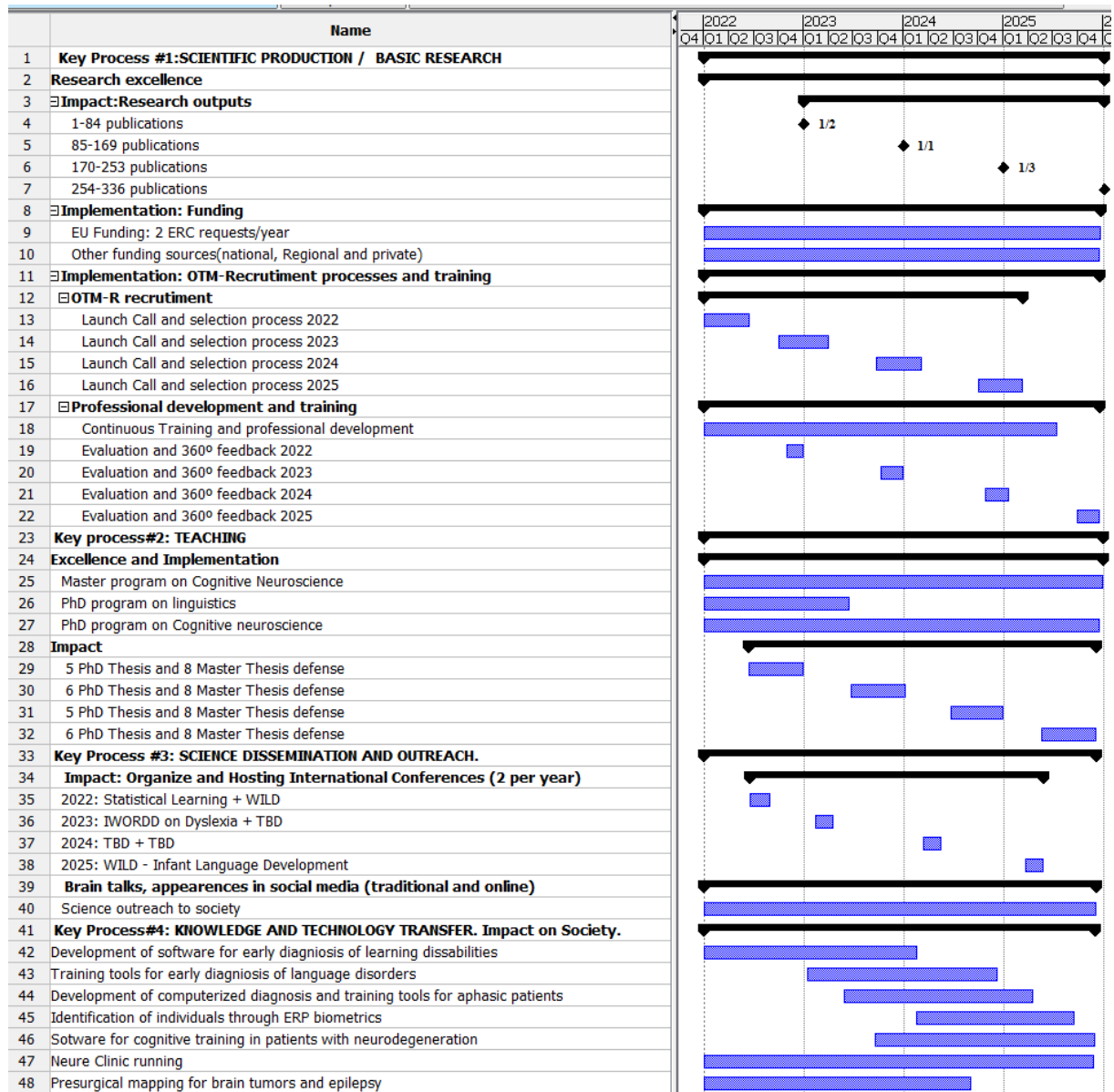


3.8. Time planning

This section should include (Max. 2 pages):

Time planning for the deployment of the strategies and activities

The work plan for the next four years is summarised in the GANTT chart that contains how the different actions and activities that have been described in the different sections will develop as time unfolds. In particular, we will focus on research outputs, fund-raising, recruiting and training of personnel, international visibility, transfer of knowledge and technology, and acquisition of new infrastructure.





3.9. Financial planning: quantification and economic justification

3.9.1. Budget

This section should include (Max. 3 pages):

Include information on the budget foreseen for 2022-2025. All the expenses must be justified by means of a detailed description of its specific destination and a study of the financial sources expected to cover those expenses.

Include the table supplied in the Excel file.

2022-2025 PERIOD

See below a general view of the budget showing a significant increase in subsequent years.

BUDGET	2022	%	2023	%	2024	%	2025	%	TOTAL 2022-2025	%
Personnel	3.949.500	62,20%	3.949.500	62,20%	3.999.500	61,53%	3.999.500	61,53%	15.898.000	61,86%
Other costs	1.755.375	27,64%	1.755.375	27,64%	1.805.375	27,78%	1.805.375	27,78%	7.121.500	27,71%
Investments (total)	645.125	10,16%	645.125	10,16%	695.125	10,69%	695.125	10,69%	2.680.500	10,43%
TOTAL BUDGET	6.350.000	100,00%	6.350.000	100,00%	6.500.000	100,00%	6.500.000	100,00%	25.700.000	100,00%

The growth objective of the centre is quite important for the following years due to the fact that the BCBL has been awarded one more time with the Severo Ochoa Grant. The centre has considered maintaining approximately the weight percentages of each budget line over the total: 60% personnel expense, 27 % other management costs, and 13 % investments.

Personnel

See outlined in the chart below a breakdown of the personnel expenditure. It corresponds to the 2022-2025 four-year period:

ESTIMATED FIGURES	BERC	PROJECTS	GRANTS	TOTAL
	2022-2025	2022-2025	2022-2025	2022-2025
	Euros	Euros	Euros	Euros
RESEARCH PERSONNEL				
Staff Scientist	275.000	942.000	1.000.000	2.217.000
Postdoc	150.000	2.414.000	2.300.000	4.864.000
Predoc	150.000	450.000	3.000.000	3.600.000
LAB PERSONNEL	750.000	1.588.000	22.000	2.360.000
ADMINISTRATION				
Admin and Technical	1.800.000	1.024.000	33.000	2.857.000
TOTAL	3.125.000	6.418.000	6.355.000	15.898.000
Funding percentage	20%	40%	40%	100%

The personnel cost has been increased for the future years. This is the plan that will be followed in terms of new recruitment:

- 1 Staff scientist, for 2 years.
- 32 Postdocs, for 2 years each
- 1 Program Manager, for 3 years.
- 1 IT Technician, for 2 years.
- 1 Receptionist for NeureClinic, for 4 years.
- 1 Therapist for NeureClinic, for 2 years.
- 1 Administration Member, for 4 years.
- 2 Lab Research Assistants, for 4 years.

Investments

Regarding investments, in the following table, there is a detail of the expected main figures:

INVESTMENTS	TOTAL
SOFTWARE AND HARDWARE	1.102.500
LAB EQUIPMENT	1.205.000
GENERAL INVESTMENTS	373.000
TOTAL	2.680.500



Some of them will be part of the lab equipment, such as an upgrade to the current NirScout System.

Near infrared spectroscopy, or NIRS, is a neuroimaging technique that records brain activity by measuring oxygen saturation in the blood. The lab technicians put on a cap that contains a series of infrared lights on the participant's head. This is a completely harmless procedure.

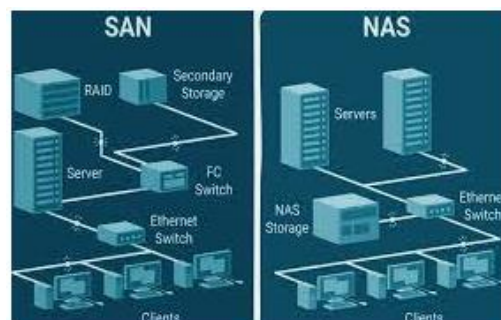
Currently, the BCBL has NIRS facilities in the Baby Lab but another system to be installed at the Hospital Donotia, as well as EEG system for babies, are foreseen within the BERC 2022-2025 budget.

Other investments that are really interesting for the BCBL lab equipment are: Optoacoustics or spectralis OCT tomography system, amongst others.



In the IT field, the BCBL needs to replace the majority of the administration and lab personnel computers as well as to upgrade the computer storage systems.

This will improve significantly the IT equipment that, in some cases, has been operating since the beginning of the centre in 2009.





Other management costs

This chapter includes all the general expenses that are not related to personnel or investments. There is a broad variety of items that are considered in this category, as reflected in the following image:

	2022-2025
OTHER COSTS	
Other management costs	
Facility Renting costs	1.037.772
Other rentings (venues, assets, etc.)	314.228
Works, repair and maintenance	1.000.000
Conference Proceedings Abroad	800.000
Publications	100.000
Social Expenses	120.000
Participants, lab specific tools and Helium	720.000
IT related expenses	240.000
Other general costs (electricity, insurances, indirect costs, et	2.789.500
TOTAL	7.121.500

Moderate growth in all expenditure items has been considered. Taking into account the expected personnel and activity growth, an increase in investments and general costs can be predicted accordingly. However, no big extra expenses have been considered.

We will analyse the renting and lab-related expenses more exhaustively in the following chapters of this document.



3.9.2. Incomes

This section should include (Max. 3 pages):

Detail of all the financial sources expected to cover the budget foreseen for the period 2022-2025.

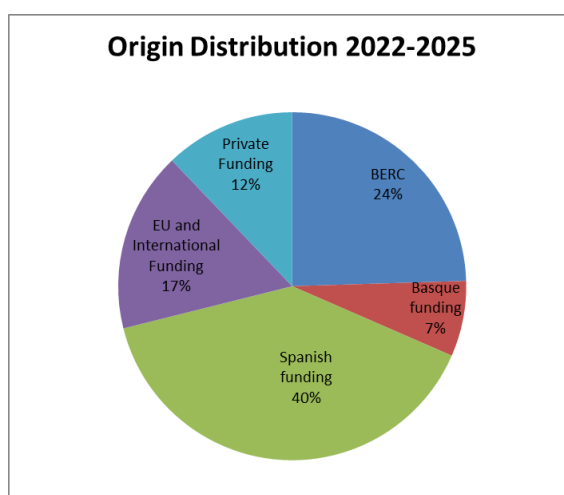
Justify the information provided and include the table supplied in the Excel file.

2022-2025 PERIOD

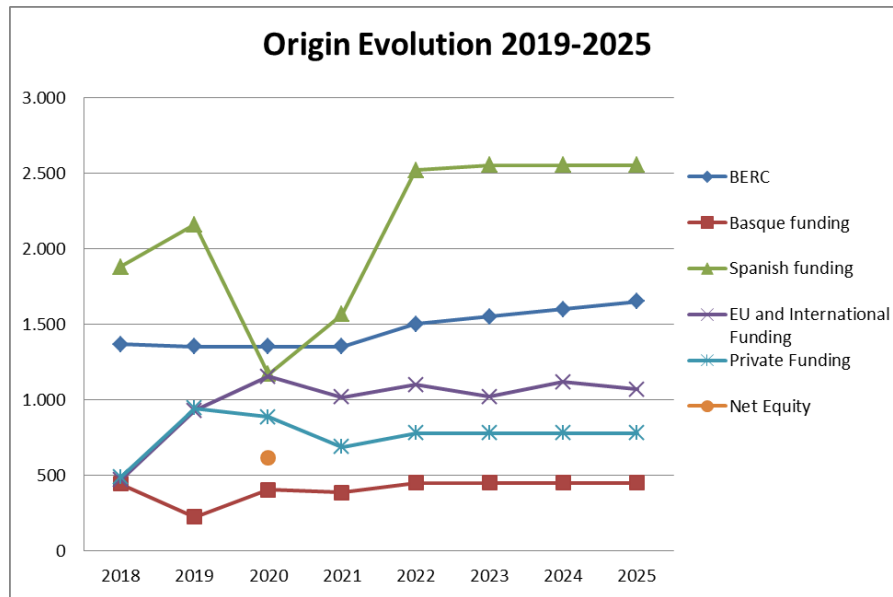
INCOMES (BERC only)	2022	%	2023	%	2024	%	2025	%	TOTAL	%
PUBLIC FUNDING	5.570.000	87,72%	5.570.000	87,72%	5.720.000	88,00%	5.720.000	88,00%	22.580.000	87,86%
BERC programme	1.500.000	23,62%	1.550.000	24,41%	1.600.000	24,62%	1.650.000	25,38%	6.300.000	24,51%
UPV/EHU funding	1.000	0,02%	1.000	0,02%	1.000	0,02%	1.000	0,02%	4.000	0,02%
IKUR funding	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
Other Basque funding	450.000	7,09%	450.000	7,09%	450.000	6,92%	450.000	6,92%	1.800.000	7,00%
CSIC funding	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
Other Spanish funding	2.519.000	39,67%	2.550.000	40,16%	2.550.000	39,23%	2.550.000	39,23%	10.169.000	39,57%
EU & International funding	1.100.000	17,32%	1.019.000	16,05%	1.119.000	17,22%	1.069.000	16,45%	4.307.000	16,76%
Other funding	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
PRIVATE FUNDING	780.000	12,28%	780.000	12,28%	780.000	12,00%	780.000	12,00%	3.120.000	12,14%
R+D contracts	30.000	0,47%	30.000	0,47%	30.000	0,46%	30.000	0,46%	120.000	0,47%
patronage	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
donations	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
returns via patents, licencing...	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
other private funding	750.000	11,81%	750.000	11,81%	750.000	11,54%	750.000	11,54%	3.000.000	11,67%
TOTAL INCOME (must match total budget)	6.350.000	100,00%	6.350.000	100,00%	6.500.000	100,00%	6.500.000	100,00%	25.700.000	100,00%

In order to estimate the revenues, the centre has considered the following factors:

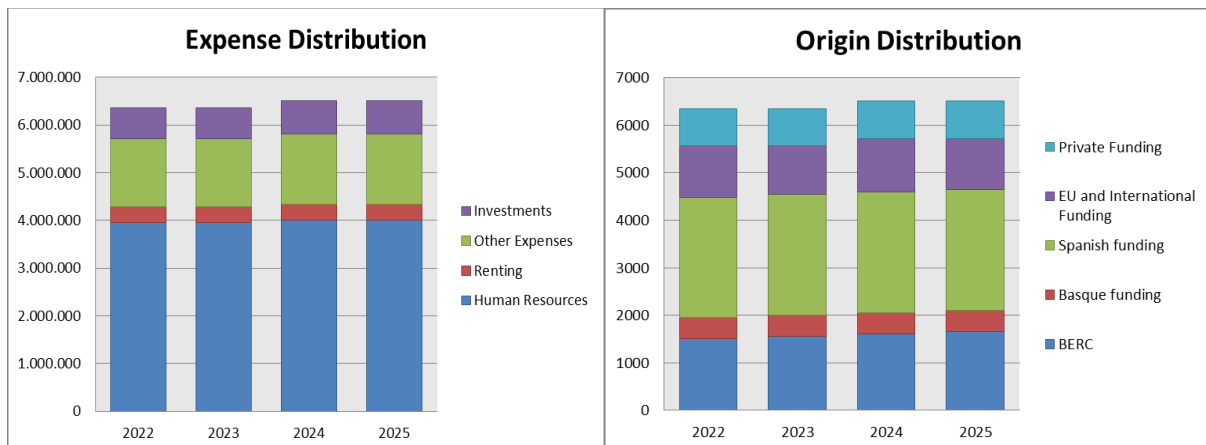
1. Success in "Severo Ochoa" grant with €1.000.000 per year in 2022-2025 period.
2. Slight increase of BERC grant, of around 10% the first year and €50k the following years.
3. Regarding EU & International funding, the BCBL has the budget of the project ERC_CoG_2018_ReadCalibration, until September 2024. We expect to be successful in another ERC grant before this one ends. The historical success rate of Marie Curies is around 2 per year, and it is expected to maintain remain like this.
4. Funding of the BERC grant over the total annual budget: average of 24.51 % over the four-year period.



In general, apart from the Severo Ochoa extra budget (€1M per year), the BCBL's budget will be quite stable in relation with previous years, with a slight increase that is considered necessary to be able to develop and maintain the excellence in an increasingly competitive framework.



See below the revenues-expenses relationship, as in the previous four-year period.



3.9.3. Cost of renting of premises

This section should include (Max. 2 pages):

Please indicate the expenses expected in renting the premises or building for the period 2022-2025, and the justification of the evolution of these renting expenses for this period. Include documents (invoices) of the expenses in order to justify the cost and any comment or additional information that could be taken into consideration in this regard.

Justify the information provided and include the table supplied in the Excel file.

Additional information

BUDGET (BERC only)	2022	2023	2024	2025	TOTAL 2022 2025
Cost of renting of facilities	259.443	259.443	259.443	259.443	1.037.772

The renting cost of the BCBL is a very significant part of the budget. There are three main renting items to be taken into consideration, in order to calculate the budget for the following years:

Miramón building:



From 2022-2025, the rental fee of the premises the BCBL uses in building number 69 of the Technology Park of Miramón are estimated to amount to 252.622,92 euros (VAT incl.), 208.779,24 euros (VAT excl.)

We do not expect a price rise in the following years, so this expense should be constant during the period at issue.

Korta building:



The premises rented by the BCBL in the Korta building, belonging to the UPV/EHU, houses a small but highly valued and necessary auxiliary lab to be close to the university community, which is of great importance in the research area at issue.

Currently, the renting price is 1705,05 euros per 3 months, which makes 568,35 euros per month, and 6820,2 euros per year.

We expect to maintain the same expense rate in the future, as it is a fixed price that has not been increased previously.

TOTAL COST OF RENTING PREMISES 2022-2025:

Additional information

BUDGET (BERC only)	2022	2023	2024	2025	TOTAL 2022 2025
Cost of renting of facilities	259.443	259.443	259.443	259.443	1.037.772

3.9.4. Degree of lab-based practical work of the centre

This section should include (Max. 3 pages):

Please indicate the expenses expected for research-related tasks such as equipment, reagents, specific tools or similar, needed to carry out experiments, for the period 2022-2025.

Justify the information provided and include the table supplied in the Excel file.

The activity carried out in the BCBL lab is the basis of the research work performed at the centre. The chart below shows the main expenses related to the work in the BCBL lab by item and year:

BUDGET (BERC only)	2022	2023	2024	2025	TOTAL 2022-2025
Cost of the lab-based practical work of the BERC	1,126,250	1,176,250	1,126,250	1,176,250	4,605,000
equipment	301,250	301,250	301,250	301,250	1,205,000
reagents	0	0	0	0	0
specific tools	25,000	25,000	25,000	25,000	100,000
maintenance of facilities	50,000	100,000	50,000	100,000	300,000
Participants	80,000	80,000	80,000	80,000	320,000
Personnel	590,000	590,000	590,000	590,000	2,360,000
Helium	80,000	80,000	80,000	80,000	320,000

Maintenance of facilities

The cost included in this section corresponds to the monthly maintenance expense for the Magnetoencephalography (MEG). This service is essential for the correct running of the machine all year round.

Magnetoencephalography (MEG) is a non-invasive method for recording cortical activity which boasts exceptional temporal and fine spatial resolution. It is used to map brain activity by recording magnetic fields produced by the electrical currents neurons generate when they communicate with each other.

During the last years, the maintenance of the machine has been restricted due to the shortage of the general budget. However, from 2022 to 2025, there is a budget saved (around €100.000 every 2 years) for full package maintenance, and €50.000 for the other 2 years for a less complete maintenance package. The MEG is one of BCBL lab's most valuable assets and it is worthy to maintain it as well as it can be. Besides, the machine is no longer new and some parts will likely start to fail.

Equipment

As we already detailed in chapter 1.1.1, there are some assets that the BCBL is planning to acquire throughout the next years:

- An upgrade to the current NirScout System, which is currently part of BCBL's BabyLab.
- Another NIRS system to be installed at the Hospital Donotia, as well as
- A EEG system for babies, are foreseen within the BERC 2022-2025 budget



Near infrared spectroscopy, or NIRS, is a neuroimaging technique that records brain activity by measuring oxygen saturation in the blood. The lab technicians put on a cap that contains a series of infrared lights on the participant's head. This is a completely harmless procedure.

- Other investments that are really interesting for the BCBL lab equipment are: Optoacoustics or spectralis OCT tomography system, amongst others.

Specific Tools



Within this section, many costs associated with the daily running of the lab are included: lab material (syringes, gel, adaptors, towels, etc.), small replacements for the different techniques (e.g., bulbs), specific materials to carry out particular tests, etc.

The budget assigned to this item is similar to previous years (except the ones affected by the restriction of the Covid19), as it is directly related to the lab activity.

Participants



The BCBL needs to obtain data of participants coming to the lab in order to carry out the research developed in the centre. Participants of all ages and social groups turn to our premises, and the amount has risen exponentially year after year since the BCBL opened in 2009.

The cost of participants the BCBL defrays is a small compensation payment that is offered in turn for the time and effort they devote to science.

The budget assigned to this item is similar to previous years (except the ones affected by the restriction of the Covid19), as it is directly

related to the lab activity.

However, we also considered the fact that during the pandemic a new way of recruiting participants' data was developed (online experiments) and also new procedures that are very likely to remain due to their benefits, for example, when there is a need for recruiting data from foreign subjects.

Personnel

The personnel related to the activity performed in the lab basically comprised the 2 staff members in charge (Lab Managers, the coordinators of each technique (Lab Coordinators) and the team of Research Assistants, whose duties are to help the research team to prepare and carry out the experiments in the centre.

As analysed in the Personnel general chapter, there is a budget of **€2.360.000** assigned to lab personnel for the years 2022-2025, which is around 14,84% of the total personnel budget. It is €40.000 higher than the previous four-year period, a difference that will be used for recruiting a new Research Assistant, during 2 years approximately.

	2022-2025
<i>STIMATED FIGURES</i>	Euros
Research Assistants	2.010.000
Lab Management	350.000
Total	2.360.000

Helium

Helium is a quite constant expense in the BCBL, as the fMRI and the MEG use it for operating. The Magnetic Resonance machine gets filled with helium approximately every three months, whereas the MEG gets filled almost weekly.

The budget assigned to this item is similar to previous years (except the ones affected by the restriction of the Covid19), as it is directly related to the lab activity. We estimate a yearly expense of €80.000, which will be mostly covered by research projects.

TOTAL LAB EXPENSES 2022-2025:

BUDGET (BERC only)	2022	2023	2024	2025	TOTAL 2022-2025
Cost of the lab-based practical work of the BERC	1,126,250	1,176,250	1,126,250	1,176,250	4,605,000



4. Indicators

This section should include the main indicators of the Excel file provided as template.

Scientific output

INDICATORS	OBTAINED RESULTS 2018-2021					PROPOSED INDICATORS 2022-2025				
	2018	2019	2020	2021	TOTAL / AVRG	2022	2023	2024	2025	TOTAL / AVRG
Number of indexed articles and reviews published in the given year	76	91	83	83	333	84	84	84	84	336
Number of indexed articles Q1	64	73	71	71	70	71	71	71	71	71
% of indexed articles Q1	84,2%	80,2%	85,5%	85,5%	83,9%	84,5%	84,5%	84,5%	84,5%	84,5%
Number of indexed articles D1	47	63	50	50	53	50	50	50	50	50
% of indexed articles D1	61,8%	69,2%	60,2%	60,2%	62,9%	59,5%	59,5%	59,5%	59,5%	59,5%
Number of indexed articles C1	4	8	5	5	6	4	4	4	4	4
% of indexed articles C1	5,3%	8,8%	6,0%	6,0%	6,5%	4,8%	4,8%	4,8%	4,8%	4,8%
% of indexed articles by the Scientific Director	18,4%	7,7%	14,5%	15,7%	14%	10,0%	10,0%	10,0%	10,0%	10,0%
Number of international scientific co-publications	62	69	69	68	268	67	67	67	67	268
Number of public private co-publications	0	0	0	0	0	0	0	0	0	0
Number of citations during the given year of all indexed articles published by the centre, total	2054	2496	2977	3000		3000	3100	3200	3300	
H index of the centre for the indexed articles published until the given year	39	44	52	54	47	54	55	56	57	56
M index of the centre for the indexed articles published until the given year	3,9	4	4,3	4,2	4,1	3,9	3,7	3,5	3,4	3,6
Number of books, book chapters and monographies published in the given year	3	2	3	3	11	2	2	2	2	8

Talent attraction and recruitment

INDICATORS	OBTAINED RESULTS 2018-2021					PROPOSED INDICATORS 2022-2025				
	2018	2019	2020	2021	TOTAL / AVRG	2022	2023	2024	2025	TOTAL / AVRG
Basque programmes	3	1	4	2	3	2	3	2	3	2,5
BERC	2	0	0	0	0,5	0	1	0	1	0,5
Basque Government (non BERC)	1	1	4	2	2	2	2	2	2	2
UPV/EHU	0	0	0	0	0	0	0	0	0	0
Others (Basque or local)	0	0	0	0	0	0	0	0	0	0
Spanish programmes	10	6	7	2	6	9	6	6	5	6,5
Minister	5	5	7	2	5	8	5	5	4	5,5
Others	5	1	0	0	2	1	1	1	1	1
International programmes	2	1	1	1	1	1	1	1	1	1
Total PhD students	15	8	12	5	10	12	10	9	9	10
Basque programmes	3	1	2	3	2	2	1	2	1	1,5
BERC	3	1	2	3	2	2	1	2	1	1,5
Basque Government (non BERC)	0	0	0	0	0	0	0	0	0	0
UPV/EHU	0	0	0	0	0	0	0	0	0	0
Others (Basque or local)	0	0	0	0	0	0	0	0	0	0
Spanish programmes	2	2	3	3	3	5	5	5	5	5
Minister	2	2	3	3	3	5	5	5	5	5
Others	0	0	0	0	0	0	0	0	0	0
International programmes	4	2	3	2	3	2	1	2	1	1,5
Total postdoctoral researchers	9	5	8	8	8	9	7	9	7	8
Basque programmes	5	7	4	7	6	6	6	6	6	6
BERC	4	4	1	4	3	3	3	3	3	3
Basque Government (non BERC)	0	2	2	2	2	2	2	2	2	2
UPV/EHU	0	0	0	0	0	0	0	0	0	0
Others (Basque or local)	1	1	1	1	1	1	1	1	1	1
Spanish programmes	0	0	0	0	0	0	0	0	0	0
Minister	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0
International programmes	2	2	2	2	2	2	2	2	2	2
Total technicians	7	9	6	9	8	8	8	8	8	8
Total BERC Personnel	9	5	3	7	6	5	5	5	5	5
Ikerbasque Research Professors	0	1	0	1	1	0	1	0	1	0,5
Ikerbasque Research Associates	1	0	0	1	0,5	1	0	1	2	1,0
Ikerbasque Research Fellows	1	0	1	3	1,3	1	1	1	1	1,0
Total Ikerbasque Personnel	2	1	1	5	2,3	2	2	2	4	2,5

**External funding (BERC centre only)**

INDICATORS	OBTAINED RESULTS 2018-2021					PROPOSED INDICATORS 2022-2025				
	2018	2019	2020	2021	TOTAL / AVRG	2022	2023	2024	2025	TOTAL / AVRG
% of other Basque funding (different from BERC funding)	13%	11%	16%	15%	16%	15%	14%	15%	14%	15%
% of Spanish funding	41%	47%	34%	30%	32%	41%	42%	40%	41%	41%
% of international funding	17%	17%	23%	28%	26%	20%	20%	20%	20%	20%
% of external funding (total)	71%	75%	73%	73%	73%	76%	76%	75%	75%	75%

Patents, transfer of knowledge and outreach activities

INDICATORS	OBTAINED RESULTS 2018-2021					PROPOSED INDICATORS 2022-2025				
	2018	2019	2020	2021	TOTAL / AVRG	2022	2023	2024	2025	TOTAL / AVRG
Requested patents, utility models	0	0	0	0	0	0	0	0	0	0
Licensed patents, utility models	0	0	1	0	1	0	1	0	0	1
Patents, utility models under exploitation	0	0	0	0	0	1	0	0	0	1
Creation of <i>spin-offs</i>	0	0	0	0	0	0	0	0	0	0
Agreements/contracts with public institutions	2	1	2	4	9	2	2	3	3	10
Agreements/contracts with private firms	6	6	1	1	14	2	2	2	2	8
Organized congresses at national level	0	0	0	0	0	0	0	0	0	0
Organized congresses at international level	3	4	1	1	9	3	2	2	2	9
Invited lectures at international scientific congresses	28	38	16	25	107	27	27	27	27	108
Events and outreach activities organized	15	14	9	3	41	10	11	10	11	42
High Level Policy oriented meetings (City Halls, Basque Government, Spanish Government, European Union...)	4	4	4	2	14	4	4	4	4	16
Activity in mass media (n°)	584	347	225	300	364	370	370	370	370	370
Activity in social networks (n°)	782	450	785	800	704	705	705	705	705	705
Visits hosted (general public, schools, associations...)	22	29	12	0	15,75	16	16	16	16	16

Training

INDICATORS	OBTAINED RESULTS 2018-2021					PROPOSED INDICATORS 2022-2025				
	2018	2019	2020	2021	TOTAL / AVRG	2022	2023	2024	2025	TOTAL / AVRG
On going	48	50	50	52	200	50	50	50	50	200
Finalized (national)	0	3	2	0	5	0	1	0	1	2
Finalized (international)	4	3	4	9	20	5	5	5	5	20
Industrial	0	0	0	0	0	0	0	0	0	0
PhD Thesis	52	56	56	61	225	55	56	55	56	222
On going	13	10	11	17	51	10	10	10	10	40
Finalized (national)	1	4	2	3	10	2	2	2	2	8
Finalized (international)	10	7	6	8	31	6	6	6	6	24
Master Thesis	24	21	19	28	92	18	18	18	18	72
PhD courses	13	13	13	13	52	13	13	13	13	52
Master courses	33	36	32	32	133	32	32	32	32	128
Advanced courses	6	6	6	6	24	7	7	7	7	28
Number of researchers participating in courses	52	55	51	51	209	52	52	52	52	208

**Internationalization**

INDICATORS	OBTAINED RESULTS 2018-2021					PROPOSED INDICATORS 2022-2025				
	2018	2019	2020	2021	TOTAL / AVRG	2022	2023	2024	2025	TOTAL / AVRG
Participation in international networks	4	5	5	4	18	5	5	5	5	20
International agreements	42	45	45	45	177	45	45	45	45	180
International projects (requested)	14	15	12	15	56	14	14	14	14	56
International projects (obtained)	6	3	3	3	15	4	4	4	4	16
% of non Spanish PhD personnel in relation to total number of PhD personnel	82%	77%	72%	75%	77%	75%	75%	75%	75%	75%
% of non Spanish PhD students in relation to total number of PhD students	63%	56%	58%	57%	59%	57%	57%	57%	57%	57%
Number of researchers who are member of editorial boards of indexed research publications	13	12	12	14	13	14	14	14	14	14
Number of researchers who are member of editorial boards of indexed Q1 research publications	12	12	8	8	10	8	8	8	8	8
Requested ERC grants	3	3	2	3	11	2	2	2	2	8
Obtained ERC grants	1	1	0	0	2	0	0	1	0	1
Visiting researchers (number of researchers)	19	28	5	11	63	16	16	16	16	64
Visiting researchers (number of months of average stay)	3	2	5	5	4	4	4	4	4	4
Nobel Laureates or Fields medal awardees assigned or contracted by the centre	0	0	0	0	0	0	0	0	0	0
International recognitions, awards	2	2	0	0	4	1	0	1	0	2

Public and private partnerships

INDICATORS	OBTAINED RESULTS 2018-2021					PROPOSED INDICATORS 2022-2025				
	2018	2019	2020	2021	TOTAL / AVRG	2022	2023	2024	2025	TOTAL / AVRG
Number of projects in cooperation with research groups of Universities within the Basque University System	1	1	2	2	1,5	2	2	2	2	2
Number of projects in cooperation with research agents within the Basque Network of Science, Technology and Innovation (non-industrial)	1	1	1	1	1	2	2	2	2	2
Number of projects in cooperation with research agents within the Basque Network of Science, Technology and Innovation (industrial)	0	0	0	0	0	0	0	0	0	0

Gender equality

INDICATORS	OBTAINED RESULTS 2018-2021					PROPOSED INDICATORS 2022-2025				
	2018	2019	2020	2021	TOTAL / AVRG	2022	2023	2024	2025	TOTAL / AVRG
Scientific director	0	0	0	0	0	0	0	0	0	0
PI	4	4	4	4	4	4	4	5	5	5
Permanent researchers (PI excluded)	1	1	3	3	2	3	3	4	4	4
Postdoctoral researchers	15	16	11	11	13	12	12	13	13	13
PhD students	16	18	20	19	18	22	25	25	26	25
Technical personnel	5	13	5	5	7	5	5	5	5	5
Management personnel	5	6	7	6	6	6	6	6	6	6
Others	11	11	10	11	11	11	11	11	11	11
Total number of women	57	69	60	59	61	63	66	69	70	67
Scientific director	1	1	1	1	1	1	1	1	1	1
PI	4	6	6	6	5,5	6	6	6	6	6
Permanent researchers (PI excluded)	1	0	2	2	1,25	2	2	2	2	2
Postdoctoral researchers	7	10	7	7	7,75	8	8	8	8	8
PhD students	15	19	23	21	19,5	20	20	20	20	20
Technical personnel	5	4	5	5	4,75	5	6	6	6	5,75
Management personnel	2	2	2	2	2	2	2	2	2	2
Others	3	4	2	2	2,75	2	2	2	2	2
Total number of men	38	46	48	46	45	46	47	47	47	46,75
% of women in the centre	60%	60%	56%	56%	58%	58%	58%	59%	60%	59%
% of women related to senior researchers	45%	42%	44%	44%	44%	44%	44%	50%	50%	47%
Activities related to promotion of gender equality (n.)	2	2	2	2	8	3	3	3	3	12

*People structure under each organization*

INDICATORS	STRUCTURE 2018-2021					PROPOSED STRUCTURE FOR 2022-2025				
	2018	2019	2020	2021	TOTAL / AVRG	2022	2023	2024	2025	TOTAL / AVRG
PI	7	5	5	6	6	8	9	10	10	9
Permanent researchers (PI excluded)	1	0	0	1	1	1	2	3	3	2
Postdoctoral researchers	23	23	20	22	22	19	21	23	23	22
PhD students	31	36	43	40	38	42	47	48	49	47
Technical personnel	11	10	10	10	10	10	12	12	12	12
Management personnel	5	8	9	9	8	8	9	9	9	9
Others	13	26	12	12	16	13	15	15	15	15
Total Personnel	91	108	99	100	100	101	115	120	121	114
PI	7	4	5	5	5	6	7	8	8	7
Permanent researchers (PI excluded)	0	0	0	0	0	1	2	3	3	2
Postdoctoral researchers	22	23	19	19	21	19	21	23	23	22
PhD students	31	36	43	40	38	42	47	48	49	47
Technical personnel	11	10	10	10	10	10	12	12	12	12
Management personnel	5	8	9	9	8	8	9	9	9	9
Others	13	26	12	12	16	13	15	15	15	15
Total BERC Personnel	89	107	98	95	97	99	113	118	119	112
PI	0	0	0	0	0	0	0	0	0	0
Permanent researchers (PI excluded)	0	0	0	0	0	0	0	0	0	0
Postdoctoral researchers	0	0	0	0	0	0	0	0	0	0
PhD students	0	0	0	0	0	0	0	0	0	0
Technical personnel	0	0	0	0	0	0	0	0	0	0
Management personnel	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0
Total UPVEHU Personnel	0	0	0	0	0	0	0	0	0	0
PI	0	0	0	0	0	0	0	0	0	0
Permanent researchers (PI excluded)	0	0	0	0	0	0	0	0	0	0
Postdoctoral researchers	0	0	0	0	0	0	0	0	0	0
PhD students	0	0	0	0	0	0	0	0	0	0
Technical personnel	0	0	0	0	0	0	0	0	0	0
Management personnel	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0
Total CSIC Personnel	0	0	0	0	0	0	0	0	0	0
Ikerbasque Research Professors	0	1	0	1	1	2	2	2	2	2
Ikerbasque Research Associates	1	0	0	1	1	0	0	0	0	0
Ikerbasque Research Fellows	1	0	1	3	1	0	0	0	0	0
Total Ikerbasque Personnel	2	1	1	5	2	2	2	2	2	2
PI	0	0	0	0	0	0	0	0	0	0
Permanent researchers (PI excluded)	0	0	0	0	0	0	0	0	0	0
Postdoctoral researchers	0	0	0	0	0	0	0	0	0	0
PhD students	0	0	0	0	0	0	0	0	0	0
Technical personnel	0	0	0	0	0	0	0	0	0	0
Management personnel	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0
Total other Personnel	0	0	0	0	0	0	0	0	0	0



BUDGET	2018	%	2019	%	2020	%	2021	%	TOTAL 2018-2021	%	2022	%	2023	%	2024	%	2025	%	TOTAL 2022-2025	%
Personnel	3.167.182	68,15%	3.808.686	67,95%	3.468.128	62,16%	3.540.967	70,64%	13.984.963	67,1%	3.949.500	62,20%	3.949.500	62,20%	3.999.500	61,53%	3.999.500	61,53%	15.898.000	61,9%
Other costs	1.337.906	28,79%	1.671.264	29,82%	1.942.053	34,81%	1.390.000	27,73%	6.341.223	30,4%	1.755.375	27,64%	1.755.375	27,64%	1.805.375	27,78%	1.805.375	27,78%	7.121.500	27,7%
Investments (total)	142.555	3,07%	125.281	2,24%	169.568	3,04%	82.000	1,64%	519.404	2,5%	645.125	10,16%	645.125	10,16%	695.125	10,69%	695.125	10,69%	2.680.500	10,4%
TOTAL BUDGET	4.647.643	100,00%	5.605.231	100,00%	5.579.749	100,00%	5.012.967	100,00%	20.845.590	100,0%	6.350.000	100,00%	6.350.000	100,00%	6.500.000	100,00%	6.500.000	100,00%	25.700.000	100,0%

Additional information

BUDGET (BERC only)	2018	2019	2020	2021	TOTAL 2018-2021	2022	2023	2024	2025	TOTAL 2022-2025
Cost of renting of facilities	289.709	268.501	256.601	259.443	1.074.254	259.443	259.443	259.443	259.443	1.037.772
Cost of the lab-based practical work of the BERC	834.523	1.033.215	574.298	647.157	3.089.193	1.126.250	1.176.250	1.126.250	1.176.250	4.605.000
equipment	610	32.860	84.900	10.000	128.370	301.250	301.250	301.250	301.250	1.205.000
reagents	0	0	0	0	0	0	0	0	0	0
specific tools	55.549	25.648	5.357	24.000	110.555	25.000	25.000	25.000	25.000	100.000
maintenance of facilities	69.058	74.579	22.041	3.000	168.679	50.000	100.000	50.000	100.000	300.000
Participants	56.181	87.615	30.952	92.374	267.123	80.000	80.000	80.000	80.000	320.000
Personnel	604.551	755.170	389.287	444.783	2.193.791	590.000	590.000	590.000	590.000	2.360.000
Helium	48.573	57.343	41.760	73.000	220.676	80.000	80.000	80.000	80.000	320.000

INCOMES (BERC only)	2018	%	2019	%	2020	%	2021	%	TOTAL	%	2022	%	2023	%	2024	%	2025	%	TOTAL	%
PUBLIC FUNDING	4.178.755	89,91%	4.662.134	83,17%	4.056.149	81,69%	4.323.593	86,25%	17.220.631	85,12%	5.570.000	87,72%	5.570.000	87,72%	5.720.000	88,00%	5.720.000	88,00%	22.580.000	87,86%
BERC programme	1.367.868	29,43%	1.350.875	24,10%	1.350.875	27,21%	1.350.875	26,95%	5.420.493	26,79%	1.500.000	23,62%	1.550.000	24,41%	1.600.000	24,62%	1.650.000	25,38%	6.300.000	24,51%
UPV/EHU funding	1.000	0,02%	1.000	0,02%	1.000	0,02%	1.000	0,02%	4.000	0,02%	1.000	0,02%	1.000	0,02%	1.000	0,02%	1.000	0,02%	4.000	0,02%
Other Basque funding	456.794	9,83%	225.401	4,02%	393.873	7,93%	386.613	7,71%	1.462.681	7,23%	450.000	7,09%	450.000	7,09%	450.000	6,92%	450.000	6,92%	1.800.000	7,00%
CSIC funding	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
Other Spanish funding	1.873.449	40,31%	2.157.627	38,49%	1.155.042	23,26%	1.569.080	31,30%	6.755.198	33,39%	2.519.000	39,67%	2.550.000	40,16%	2.550.000	39,23%	2.550.000	39,23%	10.169.000	39,57%
EU & International funding	469.806	10,11%	927.231	16,54%	1.155.359	23,27%	1.016.025	20,27%	3.568.421	17,64%	1.100.000	17,32%	1.019.000	16,05%	1.119.000	17,22%	1.069.000	16,45%	4.307.000	16,76%
Other funding	9.838	0,21%	0	0,00%	0	0,00%	0	0,00%	9.838	0,05%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
PRIVATE FUNDING	468.888	10,09%	943.097	16,83%	909.055	18,31%	689.374	13,75%	3.010.414	14,88%	780.000	12,28%	780.000	12,28%	780.000	12,00%	780.000	12,00%	3.120.000	12,14%
R+D contracts	6.057	0,13%	61.644	1,10%	34.138	0,69%	16.177	0,32%	118.016	0,58%	30.000	0,47%	30.000	0,47%	30.000	0,46%	30.000	0,46%	120.000	0,47%
patronage	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
donations	13.000	0,28%	12.000	0,21%	0	0,00%	0	0,00%	25.000	0,12%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
returns via patents, licencing...	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%	0	0,00%
other private funding	449.831	9,68%	869.453	15,51%	874.917	17,62%	673.197	13,43%	2.867.398	14,17%	750.000	11,81%	750.000	11,81%	750.000	11,54%	750.000	11,54%	3.000.000	11,67%
TOTAL INCOME (must match total budget)	4.647.643	100,00%	5.605.231	100,00%	4.965.204	100,00%	5.012.967	100,00%	20.231.045	100,00%	6.350.000	100,00%	6.350.000	100,00%	6.500.000	100,00%	6.500.000	100,00%	25.700.000	100,00%



5. Annexes

Include any annex that could contribute to the evaluation process of the centre.

Annex 1: Last report from the ISAB dated November 2020

Annex 2: Finance Planning - Invoices

Annex 3: Projects currently running or awarded along the 2018-2021 period

Annex4: Benchmarking of the Centre

Annex 5: Full list of Publications 2018-2021

Annex 6: Full list of Conference Proceedings 2018-2021

Annex 7: Top 20 Journals 2018-2021

Annex 8: Knowledge transfer. Full list of Databases

Annex 9: Full list of External Speakers 2018-2021

Annex 10: Full list of Visiting Researchers 2018-2021

Annex 11: PhD Thesis 2018-2021



Annex 1: Last report from the ISAB dated November 2020

Basque Center on Cognition, Brain and Language International Scientific Advisory Board Interim Report 2020

Executive Summary

The *International Scientific Advisory Board* (ISAB/Board) conducted its second interim review of the Basque Center on Cognition, Brain and Language (BCBL) in 2020. The review was based on the BCBL *Centre Scientific Report* 2016-2020, and the new *Centre Strategic Plan* 2021-2024, as well as discussions between the Director and the ISAB Chair. This report evaluates progress since the last full ISAB Report in 2017, including how well the BCBL has responded to previous recommendations. The ISAB favorably endorses the continued advancement of the BCBL, and finds that it is making strong progress, even given the challenges presented over the last year by the global pandemic. The ISAB is impressed by the continuing significant scientific headway made by BCBL scientists. The high quality of the research groups, including those added since 2017, is evident. The twelve highly complementary research groups, representing synergistic scientific strengths, position the BCBL well for near- and long-term success. The addition of two senior experts in computational science brings a critical new strength to the BCBL, one which the Board believes will have a direct and sustained impact on major theoretical issues in language and brain science. The Board notes the continuing successes of the faculty in receiving honors for their scholarly achievements, achieving promotions in rank, and winning national and international research grant support. There has also been positive progress in administrative organization and leadership, including work to advance diversity, equity and inclusion among the faculty, staff and trainees. The expansion of the training mission of the BCBL, especially with respect to the new Cognitive Neuroscience Ph.D. program, is impressive. The superior nature of the research at the BCBL is evident in the first rank publications in top international scientific journals. Metrics on publication impact, as reflected by citation rates, indicate a positive upward slope for the faculty as a group, and individually, over the review period, including a notable jump over the past year. The impact of this work is also reflected in related public media attention. The ISAB recognizes the accomplishments of the BCBL Director, faculty and staff for the significant acceleration in notable scientific discovery in the public interest. The BCBL has risen to join the world's top institutes for research and training in the cognitive and neural mechanisms of language, with emphases on reading, and the learning of second languages/bilingualism, in both education and communication disorders.



ISAB Interim Report 2020

Membership of the Scientific Advisory Board (ISAB)

George R. Mangun, Ph.D. (Chair)

*Distinguished Professor of Psychology and Neurology
Director, Center for Mind and Brain
University of California, Davis, U.S.A.*

Anne Cutler, Ph.D.

*Distinguished Professor
The MARCS Institute, Western Sydney University, Australia
Director Emeritus
Max Planck Institute for Psycholinguistics, The Netherlands*

William Marslen-Wilson, Ph.D.

*Honorary Professor of Language & Cognition
Department of Experimental Psychology
Director Emeritus, MRC Cognition & Brain Sciences Unit
University of Cambridge, U.K.*

James L. McClelland, Ph.D.

*Lucie Stern Professor in the Social Sciences
Department of Psychology
Director, Center for Mind, Brain and Computation
Stanford University, U.S.A.*

Cathy J. Price, Ph.D.

*Professor of Cognitive Neuroscience,
Director, Wellcome Centre for Human Neuroimaging
Queen Square Institute of Neurology
University College London, U.K.*

Timothy Shallice, Ph.D.

*Professor and Director Emeritus
Institute for Cognitive Neuroscience
University College London, U.K.
Professor Emeritus
Scuola Internazionale Superiore di Studi Avanzati, Italy*

*ISAB Interim Report 2020***TABLE OF CONTENTS*****Executive Summary******Membership of the Scientific Advisory Board (ISAB)*****I. Introduction to the 2020 Interim ISAB Report****II. Evaluations of Specific BCBL Functions and Activities**

- A. BCBL Mission, Research Excellence and International Profile**
- B. Faculty Development and Training Program**
- C. Community and Regional Outreach and Programming, & Technology Transfer**
- D. Facilities, Administration and Budget**
- E. Indicators/Metrics**
- F. Strategic Plan 2021-2024**

III. Scientific Advisory Board Recommendations**IV. Conclusions**



I. Introduction to the 2020 Interim ISAB Report

The purpose of the Interim ISAB Report is to provide an up-to-date input on the progress of the BCBL in pursuing its mission of scientific discovery, education, and public outreach. Significant developments since the 2017 ISAB site visit and report are reviewed in this document. The ISAB is impressed with the activities and progress since the 2017 report, and by stated future plans of the Director and the faculty.

The ISAB now has six members: Professors Cutler, Mangun (Chair), Marslen-Wilson, McClelland, Price and Shallice. The newest member, Professor Cathy Price, is the Director of the *Wellcome Center for Human Neuroimaging* at University College London. She is an internationally-respected scientist in the cognitive neuroscience of language, a talented leader in science administration, and a recently elected a fellow of the Royal Society (U.K.). The present report did not involve a site visit given the COVID-19 pandemic, but was instead conducted by reviewing materials provided by Director Carreiras. In addition, the ISAB Chair and Director Carreiras exchanged communications regarding the most recent developments at the BCBL, which permitted the Director to address specific questions of interest to the ISAB. The 2018-2020 *Centre Scientific Report* and the *Strategic Plan 2021-2024* were also prime sources of information for the Board. Finally, the ISAB members assessed the quality and significance of the published work of the faculty, and used available metrics of impact to inform their opinions. The ISAB plans to conduct its next site visit and full review in summer 2022, at which time a new ISAB member will be fully active:

In the 2017 ISAB report the following points were reviewed.

- 1) The scientific mission of the BCBL, research excellence, and international standing
- 2) The recruitment, achievements, advancement and review of the scientific Group Leaders
- 3) The synergies between the individual goals of the groups and the BCBL mission
- 4) Training and support of doctoral students and postdocs
- 5) The BCBL scientific and administrative organization, policies and governance
- 6) The success of extramural support of the center and research programs, and current and future budgetary impact
- 7) The contributions of the BCBL to regional scientific and societal advancement

The present interim ISAB report will address relevant aspects of the above, keeping in mind the specific recommendations made in the 2017 report, which addressed the following points (see pg. 11 of the 2017 ISAB Report):

- 1) National and international partnerships.
- 2) Activities such as the Junior Lab established at the Carmelitas School in Vitoria.
- 3) Retention plan for early career Group Leaders.
- 4) Structure of future site visits to focus on group-level achievements and recommendations.



ISAB Interim Report 2020

- 5) Increase the computational and theoretical strength of the BCBL.
- 6) Create additional support for the Director from among the Group Leaders with regards to research policy, administrative and infrastructure matters.
- 7) Continue the role of the BCBL in hosting international colloquia, symposia, conferences and summer schools/workshops.

II. Evaluations of the Current State of Specific BCBL Functions and Activities

This section is organized according to the main functional areas of the BCBL that were reviewed in detail in the 2017 ISAB Report. The focus of the ISAB comments throughout will be on new developments that address prior ISAB recommendations.

A. BCBL Mission, Research Excellence and International Profile

The BCBL continues to elevate its international presence and reputation. Considering its relatively early stage of its development (just 10 years on), it is among the most vibrant and successful research centers on brain and language in the world today. The BCBL now identifies seven primary themes or *lines* (L) of research and development that are represented among the twelve research groups, as shown in Table 1.

Table 1: Research Themes Represented in the BCBL

<i>Line 1:</i> Language Development Across the Life Span
<i>Line 2:</i> Speech Perception, Production and Disorders
<i>Line 3:</i> Reading and Dyslexia
<i>Line 4:</i> Multilingualism
<i>Line 5:</i> Neurodegeneration, Brain Damage and Rehabilitation
<i>Line 6:</i> Language and Other Cognitive Systems
<i>Line 7:</i> Advanced Methods in Cognitive Neuroscience

Developing Scientific Strength. Since the 2017 review, five additional research groups have been added to the BCBL portfolio, while two have closed because the group leaders were highly successful in being selected for high-level positions elsewhere. The latter were the groups led by Dr. Mari Cruz Rodríguez-Oroz (Parkinson Disease and Neurodegeneration) who departed to accept a highly competitive and prestigious position as the Director of the Department of Neurology and the CIMA Program in Neuroscience at the University of Navarra, and the group led by Dr. Jon Andoni Duñabeitia (Multilingual Literacy) who received a professorship at the University of Nebrija.

The five new groups are the *Neurolinguistics and Aphasia* group led by Dr. Mancini (planning for which began prior to 2017), *Infant Language and Cognition* led by Dr. Marina Kalashnikova, the methods group, *Signal Processing in Neuroimaging*, led by Dr. Cesar Caballero, the *Statistical Learning* group led by Professor Ram Frost, and most recently, the *Computational Neuroscience* group led by Professor James Magnuson.



As of the writing of this report, the active BCBL Groups and their intersecting research lines (see Table 1) are shown in Table 2.

Table 2: Research Groups and Intersecting Research Lines of the BCBL

Group 1: Brain Rhythms and Cognition – Prof. Nicola Molinaro, Group Leader (L2, L3, L8)
Group 2: (New since 2019) Computational Neuroscience – Prof. James Magnuson, Group Leader (L1, L2, L3, L4)
Group 3: Consciousness – Prof. David Soto, Group Leader (L1, L4, L6, L7)
Group 4: Developmental Language Disorders – Dr. Marie Lallier, Group Leader (L2, L3, L4)
Group 5: (New since 2017) Infant Language and Cognition: Dr. Marina Kalashnikova, Group Leader (L1, L4)
Group 6: Language and Memory Control: Prof. Kepa Paz-Alonso, Group Leader (L1, L3, L4, L6)
Group 7: Neurobiology of Language: Prof. Manuel Carreiras, Group Leader (L3, L4, L5)
Group 8: (New since 2017) Neurolinguistics and Aphasia: Dr. Simona Mancini, Group Leader (L2, L4, L5)
Group 9: Speech and Bilingualism: Prof. Clara Martin, Group Leader (L2, L4)
Group 10: Spoken Language: Prof. Arthur Samuel, Group Leader (L2, L4)
Group 11: (New since 2017) Signal Processing in Neuroimaging: Dr. Cesar Caballero, Group Leader (L5, L7)
Group 12: (New since 2017) Statistical Learning: Prof. Ram Frost, Group Leader (L3, L8).

The groups have grown and developed in a robust manner in recent years and months, and the ISAB recognizes the breadth and depth of these intersecting research programs. The present groups are well aligned and coordinated with the BCBL mission, and reflect careful strategic planning by the Director and faculty. Moreover, the development of these groups since 2017 responded well to the prior recommendations of the ISAB. The Board feels that the current scientific structure of the BCBL – especially with respect to the balance among thematic areas, and between basic and translational science – puts it in a strong position to amplify its already significant societal impact.

Research Progress and Discovery. The BCBL has an overarching focus on reading, second language learning and bilingualism. The general approach is to delineate both the cognitive, computational and brain mechanisms that support these different aspects of language. The work includes basic science investigation of this complex human brain function, and the development of new diagnostic and treatment approaches for language disorders. One key aim is to understand what neural deficits result in people having difficulties learning to read, with the goal of developing targeted interventions to ameliorate the resulting disabilities. Another primary objective is educational, to improve second language learning in the classroom. Most of the world's population is bilingual or are learning another language, either as children or adults.



Understanding the underlying cognitive and brain mechanisms of language learning will facilitate the optimization of language education. This focus on reading and spoken language mechanisms has significance for virtually every human being on the planet. The BCBL has made fundamental new discoveries in several areas, and the ISAB identifies three of particular note.

Second Language Learning Methods. Learning language is a uniquely human function, and it is highly correlated with educational and career success. Recently, BCBL scientists demonstrated, in dramatic contrast to standard thinking, that learning to understand the sounds of a new language is hindered when adult learners speak these sounds during learning. This counter-intuitive finding suggests that the methods for teaching the multitude of students around the world another language should be amended to take advantage of this new finding.

Reading and Brain Pathways. It has been known for a number of years that a particular region of the brain is critical for determining the visual form of words in reading. Using modern brain imaging to look at the structure and function of this region, BCBL researchers show that two different parts of this region are functionally connected to different anatomical networks that are respectively involved in (i) the analysis of the visual features of the written words and (ii) the transmission of visual input to higher-level language processing systems. This discovery will help the understanding of developmental language disorders like dyslexia, and also alexia following brain damage. The authors additional finding that functional activation in each region was predictive of behavior outside the brain scanner can also help to lead to a potential diagnostic tool, and to increase our knowledge of individual differences in reading skill in the general population.

Dyslexia and Brain Synchronization. BCBL scientists used highly sensitive tools for measuring the magnetic signals produced by active brain cells to discover a new brain correlate of dyslexia. Individuals whose ability to read is hindered by dyslexia, a brain disorder that involves difficulty recognizing speech sounds, show asynchronous patterns of brain activity – in signals called delta waves – during listening. This asynchronous brain activity was observed in early stages of sound processing rather than higher level language areas. This discovery holds great promise for enabling the early identification of children at risk for dyslexia, which in turn could permit early interventions, as well as a means of assessing the success of such interventions.

B. Faculty Development and Training Program

Group Leaders and Scientific Staff. The progress of the Group Leaders already in place at the last full review in 2017 has been impressive, and the ISAB notes their successes in obtaining fellowships (Marie Curie, Ikerbasque, Ramon y Cajal), promotions in rank, and extramural funding from national and international sources. The ISAB has previously noted the receipt of a prestigious European Research Council (ERC) Consolidator Grant by Professor Clara Martín, in support of her *Speech and Bilingualism* group; she has now been promoted to Ikerbasque Research Professor (full professor equivalent). Nicola Molinaro and Kepa Paz-Alonso have also been promoted to Ikerbasque Associate (associate professor equivalent). Since the last review, Professor Carreiras has received a major new competitive grant from the La Caixa Foundation, to carry out the *Dysthal (dyslexia-thalamus) Project* on dyslexia, which he will lead. The ISAB



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also noted Professor Carreiras' success in securing a much sought after ERC Proof of Concept grant in 2018, for the development of neurofeedback methods in to support reading success in school children.

Recruitment of new Group Leaders has been highly successful. Dr. Kalashnikova heads the *Infant Language and Cognition* group, and joins the BCBL from the MARCS Institute at Western Sydney University, Australia; she holds a competitive Marie Curie Fellowship (2018-2020), and has received both a Ramon y Cajal Fellowship and is an Ikerbasque Fellow. Dr. Cesar Caballero, a Ramon y Cajal Fellow, leads the *Signal Processing in Neuroimaging* group. He is a talented MRI physicist, with strong international collaborations, and specific expertise in functional and structural MRI for application in cognitive neuroscience research. Dr. Simona Mancini leads the *Neurolinguistics and Aphasia* group, and holds a Ramon Y Cajal Fellowship. Professor Ram Frost is a senior international scholar with a long history of significant work in reading, visual word recognition and statistical learning, and is a recipient of an ERC Advanced Grant (about 33% of the €2.5M grant supports work at the BCBL). Finally, the most recent addition is Professor James Magnuson, who leads the Computational Neuroscience group. A distinguished psycholinguist, he brings to the BCBL critical new computational skills. Magnuson also has rich experience in developing and running interdisciplinary training programs at the cutting-edge of human cognition research, and will bring important additional strengths to the BCBL training mission. These last two additions (Frost and Magnuson) address prior recommendation of the ISAB to recruit senior leaders, and to enhance computation science methods; we specifically comment on the latter with respect to the scientific directions of the BCBL in section F. **Strategic Plan 2021-2024.**

Support for Diversity and Equity. The ISAB recognizes the progress that has been made on the tenets of the BCBL *Gender Action Plan*, which was developed in 2016 to respond to the *Strategic Vision of the European Research Area*, and in response to prior ISAB recommendations. The plan has multiple components, including work-life balance strategies, and the implementation of procedures to ensure equity (e.g., in salary), access (e.g., to research infrastructure, student support), and in administrative structure of the centre (i.e., the involvement of the Group Leaders in planning and decision making). The majority (>60%) of the personnel of the BCBL (i.e., trainees, scientific and administrative staff) are women. At the same time, only four group leaders are women, and only one is presently a full professor (Prof. Martin). The greatest progress in gender diversity has been among the eight tenure-track early career scientists, 75% of whom are women, with three being group leaders. This bodes well for the future as these talented scholars climb the academic ranks.

Graduate and Postdoctoral Training. The ISAB notes the significant and continuing growth in Ph.D. students since 2017, which primarily involves students entering the new Ph.D. program in *Cognitive Neuroscience*. Over the past two years, recruitment of students has been highly successful, especially in the Cognitive Neuroscience Ph.D. program, which now has a total of 43 trainees pursuing the doctoral degree. This is a significant cohort, and the Board felt this was an important development. The numbers of postdoctoral trainees also continues to grow steadily, reaching 25 in 2020, and these postdocs have been very successful in obtaining research fellowships to pursue their research and training. The growth in the numbers of doctoral trainees reflects the growth in the research groups and therefore research mentors, not

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merely the offering of new programs. This reflects a robust developmental trajectory in research and training, which helps to ensure that trainees receive excellent opportunities. Information about the success of trainees in securing subsequent training, research opportunities and academic positions is still developing, but the early evidence is promising (see measures of the trainee program success under **E. Indicators/Metrics**).

C. Community and Regional Outreach and Programming, & Technology Transfer

The BCBL continues to run an effective outreach mission. Since 2017, they have hosted several prominent local and international events (i.e., conferences, workshops etc.). In total these have involved close to 1000 participants from around the world. The ISAB took special note of the three programs. *Brain Hack*, which is conducted annually, brings together stakeholders from academia and industry to pursue new directions for collaborations using cognitive neuroscience methods such as brain imaging. The international conference on *Statistical Learning* is also highly successful. In 2019 it brought together close to 200 scholars from Europe, North America and the Middle East to consider computational approaches to learning in language, audition, vision and music. These programs were supported from multiple sources of funding, and made significant contributions to the outreach mission of the BCBL, as well as to important issues such as scientific transparency and integrity. The *Workshop on Infant Language Development* (WILD) has become a regular event, and so far, every 2nd meeting of WILD has been held at the BCBL. This fast growing community has effectively been formed by the existence of the WILD workshop. Finally, in 2020, the BCBL was a prominent sponsor of the annual Cognitive Neuroscience Society meeting, which was the first in its long history to be conducted entirely as a virtual event, given the pandemic. The BCBL joined major international centers as a sponsor, including the Max Planck Society, University College London, and the Australasian Cognitive Neuroscience Society (ACNS). Overall, the ISAB finds the outreach and dissemination efforts of the BCBL to be superb; few research institutions are as effective as the BCBL in this regard.

In the realm of technology transfer, the ISAB observed a significant uptick in activity at the BCBL. The raw numbers of items developed and distributed to the public/private sector are at an all-time high, and the organizational effectiveness of this tech transfer has noticeably improved. The ISAB singled out the work associated with the successful *Neure Clinic*, developed with funds from the BCBL's Severo Ochoa grant. The important mission of the *Neure Clinic* is to foster research in neurological patients, improve the diagnosis of learning disorders in children, and to develop computerized tools for diagnosis and amelioration of learning disorders in the *NeureSoft* unit at BCBL. Finally, the support by the BCBL for several important databases is to be applauded, and provides an important open access service to language researchers worldwide.

D. Facilities, Administration and Budget

The scientific infrastructure of the BCBL is competitive with any similar top-ranked research institute in the world today. The array of cutting-edge tools for experimental and computational neuroscience research is impressive. The far-sighted decision to add off-site laboratories away from the main facility has created valuable additional infrastructure, without which important work involving, for example, studies of school children, would be much less straightforward. The expansion of the physical space and the reorganization of the facilities that was underway

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during the last ISAB site visit in 2017 is now complete. As a result, the BCBL has been able to accommodate the increased numbers of personnel that accompany the recruitment of new Group Leaders, trainees and support personnel, as well as international collaborators coming for shorter periods of time.

Changes have been made to the well-organized business administration side of the BCBL, and the ISAB continues to believe the positive developments in human resource management are based on best practices in the field. The BCBL has a Human Resources Strategy for Researchers (HRS4R) Seal of Excellence, and has adopted the European Commission's recommendations for open, transparent and merit based recruitment policies. The goal to advance human capital through strategic, well-vetted methods, is viewed positively by the Board.

Significant changes made to the academic administration seem to be paying off well. Previously, in the last full ISAB Report, the Board had recommended that the Director solicit assistance from among the rapidly maturing group leaders to assist with strategic planning, mentoring, and related matters. Director Carreiras has implemented several new initiatives to respond to this important recommendation. Although it is still rather early to assess the successes of these measures, the ISAB supports this general direction of travel, and encourages its continued refinement. One important innovation was the creation of leadership teams from among the group leaders, to encourage them to take more active roles at the BCBL that are appropriate for their duties, goals and stage of career.

As noted in our 2019 Interim Report, the Director meets monthly with all the Group Leaders and the BCBL General Manager to discuss center policies, operations and plans. The management of key functions has been organized such that one Group Leader is responsible for the master's degree program (Headmaster), and another for the new Ph.D. program in Cognitive Neuroscience (Graduate Director). The vetting and approval of experimental protocols is accomplished using procedures led by the Director and Group Leaders. The *Ethics Committee* (currently, Marina Kalashnikova and Simona Mancini) evaluates proposed studies for human subjects compliance and so forth. If the project complies with the BCBL ethical standards, the project documentation is then routed to the *Scientific Committee* (currently, Clara Martin, Nicola Molinaro, Kepa Paz-Alonso) for evaluation of factors such as rigor of the hypothesis and aims, statistical power, and analytic pipeline. Changes or clarifications may be requested, or the project may be rejected. Once recommended by the *Scientific Committee*, the researcher in charge presents the project at a project presentation meeting that is open to all members of the BCBL where the project is discussed openly and any other limitations or considerations raised can be addressed in further revision. Final approval is forwarded to the respective lab managers who schedule the experiment and necessary staffing to conduct the experiment. As previously noted, the ISAB found this process to be well organized, and felt that it was leading to high quality experimental work of high integrity and ethics.

E. Indicators/Metrics

Various quantitative indicators point to the continuing strong progress of the BCBL across a wide range of its activities. With respect to research productivity, citations of the work of BCBL



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scientists continues to climb. Since 2017 the number of citations has almost doubled to 4,100, and the composite center H-index has risen from 32 to 41 (H-index is a measure of both productivity and impact of publications). Perhaps more importantly, there has been a steady rise in H-index of each of the Group Leaders over the past several years, and their citation rates have climbed steadily. Indeed, from 2019 to 2020, there was an across the board jump in citations for the Group Leaders (28% rise in citations over the preceding year). Considering just the eight early career Group Leaders, the rise is even more impressive (37% increase over the preceding year). Of importance for the future of the BCBL as a leading international research center is the numbers of papers that have been accepted in premier international scientific journals. The Board appreciated the BCBL's achievement in placing ~80% of all published papers (N=386) in high-status journals (top 10% of journals by accepted metrics) since the 2017 review. This includes papers in top journals such as *PNAS*, *Scientific Reports*, *Current Biology*, *Journal of Memory and Language*, and *Developmental Science*. This is an excellent record by any international standard.

Grant success has been strong from both national and international sources, including the highly competitive European Research Council; the ISAB was pleased to see collaborative research projects between the BCBL and other international institutes, such as the work with the Max Planck Institute for Psycholinguistics through the FLAG-ERA's Human Brain Project. The numbers of Ikerbasque professors, associates and fellows has doubled from 5 in 2017 to 11 today.

Graduate and postdoctoral training at the BCBL has matured significantly. The Master's program in Cognitive Neuroscience has enrolled 99 students to date. Many of these students have gone on to Ph.D. programs around the world, including 27 at the BCBL. Very clear success is noted in the significant numbers of students graduating with the Ph.D. in Linguistics (N=16) and the newer Cognitive Neuroscience Ph.D. Program (N=25). Although the latter program was only founded in 2018, many of the students who entered in the Linguistics Program subsequently petitioned to transfer to the Cognitive Neuroscience Program, which both explains the significant numbers of dissertations for a program that is only officially two-years old, and demonstrates the popularity of that degree program. At present, there are 43 students in the Cognitive Neuroscience Program at various stages of progress toward the Ph.D. degree. This is an excellent number of trainees by international standards, given the size of the BCBL. The training of postdoctoral scientists is very strong as measured by the receipt of prestigious fellowships, and successful competition for faculty positions at respected institutions. For example, the Board noted the success of BCBL postdoctoral fellow Dr. Liv Holwerstein, who in 2020 obtained a highly-competitive faculty position as an Assistant Professor of Psychology at the University of California, Santa Cruz, where she is now building her own laboratory. The ISAB has no doubt that her postdoctoral training at the BCBL was a major contributor to this success.

Finally, the BCBL researchers and faculty hold many competitive fellowships and grants, including Ikerbasque Fellowships and Ramon y Cajal Fellowships (tenure-track fellowships), and the research staff and postdocs have been very successful with other fellowships, including Marie Curie Fellowships. The Board was pleased to learn that the Director, Manuel Carreiras, was honored with an important recognition, receiving the prestigious *Spanish National Prize*



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'Pascual Madoz' in Social Sciences 2019, from the Ministry of Science. Professor Carreiras was recognized as follows: "He is an international figure in the field of language processing, in the area of experimental psychology. His capacity to create groups of excellence and transfer of knowledge is remarkable. His work has an extraordinary social impact." The award was acknowledged in person by Felipe VI, King of Spain.

F. Strategic Plan 2021-2024

The ISAB reviewed the Strategic Plan 2021-2024 with great interest. It is a thoughtful plan that considers both the opportunities and challenges (threats) to future success of the BCBL, and sets appropriately high expectations. In all aspects of the BCBL's stated mission and range of activities, the Strategic Plan provides direction and sets clear goals. A complete review of the Strategic Plan 2021-2024 is beyond the scope of this interim report, and therefore the Board touches only on major components of the plan at this time. Evaluation of the details of the plan and its ongoing implementation will continue over this coming year as we prepare for the 2022 site visit and five-year ISAB report.

Scientific Directions. The BCBL has rich scholarship and research across a variety of topics relevant to understanding human language and cognition. The Strategic Plan 2021-2024 outlines two main overarching goals; to pursue educational neuroscience, and to translate science for advancing human health and productivity related to language use and language disorders. The Board feels that the plans capitalize on the core strengths of the BCBL and have high potential to create new synergies among the research groups that will open novel areas of inquiry for the BCBL scientists and trainees.

Building Computational Science. Over the last few years, the BCBL has greatly increased its engagement with underlying theory and broader principles, and the coming years under the Centre Strategic Plan 2021-2024 will see advances in this area, especially given the appointments of Professors Frost and Magnuson as new Group Leaders. Their recruitment addresses a critical gap in computational science that was identified in the 2017 ISAB Report. The combination of behavioral experimentation with mathematical theory and/or computer simulation is a major step forward for the BCBL that will enable theoretical questions to be pursued across cognitive and brain studies of language. Dr. Frost addresses the processes whereby a learning system can acquire language skills by becoming familiar with the statistical structure inherent in linguistic and other experience. Dr. Magnuson explores how the processing of sensory information interacts with language-specific knowledge to shape the processes that leads from sensory signals to understanding. In both of these areas, it has become increasingly clear over the last several years that mathematical theory and computer simulation are necessary complements to experimental research approaches. Just as explicit quantitative theory has been central to progress in physics, and computer simulation has been central to the recent emergence of exciting progress in artificial intelligence, so too must the effort to understand cognition, language and their bases in the brain draw on mathematical theory and computer simulation. By recruiting these outstanding scientists, the leadership of the BCBL has not only demonstrated its appreciation of the importance of this complementarity, it has also successfully put itself in a position to exploit it in the years ahead.



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International Leadership. The BCBL has a very prominent international presence, and this has been facilitated by their leadership in convening scholarly events that advance cutting-edge issues in language and cognition (reviewed earlier in the discussion of outreach activities). In this way, the BCBL establishes itself at the forefront by monitoring the research fields to which it belongs locally and globally, and exercising a willingness to act in ways that help develop the fields for the wider scientific community. The Board feels that the BCBL does this particularly well, and that has enhanced its reputation. The continued plans regarding outreach, and the goal to further expand the public information component of the BCBL effort is viewed by the Board as highly relevant for increasing the already significant societal impact of the centre.

III. Recommendations of the Scientific Advisory Board

The Board offers the following specific recommendations and observations:

1. As the new Ph.D. program grows, it will be important to gather specific and detailed information on the outcomes of the graduates. This should include long-term follow up, such as whether they obtain postdocs in leading labs, how they are funded in those training positions (individual fellowships, etc.). If they go instead to industry or public sector positions, efforts should be made to find out whether they remain in cognitive brain research. Over the long term, their success in obtaining independent positions in academia or research institutes should also be tracked. This information should also be tracked for the masters students (e.g., do they pursue a Ph.D., etc.) and postdoctoral fellows.

2. The Impact of the Severo Ochoa grant has been of great importance for the development and success of the BCBL, most notably in improving the research infrastructure (e.g., upgrade of the MRI), which is critical for supporting the recruitment, success and retention of the best researchers. The Severo Ochoa funding is one of the pillars upon which the BCBL has built its current truly excellent twelve research groups. In addition, the Severo Ochoa support provided doctoral and postdoctoral scholars that additionally fueled the research efforts at the BCBL, and this has had a major impact. We previously recommended that the Director develop a strategic plan for continuing center-wide support of this type, which has been produced for 2021-2024. Without such support, many important projects might not be possible, and the success of the BCBL as a whole might be slowed.

3. We applaud the Director and his colleagues for their commitment to and success in advancing diversity and equity, but also encourage continued progress. Over time, there should be an increase in the percentage of more senior researchers at the BCBL (e.g., full professors) who enhance diversity and equity, including in gender diversity. It is praiseworthy that gender diversity is strong among the trainees and early career researchers, but it is equally important that the senior faculty members reflect this diversity. With this in mind, the Board recommends planning that considers not only recruitment, but importantly retention of women and those contributing to diversity. It will be important to continue to prepare early career scientists for roles in leadership. In this regard the Director's actions to create leadership committees, and to distribute decision making in a formal manner with the Group Leaders is a very positive direction.



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4. The exceptionally successful programs in outreach to both the scientific and non-scientific communities are laudable, and these should be continued as a high priority of the BCBL. These are noted in the *Centre Strategic Plan 2021-2024*, but the Board would recommend developing plans to deal with the issues arising from the global pandemic with respect to hosting scientific meetings, and urges the Director and faculty to consider how to advance novel means to continue the scientific outreach under the current (and likely future) limitations in physical gathering.

5. Joint international grants, including with scientific agencies in the United States are encouraged, and the ISAB believes that as stated in the new scientific plan, that US National Science Foundation, National Institutes of Health, and private sources could provide additional research funding. Although this is not usually the case for non-US entities, because two of the Group Leaders are US scientists who maintain research capability at US universities, this opens the door for properly structured applications for new awards.

6. The ISAB encourages the Director to advance scientific collaboration with the international vendors (e.g., Siemens, Philips, Brain Products, etc.) that support the technology used at the BCBL for research. We appreciate that the BCBL does pursue such collaborations, but suggest that widening those might lead to advantages in upgrading existing infrastructure and/or replacing it with next-generation equipment, software and options; for example, upgrades to the MEG or MRI systems.

IV. Conclusions

The ISAB finds that the BCBL has continued a high rate of productivity and successfully advanced its mission since the full review in 2017. The Board was pleased with the responses to the 2017 recommendations, noting that in many cases the BCBL has gone beyond what was recommended. Similarly, the new *Centre Strategic Plan 2021-2024* is promising for guiding the BCBL forward. The high quality of the faculty is evident in their continued career advancement, scientific success, and national and international recognition. The ISAB supports the latest recruitments to the BCBL, as well as the rapid progress of the training programs. The Board also notes the international leadership shown by the BCBL in sponsoring international meetings, and hosting popular scientific events that advance critical theory in the field of language research. Outreach, technology transfer and societal impact are all progressing well. The Director is to be congratulated for his continued focus on achievement, while also championing diversity and equity. The BCBL has established itself as a vibrant international centre for research and training in human language and brain function, and in so doing, provides impactful service to society locally, nationally and internationally.

Submitted November 20th 2020



Annex 2: Finance Planning - Invoices

1- Renting Invoices:

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PARKE
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Firmado por: PARQUE CIENTIFICO Y TECNOLÓGICO DE GIPUZKOA,
Fecha: 2020.04.21 14:54:23 +02:00
Motivo: Firma Factura Electrónica

BCBL-BASQUE CENTER ON COGNITION, BRAIN
AND LANGUAGE
Paseo Mikeletegi nº 69
20009 SAN SEBASTIAN
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C.I.F.: G20988929

Factura Nº: FV20/0660
Fecha: 21/04/2020

CONCEPTO	IMPORTE EUROS
Alquiler del local nº132 del Edificio A1.1 y de la plaza de garaje nº 51 en sótano del Edificio A1.1 del Parque Científico y Tecnológico de Gipuzkoa, correspondiente a Abril	1.233,78
Alquiler de los locales nº222.026.032.036, local pasillo de acceso, locales nº222.226.232.236, local pasillo de acceso, locales nº211.215.221.225 y local pasillo de acceso del Edificio A1.1 y de las plazas de garaje nº 36.37.38.39.45 y 48 en sótano del Edificio A1.1 del Parque Científico y Tecnológico de Gipuzkoa, correspondiente a Abril	16.164,49

Vencimientos			BASE IMPONIBLE	IVA 21 %	TOTAL FACTURA (€)
Recibo Apilamiento Consejo Gobierno	Apilado	21.051,91	17.398,27	3.653,64	21.051,91

De conformidad con lo dispuesto en la Ley Orgánica 15/1999 de 13 de diciembre, se informa que los datos de carácter personal que nos ha facilitado están recogidos en un fichero denominado "CLIENTES", del que es responsable PARQUE CIENTIFICO Y TECNOLÓGICO DE GIPUZKOA-GIPUZKOA ZENTRIA ETA TEKNOLOGIA PARKEA con domicilio en Paseo Mikeletegi, 69, 20009 San Sebastián.
Este fichero tiene como finalidad gestionar la información a efectos administrativos y comerciales. Esta información podrá ser facilitada, siempre que sea necesario, a otras empresas del grupo, a las empresas colaboradoras y a la Administración pública con consentimiento en la materia.
Este fichero, ha sido notificado a la Agencia Española de Protección de Datos y cuenta con las medidas de seguridad necesarias para garantizar la total seguridad de los datos.
La información de carácter personal que nos ha facilitado, quedará sujeta a las modificaciones, supresión o cancelación, en los términos establecidos por la Ley indicada, dirigiendo una comunicación escrita a los Responsables de Seguridad de Gipuzkoa@parke.eus

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Motivo: Firma Factura Electrónica

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C.I.F.: G20988929

Factura Nº: FV20/0934
Fecha: 01/06/2020

CONCEPTO	IMPORTE EUROS
Alquiler del local nº132 del Edificio A1.1 y de la plaza de garaje nº 51 en sótano del Edificio A1.1 del Parque Científico y Tecnológico de Gipuzkoa, correspondiente a Junio	1.233,78
Alquiler de los locales nº222.026.032.036, local pasillo de acceso, locales nº222.226.232.236, local pasillo de acceso, locales nº211.215.221.225 y local pasillo de acceso del Edificio A1.1 y de las plazas de garaje nº 36.37.38.39.45 y 48 en sótano del Edificio A1.1 del Parque Científico y Tecnológico de Gipuzkoa, correspondiente a Junio	16.164,49

Vencimientos			BASE IMPONIBLE	IVA 21 %	TOTAL FACTURA (€)
Recibo Apilamiento Consejo Gobierno	Apilado	21.051,91	17.398,27	3.653,64	21.051,91

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Motivo: Firma Factura Electrónica

BCBL-BASQUE CENTER ON COGNITION, BRAIN
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Factura Nº: FV20/1940
Fecha: 02/12/2020

CONCEPTO	IMPORTE EUROS
Alquiler del local nº132 del Edificio A1.1 y de la plaza de garaje nº 51 en sótano del Edificio A1.1 del Parque Científico y Tecnológico de Gipuzkoa, correspondiente a Diciembre	1.233,78
Alquiler de los locales nº222.026.032.036, local pasillo de acceso, locales nº222.226.232.236, local pasillo de acceso, locales nº211.215.221.225 y local pasillo de acceso del Edificio A1.1 y de las plazas de garaje nº 36.37.38.39.45 y 48 en sótano del Edificio A1.1 del Parque Científico y Tecnológico de Gipuzkoa, correspondiente a Diciembre	16.164,49

Vencimientos			BASE IMPONIBLE	IVA 21 %	TOTAL FACTURA (€)
RECIBO BANCARIO	30/12/2020	21.051,91	17.398,27	3.653,64	21.051,91

De conformidad con lo dispuesto en la Ley Orgánica 15/1999 de 13 de diciembre, se informa que los datos de carácter personal que nos ha facilitado están recogidos en un fichero denominado "CLIENTES", del que es responsable PARQUE CIENTIFICO Y TECNOLÓGICO DE GIPUZKOA-GIPUZKOA ZENTRIA ETA TEKNOLOGIA PARKEA con domicilio en Paseo Mikeletegi, 69, 20009 San Sebastián.
Este fichero tiene como finalidad gestionar la información a efectos administrativos y comerciales. Esta información podrá ser facilitada, siempre que sea necesario, a otras empresas del grupo, a las empresas colaboradoras y a la Administración pública con consentimiento en la materia.
Este fichero, ha sido notificado a la Agencia Española de Protección de Datos y cuenta con las medidas de seguridad necesarias para garantizar la total seguridad de los datos.
La información de carácter personal que nos ha facilitado, quedará sujeta a las modificaciones, supresión o cancelación, en los términos establecidos por la Ley indicada, dirigiendo una comunicación escrita a los Responsables de Seguridad de Gipuzkoa@parke.eus

PARQUE CIENTIFICO Y TECNOLÓGICO DE GIPUZKOA-GIPUZKOA ZENTRIA ETA TEKNOLOGIA PARKEA,S.L
Paseo Mikeletegi, 69, 20009 San Sebastián
T: 943 963 003 / 943 963 004 / 943 963 005
gipuzkoa@parke.eus / www.parke.eus

Unibertsitatearen jabetza publikoa erabiltzeari dagokion TASAREN KITAPENA
(UPV/EHUko 2012ko aurrekontuetako 15. art.)
2020ko urtarilaren 16a
Kitapenaren zk.: 1/2020

Datuak:
BASQUE CENTER ON COGNITION, BRAIN AND LANGUAGE (BCBL) elkarte
IFK: G20988929
Mikeletegi pasealekua, 69 – 20009, Donostia.

Epea:
2020ko LEHENENGO HERUHLERKOA

Kontzeptua:
Unibertsitatearen jabetza publikoa erabiltzea (UPV/EHUko: Gipuzkoako Campusko Joxe Mari Korta Zentroko beheko solairuko 0A6 eta 0A7 GELAK).

Zerbitzuko:
1.705,05 €

Epea:
Hamar egun, kitapenaren jakinarazpena jasotzen denetik.

Sarrera non egin:
Kortu korronte zk.: 2095 0292 92 3239000001 (Adierazi Kitapenaren zerbaita)

Oharra:
Ordaintzen atzeratu gero, interesak ere kobratuko zaizkizue, kalte ordain gisa, tasa ordaindu beharko zenukiren egunetik aurrera hitzartzen diren arte. Ordaindu ezaz, izendur egingo zaizue lokalak erabiltzeko baimena, arautegietan jasotzen diren bestelako ondorioak pairatzea gain, zerbait UPV/EHUko Gertakarien 2012ko urtarilaren 28ko Erabakian, zeinaren bidez baimena eman zitzaizuen lokalak erabiltzeko adierazitaok.

LIQUIDACIÓN POR TASA por ocupación del dominio público universitario
(Art. 15 de los Presupuestos de la UPV/EHU 2012)
16 de enero de 2020

Liquidación nº 1/2020

Identificación:
ASOCIACIÓN BCBL BASQUE CENTER ON COGNITION, BRAIN AND LANGUAGE
C.I.F. G20988929
Paseo Mikeletegi, 69 – 20009 – San Sebastián

Ejercicio:
1º TRIMESTRE 2020

Concepto:
Ocupación de dominio público universitario SALAS Nº 0A6 y 0A7 de la planta baja del Centro Joxe Mari Korta en el Campus de Gipuzkoa de la UPV/EHU.

Importe:
1.705,05 €

Plazo:
10 días desde la recepción de la liquidación.

Ingreso:
Cuenta corriente nº 2095 0292 92 3239000001 (Identificando el número de liquidación)

Advertencia:
En el supuesto de que demore el pago de la tasa, vendrá obligado a satisfacer, en concepto de indemnización moratoria, el interés legal del dinero sobre la cantidad debida desde la fecha en que aquel se devengó hasta el día en que se hiciera efectivo, siendo motivo de extinción de la autorización de ocupación la falta de pago, junto con las demás consecuencias recogidas en la normativa aplicable y, en concreto, en la Resolución del Gerente de la UPV/EHU, de 28 de septiembre de 2012, por la que se autoriza la ocupación de los locales citados.

UPV/EHUko Gipuzkoako Campusko gertakariak
Vicegerente del Campus de Gipuzkoa de la UPV/EHU

GIPUZKOAKO CAMPUSA
CAMPUS DE GIPUZKOA
Avda de Tolosa 12
20018 Donostia-San Sebastián
T: 94 963 01522



2- Equipment Invoices:

VPixx Technologies Inc.
630 Clairevue West suite 301
Saint-Bruno, Quebec J3V 6B4
Canada

INVOICE
Invoice No.: IN01013
Date: 2020/02/26
Ship Date: 2020/02/26
Page: 1
Order No.: 202001

Sold to: **Asociación BCBL**
Paseo Mikeletegi 69
Donostia, San Sebastian 20009
Spain

Ship to: **Asociación BCBL**
Paseo Mikeletegi 69
Donostia, San Sebastian 20009
Spain

Carrier: FedEx
Tracking Number: 8001 4109 4487
Incoterms: DAP (delivery at place)

Payment terms: Terms: Net 30. Due 2020/03/27.

Item	Description	Quantity	Unit Price	Amount
VPX-TRK-3500C	TRACKPlex - MRI kHz single camera binocular eye tracker	1	27,863.00	€27,863.00
VPX-TRK-9000	InfraRed Short Range 850nm illuminator	1	935.00	€935.00
PRO3M0 C	PRO3Plex/TRACKPlex console discount	1	-4,675.00	€-4,675.00
VPX-ACC-4900	Complete RESPONSEPlex AMRI dual handheld control pad kit (2 buttons each)	1	2,805.00	€2,805.00
VPX-ACC-8100	SOUNDPlex MR/EEG Stereo system kit with RFI filtered BNC	1	6,078.00	€6,078.00
VPX-ACC-5182	MRI rear projection screen with frame and stand -- 39" X 29.5"	1	1,122.00	€1,122.00
NOTE 1	Exchange 75mm lens to 50mm lens	1		
Discount	Special Discount	1	-2,522.00	€-2,522.00
NOTE 2	Screen customization: 120cm legs, maintain 90cm under bottom of projection screen for TPX3 clearance	1		
Discount	Special Discount	1	-281.00	€-281.00
VPX-SER-9000	Shipping and handling	1	1,161.00	€1,161.00
			Total Amount	€32,486.00

Comment: A late penalty will be added to any unpaid amount more than 30 days from billing date at the rate of 2% monthly (26.82% annually).

TPS #: 881840011
TVQ #: 1088238997

Thank you for choosing VPixx Technologies for your vision testing requirements

VPixx Technologies Inc.
630 Clairevue West suite 301
Saint-Bruno, Quebec J3V 6B4
Canada

INVOICE
Invoice No.: IN01013
Date: 2020/02/26
Ship Date: 2020/02/26
Page: 1
Order No.: 202002

Sold to: **Asociación BCBL**
Paseo Mikeletegi 69
Donostia, San Sebastian 20009
Spain

Ship to: **Asociación BCBL**
Paseo Mikeletegi 69
Donostia, San Sebastian 20009
Spain
Shipping contact: Miguel Arcoana

Carrier: FedEx Freight
Tracking Number: 8001 4109 4487
Incoterms: DAP (delivery at place)

Payment terms: Terms: Net 30. Due 2020/03/27.

Item	Description	Quantity	Unit Price	Amount
VPX-PRO-5050B	PRO3Plex projector without controller	1	27,115.00	€27,115.00
VPX-ACC-8504	Super long throw lens, 2.4 - 4.0	1	3,894.00	€3,894.00
VPX-ACC-7000	PRO3Plex dual-link DV1 booster and active USB cable, length 35 feet/10 m	1	187.00	€187.00
VPX-LCD-1008	LCD LED monitor 24" 1920 x 1080 @120Hz for PRO3Plex console monitor	1	398.00	
VPX-OPX-5050C	DATAPro3 data acquisition system with DisplayPort	1	9,163.00	€9,163.00
VPX-SER-9000	Shipping and handling	1	663.00	€663.00
			Total Amount	€40,822.00

Comment: A late penalty will be added to any unpaid amount more than 30 days from billing date at the rate of 2% monthly (26.82% annually).

TPS #: 881840011
TVQ #: 1088238997

Thank you for choosing VPixx Technologies for your vision testing requirements

gestionnet
Polígono Industrial Axpe
Ribera de Axpe, N° 11 Edif. A L-209
48950 Erandio - Vizcaya
GESTIONET MULTIMEDIA, S.L. CIF. B-05 18 99 32

Tel. 94 464 93 39
Fax 94 460 47 93

Nombre: **ASOCIACIÓN BCBL BASQUE CENTER ON COGNITION, BRAIN AND LANGUAGE**
Dirección: **PASEO MIKELETEGI, N° 69**
C.I.F.: **G-20988929**
Población: **DONOSTI - GIPUZKOA**
Código Postal: **28009**

N° Factura: **144/1118**
Fecha: **27/11/2018**

CONCEPTO	IMPORTE	IVA 21%
Segundo pago del 60% del desarrollo de la plataforma online de gestión de software Neure, de diagnóstico de trastorno específico de lenguaje según programa Severo Ochoa SEV-2015-0490	24.360 €	5.115,60 €
TOTAL	29.475,60 €	

Forma de pago: Transferencia
BANKIA, N° IBAN:
ES29 2038 4207 3760 0011 5027

gestionnet
Polígono Industrial Axpe
Ribera de Axpe, N° 11 Edif. A L-209
48950 Erandio - Vizcaya
GESTIONET MULTIMEDIA, S.L. CIF. B-05 18 99 32

Tel. 94 464 93 39
Fax 94 460 47 93

Nombre: **ASOCIACIÓN BCBL BASQUE CENTER ON COGNITION, BRAIN AND LANGUAGE**
Dirección: **PASEO MIKELETEGI, N° 69**
C.I.F.: **G-20988929**
Población: **DONOSTI - GIPUZKOA**
Código Postal: **28009**

N° Factura: **96/0918**
Fecha: **05/09/2018**

CONCEPTO	IMPORTE	IVA 21%
Primer pago del 40% del desarrollo de la plataforma online de gestión de software Neure, de diagnóstico de trastorno específico de lenguaje según programa Severo Ochoa SEV-2015-0490	16.240 €	3.410,40 €
TOTAL	19.650,40 €	

Forma de pago: Transferencia
BANKIA, N° IBAN:
ES29 2038 4207 3760 0011 5027



3- Specific Tools:

biodonostia
neuroimágenes instituto
instituto de investigación sanitaria

ASOCIACION BASQUE CENTER ON
COGNITION,
BRAIN AND LANGUAGE
Pº MIKELETEGI 69
20009 DONOSTIA (GIPUZKOA)
ESPAÑA
CIF/NIF: G20988929

Nº FACTURA 2018/8/324
FECHA FACTURA 21/09/2018

Facturación de los servicios aceptados en presupuesto: EX/PG/ARR/2018/142 *	44.865,00 €
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PROCESAMIENTO MICROARRAYS / GENOTIPADO PROYECTO PCIN-2015-061 Multi-Lateral

* (presupuesto aceptado para 9 grupos de 16 muestras cada uno)

BASE IVA	% IVA	TOTAL IVA
0,00 €	0,00 %	0,00 €
0,00 €	4,00 %	0,00 €
0,00 €	10,00 %	0,00 €
44.865,00 €	21,00 %	9.421,65 €
TOTAL		54.286,65 €

Forma de pago: 30 días f./fra.
Transferencia a nº cta. 2095-0611-02-1063897119
BIC: BASKES28XXX
IBAN: ESS2 2095 0611 02 1063897119

* Rogamos indiquen el nº de factura en el concepto a la hora de realizar el pago.

Inscrita en el Registro General de Asociaciones del País Vasco, con fecha 14 de junio de 2010.
Nº de registro: AS/G/15251/2010
CIF: G20988929

ASOCIACIÓN INSTITUTO BIODONOSTIA, Pº Dr. Beigiletaín s/n, 20014 Donostia-San Sebastián, (Gipuzkoa) - España.
Tfno: +00 34 943 006012 - Fax: +00 34 943 006250

Bionic
FUNDADA EN 1980

BIONIC IBERICA, S.A.
CL Mavic Nº 81
08320 - MASNOU, EL
BARCELONA - ESPAÑA
CIF: A28820182
Telephone: 93540 19 09 Fax: 93555 69 21
e-Mail:

Fecha operación: 25/11/2018

Artículo	Cil.	Artículo	Descripción	Unidades	Precio	Importe (EUR)
18	2.385		de fecha 25-11-2018			
---			BP-135-1560 SET DE 32 ELECTRODOS ACTIVOS SNAP SL	2,00	2.100,00	4.200,00
---			CAP-64: GORRO DE 64 POSICIONES ADICIONAL	3,00	390,00	1.170,00
---			TALLAS: 56, 58 Y 54 CM			

→ Corregir
send solo

Importe neto	Total dto.	Base I.V.A.	% I.V.A.	I.V.A.
5.370,00		5.370,00	21,00	1.127,70

Líquido (EUR): 6.497,70

Forma de pago: PAGO A 30 DIAS
Elector: TRANSFERENCIA
BANCA: MARCELINA MONTEYS
IBAN: ES0320380294486000107569
BIC: CAHVESMMXXX

Inscrita en el registro mercantil de Madrid nº1, Tomo 22 - Folio 120 - Sección 3ª, hoja nº 60593

abintek

ABINTEK BIOPHARMA S.L.
Parque Tecnológico de Bizkaia, Edificio 804
48160 Derio - Bizkaia (Spain)
CIF: E8856435657

CLIENTE/CLIENT
ASOCIACION BCBL
Paseo Mikeletegi, 69 2ª Planta
20009 SAN SEBASTIAN
GIPUZKOA
ESPAÑA
Interloc: LARRAITZ LOPEZ
N.I.F. G20988929 Fax
Email: LLOPEZ@BCBLU.LLOPEZ@BCBLEU

FACTURA / INVOICE

CDX CLIENTE	S/PEDIDO	NÚMERO FACTURA	FECHA FACTURA	CONDICIONES DE PAGO
CLIENT CODE	CLIENT ORDER	INVOICE NUMBER	INVOICE DATE	PAYMENT TERMS
1250		1 001240	21/02/2019	TRANSFERENCIA 30 DIAS

REFERENCIA	DESCRIPCIÓN	CANTIDAD	PRECIO UNIDAD	DTO. %	IVA	TOTAL
OP-500	Saliva self collection kit (OG-500)	250,00	18,82		21,00	4.705,00
F. IABGNT	Gastos de Envío	1,00	25,00		21,00	25,00

TIPO	IMPORTE	DESCUENTO	PORCIÓN PAGO	PORTES	FINANCIACIÓN	SALDO	I.V.A.	R.E.
21,00	4.730,00					4.730,00	993,30	
10,00								
4,00								
TOTAL (EUR):							5.723,30	


VENCIMIENTO / DUE DATE: 23/03/2019 5.723,30

Datos Bancarios
BBVA GRAN VIA, 12-4º PLTA. OFIC. 1 48001 BILBAO ESPAÑA
BBVAESMMXXX
ES55 0182 1299 46 0208010161

Le informamos conforme a lo previsto en el RGPD de 27 de abril de 2016 que ABINTEK BIOPHARMA, S.L., recaba y trata sus datos de carácter personal aplicando las medidas técnicas y organizativas que garantizan su confidencialidad, con la finalidad de gestionar la relación que le vincula. Usted da su consentimiento y autorización para dicho tratamiento. Conservaremos sus datos de carácter personal únicamente el tiempo imprescindible para gestionar nuestra relación. Podrá ejercitar los derechos de acceso, rectificación, supresión, limitación, portabilidad y oposición dirigiéndose a ABINTEK BIOPHARMA, S.L., con dirección PARQUE TECNOLÓGICO DE BIZKAIA, ROSARIO, 48160, BIZKAIA, inscrita en el Registro Mercantil de Vizcaya, Tomo 4746, Libro 0, Folio 76, Hoja B1-47273 Inscrp. 4, C.I.F. B-95435657

Dirección de Entrega / Delivery Address
1 ASOCIACIÓN BCBL
Paseo Mikeletegi, 69 2ª Planta
20009 SAN SEBASTIAN
GIPUZKOA
ESPAÑA
Interloc: LARRAITZ LOPEZ
Tel

4- Helium:


NIPPON GASES
The Gas Professionals

NIPPON GASES ESPAÑA,S.L.U.
OFICINA CENTRAL:ORENSE,I-28020 MADRID-EDIFICIO CENTRO
TELEFONO:91 453 30 00-FAX:91 551 43 07

DESCUENTO
MANTEN-
MIENTOS
ANUALIZADO
1
IMPORTE
TOTAL
DESCUENTO
MANTEN-
MIENTOS
ANUALIZADO
1

LIB#926149

1

20.56.1020

31.03.2020

Nº FACTURA

SEDA

SPEDIRNTE

FECHA

PARA CUALQUIER INFORMACION SOBRE ESTA FACTURA

NIPPON GASES

C/ORENSE,11 - Pº Plaza

28020 MADRID

TEFNO:902-555171

ccsadmin@nippongases.com

ASOCIACION BCBL

Pº MIKELETEGI Nº69 - 2º

20009 DONOSTIA

GUIPUZCOA

N.I.F. G20988929

CONDICIONES DE PAGO

GIRO A 30 DIAS VTO. 20.05.2020

Para su comodidad y agilidad, existiente recibir su factura por correo electrónico en:

ccsadmin@nippongases.com

FECHA	NOTA	CODIGO	CONCEPTO	CANTIDAD	UN	PRECIO UNITARIO	IMPORTE	I.V.A.
17.03.2020	664067	GREM99	HELIO LIQ RESONANCIAS RECIP CRIOG PEQ	100,00	LN	13,76	1.376,00	21,00
24.03.2020	664208	GREJX50	HELIO EXTRAPORO 3X BOT 50L	36,40	MS	36,40	36,40	MS
26.03.2020	664236	GREJX50	HELIO EXTRAPORO 3X BOT 50L	36,40	MS	36,40	36,40	MS
			TOTAL HELIO EXTRAPORO 3X BOT 50L	72,80	MS	15,67	1.155,36	21,00
24.03.2020	664208	PO99987	SERVICIO ALMACEN BOT	4,00	MS	4,00	4,00	MS
26.03.2020	664236	PO99987	SERVICIO ALMACEN BOT	4,00	MS	4,00	4,00	MS
			TOTAL SERVICIO ALMACEN BOT	8,00	MS	15,10	120,80	21,00
17.03.2020	664067	PO99989	SERVICIO ALMACEN RECIP CRIOG PEQ	1,00	MS	26,55	26,55	21,00
17.03.2020	664067	BRECS00	CARGO POR SUMINISTRO DE HELIO	100,00	MS	36,40	36,40	MS
24.03.2020	664208	BRECS00	CARGO POR SUMINISTRO DE HELIO	36,40	MS	36,40	36,40	MS
26.03.2020	664236	BRECS00	CARGO POR SUMINISTRO DE HELIO	36,40	MS	36,40	36,40	MS
			TOTAL CARGO POR SUMINISTRO DE HELIO	172,80	MS			21,00
17.03.2020	664067	BRETC00	RECARGO TIPO CAMBIO	100,00	MS	36,40	36,40	MS
24.03.2020	664208	BRETC00	RECARGO TIPO CAMBIO	36,40	MS	36,40	36,40	MS
26.03.2020	664236	BRETC00	RECARGO TIPO CAMBIO	36,40	MS	36,40	36,40	MS
			TOTAL RECARGO TIPO CAMBIO	172,80	MS			21,00
		BO00000	TOTAL MEDIO AMBIENTE Y REGlamentACION	11,00	MS	0,97	10,67	21,00
31.03.2020	755466	BO09987	PRESTACION DE ENVASES BOT	48,00	MS	1,29	61,92	21,00
		BO07800	SERVICIO SEGURIDAD	11,00	MS	0,98	10,78	21,00

4555502

NIPPON GASES ESPAÑA,S.L.U. N° MANTEN I 9 SED. Y 47 MS. HELIO MANTEN- MIENTOS ANUALIZADO VTO. 20.05.2020

PRECIOS APLICADOS DE ACUERDO CON LA REGULACION VIGENTE

RAVA, CTA: E89101823994004010082019

BRVAE98M

BASE IMPONIBLE

TIPO I.V.A.

IMP. I.V.A.

2.775,11

21,00

582,77

TOTAL

TOTAL FACTURA

RAVA, CTA: E89101823994004010082019

BRVAE98M

BASE IMPONIBLE

TIPO I.V.A.

IMP. I.V.A.

2.775,11

21,00


582,77

TOTAL

TOTAL FACTURA

Con la recepción de la presente factura, el CLIENTE declara que acepta el contenido de las condiciones generales para Gas y Conservación de envases de NIPPON GASES ESPAÑA, S.L.U., que se encuentran disponibles en la página web de NIPPON GASES ESPAÑA, S.L.U. (<http://nippongasesclub.com/sitio/download/221/>), y de las que ha tenido completo conocimiento

Praxair España es ahora Nippon Gases España, el NIF no varía.


NIPPON GASES
The Gas Professionals

NIPPON GASES ESPAÑA,S.L.U.
OFICINA CENTRAL:ORENSE,I-28020 MADRID-EDIFICIO CENTRO
TELEFONO:91 453 30 00-FAX:91 551 43 07

DESCUENTO
MANTEN-
MIENTOS
ANUALIZADO
1
IMPORTE
TOTAL
DESCUENTO
MANTEN-
MIENTOS
ANUALIZADO
1

LIB#926149

2

20.56.1020

31.03.2020

Nº FACTURA

SEDA

SPEDIRNTE

FECHA

PARA CUALQUIER INFORMACION SOBRE ESTA FACTURA

NIPPON GASES

C/ORENSE,11 - Pº Plaza

28020 MADRID

TEFNO:902-555171

ccsadmin@nippongases.com

ASOCIACION BCBL

Pº MIKELETEGI Nº69 - 2º

20009 DONOSTIA

GUIPUZCOA

N.I.F. G20988929

CONDICIONES DE PAGO

GIRO A 30 DIAS VTO. 20.05.2020

Para su comodidad y agilidad, existiente recibir su factura por correo electrónico en:

ccsadmin@nippongases.com

FECHA	NOTA	CODIGO	CONCEPTO	CANTIDAD	UN	PRECIO UNITARIO	IMPORTE	I.V.A.
		BO07800	TRATABILIDAD ENVASES	9,00	MS	1,45	13,05	21,00

4555502

NIPPON GASES ESPA



TOTAL.....	2.775,11	EUROS
I.V.A.....	582,77	EUROS
TOTAL FACTURA	3.357,88	EUROS



NIPPON GASES
The Gas Professionals

NIPPON GASES ESPAÑA, S.L.U.
OFICINA CENTRAL-ORENSE,11-28020 MADRID-EDIFICIO CENTRO
TELÉFONO-91 453 30 00-FAX-91 555 43 07

05433044Z
MANUEL
ARACIL, PE
638062339
1

UR20030035 1 20.06.2020 30.06.2020
Nº FACTURA SERIA NÚMERO FECHA

PARA CUALQUIER INFORMACIÓN SOBRE ESTA FACTURA
NIPPON GASES
CORENSE, 11 - 9º Planta
28020 MADRID
TELNO 902-555173
csccadministracion@nippongases.com

ASOCIACION BCBL
Pº MIKELETEGI Nº69 - 2º
20009 DONOSTIA
GUIPUZCOA
N.I.F. G20988929

CONDICIONES DE PAGO
GERO A 30 DIAS VTO 20.06.2020

Para su comodidad y agilidad, solicitamos recibir sus facturas por correo electrónico en:
csccreditos@nippongases.com

FECHA	SERIA	USUARIO	CONCEPTO	CANTIDAD	PRECIO UNITARIO	IMPORTE	I.V.A.
19.06.2020	488109	GREMERB	HELIO GAS USO MEDICINAL RECARGA	3,00	43,76	131,28	21,00
19.06.2020	488109	GREMERB	HELIO LIQUIDO USO MEDICINAL RECARGA	452,00	13,76	6.219,52	21,00
19.06.2020	488109	SRECS00	CARGO POR SUMINISTRO DE HELIO	455,00			21,00
19.06.2020	488109	SRETC00	RECARGO TIPO CAMBIO	455,00			21,00
30.06.2020	113482	8009887	PRESTACION DE ENVASES BOT	90,00	1,29	116,10	21,00
				6.376,90	21,00	1.339,15	
				TOTAL		6.376,90	EUROS
				I.V.A.		1.339,15	EUROS
				TOTAL FACTURA		7.716,05	EUROS

92418310 NIPPON GASES ESPAÑA, S.L.U. R.M.28489131 D.N.I. F. 47.065.877 VOLUMEN DE SUMINISTRO DE GAS MEDICINAL
PRECIOS APLICADOS DE ACUERDO CON LA LEGISLACIÓN VIGENTE

SEVIA, CTA: ES8101823994040100802019 BSVARSDM
BSCM, CTA: ES4900491500062510164989 BSCHESDM

BASE IMPONIBLE TIPO I.V.A. IMP. I.V.A.
6.376,90 21,00 1.339,15

Con la expedición de la presente factura, el CLIENTE declara que acepta el costo fijo de las condiciones generales para

TOTAL	6.376,90	EUROS
I.V.A.	1.339,15	EUROS
TOTAL FACTURA	7.716,05	EUROS

NIPPON GASES
The Gas Professionals

NIPPON GASES ESPAÑA, S.L.U.
OFICINA CENTRAL-ORENSE,11-28020 MADRID-EDIFICIO CENTRO
TELÉFONO-91 453 30 00-FAX-91 555 43 07

05433044Z
MANUEL
ARACIL, PE
638062339
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UR20030035 1 20.06.2020 15.10.2020
Nº FACTURA SERIA NÚMERO FECHA

PARA CUALQUIER INFORMACIÓN SOBRE ESTA FACTURA
NIPPON GASES
CORENSE, 11 - 9º Planta
28020 MADRID
TELNO 902-555173
csccadministracion@nippongases.com

ASOCIACION BCBL
Pº MIKELETEGI Nº69 - 2º
20009 DONOSTIA
GUIPUZCOA
N.I.F. G20988929

CONDICIONES DE PAGO
GERO A 30 DIAS VTO 20.11.2020

Para su comodidad y agilidad, solicitamos recibir sus facturas por correo electrónico en:
csccreditos@nippongases.com

FECHA	SERIA	USUARIO	CONCEPTO	CANTIDAD	PRECIO UNITARIO	IMPORTE	I.V.A.
08.10.2020	400954	GREMERB	HELIO GAS USO MEDICINAL RECARGA	5,00	13,76	68,80	21,00
08.10.2020	400954	GREMERB	HELIO LIQUIDO USO MEDICINAL RECARGA	471,00	13,76	6.480,96	21,00
08.10.2020	400954	SRECS00	CARGO POR SUMINISTRO DE HELIO	476,00			21,00
08.10.2020	400954	SRETC00	RECARGO TIPO CAMBIO	476,00			21,00
15.10.2020	334264	8008800	ACONDICIONAMIENTO HIGIENICO-SANITARIO	1,00	2,00	2,00	21,00
				6.551,76	21,00	1.375,87	
				TOTAL		6.551,76	EUROS
				I.V.A.		1.375,87	EUROS
				TOTAL FACTURA		7.927,63	EUROS

92418369 NIPPON GASES ESPAÑA, S.L.U. R.M.28489131 D.N.I. F. 47.065.877 VOLUMEN DE SUMINISTRO DE GAS MEDICINAL
PRECIOS APLICADOS DE ACUERDO CON LA LEGISLACIÓN VIGENTE

SEVIA, CTA: ES8101823994040100802019 BSVARSDM
BSCM, CTA: ES4900491500062510164989 BSCHESDM

BASE IMPONIBLE TIPO I.V.A. IMP. I.V.A.
6.551,76 21,00 1.375,87

Se engloban en ACONDICIONAMIENTO HIGIENICO-SANITARIO los gastos derivados de la adopción de medidas de seguridad sanitarias para los trabajadores de Nippon Gases y de sus clientes, la contratación de nuevos trabajadores para sustituir al personal de riesgo, los gastos extra de transporte y producción, así como los necesarios para el cumplimiento de las medidas de higiene, desinfección, prevención y acondicionamiento

TOTAL	6.551,76	EUROS
I.V.A.	1.375,87	EUROS
TOTAL FACTURA	7.927,63	EUROS



Annex 3: Projects currently running or awarded along the 2018-2021 period

EUROPEAN RESEARCH COUNCIL



PI	Grant	Amount	Period
Frost, Ram	GA 692502 - ERC AdG - L2STAT	800,000 €	2016-2021
Carreiras, Manuel	GA 787487 - ERC PoC - OSCILANG	150,000 €	2018-2020
Martin, Clara	GA 819093 - ERC CoG - READCALIBRATION	1,875,000 €	2019-2024

EUROPEAN COMMISSION: 7PM Programme



PI	Grant	Amount	Period
Carreiras, Manuel	GA 613465 - ATHEME	306,710 €	2014-2019

EUROPEAN EXECUTIVE AGENCY (REA): Marie Skłodowska-Curie Programme



PI	Grant	Amount	Period
Wilson, Lisa	H2020-MSCA-EF-2014-GA-657474-BIOMARK	170,122 €	2016 -2018
López, Rocio	H2020-MSCA-EF-2015-GA-65747-VIAWORD	170,121 €	2016 -2018
De Bruin, Angela	H2020-MSCA-IF-2016-GA-743691-CAB	158,121 €	2017-2019
Guediche, Sara	H2020-MSCA-IF-2017-GA-799554-E-CLIPS	158,121 €	2018-2021
Kapnoulia, Effie	H2020-MSCA-IF-2017-GA-793919- OPTISELL	170,121 €	2018-2021
Klimovich, Anastasia	H2020-MSCA-IF-2017-GA-798971-PRESPEECH	170,121 €	2018-2020
Kalashnikova, Marina	H2020-MSCA-IF-2017-GA-798908-OPTIMISINGIDS	158,121 €	2018-2020
Lerma, Garikoitz	H2020-MSCA-GF-2017-GA-795807-RECIMODEL	257,191 €	2018-2021
Polyanskaya, Leona	H2020-MSCA-GF-2017-GA-792331-METABIL	170,121 €	2018-2021
Caffarra, Sendy	H2020-MSCA-GF-2018-GA-837228-ENGRAVING	245,732 €	2019-2022
Cespón, Jesús	H2020-MSCA-IF-2018-GA-838536-BILINGUALPLAS	185,721 €	2020-2022
Stoehr, Antje	H2020-MSCA-IF-2018-GA-843533-LIPPS	173,721 €	2020-2022
Pinet, Svetlana	H2020-MSCA-IF-2019-GA-843533-OWLI	160,932 €	2021-2023
Amoruso, Lucia	H2020-MSCA-GF-2020-GA-101025814-MULTILAND	224,496 €	2020-2023
Carrión, Amaia	H2020-MSCA-IF-2020-GA-101027016-READING BIG	172,932 €	2021-2023
Biondo, Nicoletta	H2020-MSCA-GF-2020-GA-101028370-TIME	245,732 €	2021-2024

MINISTERIO DE CIENCIA E INNOVACIÓN



PI	Grant	Amount	Period
Molinero, Nicola	PSI 2015-65694-P PREPROC	88,209 €	2016-2018
Paz-Alonso, Kepa	PSI 2015-65696-P MAGNO	72,700 €	2016-2018
Carreiras, Manuel	APCIN 2015-061 MULTI-LATERAL	231,000 €	2015-2018
Duñabeitia, Jon Andoni	PSI 2015-65689-P MIXLEARN	64,251 €	2016-2018
Lallier, Marie	PSI 2015-65338-P DICHOBIL	64,009 €	2016-2018
Carreiras, Manuel	PSI 2015-67353-R READEAF	108,900 €	2016-2018
Giezen, M.; Costello, B.	PSI 2016-76435-P SIGNEVAL	84,700 €	2016-2019
Soto, David	PSI 2016-76443-P METAWARE	58,080 €	2016-2019
Bourguignon, Mathieu	PSI 2016-77175-P SPEECHDEGEN	87,725 €	2016-2019
Mancini, S.; Alemán, J.	FFI2016-76432-P LAMPT	54,450 €	2016-2019
Carreiras, Manuel	BFU2016-81721 RED CENTROS DE EXCELENCIA ESPAÑOLES	120,000 €	2017-2019
Carreiras, Manuel	PSI2016-81881 REDT	20,000 €	2017-2019
Bergougnan, Loretxu	PSI2015-73408-JIN REVERSALA	134,310 €	2017-2019
Carreiras, Manuel	SEV-2015-0490 EXCELENCIA SEVERO OCHOA	4,000,000 €	2016-2019
Samuel, Arthur	PSI2017-82563-P COLAPOP	97,768 €	2018-2020
Martin, Clara	PSI2017-82941-P REFO	98,373 €	2018-2020
Martin, Clara	ERC2018-092833 READCALIBRATION	75,000 €	2018-2019
Paz-Alonso, Kepa	PGC2018-093408-B THALANG	84,700 €	2019-2021



MINISTERIO DE CIENCIA E INNOVACIÓN



PI	Grant	Amount	Period
Richter, Craig	PGC2018-093474-A OSC-PAD	90.750 €	2019-2020
Carreiras, M. Quiñones, I.	RTI2018-093547-B LANGCONN	169.400 €	2019-2021
Amoruso, Lucia	RTI2018-096216-A- MEGLIOMA	72.600 €	2019-2021
Lallier, Marie	RTI2018-096242-B VISOSCIL	72.600 €	2019-2021
Molinaro, Nicola	RTI2018-096311-B TRAINSYNCHRO	171.336 €	2019-2021
Ordin, Mikhail	RTI2018-098317-B BILMETACOG	84.700 €	2019-2021
Soto, David	PID2019-105494GB-BRAINMETALOOP	154.880 €	2020-2024
Caballero, Cesar	PID2019-105520GB-qRSFMRI	47.432 €	2020-2023
Kalashnikova, Marina	PID2019-105528GA-CONTUR	48.400 €	2020-2023
Cespon, Jesús	PID2019-105538RA-BILINGUALAGE	60.500 €	2020-2023
Costello, B; Giezen, B.	PID2019-107325GB-BiTri	121.000 €	2020-2023
Mancini, Simona	PID2020-113945RB-I00 TENL.ESP	56.870 €	2021-2025
Kapnoulas, E; Samuel, A.	PID2020-113348GB-I00 CO-LEXI	66.550 €	2021-2024
Martin, C.; Pinet, S.	PID2020-113926GB-I00 CROSSPOD	102.850 €	2021-2024
Ruzzoli, M.	PID2020-114717RA-I00 SweetC	88.330 €	2021-2024
Magnuson, J.	PID2020-119131GB-I00 BLIS	84.700 €	2021-2024

GOBIERNO VASCO – EUSKO JAURLARITZA



PI	Grant	Amount	Period
Paz-Alonso, Kepa	PI 2016-1-12 ATLAS MULTIMODAL DE NÚCLEOS TALÁMICOS Y SU APLICACIÓN AL ESTUDIO DE LA DISLEXIA	55.791 €	2017-2019
Molinaro, Nicola	PI 2016-1-14 MARCADORES NEUROBIOLÓGICOS PARA EL DIAGNÓSTICO DE LOS TRASTORNOS DEL DESARROLLO DEL LENGUAJE	57.260 €	2017-2019
Soto, David	PI 2017-1-25 LA INTERACCIÓN ENTRE LA MEMORIA OPERATIVA Y LA ATENCIÓN VISUAL A LO LARGO DEL CICLO VITAL	69.600 €	2017-2019
Carreiras, Manuel	ELKARTEK KK-201700103 NEUROMOD: SISTEMA DE NEUROMODULACIÓN EN LAZO CERRADO PARA LA MEJORA DEL SUEÑO Y LA MEMORIA BASADO EN LA REGENERACIÓN Y MANIPULACIÓN NEURONAL	56.569 €	2017-2018
Martin, Clara	PIBA 2018-29 PRAD: PHONEMIC RECALIBRATION IN AVERAGE READER AND DYSLEXIC CHILDREN	50.000 €	2018-2021
Kalashnikova, Marina	PI 2019-54 BUSCAR PALABRAS: HABILIDADES TEMPRANAS PARA LA SEGMENTACIÓN DEL HABLA Y SU RELACIÓN CON EL DESARROLLO DE VOCABULARIO EN BEBÉS BILINGÜES	43.395 €	2019-2021
Caballero, Cesar	PI 2019-104 QUANTIFYING THE DYNAMICS OF SPONTANEOUS BRAIN FLUCTUATIONS WITH CALIBRATED FUNCTIONAL MAGNETIC RESONANCE IMAGING TECHNIQUES	48.912 €	2019-2021
Mancini, Simona	PIBA-2020-1-0024 ACS.eus (APHASIA COGNITIVE SCREENING IN BASQUE): FILLING GAPS AND OVERCOMING BIAS IN CURRENT APHASIA ASSESSMENT	48.340 €	2020-2022
Paz-Alonso, Kepa	PIBA_2021_1_0003 CONTRIBUTION OF MAGNOCELLULAR AND PARVOCELLULAR VISUAL SYSTEMS TO NORMAL READING AND DYSLEXIA	50.000 €	2021-2024



DIPUTACIÓN FORAL DE GIPUZKOA – GIPUZKOAKO FORU ALDUNDIA



PI	Grant	Amount	Period
Lallier, Marie	MARCADORES NEUROBIOLÓGICOS PARA EL DIAGNÓSTICO DEL TRANSTORNO ESPECÍFICO DEL LENGUAJE (TEL)	25.620 €	2017-2018
Mancini, Simona	ASC.ESP AFASIA: SCREENING COGNITIVO PARA EL ESPAÑOL UNIFICANDO PERSPECTIVAS CLÍNICAS Y NEUROCIÉNTICAS	39.410 €	2018-2019
Paz-Alonso, Kepa	ADINBERRI: ENTRENAMIENTO DE CAPACIDADES COGNITIVAS SUPERIORES EN MAYORES	83.434 €	2018-2019
Arocena, Miguel Angel	TALENTO: PARQUE TECNOLÓGICO: EMPLOYER BRANDING	7.500 €	2018-2019
Arocena, Miguel Angel	TALENTO: BCBL. GARAPEN	12.000 €	2018-2019
Caballero, C.; Quiñones, I.	TENDIENDO PUENTES ENTRE LAS NEUROCIENCIAS Y LA NEUROCIROLOGÍA	29.240 €	2019-2020

PRIVATE FUNDING

PI	Funding Agency and Grant	Amount	Period
Mancini, Simona	BBVA FOUNDATION - ACS.esp: screening de la afasia en español	35.000 €	2018-2020
Carreiras, Manuel	LA CAIXA FOUNDATION, HEALTH RESEARCH-Dyslexia and the thalamus: Integrating anatomy and function in a mechanistic account of the reading brain	500.000 €	2019-2022
Paz-Alonso, Kepa	TATIANA PEREZ DE GUZMAN EL BUENO FOUNDATION-Dislexia e interacciones tálamo-corticales: Una visión mecanística de la lectura basada en redes funcionales y estructurales	47.850 €	2019-2021
Carreiras, Manuel	NSF-NATIONAL SCIENCE FOUNDATION-Examining Native Language Variability and its Effects on Second Language Processing: An Event-Related Potentials Investigation of Referential Dependencies	72.055 €	2018-2021
Carreiras, Manuel	FUNDACION CIENTIFICA AECC-Biomarcadores de recuperación cognitiva postquirúrgica en tumores cerebrales	300.000 €	2020-2023
Arocena, Miguel Angel	FUNDACION KUTXABANK-Herramientas diagnóstico Dislexia en Euskera	19.972 €	2019-2021
Arocena, Miguel Angel	FUNDACION KUTXABANK-Burmuinaren Txokoa	18.600 €	2021-2022

Annex 4: Benchmarking of the Centre

We have included a BENCHMARKING OF THE CENTRE against other international centres considered to be the leaders in the field. This benchmarking compares size, research output, human resources, number of researchers and employees, publications and impact, and budget, as well as the source of the information.

According to the Oxford English Dictionary, “benchmarking” means “to evaluate (something) by comparison with a standard”.

Following this definition, below we use three key benchmarks to evaluate BCBL's performance with respect to nine centres that are recognised as leaders in our field. (Funding and budget details for the nine benchmark institutions are not available and therefore could not be included.)

1. **Research output and productivity of research staff**
2. **Growth rates of centre publications**
3. **Publications in Top 25% and 10% CiteScore Percentiles**

1.- **Research output and productivity of research staff: BCBL ranking for the 2018-2020 period.** This evaluation shows the ratio between the number of R3 and R4* postdoctoral researchers (obtained from the website of each institution) and their number of indexed publications (obtained from Scopus/Scival August 26, 2021). We do not include the year 2021, as it is still ongoing.

*According to EURAXESS, R3s are Established Researchers (Researchers who have developed a level of independence), and R4 are Leading Researchers (Researchers leading their research area or field).

(<https://euraxess.ec.europa.eu/europe/career-development/training-researchers/research-profiles-descriptors>)

Centre / Institution	Country	Scopus ID	Publications: Articles and Reviews			Average published 2018-2020	RATIO PUBLICATIONS PER R3-R4 RESEARCHER
			2018	2019	2020		
Max Planck Institute for Human Cognitive and Brain sciences	Germany	60025323	235	255	250	247	2,94
BCBL - Basque Center on Cognition, Brain and Language	Spain	60111834	76	91	83	83	2,60
ISC - Institut des Sciences Cognitives Marc Jeannerod	France	60108304	86	75	69	77	2,56
UCL Institute of Cognitive Neuroscience	UK	60109771	161	172	160	164	2,31
Max Planck Institute for Psycholinguistics	Netherlands	60024516	165	162	166	164	2,28
MRC Cognition and Brain Sciences Unit	UK	60029069	133	129	165	142	2,03
LPC - Laboratoire de Psychologie Cognitive	France	60107110	64	65	48	59	1,97
LNC - Laboratoire de Neurosciences Cognitives - CNRS & Aix-Marseille Université	France	60107158	34	36	21	30	1,21
Donders Institute for Brain Cognition and Behaviour	Netherlands	60102054	44	64	66	58	0,36
Brams - Centre for Research on Brain, Language, and Music	Canada	60083646	25	19	18	21	0,21

Benchmarking of Research centres/units, sorted according to production rate. Source: SCOPUS/SCIVAL and each institution's website.

The ratio “publications/researcher” (where researchers include Principal investigators, Senior Researchers, and Postdoctoral researchers who obtained their PhD three or more years ago: R3+R4) reveals that the BCBL is among the top 2 centres in the field in terms of production per R3-R4 researcher. This result is particularly remarkable since it compares the BCBL, a young institution, with well-established international centres of excellence.

2.- **Centre growth rates:** The publication growth rate in last three years 2018-2020 compared to 2015-2017

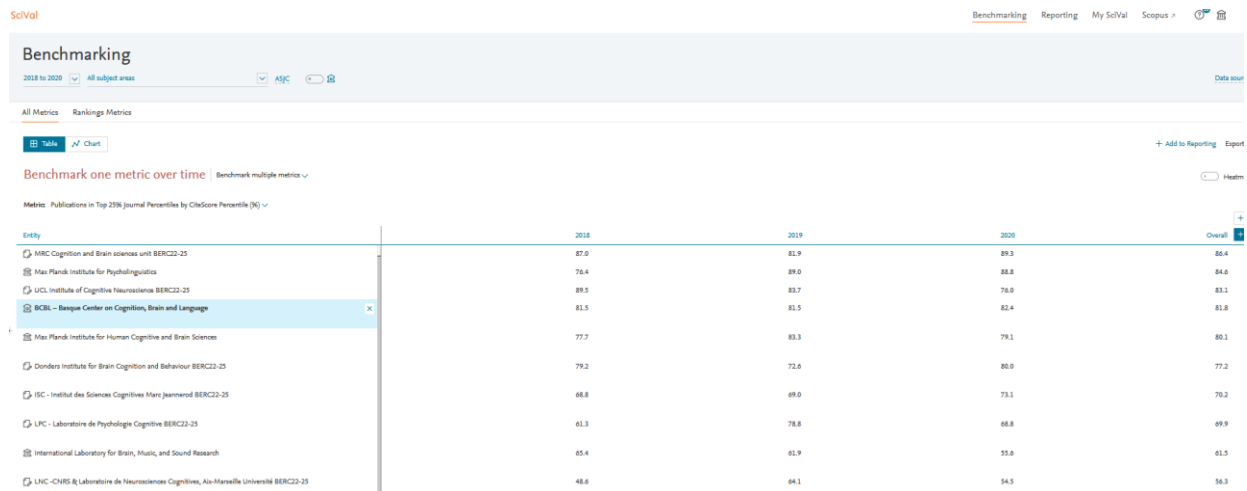
Centre / Institution	Country	Scopus ID	Publications: Articles and Reviews						Average published 2015-2017	Average published 2018-2020	% Growth between periods
			2015	2016	2017	2018	2019	2020			
Donders Institute for Brain Cognition and Behaviour	Netherlands	60102054	35	32	35	44	64	66	34	58	71%
BCBL - Basque Center on Cognition, Brain and Language	Spain	60111834	59	74	61	76	91	83	65	83	29%
ISC - Institut des Sciences Cognitives Marc Jeannerod	France	60108304	61	67	68	86	75	69	65	77	17%
Max Planck Institute for Psycholinguistics	Netherlands	60024516	149	125	158	165	162	166	144	164	14%
LPC - Laboratoire de Psychologie Cognitive	France	60107110	48	58	60	64	65	48	55	59	7%
LNC - Laboratoire de Neurosciences Cognitives - CNRS & Aix-Marseille Université	France	60107158	35	25	27	34	36	21	29	30	5%
MRC Cognition and Brain Sciences Unit	UK	60029069	145	136	137	133	129	165	139	142	2%
Max Planck Institute for Human Cognitive and Brain sciences	Germany	60025323	232	251	266	235	255	250	250	247	-1%
UCL Institute of Cognitive Neuroscience	UK	60109771	235	196	183	161	172	160	205	164	-20%
Brams - Centre for Research on Brain, Language, and Music	Canada	60083646	25	26	31	25	19	18	27	21	-24%

Benchmarking of Research centres/units, sorted according to growth rate. Source: SCOPUS/SCIVAL

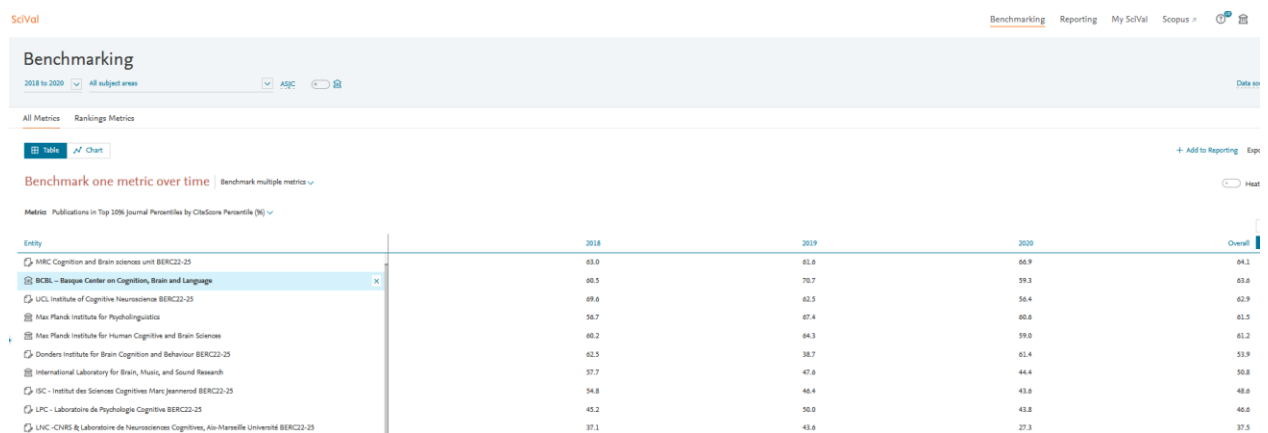
The table shows that the BCBL is among the top 2 centres in its field in terms of productivity growth rates.

3.- Publications in Top 25% and 10% CiteScore Percentiles: This benchmark uses Scopus /SciVal database filters to provide a closer look at BCBL's publication record. The screenshots from SciVal show that BCBL ranks fourth in Top 25% (Q1) and second in Top 10% (D1).

a) Top 25% (Q1):

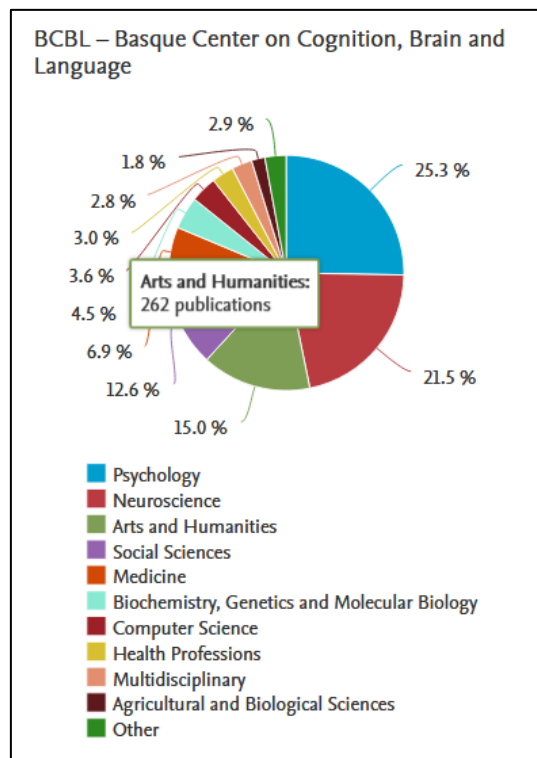


b) Top 10% (D1)



Moreover, the BCBL had a normalised impact of 1,37 in the 2018-2020 period. This indicates that we are +37% above the world average in terms of impact in our fields of expertise.

The next graph shows the main research fields to which the BCBL contributes: Psychology (25,3% of our production), Neuroscience (21,5%), and Arts and Humanities (15%).



BCBL main areas. Source: SCOPUS-SCIVAL.

Conclusions:

- The average ratio of publications per researcher (R3+R4) at the BCBL exceeds the average ratio of the sample. The BCBL is ranked second in terms of this indicator with 2.60 papers per researcher.
- BCBL's scientific publication growth rate was 29% higher in 2018-2020 than in the previous 2015-2017 period and exceeds the average growth rate of the sample. The BCBL is ranked SECOND in terms of this indicator with increased growth rate of 29%.
- The BCBL ranks high in terms of both productivity and growth.
- Using data filters on the SCOPUS benchmarking tool (Scival) to search for Publications in the Top 25%, 10% and 5% Journal Percentiles by CiteScore Percentile, the BCBL ranks fourth in Top 25% (Q1) and second in Top 10% (D1).
- The BCBL had a normalised impact of 1,37 in the 2018-2020 period, +37% above the world average in terms of impact.
- In addition to these benchmarks, we carried out a qualitative analysis of the research areas of all centres in the sample. This analysis shows that while the BCBL continues to develop excellence in its "core" field, Cognitive Neuroscience, it has also developed an important multidisciplinary and transversal dimension, to become an international centre of reference.

Annex 5: Full list of Publications 2018-2021

2018

Journal Articles

1. Abrahamse, E., & Guida, A. (2018). Commentary: Coding of serial order in verbal, visual and spatial working memory. *Frontiers in Psychology*, 9:2330. Doi:10.3389/fpsyg.2018.02330
2. Aguasvivas, J.A., Carreiras, M., Brysbaert, M., Mander, P., Keuleers, E., & Duñabeitia, J.A. (2018). SPALEX: A Spanish lexical decision database from a massive online data collection. *Frontiers in Psychology*, 9:2156. Doi:10.3389/fpsyg.2018.02156
3. Amoruso, L., Finisguerra, A., & Urgesi, C. (2018). Autistic traits predict poor integration between top-down contextual expectations and movement kinematics during action observation. *Scientific Reports*, 8:16208. Doi:10.1038/s41598-018-33827-8
4. Amoruso, L., Finisguerra, A., & Urgesi, C. (2018). Contextualizing action observation in the predictive brain: Causal contributions of prefrontal and middle temporal areas. *NeuroImage*, 177, 68–78. Doi:10.1016/j.neuroimage.2018.05.020
5. Antzaka, A., Martin, C.D., Caffarra, S., Schlöfel, S., Carreiras, M., & Lallier, M. (2018). The effect of orthographic depth on letter string processing: The case of visual attention span and rapid automatized naming. *Reading and Writing*, 31 (3):583-605. Doi:10.1007/s11145-017-9799-0.
6. Arganda-Carreras, I., Manoliu, T., Mazuras, N., Schulze, F., Iglesias, J.E., Buhler, K., Jenett, A., Rouyer, F., & Andrey, P. (2018). A Statistically Representative Atlas for Mapping Neuronal Circuits in the Drosophila Adult Brain. *Frontiers in Neuroinformatics*, 12. Doi:10.3389/fninf.2018.0001
7. Baart, M., & Vroomen, J. (2018). Recalibration of vocal affect by a dynamic face. *Experimental Brain Research*, 236 (7), 1911–1918. Doi: 1911-1918doi:10.1007/s00221-018-5270-y
8. Biondo, N., Vespignani, F., Rizzi, L. & Mancini, S. (2018). Widening agreement processing: a matter of time, features and distance. *Language, Cognition and Neuroscience*, 33:7, 890-911. Doi:10.1080/23273798.2018.1446542
9. Blanco, B., Molnar, M., & Caballero-Gaudes, C. (2018). Effect of prewhitening in resting state functional near-infrared spectroscopy data. *Neurophotonics*, 5(4), 040401. Doi:10.1117/1.NPh.5.4.040401
10. Bogaerts, L., Siegelman, N., Ben-Porat, T., & Ram Frost, R. (2018). Is the Hebb repetition task a reliable measure of individual differences in sequence learning? *Quarterly Journal of Experimental Psychology*, 71(4), 892–905. Doi:10.1080/17470218.2017.1307432
11. Borrigan, M., Martin, C.D., De Bruin, A., & Duñabeitia, J. A. (2018). Exploring different types of inhibition during bilingual language production. *Frontiers in Psychology*, 9:2256. Doi:10.3389/fpsyg.2018.02256
12. Bourguignon, M., Molinaro, N., & Wens, V. (2018). Contrasting functional imaging parametric maps: the mislocation problem and alternative solutions. *NeuroImage*, 169, 200–211. Doi:10.1016/j.neuroimage.2017.12.033
13. Branzi, F.M., Calabria, M., Gade, M., Fuentes, L.J., & Costa, A. (2018). On the bilingualism effect in task switching. *Bilingualism: Language and Cognition*, 21(1), 195-208. Doi:10.1017/S136672891600119X
14. Bundt, C., Ruitenberg, M., Abrahamse, E.L., & Notebaert, W. (2018). Early and late indications of item-specific control in a Stroop mouse tracking study. *PLOS ONE*, 13(5): e0197278. Doi:10.1371/journal.pone.0197278
15. Caffarra, S., Michell, E., & Martin, C.D. (2018). The impact of foreign accent on irony interpretation. *Plos One*, 13(8): e0200939. Doi:10.1371/journal.pone.0200939
16. Cañas, A., Juncadella, M., Lau, R., Gabarrós, A., & Hernández, M. (2018). Working Memory Deficits After Lesions Involving the Supplementary Motor Area. *Frontiers in Psychology*, 9:765. Doi:10.3389/fpsyg.2018.00765
17. Cespón, J., Galdo-Álvarez, S., & Díaz, F. (2018). Event-related potentials reveal altered executive control activity in healthy elderly with subjective memory complaints. *Frontiers in Human Neuroscience*, 12:445. Doi:10.3389/fnhum.2018.00445
18. Cespón, J., Miniussi, C., & Pellicciari, M.C. (2018). Interventional programmes to improve cognition during healthy and pathological ageing: Cortical modulations and evidence for brain plasticity. *Ageing Research Reviews*, 43, 81-98. Doi:10.1016/j.arr.2018.03.001

19. Chica, A.B., Thiebaut de Schotten, M., Bartolomeo, P., & Paz-Alonso, P.M. (2018). White matter microstructure of attentional networks predicts attention and consciousness functional interactions. *Brain Structure and Function*, 223(2), 653-668. Doi:10.1007/s00429-017-1511-2
20. Chow, W.-Y., Nevins, A., & Carreiras, M. (2018). Effects of Subject-Case Marking on Agreement Processing: ERP evidence from Basque. *Cortex*, 99, 319-329. Doi:10.1016/j.cortex.2017.12.009
21. Coolen, T., Dumitrescu, A.M., Bourguignon, M., Wens, V., Urbain, C., & de Tiège, X. (2018). Presurgical electromagnetic functional brain mapping in refractory focal epilepsy. *Zeitschrift für Epileptologie*, 31, 203-212. Doi:10.1007/s10309-018-0189-7
22. de Bruin, A., & Della Sala, S. (2018). Effects of age on inhibitory control are affected by task-specific features. *Quarterly Journal of Experimental Psychology*, 71(5), 1219-1233. Doi:10.1080/17470218.2017.1311352
23. de Bruin, A., Samuel, A.G., & Duñabeitia, J.A. (2018). Voluntary language switching: When and why do bilinguals switch between their languages? *Journal of Memory and Language*, 103, 28-43. Doi:10.1016/j.jml.2018.07.005.
24. Delgado-Alvarado, M., Dacosta-Aguayo, R., Navalpotro-Gómez, I., Gago, B., Gorostidi, A., Jiménez-Urbiet, H., Quiroga-Varela, A., Ruiz-Martínez, J., Bergareche, A., & Rodríguez-Oroz, M.C. (2018). Ratios of proteins in cerebrospinal fluid in Parkinson's disease cognitive decline: prospective study. *Movement Disorders*, 33, 1809-1813. Doi:10.1002/mds.27518
25. Dranca, L., de Abetxuko Ruiz de Mendarozketa, L., Goñi, A., Illarramendi, A., Navalpotro Gomez, I., Manuel Delgado-Alvarado, M., & Rodríguez-Oroz, M.C. (2018). Using Kinect to classify Parkinson's disease stages related to severity of gait impairment. *BMC Bioinformatics*, 19, 471. Doi:10.1186/s12859-018-2488-4
26. Dresler, T., Bugden, S., Gouet, C., Lallier, M., Godoy Oliveira, D., Pinheiro-Chagas, P., Pires, A.-C., Wang, Y., Zugarramurdi, C., & Weissheimer, J. (2018). A Translational Framework of Educational Neuroscience in Learning Disorders. *Frontiers in Integrative Neuroscience*, 12:25. Doi:10.3389/fnint.2018.00025
27. Dumay, N. (2018). Look more carefully: Even your data show sleep makes memories more accessible. A reply to Schreiner and Rasch (2018). *Cortex*, 101, 288-293. Doi:10.1016/j.cortex.2017.12.013
28. Dumay, N., Sharma, D., Kellen, L., & Abdelrahim, S. (2018). Setting the alarm: Word emotional attributes require consolidation to be operational. *Emotion*, 18(8), 1078-1096. Doi:10.1037/emo0000382
29. Duñabeitia, J.A., Crepaldi, D., Meyer, A.S., New, B., Pliatsikas, C., Smolka, E., & Brysbaert, M. (2018). MultiPic: A standardized set of 750 drawings with norms for six European languages. *Quarterly Journal of Experimental Psychology*, 71(4), 808-816. Doi:10.1080/17470218.2017.1310261
30. Frances, C., Costa, A., & Baus, C. (2018). On the effects of regional accents on memory and credibility. *Acta psychologica*, 186, 63-70. Doi:10.1016/j.actpsy.2018.04.003.
31. García-Palacios, A., Costa, A., Castilla, D., del Río, E., Casaponsa, A., & Duñabeitia, J.A. (2018). The effect of foreign language in fear acquisition. *Scientific Reports*, 8, 1157. Doi:10.1038/s41598-018-19352-8
32. Giannelli, F., & Molinaro, N. (2018). Reanalyzing language expectations: Native language knowledge modulates the sensitivity to intervening cues during anticipatory processing. *Psychophysiology*, 55:e13196. Doi:10.1111/psyp.13196
33. Gomez, D., Mok, P., Ordin, M., Mehler, J., & Nespor, M. (2018). Statistical speech segmentation in tone languages: The role of lexical tones. *Language and Speech*, 61(1), 84-96. Doi:10.1177/0023830917706529.
34. Guida, A., Megreya, A.M., Lavielle-Guida, M., Noël, Y., Mathy, F., van Dijkck, J.-P., & Abrahamse, E.L. (2018). Spatialization in working memory is related to literacy and reading direction: Culture "literarily" directs our thoughts. *Cognition*, 175, 96-100. Doi:10.1016/j.cognition.2018.02.013
35. Iglesias, J.E., Insausti, R., Lerma-Usabiaga, G., Bocchetta, M., Van Leemput, K., Greve, D.N., van der Kouwe, A., Fischl, B., Caballero-Gaudes, C., & Paz-Alonso, P.M. (2018). A probabilistic atlas of the human thalamic nuclei combining ex vivo MRI and histology. *NeuroImage*, 183, 314-326. Doi:10.1016/j.neuroimage.2018.08.012
36. Janssen, N., Hernández-Cabrera, J.A., & Ezama Foronda, L. (2018). Improving the signal detection accuracy of functional Magnetic Resonance Imaging. *NeuroImage*, 176, 92-109. Doi:10.1016/j.neuroimage.2018.01.076.
37. Jinnah, H. A., Albanese, A., Bhatia, K. P., Cardoso, F., Da Prat, G., de Koning, T. J., Espay, A. J., Fung, V., Garcia-Ruiz, P. J., Gershanik, O., Jankovic, J., Kaji, R., Kotschet, K., Marras, C., Miyasaki, J. M., Morgante, F., Munchau, A., Pal, P. K., Rodríguez Oroz, M.C., Rodríguez-Violante, M., Schöls, L., Stamelou, M., Tijssen, M., Uribe Roca, C., de la Cerda, A., Gatto, E. M., & for the International Parkinson's Disease Movement Disorders Society Task Force on Rare Movement Disorders. (2018). Treatable inherited rare movement disorders. *Movement Disorders*, 33, 21-35. Doi:10.1002/mds.27140



38. Kamavuako, E.N., Sheikh, U.A., Gilani, S.O., Jamil, M., & Niazi, I.K. (2018). Classification of Overt and Covert Speech for Near-Infrared Spectroscopy-Based Brain Computer Interface. *Sensors*, 18, 2989. Doi:10.3390/s18092989
39. Lallier, M. (2018). Auditory attention, theory of dynamic attending and developmental dyslexia. [Attention auditive, théorie de l'attention dynamique et dyslexie développementale]. *ANAE - Approche Neuropsychologique Des Apprentissages Chez l'Enfant*, 30(157), 707-714.
40. Lallier, M., Abu Mallouh, R., Mohammed A. M., Khalifa, B., Perea, M., & Carreiras, M. (2018). Does the visual attention span play a role in reading in Arabic? *Scientific Studies of Reading*, 22:2, 181-190. Doi:10.1080/10888438.2017.1421958
41. Lallier, M., & Carreiras, M. (2018). Cross-linguistic transfer in bilinguals reading in two alphabetic orthographies: The grain size accommodation hypothesis. *Psychonomic Bulletin & Review*, 25(1):386-401. Doi:10.3758/s13423-017-1273-0
42. Lallier, M., Thierry, G., Barr, P., Carreiras, M., & Tainturier, M-J. (2018). Learning to read bilingually modulates the manifestations of dyslexia in adults. *Scientific Studies of Reading*, 22:4, 335-349, Doi:10.1080/10888438.2018.1447942
43. Lehtonen, M., Soveri, A., Laine, A., Järvenpää, J., de Bruin, A., & Antfolk, J. (2018). Is Bilingualism Associated with Enhanced Executive Functioning in Adults? A Meta-Analytic Review. *Psychological Bulletin*, 144(4), 394–425. Doi:10.1037/bul0000142
44. Lerma-Usabiaga, G., Carreiras, M., & Paz-Alonso, P.M. (2018). Converging evidence for functional and structural segregation within the left ventral occipitotemporal cortex in reading. *Proceedings of the National Academy of Sciences of the United States of America*, 115(42), E9981-E9990. doi:10.1073/pnas.1803003115
45. Malik-Moraleda, S., Orihuela, K., Carreiras, M., & Duñabeitia, J.A. (2018). The consequences of literacy and schooling for parsing strings. *Language, Cognition and Neuroscience*, 33 (3):293-299. Doi:10.1080/23273798.2017.1313436
46. Mancini, S. (2018). When grammar and parsing agree. *Frontiers in Psychology*, 9:336. Doi:10.3389/fpsyg.2018.00336
47. Martin, C.D., Branzi, F.M., Bar, M. (2018). Prediction is Production: The missing link between language production and comprehension. *Scientific Reports*, 8: 1079. Doi:10.1038/s41598-018-19499-4
48. Martin, C.D., Niziolek, C.A., Duñabeitia, J.A., Perez, A., Hernandez, D., Carreiras, M., & Houde, J.F. (2018). Online Adaptation to Altered Auditory Feedback Is Predicted by Auditory Acuity and Not by Domain-General Executive Control Resources. *Frontiers in Human Neuroscience*, 12:91. Doi:10.3389/fnhum.2018.00091
49. Martorell, J. (2018). Merging generative linguistics and psycholinguistics. *Frontiers in Psychology*, 9:2283. Doi:10.3389/fpsyg.2018.02283
50. Marty, B., Bourguignon, M., Jousmäki, V., Wens, V., Goldman, S., & De Tiège, X. (2018). Movement Kinematics Dynamically Modulates the Rolandic ~20-Hz Rhythm During Goal-Directed Executed and Observed Hand Actions. *Brain Topography*, 31:566–576. Doi:10.1007/s10548-018-0634-y
51. May, L., Gervain, J., Carreiras, M., & Werker, J.F. (2018). The specificity of the neural response to speech at birth. *Developmental Science*, 21:e12564. Doi:10.1111/desc.12564
52. Molinaro, N., & Lizarazu, M. (2018). Delta (but not theta)-band cortical entrainment involves speech-specific processing. *European Journal of Neuroscience*, 48, 2642–2650. Doi:10.1111/ejn.13811
53. Molinaro, N., & Monsalve, I.F. (2018). Perceptual facilitation of word recognition through motor activation during sentence comprehension. *Cortex*, 108, 144-159. Doi:10.1016/j.cortex.2018.07.001
54. Monsalve, I.F., Bourguignon, M., & Molinaro, N. (2018). Theta oscillations mediate pre-activation of highly expected word initial phonemes. *Scientific Reports*, 8:9503. Doi:10.1038/s41598-018-27898-w
55. Paz-Alonso, P.M., Oliver, M., Lerma-Usabiaga, G., Caballero-Gaudes, C., Quiñones, I., Suárez-Coalla, P., Duñabeitia, J.A., Cuetos, F., & Carreiras, M. (2018). Neural correlates of phonological, orthographic and semantic reading processing in dyslexia. *NeuroImage: Clinical*, 20, 433–447. Doi:10.1016/j.nicl.2018.08.018
56. Perea, M., Abu Mallouh, R., Mohammed, A., Khalifa, B., & Carreiras, M. (2018). Does visual letter similarity modulate masked form priming in young readers of Arabic? *Journal of Experimental Child Psychology*, 169, 110–117. Doi:10.1016/j.jecp.2017.12.004
57. Perea, M., Marcet, A., & Acha, J. (2018). Does consonant-vowel skeletal structure play a role early in lexical processing? Evidence from masked priming. *Applied Psycholinguistics*, 39, 169–186. Doi:10.1017/S0142716417000431



58. Perea, M., Marcet, A., & Fernández-López, M. (2018). Does letter rotation slow down orthographic processing in word recognition? *Psychonomic Bulletin & Review*, 25:2295-2300. Doi:10.3758/s13423-017-1428-z.
59. Pourquié, M., & Nespoulous, J.L. (2018). On linguistic properties of verbal number systems: A cross-linguistic study of number transcoding errors observed in a Basque--French bilingual patient with aphasia. *Lingua*, 203, 27-35. Doi:10.1016/j.lingua.2017.10.002
60. Quiñones, I., Molinaro, N., Mancini, S., Hernández-Cabrera, J.A., Barber, H., & Carreiras, M. (2018). Tracing the interplay between syntactic and lexical features: fMRI evidence from agreement comprehension. *NeuroImage*, 175, 259–271. Doi:10.1016/j.neuroimage.2018.03.069
61. Richter, C.G., Coppola, R., & Bressler, S.L. (2018). Top-down beta oscillatory signaling conveys behavioral context in early visual cortex. *Scientific Reports*, 8: 6991. Doi:10.1038/s41598-018-25267-1
62. Rinne, P., Hassan, M., Fernandes, C., Han, E., Hennessy, E., Waldman, A., Sharma, P., Soto, D., Leech, R., Malhotra, P.A., & Bentley, P. (2018). Motor dexterity and strength depend upon integrity of the attention-control system. *Proceedings of the National Academy of Sciences of the United States of America*, 115(3), E536–E545. Doi:10.1073/pnas.1715617115
63. Rodríguez-Morilla, B., Madrid, J. A., Molina, E., Pérez-Navarro, J., & Correa, Á. (2018). Blue-Enriched Light Enhances Alertness but Impairs Accurate Performance in Evening Chronotypes Driving in the Morning. *Frontiers in Psychology*, 9:688. Doi:10.3389/fpsyg.2018.00688
64. Rodríguez-Rojas, R., Carballo-Barreda, M., Alvarez, L., Guridi, J., Pavon, N., Garcia-Maeso, I., Macías, R., Rodríguez-Oroz, M.C., & Obeso, J. A. (2018). Subthalamotomy for Parkinson's disease: clinical outcome and topography of lesions. *Journal of Neurology, Neurosurgery & Psychiatry*, 89, 572-578. Doi:10.1136/jnnp-2017-316241.
65. Rofes, A., Zakariás, L., Ceder, K., Lind, M., Johansson, M.B., de Aguiar, V., Bjekić, J., Fyndanis, V., Gavarró, A., Simonsen, H.G., Sacristán, C.H., Kambanaros, M., Kraljević, J.K., Martínez-Ferreiro, S., Mavis, I., Orellana, C.M., Sör, I., Lukács, Á., Tunçer, M., Vuksanović, J., Ibarrola, A.M., Pourquié, M., Varlokosta, S., & Howard, D. (2018). Imageability ratings across languages. *Behavior Research Methods*, 50: 1187. Doi:10.3758/s13428-017-0936-0.
66. Rosenthal, C.R., Mallik, I., Caballero-Gaudes, C., Sereno, M., & Soto, D. (2018). Learning of goal-relevant and -irrelevant complex visual sequences in human V1. *NeuroImage*, 179, 215–224. Doi:10.1016/j.neuroimage.2018.06.023
67. Samuel, A.G., & Tangella, K. (2018). Sound changes that lead to seeing longer-lasting shapes. *Attention, Perception & Psychophysics*, 80 (4):986-998;10.3758/s13414-017-1475-6
68. Sánchez-Morán, M., Hernández, J.A., Duñabeitia, J.A., Estévez, A., Bárcena, L., González-Lahera, A., Bajo, M.T., Fuentes, L.J., Aransay, A.M., & Carreiras, M. (2018). Genetic association study of dyslexia and ADHD candidate genes in a Spanish cohort: Implications of comorbid samples. *PLoS ONE*, 13(10): e0206431. Doi:10.1371/journal.pone.0206431
69. Sevcikova Sehyr, Z., Giezen, M.R., & Emmorey, K. (2018). Comparing semantic fluency in American Sign Language and English. *Journal of Deaf Studies and Deaf Education*, 23:4, 399–407. Doi:10.1093/deafed/eny013
70. Siegelman, N., Bogaerts, L., Elazar, A., Arciuli, J., & Frost, R. (2018). Linguistic entrenchment: Prior knowledge impacts statistical learning performance. *Cognition*, 177, 198-213. Doi:10.1016/j.cognition.2018.04.011.
71. Siegelman, N., Bogaerts, L., Kronenfeld, O., & Frost, R. (2018). Redefining “Learning” in Statistical Learning: What Does an Online Measure Reveal About the Assimilation of Visual Regularities? *Cognitive Science*, 42: 692-727. Doi:10.1111/cogs.12556
72. Silvetti, M., Vassena, E., Abrahamse, E., & Verguts, T. (2018). Dorsal anterior cingulate-brainstem ensemble as a reinforcement meta-learner. *PLOS Computational Biology*, 14(8): e1006370. Doi:10.1371/journal.pcbi.1006370
73. Soto, D., Theodoraki, M., & Paz-Alonso, P.M. (2018). How the human brain introspects about one's own episodes of cognitive control. *Cortex*, 107, 110-120. Doi:10.1016/j.cortex.2017.10.016
74. Thompson, W.H., Richter, C.G., Plavén-Sigray, P., & Fransson, P. (2018). Simulations to benchmark time-varying connectivity methods for fMRI. *PLOS Computational Biology*, 14(5): e1006196. Doi:10.1371/journal.pcbi.1006196
75. Van de Putte, E., De Baene, W., Garcia Penton, L., Woumans, E., Dijkgraaf, A., & Duyck, W. (2018). Anatomical and functional changes in the brain after simultaneous interpreting training: A longitudinal study. *Cortex*, 99, 243-257. Doi:10.1016/j.cortex.2017.11.024.



76. Vuckovic, A., Ferrer Gallardo, V.J., Jarjees, M., Fraser, M., & Purcell, M. (2018). Prediction of central neuropathic pain in spinal cord injury based on EEG classifier. *Clinical Neurophysiology*, 129: 8, 1605-1617. Doi:10.1016/j.clinph.2018.04.750.
77. Zhang, X., & Samuel, A.G. (2018). Is speech recognition automatic? Lexical competition, but not initial lexical access, requires cognitive resources. *Journal of Memory and Language*, 100, 32–50. Doi:10.1016/j.jml.2018.01.002
78. Zheng, Y., & Samuel, A.G. (2018). The effects of ethnicity, musicianship, and tone language experience on pitch perception. *Quarterly Journal of Experimental Psychology*, 71, 2627-2642. Doi:10.1177/1747021818757435.
79. Zurrón, M., Lindín, M., Cespón, J., Cid-Fernández, S., Galdo Álvarez, S., Ramos-Goicoa, M., & Díaz, F. (2018). Effects of mild cognitive impairment on the event-related brain potential components elicited in executive control tasks. *Frontiers in Psychology*, 9:842. Doi:10.3389/fpsyg.2018.00842

Conference Paper

1. Caballero-Gaudes, C., Bandettini, P. A., & Gonzalez-Castillo, J. (2018). A temporal deconvolution algorithm for multiecho functional MRI. Paper presented at the Proceedings - International Symposium on Biomedical Imaging, 2018-April 608-611. doi:10.1109/ISBI.2018.8363649
2. Caballero-Gaudes, C., Moia, S., Bandettini, P., & Gonzalez-Castillo, J. (2018). Quantitative deconvolution of fMRI data with Multiecho Sparse Paradigm Free Mapping. In: Frangi A., Schnabel J., Davatzikos C., Alberola-López C., Fichtinger G. (eds) Medical Image Computing and Computer Assisted Intervention – MICCAI 2018. Lecture Notes in Computer Science, vol 11072. Springer, Cham. Doi:10.1007/978-3-030-00931-1_36
3. Ostiz-Blanco, M., Lallier, M., Grau, S., Rello, L., Bigham, J. P., & Carreiras, M. (2018). Jellys: Towards a videogame that trains rhythm and visual attention for dyslexia. Paper presented at the ASSETS 2018 - Proceedings of the 20th International ACM SIGACCESS Conference on Computers and Accessibility, 447-449. doi:10.1145/3234695.3241028
4. Ostiz-Blanco, M., Pina, A., Lizaso, M., Astráin, J. J., & Arrondo, G. (2018). Using the musical multimedia tool ACMUS with people with severe mental disorders: A pilot study. Paper presented at the ASSETS 2018 - Proceedings of the 20th International ACM SIGACCESS Conference on Computers and Accessibility, 462-464. doi:10.1145/3234695.3241016

Book chapters/books

1. Lallier, M., Lizarazu, M., Molinaro, N., Bourguignon, M., Ríos-López, P., & Carreiras, M. (2018). From Auditory Rhythm Processing to Grapheme-to-Phoneme Conversion: How Neural Oscillations Can Shed Light on Developmental Dyslexia. In Lachamann, T. & Weis, T. (Eds). *Reading and Dyslexia: From Basic Functions to Higher Order Cognition*, vol 16. Springer, Cham. DOI10.1007/978-3-319-90805-2_8.
2. Mancini, M. (2018). *Features in Agreement and Processing*. Newcastle-Upon-Tyne, UK: Cambridge Scholars Publishers
3. Salillas, E., & Martinez, A. (2018). Linguistic Traces in Core Numerical Knowledge: An Approach From Bilingualism Language and Culture in Mathematical Cognition. In D.B. Berch, D.C. Geary, & K. Mann Koepeke (Eds.). *Language and Culture in Mathematical Cognition*. Cambridge, United States: Academic Press.



2019

Journal Articles

1. Alemán Bañón, J., & Martin, C.D. (2019). Anticipating information structure: An event-related potentials study of focus assignment via the it-cleft. *Neuropsychologia*, 134. Doi:10.1016/j.neuropsychologia.2019.107203
2. Amoruso, L., & Finisguerra, A. (2019). Low or high-level motor coding? The role of stimulus complexity. *Frontiers in Human Neuroscience (Motor Neuroscience)*, 13:332. Doi:10.3389/fnhum.2019.00332
3. Amoruso, L., Narzisi, A., Pinzino, M., Finisguerra, A., Billeci, L., Calderoni, S., Fabbro, F., Muratori, F., Volzone, A., & Urgesi, C. (2019). Contextual priors do not modulate action prediction in children with autism. *Proceedings of the Royal Society B*, 286: 20191319. Doi:10.1098/rspb.2019.1319
4. Anderson, R.M., Giezen, M.R., & Pourquié, M. (2019). Basque-Spanish bilingual children's expressive and receptive grammatical abilities. *Linguistic Approaches to Bilingualism*, 9(4-5), 687-709. Doi:10.1075/lab.17034.and
5. Antón, E., Carreiras, M., & Duñabeitia, J.A. (2019). The impact of bilingualism on executive functions and working memory in young adults. *Plos One*, 14(2): e0206770. Doi:10.1371/journal.pone.0206770
6. Antzaka, A., Acha, J., Carreiras, M., & Lallier, M. (2019). Does the visual attention span play a role in the morphological processing of orthographic stimuli? *Quarterly Journal of Experimental Psychology*, 72(7), 1704–1716. Doi:10.1177/1747021818806470
7. Barraza, P., Dumas, G., Liu, H., Blanco-Gomez, G., van den Heuvel, M. I., Baart, M., & Pérez, A. (2019). Implementing EEG hyperscanning setups. *MethodsX*, 6, 428–436. Doi:10.1016/j.mex.2019.02.021.
8. Bastarrika-Iriarte, A., & Caballero-Gaudes, C. (2019). Closing eyes during auditory memory retrieval modulates alpha rhythm but does not alter tau rhythm. *NeuroImage*, 197:60-68. Doi:10.1016/j.neuroimage.2019.04.053.
9. Belyk, M., Schultz, B. G., Correia, J., Beal, D. S., & Kotz, S. A. (2019). Whistling shares a common tongue with speech: Bioacoustics from real-time MRI of the human vocal tract. *Proceedings of the Royal Society B: Biological Sciences*, 286 (1911), 20191116. Doi:10.1098/rspb.2019.1116
10. Behroozmand, R., Johari, K., Kelley, R.M., Kapnola, E.C., Narayanan, N.S., & Greenlee, J.D.W. (2019). Effect of Deep Brain Stimulation on Vocal Motor Control Mechanisms in Parkinson's Disease. *Parkinsonism & Related Disorders*, 63, 46–53. Doi:10.1016/j.parkreldis.2019.03.002
11. Biondo, N., Vespignani, F., & Dillon, B. (2019). Attachment and Concord of Temporal Adverbs: Evidence From Eye Movements. *Frontiers in Psychology*, 10:983. Doi:10.3389/fpsyg.2019.00983
12. Bourbon-Teles, J., & Soto, D. (2019). Assessing the role of the left dorsal frontal cortex in working memory guidance: attentional or mnemonic? A neurostimulation study. *Neuroscience*, 411, 140-149. Doi:10.1016/j.neuroscience.2019.04.049.
13. Bourguignon, M., Dalal, S.S., Jerbi, K., & De Tiège, X. (2019). Coupling between human brain activity and body movements: Insights from non-invasive electromagnetic recordings. *NeuroImage*, 203. Doi:10.1016/j.neuroimage.2019.116177
14. Brice, H., Mencl, W. E., Frost, S. J., Bick, A. S., Rueckl, J. G., Pugh, K. R., & Frost, R. (2019). Neurobiological signatures of L2 proficiency: Evidence from a bi-directional cross-linguistic study. *Journal of Neurolinguistics*, 50, 7-16. Doi:10.1016/j.jneuroling.2018.02.004
15. Brothers, T., Hoversten, L. J., Dave, S., Traxler, M. J., & Swaab, T. Y. (2019). Flexible predictions during listening comprehension: Speaker reliability affects anticipatory processes. *Neuropsychologia*, 135. Doi:10.1016/j.neuropsychologia.2019.107225
16. Bury, G., García-Huésca, M., Bhattacharya, J., & Ruiz, M. H. (2019). Cardiac afferent activity modulates early neural signature of error detection during skilled performance. *NeuroImage*, 199, 704-717. Doi:10.1016/j.neuroimage.2019.04.043
17. Caballero-Gaudes, C., Moia, S., Panwar, P., Bandettini, P. A., & Gonzalez-Castillo, J. (2019). A deconvolution algorithm for multi-echo functional MRI: Multi-echo sparse paradigm free mapping. *NeuroImage*, 202. Doi:10.1016/j.neuroimage.2019.116081
18. Caffarra, S., & Martin, C.D. (2019). Not all errors are the same: ERP sensitivity to error typicality in foreign accented speech perception. *Cortex*, 116, 308-320. Doi:10.1016/j.cortex.2018.03.007
19. Caffarra, S., Mendoza, M., & Davidson, D. (2019). Is the LAN effect in morphosyntactic processing an ERP artifact? *Brain & Language*, 191, 9-16. Doi:10.1016/j.bandl.2019.01.003

20. Caffarra, S., Motamed, A.H., Michell, E., & Martin, C.D. (2019). When is irony influenced by communicative constraints? ERP evidence supporting interactive models. *European Journal of Neuroscience*, 50(10), 3566-3577. Doi:10.1111/ejn.14503.
21. Casasanto, D., & de Bruin, A. (2019). Metaphors we learn by: Directed motor action improves word learning. *Cognition*, 182, 177-183. Doi:10.1016/j.cognition.2018.09.015
22. Cespón, J., Rodella, C., Miniussi, C., & Pellicciari, M.C. (2019). Behavioural and electrophysiological modulations induced by transcranial direct current stimulation in healthy elderly and Alzheimer's disease patients: a pilot study. *Clinical Neurophysiology*, 130, 2038-2052. Doi:10.1016/j.clinph.2019.08.016
23. Choi, W., Tong, S.X., & Samuel, A.G. (2019). Better than native: Tone language experience enhances English lexical stress discrimination in Cantonese-English bilingual listeners. *Cognition*, 189, 188-192. Doi:10.1016/j.cognition.2019.04.004
24. Dampur , J., L pez-P rez, P. J., & Barber, H.A. (2019). Meaning-based attentional guidance as a function of foveal and task-related cognitive loads. *Language, Cognition and Neuroscience*, 34:1, 1-12. Doi:10.1080/23273798.2018.1484149
25. de Bruin, A. (2019). Not all bilinguals are the same: A call for more detailed assessments and descriptions of bilingual experiences. *Behavioral Sciences*, 9(3), 33. Doi:10.3390/bs9030033
26. de-Dios-Flores, I. (2019). Processing sentences with multiple negations: grammatical structures that are perceived as unacceptable. *Frontiers in Psychology*, 10:2346. Doi:10.3389/fpsyg.2019.02346
27. Declerck, M., Koch, I., Dunabeitia, J.A., Grainger, J., & Stephan, D.N. (2019). What Absent Switch Costs and Mixing Costs During Bilingual Language Comprehension Can Tell Us About Language Control. *Journal of Experimental Psychology: Human Perception and Performance*, 45(6), 771-789. Doi:10.1037/xhp0000627
28. Destoky, F., Philippe, M., Bertels, J., Verhasselt, M., Coquelet, N., Vander Ghinst, M., Wens, V., De Ti ge, X., & Bourguignon, M. (2019). Comparing the potential of MEG and EEG to uncover brain tracking of speech temporal envelope. *NeuroImage*, 184, 201-213. Doi:10.1016/j.neuroimage.2018.09.006
29. Frost, R., Armstrong, B.C., & Christiansen, M.H. (2019). Statistical learning research: A critical review and possible new directions. *Psychological Bulletin*, 145(12), 1128-1153. Doi:10.1037/bul0000210
30. Guediche, S., Zhu, Y., Minicucci, D., & Blumstein, S.E. (2019). Written sentence context effects on acoustic-phonetic perception: fMRI reveals cross-modal semantic-perceptual interactions. *Brain and Language*, 199. Doi:10.1016/j.bandl.2019.104698
31. Grotheer, M., Zhen, Z., Lerma-Usabiaga, G., & Grill-Spector, K. (2019). Separate lanes for adding and reading in the white matter highways of the human brain. *Nature Communications*, 10, 3675. Doi:10.1038/s41467-019-11424-1
32. Gonzalez-Castillo, J., Caballero-Gaudes, C., Topolski, N., Handwerker, D.A., Pereira, F., & Bandettini, P.A. (2019). Imaging the spontaneous flow of thought: Distinct periods of cognition contribute to dynamic functional connectivity during rest. *NeuroImage*, 202. Doi:10.1016/j.neuroimage.2019.116129.
33. Gurunandan, K., Carreiras, M., & Paz-Alonso, P.M. (2019). Functional plasticity associated with language learning in adults. *NeuroImage*, 201. Doi:10.1016/j.neuroimage.2019.116040
34. Gussow, A.E., Kapnola, E.C., & Molinaro, N. (2019). Any leftovers from a discarded prediction? Evidence from eye-movements during sentence comprehension. *Language, Cognition and Neuroscience*, 34:8, 1041-1058. Doi:10.1080/23273798.2019.1617887
35. Guti rrez-Sigut, E., Marcet, A., & Perea, M. (2019). Tracking the time course of letter visual-similarity effects during word recognition: A masked priming ERP investigation. *Cognitive, Affective, and Behavioral Neuroscience*, 19: 966. Doi:10.3758/s13415-019-00696-1
36. Gutierrez-Sigut, E., Vergara-Mart nez, M., & Perea, M. (2019). Deaf readers benefit from lexical feedback during orthographic processing. *Scientific Reports*, 9:12321. Doi:10.1038/s41598-019-48702-3.
37. Haft, S.L., Kepinska, O., Caballero, J.N., Carreiras, M., & Hoeft, F. (2019). Attentional Fluctuations, Cognitive Flexibility, and Bilingualism in Kindergarteners. *Behavioral Sciences*, 9, 58. Doi:10.3390/bs9050058
38. Ivaz, L., Griffin, K., & Du abeitia, J. A. (2019). Self-bias and the emotionality of foreign languages. *Quarterly Journal of Experimental Psychology*, 72(1), 76-89. Doi:10.1177/1747021818781017
39. Jim nez-Urbiet , H., Gago, B., Quiroga-Varela, A., Rodr guez-Chinchilla, T., Merino-Gal n, L., Oregi, A., Belloso-Iguerategui, A., Delgado-Alvarado, M., Navalpotro-G mez, I., Marin, C., Fernagut, P.O., & Rodr guez-Oroz, M.C. (2019). Pramipexole-induced impulsivity in mildparkinsonian rats: A model of impulse control disorders in parkinson's disease. *Neurobiology of Aging*, 75, 126-135. Doi:10.1016/j.neurobiolaging.2018.11.021



40. Kalashnikova, M., Goswami, U., & Burnham, D. (2019). Delayed development of phonological constancy in toddlers at family risk for dyslexia. *Infant Behavior and Development*, 57. Doi:10.1016/j.infbeh.2019.101327
41. Kalashnikova, M., Goswami, U., & Burnham, D. (2019). Sensitivity to amplitude envelope rise time in infancy and vocabulary development at three years: A significant relationship. *Developmental Science*, 22:e12836. Doi:10.1111/desc.12836
42. Kalashnikova, M., Oliveri, A., & Mattock, K. (2019). Acceptance of lexical overlap by monolingual and bilingual toddlers. *International Journal of Bilingualism*, 23(6), 1517–1530. Doi:10.1177/1367006918808041
43. Kapnola, E.C. & Samuel, A.G. (2019). Voices in the mental lexicon: Words carry indexical information that can affect access to their meaning. *Journal of Memory and Language*, 107, 111-127. Doi:10.1016/j.jml.2019.05.001
44. Kartushina, N., & Martin, C.D. (2019). Talker and Acoustic Variability in Learning to Produce Second Language Sounds: Evidence from Articulatory Training. *Language Learning*, 69:1, 71–105. Doi:10.1111/lang.12315
45. Kartushina, N., & Martin, C.D. (2019). Third-language learning affects bilinguals' production in both their native languages: A longitudinal study of dynamic changes in L1, L2 and L3 vowel production. *Journal of Phonetics*, 77. Doi:10.1016/j.wocn.2019.100920
46. Klimovich-Gray, A., & Bozic, M. (2019). Domain-general and domain-specific computations in single word processing. *NeuroImage*, 202. Doi:10.1016/j.neuroimage.2019.116112
47. Leminen, A., Smolka, E., Duñabeitia, J.A., & Pliatsikas, C. (2019). Morphological processing in the brain: The good (inflection), the bad (derivation) and the ugly (compounding). *Cortex*, 116, 4-44. Doi:10.1016/j.cortex.2018.08.016
48. León, I., Rodrigo, M.J., El-Deredy, W., Modroño, C., Hernández-Cabrera, J.A., & Quiñones, I. (2019). Limbic-visual attenuation to crying faces underlies neglectful mothering. *Scientific Reports*, 9:6373. Doi:10.1038/s41598-019-42908-1
49. Lerma-Usabiaga, G., Mukherjee, P., Ren, Z., Perry, M.L., & Wandell, B.A. (2019). Replication and generalization in applied neuroimaging. *NeuroImage*, 202. Doi:10.1016/j.neuroimage.2019.116048.
50. Lindborg, A., Baart, M., Stekelenburg, J.J., Vroomen, J., & Andersen, T.S. (2019). Speech-specific audiovisual integration modulates induced theta-band oscillations. *PLOS ONE*: e0219744. Doi:10.1371/journal.pone.0219744
51. Ling, S., Lee, A.C.H., Armstrong, B.C., & Nestor, A. (2019). How are visual words represented? Insights from EEG-based visual word decoding, feature derivation and image reconstruction. *Human Brain Mapping*, 40: 5056–5068. Doi:10.1002/hbm.24757
52. Lizarazu, M., Lallier, M., & Molinaro, N. (2019). Phase–amplitude coupling between theta and gamma oscillations adapts to speech rate. *Annals of the New York Academy of Sciences*, 1453: 140-152. Doi:10.1111/nyas.14099
53. López Zunini, R.A., Morrison, C., Kousaie, S., & Taler, V. (2019). Task switching and bilingualism in young and older adults: A behavioral and electrophysiological investigation. *Neuropsychologia*, 133. Doi:10.1016/j.neuropsychologia.2019.107186.
54. Luthra, S., Fuhrmeister, P., Molfese, P., Guediche, S., Blumstein, S., & Myers, E. (2019). Brain-behavior relationships in incidental learning of non-native phonetic categories. *Brain and Language*, 198. Doi:10.1016/j.bandl.2019.104692
55. Luthra, S., Guediche, S., Blumstein, S.E., & Myers, E.B. (2019). Neural substrates of subphonemic variation and lexical competition in spoken word recognition. *Language, Cognition and Neuroscience*, 34:2, 151-169, DOI:10.1080/23273798.2018.1531140
56. Mancini, S., Massol, S., Duñabeitia, J.A., Carreiras, M., & Molinaro, N. (2019). Agreement and illusion of disagreement: an ERP study on Basque. *Cortex*, 116, 154-167. Doi:10.1016/j.cortex.2018.08.036
57. Martin, C.D., Underwood, A., & Molinaro, N. (2019). I'm doing better on my own: Social inhibition in vocabulary learning in adults. *Frontiers in Psychology*, 10:1350. Doi:10.3389/fpsyg.2019.01350.
58. Martínez, A. (2019). Language and math: What if we have two separate naming systems? *Languages*, 4(3). Doi:10.3390/languages4030068
59. Martín-Signes, M., Paz-Alonso, P.M., & Chica, A.B. (2019). Connectivity of frontoparietal regions reveals executive attention and consciousness interactions. *Cerebral Cortex*, 29:11, 4539–4550. Doi:10.1093/cercor/bhy332



60. Marty, B., Naeije, G., Bourguignon, M., Wens, V., Jousmäki, V., Lynch, D.R., Gaetz, W., Goldman, S., Hari, R., Pandolfo, M., & De Tiège, X. (2019). Evidence for genetically determined degeneration of proprioceptive tracts in Friedreich ataxia. *Neurology*, 93, (2), e116-e124. Doi:10.1212/WNL.00000000000007750
61. Mishra, R.K., Padmanabhuni, M., Bhandari, P., Viswambharan, S., & Prasad, S.G. (2019). Language proficiency does not modulate executive control in older bilinguals. *Aging, Neuropsychology, and Cognition*, 26:6, 920-951. Doi:10.1080/13825585.2018.1562029
62. Modelska, M., Pourquié, M., & Baart, M. (2019). No "self" advantage for audiovisual speech aftereffects. *Frontiers in Psychology*, 10:685. Doi:10.3389/fpsyg.2019.00658
63. Morera, Y., van der Meij, M., de Vega, M., & Barber, H. A. (2019). Are sensory-motor relationships encoded ad hoc or by default?: An ERP study. *Frontiers in Psychology*, 10:966. Doi:10.3389/fpsyg.2019.00966
64. Morucci, P., Bottini, R., & Crepaldi, D. (2019). Augmented Modality Exclusivity Norms for Concrete and Abstract Italian Property Words. *Journal of Cognition*, 2(1): 42, 1–14. Doi:10.5334/joc.88
65. Naeije, G., Wens, V., Bourguignon, M., Goldman, S., Pandolfo, M., & De Tiège, X. (2019). Altered neocortical tactile but preserved auditory early change detection responses in Friedreich ataxia. *Clinical Neurophysiology*, 130:8, 1299-1310. Doi:10.1016/j.clinph.2019.05.003.
66. Navalpotro-Gomez, I., Dacosta-Aguayo, R., Molinet-Dronda, F., Martin-Bastida, A., Botas-Peñín, A., Jimenez-Urbiet, H., Delgado-Alvarado, M., Gago, B., Quiroga-Varela, A., Rodriguez-Oroz, M.C. (2019). Nigrostriatal dopamine transporter availability, and its metabolic and clinical correlates in Parkinson's disease patients with impulse control disorders. *European Journal of Nuclear Medicine and Molecular Imaging*, 46 (10), 2065-2076. Doi:10.1007/s00259-019-04396-3
67. Notaro, G., van Zoest, W., Altman, M., Melcher, D., & Hasson, U. (2019). Predictions as a window into learning: Anticipatory fixation offsets carry more information about environmental statistics than reactive stimulus-responses. *Journal of Vision*, 19(2):8, 1-22. Doi:10.1167/19.2.8.
68. Nozari, N., Martin, C.D., & McCloskey, N. (2019). Is repairing speech errors an automatic or a controlled process? Insights from the relationship between error and repair probabilities in English and Spanish. *Language, Cognition and Neuroscience*, 34:9, 1230-1245. Doi:10.1080/23273798.2019.
69. Ordin, M. (2019). Speech rhythm as naturally occurring and culturally transmitted behavioral patterns. *Annals of the New York Academy of Sciences*, 1453, 5-11. Doi:10.1111/nyas.14234
70. Ordin, M., Polyanskaya, L., Gomez, D., & Samuel, A. (2019). The role of native language and the fundamental design of the auditory system in detecting rhythm changes. *Journal of Speech, Language and Hearing Research*, 62(4):835-852. Doi:10.1044/2018_JSLHR-S-18-0299
71. Pérez, A., Dumas, G., Karadag, M., & Duñabeitia, J.A. (2019). Differential brain-to-brain entrainment while speaking and listening in native and foreign languages. *Cortex*, 111, 303-315. Doi:10.1016/j.cortex.2018.11.026
72. Polyanskaya, L., & Ordin, M. (2019). The effect of speech rhythm and speaking rate on assessment of pronunciation in a second language. *Applied Psycholinguistics*, 40(3), 795-819. Doi:10.1017/S0142716419000067
73. Polyanskaya, L., Samuel, A.G., & Ordin, M. (2019). Regularity in speech rhythm as a social coalition signal. *Annals of the New York Academy of Sciences*, 1453, 153-165. Doi:10.1111/nyas.14193
74. Polyanskaya, L., Samuel, A.G., & Ordin, M. (2019). Speech Rhythm Convergence as a Social Coalition Signal. *Evolutionary Psychology*, 17(3), 1-11. Doi:10.1177/1474704919879335
75. Pourquié, M., Lacroix, H., & Kartushina, N. (2019). Investigating vulnerabilities in grammatical processing of bilinguals: Insights from basque-spanish adults and children. *Linguistic Approaches to Bilingualism*, 9(4-5), 600-627. Doi:10.1075/lab.17035.pou
76. Pozuelos, J.P., Combata, L.M., Abundis, A., Paz-Alonso, P.M., Conejero, A., Guerra, S. & Rueda, M.R. (2019). Metacognitive scaffolding boosts cognitive and neural benefits following executive attention training in children. *Developmental Science*. 22:e12756. Doi:10.1111/desc.12756
77. Re, D., Inbar, M., Richter, C.G., & Landau, A.N. (2019). Feature-Based Attention Samples Stimuli Rhythmically. *Current biology*, 29(4), 693-699.e4. Doi:10.1016/j.cub.2019.01.010
78. Rice, C.A., Beekhuizen, B., Dubrovsky, V., Stevenson, S., & Armstrong, B.C. (2019). A comparison of homonym meaning frequency estimates derived from movie and television subtitles, free association, and explicit ratings. *Behavior Research Methods*, 51:1399–1425. Doi:10.3758/s13428-018-1107-7
79. Ríos-López, P., Molinaro, N., & Lallier, M. (2019). Tapping to a beat in synchrony predicts brain print sensitivity in pre-readers. *Brain and Language*, 199. Doi:10.1016/j.bandl.2019.104693.

80. Schauenburg, G., Conrad, M., von Scheve, C., Barber, H. A., Ambrasat, J., Aryani, A., & Schröder, T. (2019). Making sense of social interaction: Emotional coherence drives semantic integration as assessed by event-related potentials. *Neuropsychologia*, 125, 1-13. Doi:10.1016/j.neuropsychologia.2019.01.002
81. Sheikh, U. A., Carreiras, M., & Soto, D. (2019). Decoding the meaning of unconsciously processed words using fMRI-based MVPA. *NeuroImage*, 191:430-440. Doi:10.1016/j.neuroimage.2019.02.010
82. Siegelman, N., Bogaerts, L., Armstrong, B.C., & Frost, R. (2019). What exactly is learned in visual statistical learning? Insights from Bayesian modeling. *Cognition*, 192. Doi:10.1016/j.cognition.2019.06.014.
83. Siegelman, N., Bogaerts, L., & Frost, R. (2019). What determines visual statistical learning performance? insights from information theory. *Cognitive Science*, 43(12). Doi:10.1111/cogs.12803
84. Soto, D., Sheikh, U.A., Rosenthal, C.R. (2019). A novel framework for unconscious processing. *Trends in Cognitive Sciences*, 23:5, 372-376. Doi:10.1016/j.tics.2019.03.002.
85. Staub, A., & Goddard, K. (2019). The Role of Preview Validity in Predictability and Frequency Effects on Eye Movements in Reading. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 45(1):110-127. Doi:10.1037/xlm0000561
86. Stoehr, A., Benders, T., van Hell, J.G., & Fikkert, P. (2019). Bilingual Preschoolers' Speech is Associated with Non-Native Maternal Language Input. *Language Learning and Development*, 15:1, 75-100. Doi:10.1080/15475441.2018.1533473
87. Valdois, S., Lassus-Sangosse, D., Lallier, M., Moreaud, O., & Pisella, L. (2019). What bilateral damage of the superior parietal lobes tells us about visual attention disorders in developmental dyslexia. *Neuropsychologia*, 130, 78-91. Doi:10.1016/j.neuropsychologia.2018.08.001
88. Vander Ghinst, M., Bourguignon, M., Niesen, M., Wens, V., Hassid, S., Choufani, G., Jousmäki, V., Hari, R., Goldman, S., & De Tiège, X. (2019). Cortical tracking of speech-in-noise develops from childhood to adulthood. *The Journal of Neuroscience*, 39(15):2938-2950. Doi:10.1523/JNEUROSCI.1732-18.2019
89. Villameriel, S., Costello, B., Dias, P., Giezen, M., & Carreiras, M. (2019). Language Modality Shapes the Dynamics of Word and Sign Recognition. *Cognition*, 191. Doi:10.1016/j.cognition.2019.05.016
90. Wens, V., Bourguignon, M., Vander Ghinst, M., Mary, A., Marty, B., Coquelet, N., Naeije, G., Peigneux, P., Goldman, S., & De Tiège, X. (2019). Synchrony, metastability, dynamic integration, and competition in the spontaneous functional connectivity of the human brain. *Neuroimage*, 199, 313-324. Doi:10.1016/j.neuroimage.2019.05.081.
91. Zeng, Z., Kalashnikova, M., & Antoniou, M. (2019). Integrating bilingualism, verbal fluency, and executive functioning across the lifespan. *Journal of Cognition and Development*, 20:5, 656-679. Doi:10.1080/15248372.2019.1648267
92. Zheng, Y., & Samuel, A.G. (2019). How much do visual cues help listeners in perceiving accented speech? *Applied Psycholinguistics*, 40, 93-109. Doi:10.1017/S0142716418000462

Conference Paper

1. Ansorena, X., Hernández, M., Carreiras, M., Quemada, J.I., & Mancini, S. (2019). Short Term Memory and sentence processing in deep dysphasia. *Stem-, Spraak- en Taalpathologie*, 24, Supplement, 104-107.

Book chapters/books

1. de Bruin, A., & Della Sala, S. (2019). The bilingual advantage debate: publication biases and the decline effect. In J. W. Schwieter (Ed.), *The Handbook of the Neuroscience of Multilingualism* (736 - 753). Wiley-Blackwell.
2. Paz-Alonso, P.M., Oliver, M., Quiñones, I., & Carreiras, M. (2019). Neural basis of monolingual and bilingual reading. In G.I. de Zubicaray & N.O. Schiller (Eds.), *Oxford Handbook of Neurolinguistics*. New York: Oxford University Press. Doi:10.1093/oxfordhb/9780190672027.013.24

2020

Journal Articles

1. Aguasvivas, J., Carreiras, M., Brysbaert, M., Mandera, P., Keuleers, E., & Duñabeitia, J.A. (2020). How do Spanish speakers read words? Insights from a crowdsourced lexical decision megastudy. *Behavior Research Methods*, 52, 1867–1882. Doi:10.3758/s13428-020-01357-9
2. Amoroso, L., Finisguerra, A., & Urgesi, C. (2020). Spatial frequency tuning of motor responses reveals differential contribution of dorsal and ventral systems to action comprehension. *Proceedings of the National Academy of Sciences*, 117(23), 13151-13161. Doi:10.1073/pnas.1921512117
3. Archila-Meléndez, M.E., Valente, G., Gommer, E.D., Correia, J.M., ten Oever, S., Peters, J.C., Reithler, J., Hendriks, M.P.H., Cornejo Ochoa, W., Schijns, O.E.M.G., Dings, J.T.A., Hilkman, D.M.W., Rouhl, R.P.W., Jansma, B.M., van Kranen-Mastenbroek, V.H.J.M., & Roberts, M.J. (2020). Combining Gamma With Alpha and Beta Power Modulation for Enhanced Cortical Mapping in Patients With Focal Epilepsy. *Frontiers in Human Neuroscience*. 14:555054. Doi:10.3389/fnhum.2020.555054
4. Aурtenetxe, S., Molinaro, N., Davidson, D., & Carreiras, M. (2020). Early dissociation of numbers and letters in the human brain. *Cortex*, 130, 192-202. Doi:10.1016/j.cortex.2020.03.030
5. Bobb, S.C., Von Holzen, K., Mayor, J., Mani, N., & Carreiras, M. (2020). Co-activation of the L2 during L1 auditory processing: An ERP cross-modal priming study. *Brain and Language*, 203. Doi:10.1016/j.bandl.2019.104739
6. Bogaerts, L., Frost, R., & Christiansen, M. H. (2020). Integrating statistical learning into cognitive science. *Journal of Memory and Language*, 115. Doi:10.1016/j.jml.2020.104167
7. Bogaerts, L., Richter, C. G., Landau, A. N., & Frost, R. (2020). Beta-band activity is a signature of statistical learning. *The Journal of Neuroscience*, 40(39), 7523-7530. Doi:10.1523/JNEUROSCI.0771-20.2020
8. Bolton, T.A., Kebets, V., Glerean, E., Zöllner, D., Li, J., Yeo, B.T., Caballero-Gaudes, C., & Van De Ville, D. (2020). Agito ergo sum: Correlates of spatio-temporal motion characteristics during fMRI. *NeuroImage*, 209. Doi:10.1016/j.neuroimage.2019.116433
9. Bolton, T.A.W., Uruñuela, E., Tian, Y., Zalesky, A., Caballero-Gaudes, C., & Van De Ville, D. (2020). Sparse coupled logistic regression to estimate co-activation and modulatory influences of brain regions. *Journal of Neural Engineering*, 17, 065003. Doi:10.1088/1741-2552/aba55e
10. Boudelaa, S., Perea, M., & Carreiras, M. (2020). Matrices of the Frequency and Similarity of Arabic Letters and Allographs. *Behavior Research Methods*, 52, 1893–1905. Doi:10.3758/s13428-020-01353-z
11. Bourguignon, M., Baart, M., Kapnoula, E.C., & Molinaro, N. (2020). Lip-reading enables the brain to synthesize auditory features of unknown silent speech. *Journal of Neuroscience*, 40(5), 1053-1065. Doi:10.1523/JNEUROSCI.1101-19.2019
12. Bourguignon, M., Molinaro, N., Lizarazu, M., Taulu, S., Jousmaki, V., Lallier, M., Carreiras, M., & De Tiège, X. (2020). Neocortical activity tracks the hierarchical linguistic structures of self-produced speech during reading aloud. *Neuroimage*, 216. Doi:10.1016/j.neuroimage.2020.116788
13. Branzi, F.M., Martin, C.D., Carreiras, M., & Paz-Alonso, P.M. (2020). Functional connectivity reveals dissociable ventrolateral prefrontal mechanisms for the control of multilingual word retrieval. *Human Brain Mapping*, 41:1, 80–94. Doi:10.1002/hbm.24788
14. Brookman, R., Kalashnikova, M., Conti, J., Xu-Rattanasone, N., Grant, K. A., Demuth, K., & Burnham, D. (2020). Depression and anxiety in the postnatal period: An examination of infants' home language environment, vocalisations, and expressive language abilities. *Child Development*, 91(6), e1211-e1230. Doi:10.1111/cdev.13421
15. Brookman, R., Kalashnikova, M., Conti, J., Xu-Rattanasone, N., Grant, K. A., Demuth, K., & Burnham, D. (2020). Maternal depression affects infants' lexical processing abilities in the second year of life. *Brain Sciences*, 10, 977. Doi:10.3390/brainsci10120977
16. Burgering, M., van Laarhoven, T., Baart, M., & Vroomen, J. (2020). Fluidity in the perception of auditory speech: Cross-modal recalibration of voice gender and vowel identity by a talking face. *Quarterly Journal of Experimental Psychology*, 73:6, 957-967. Doi:10.1177/1747021819900884
17. Caffarra, S., Wolpert, M., Scarinci, D., & Mancini, S. (2020). Who are you talking to? The role of addressee identity in utterance comprehension. *Psychophysiology*, 57:e13527. Doi:10.1111/psyp.13527



18. Cespón, J., & Carreiras, M. (2020). Is there electrophysiological evidence for a bilingual advantage in neural processes related to executive functions? *Neuroscience and Biobehavioral Reviews*, 118, 315-330. Doi:10.1016/j.neubiorev.2020.07.030
19. Cespón, J., Hommel, B., Korsch, M., & Galashan, D. (2020). The neurocognitive underpinnings of the simon effect: an integrative review of current research. *Cognitive, affective and Behavioral Neuroscience*, 20:1133–1172. Doi:10.3758/s13415-020-00836-y
20. Charoy, J., & Samuel, A.G. (2020). The effect of orthography on the recognition of pronunciation variants. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 46(6), 1121–1145. Doi:10.1037/xlm0000781
21. Coolen, T., Wens, V., Vander Ghinst, M., Mary, A., Bourguignon, M., Naeije, G., Peigneux, P., Sadeghi, N., Goldman, S., & De Tiège, X. (2020). Frequency-dependent intrinsic electrophysiological functional architecture of the human verbal language network. *Frontiers in Integrative Neuroscience*, 14:27. Doi:10.3389/fnint.2020.00027
22. Coquelet, N., Wens, V., Mary, A., Niesen, M., Puttaert, D., Ranzini, M., Vander Ghinst, M., Bourguignon, M., Peigneux, P., Goldman, S., Woolrich, M., & De Tiège, X. (2020). Changes in electrophysiological static and dynamic human brain functional architecture from childhood to late adulthood. *Scientific Reports*, 10(1), 18986. Doi:10.1038/s41598-020-75858-0
23. Coquelet, N., De Tiège, X., Destoky, F., Roshchupkina L., Bourguignon, M., Goldman, S., Peigneux, P., & Wens, V. (2020). Comparing MEG and high-density EEG for intrinsic functional connectivity mapping. *NeuroImage*, 210. Doi:10.1016/j.neuroimage.2020.116556
24. Correia, J.M., Caballero-Gaudes, C., Guediche, S., & Carreiras, M. (2020). Phonatory and articulatory representations of speech production in cortical and subcortical fMRI responses. *Scientific Reports*, 10:4529. Doi:10.1038/s41598-020-61435-y
25. Davis, C.P., Joergensen, G.H., Boddy, P., Dowling, C., & Yee, E. (2020). Making It Harder to “See” Meaning: The More You See Something, the More Its Conceptual Representation Is Susceptible to Visual Interference. *Psychological Science*, 31(5), 505-517. Doi:10.1177/0956797620910748
26. de Bruin, A., Samuel, A.G., & Duñabeitia, J.A. (2020). Examining bilingual language switching across the lifespan in cued and voluntary switching contexts. *Journal of Experimental Psychology: Human Perception and Performance*, 46(8), 759-788. Doi:10.1037/xhp0000746
27. De Tiège, X., Bourguignon, M., Piitulainen, H., & Jousmäki, V. (2020). Sensorimotor mapping with MEG: An update on the current state of clinical research and practice with considerations for clinical practice guidelines. *Journal of Clinical Neurophysiology : Official Publication of the American Electroencephalographic Society*, 37(6), 564-573. Doi:10.1097/WNP.0000000000000481
28. Delogu, F., Jachmann, T., Staudte, M., Vespignani, F., & Molinaro, N. (2020). Discourse expectations are sensitive to the Question under Discussion: Evidence from ERPs. *Discourse Processes*, 57(2), 122-140. Doi:10.1080/0163853X.2019.1575140
29. Destoky, F., Bertels, J., Niesen, M., Wens, V., Vander Ghinst, M., Leybaert, J., Lallier, M., Ince, R.A.A., Gross, J., De Tiège, X., & Bourguignon, M. (2020). Cortical tracking of speech in noise accounts for reading strategies in children. *PLoS Biology*, 18(8): e3000840. Doi:10.1371/journal.pbio.3000840
30. Duñabeitia, J.A., Borragan, M., De Bruin, A.M.T., & Casaponsa, A. (2020). Changes in the sensitivity to language-specific orthographic patterns with age. *Frontiers in Psychology*, 11:1691. Doi:10.3389/fpsyg.2020.01691
31. Escudero, P., & Kalashnikova, M. (2020). Infants use phonetic detail in speech perception and word learning when detail is easy to perceive. *Journal of Experimental Child Psychology*, 190. Doi:10.1016/j.jecp.2019.104714
32. Frances, C., De Bruin, A., & Duñabeitia, J.A. (2020). The effects of language and emotionality of stimuli on vocabulary learning. *PLOS ONE*, 15(10): e0240252. Doi:10.1371/journal.pone.0240252
33. Frances, C., De Bruin, A., & Duñabeitia, J.A. (2020). The influence of emotional and foreign language context in content learning. *Studies in Second Language Acquisition*, 42(4), 891-903. Doi:10.1017/S027226311900072X
34. Frances, C., Martin, C. D., & Duñabeitia, J. A. (2020). The effects of contextual diversity on incidental vocabulary learning in the native and a foreign language. *Scientific Reports*, 10(13967). Doi:10.1038/s41598-020-70922-1
35. Frances, C., Pueyo, S., Anaya, V., & Duñabeitia, J.A. (2020). Interpreting Foreign Smiles: Language Context and Type of Scale in the Assessment of Perceived Happiness and Sadness. *Psicológica*, 41, 21-38. Doi:10.2478/psicolj-2020-0002



36. Garrido, L.E., Barrada, J.R., Aguasvivas, J.A., Martínez-Molina, A., Arias, V.B., Golino, H.F., Legaz, E., Ferris, G., & Rojo-Moreno, L. (2020). Is Small Still Beautiful for the Strengths and Difficulties Questionnaire? Novel Findings Using Exploratory Structural Equation Modeling. *Assessment*, 27(6), 1349-1367. Doi:10.1177/1073191118780461
37. Grunden, N., Piazza, G., García-Sánchez, C., & Calabria, M. (2020). Voluntary Language Switching in the Context of Bilingual Aphasia. *Behavioral Sciences*, 10(9), 141. Doi:10.3390/bs10090141
38. Guediche, S., Baart, M., & Samuel, A.G. (2020). Semantic priming effects can be modulated by crosslinguistic interactions during second language auditory word recognition. *Bilingualism: Language and Cognition*, 23(5), 1082-1092. Doi:10.1017/S1366728920000164
39. Gurunandan, K., Arnaez-Telleria, J., Carreiras, M., & Paz-Alonso, P.M. (2020). Converging evidence for differential specialization and plasticity of language systems. *The Journal of Neuroscience*, 40(50):9715–9724 Doi:10.1523/JNEUROSCI.0851-20.2020
40. Heunis, S., Lamerichs, R., Zinger, S., Caballero-Gaudes, C., Jansen, J. F. A., Aldenkamp, B., & Breeuwer, M. (2020). Quality and denoising in real-time functional magnetic resonance imaging neurofeedback: A methods review. *Human Brain Mapping*, 41(12), 3439-3467. Doi:10.1002/hbm.25010
41. Hoversten, L.J., & Traxler, M.J. (2020). Zooming in on zooming out: Partial selectivity and dynamic tuning of bilingual language control during reading. *Cognition*, 195. Doi:10.1016/j.cognition.2019.104118
42. Janssen, N., Meij, M., López-Pérez, P.J., & Barber, H.A. (2020). Exploring the temporal dynamics of speech production with EEG and group ICA. *Scientific Reports*, 10(1). Doi:10.1038/s41598-020-60301-1
43. Jevtović, M., Duñabeitia, J.A., & de Bruin, A. (2020). How do bilinguals switch between languages in different interactional contexts? A comparison between voluntary and mandatory language switching. *Bilingualism: Language and Cognition*, 23(2), 401-413. Doi:10.1017/S1366728919000191
44. Jiménez, L., Abrahamse, E., Méndez, C., & Braem, S. (2020). Does incidental sequence learning allow us to better manage upcoming conflicting events? *Psychological Research*, 84, 2079–2089. Doi:10.1007/s00426-019-01201-6
45. Jiménez-Urbietia, H., Gago, B., Quiroga-Varela, A., Rodríguez-Chinchilla, T., Merino-Galán, L., Delgado-Alvarado, M., Navalpotro-Gómez, I., Belloso-Iguerategui, A., Marin, C., & Rodríguez-Oroz, M.C. (2020). Motor impulsivity and delay intolerance are elicited in a dose-dependent manner with a dopaminergic agonist in parkinsonian rats. *Psychopharmacology*, 237(8), 2419-2431. Doi:10.1007/s00213-020-05544-6
46. Kalashnikova, M., Goswami, U., & Burnham, D. (2020). Infant-directed speech to infants at risk for dyslexia: A novel cross-dyad design. *Infancy*, 25(3), 286-303. Doi:10.1111/inf.12329
47. Kalashnikova, M., Goswami, U., & Burnham, D. (2020). Novel word learning deficits in infants at family risk for dyslexia. *Dyslexia*, 26: 3– 17. Doi:10.1002/dys.1649
48. Kalashnikova, M., & Kember, H. (2020). Prosodic cues in infant-directed speech facilitate young children's conversational turn predictions. *Journal of Experimental Child Psychology*, 199. Doi:10.1016/j.jecp.2020.104916
49. Klimovich-Gray, A., & Molinaro, N. (2020). Synchronizing internal and external information: A commentary on Meyer, Sun & Martin (2020). *Language, Cognition and Neuroscience*, 35(9), 1129-1132. Doi:10.1080/23273798.2020.1743875
50. Larraza, S., Molnar, M., & Samuel, A.G. (2020). Phonemic contrasts under construction? evidence from basque. *Infancy*, 25(3), 304-318. Doi:10.1111/inf.12330
51. Lee, C.W., Blanco, B., Dempsey, L., Chalia, M., Hebden, J.C, Caballero-Gaudes, C., Austin, T., & Cooper, R.J.(2020). Sleep State Modulates Resting-State Functional Connectivity in Neonates. *Frontiers in Neuroscience*, 14:347. Doi:10.3389/fnins.2020.00347
52. Lerma-Usabiaga, G., Benson, N., Winawer, J., & Wandell, B.A. (2020). A validation framework for neuroimaging software: The case of population receptive fields. *PLoS Computational Biology*, 16(6): e1007924. Doi:10.1371/journal.pcbi.1007924
53. Lerma-Usabiaga, G., Mukherjee, P., Perry, M.L., & Wandell, B.A. (2020). Data-science ready, multisite, human diffusion MRI white-matter-tract statistics. *Scientific Data*, 7(1). Doi:10.1038/s41597-020-00760-3
54. Li, K.M., Bentley, P., Nair, A., Halse, O., Barker, G., Russell, C., Soto, D., & Malhotra, P.A.(2020). Reward Sensitivity Predicts Dopaminergic Response in Spatial Neglect. *Cortex*, 122, 213-224. Doi:10.1016/j.cortex.2018.09.002
55. Lizarazu, M., Gil-Robles, S., Pomposo, I., Nara, S., Amoroso, L., Quiñones, I., & Carreiras, M. (2020). Spatiotemporal dynamics of postoperative functional plasticity in patients with brain tumors in language areas. *Brain and Language*, 202. Doi:10.1016/j.bandl.2019.104741

56. López Zunini, R.A., Baart, M., Samuel, A.G., & Armstrong, B.C. (2020). Lexical access versus lexical decision processes for auditory, visual, and audiovisual items: Insights from behavioral and neural measures. *Neuropsychologia*, 137. Doi:10.1016/j.neuropsychologia.2019.107305
57. Lovcevic, I., Kalashnikova, M., & Burnham, D. (2020). Acoustic features of infant-directed speech to infants with hearing loss. *Journal of the Acoustical Society of America*, 148(6), 3399-3416. Doi:10.1121/10.0002641
58. Luthra, S., Correia, J.M., Kleinschmidt, D. F., Poeppel, L., & Myers, E.B. (2020). Lexical information guides retuning of neural patterns in perceptual learning for speech. *Journal of Cognitive Neuroscience*, 32(10), 2001-2012. Doi:10.1162/jocn_a_01612
59. McLean, M.A., Van den Bergh, B.R.H., Baart, M., Vroomen, J., & van den Heuvel, M.I. (2020). The late positive potential (LPP): A neural marker of internalizing problems in early childhood. *International Journal of Psychophysiology*, 155, 78-86. Doi:10.1016/j.ijpsycho.2020.06.005
60. Mei, N., Flinker, A., Zhu, M., Cai, Q., & Tian, X. (2020). Lateralization in the dichotic listening of tones is influenced by the content of speech. *Neuropsychologia*, 140. Doi:10.1016/j.neuropsychologia.2020.107389
61. Mei, N., Rankine, S., Olafsson, E., & Soto, D. (2020). Similar history biases for distinct prospective decisions of self-performance. *Scientific Reports*, 10:5854. Doi:10.1038/s41598-020-62719-z
62. Meles, S. K., Renken, R. J., Pagani, M., Teune, L. K., Arnaldi, D., Morbelli, S., Nobili, F., & Laar, T.V., Obeso, J.A., & Rodríguez-Oroz, M.C., & Leenders, K. L. (2020). Abnormal pattern of brain glucose metabolism in Parkinson's disease: Replication in three european cohorts. *European Journal of Nuclear Medicine and Molecular Imaging*, 47, 437-450. Doi:10.1007/s00259-019-04570-7
63. Molinaro, N. (2020). "Words and emotions in sentence context": A commentary on Hinojosa, Moreno & Ferré (2019). *Language, Cognition and Neuroscience*, 35(7), 862-864. Doi:10.1080/23273798.2019.1647346
64. Navalpotro-Gomez, I., Kim, J., Paz-Alonso, P.M., Delgado-Alvarado, M., Quiroga-Varela, A., Jimenez-Urbiet, H., Carreiras, M., Strafella, A.P., & Rodríguez-Oroz, M.C. (2020). Disrupted salience network dynamics in parkinson's disease patients with impulse control disorders. *Parkinsonism and Related Disorders*, 70, 74-81. Doi:10.1016/j.parkreldis.2019.12.009
65. Ordin, M., Polyanskaya, L., & Soto, D. (2020). Metacognitive processing in language learning tasks is affected by bilingualism. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 46(3), 529-538. Doi:10.1037/xlm0000739
66. Ordin, M., Polyanskaya, L., & Soto, D. (2020). Neural bases of learning and recognition of statistical regularities. *The Annals of the New York Academy of Sciences*, 1467: 60-76. Doi:10.1111/nyas.14299.
67. Ordin, M., Polyanskaya, L., Soto, D., & Molinaro, N. (2020). Electrophysiology of statistical learning: exploring the online learning process and offline learning product. *European Journal of Neuroscience*, 51(9), 2008-2022. Doi:10.1111/ejn.14657.
68. Paz-Alonso, P.M., Navalpotro-Gomez, I., Boddy, P., Dacosta-Aguayo, R., Delgado-Alvarado, M., Quiroga-Varela, A., Jimenez-Urbiet, H., Carreiras, M., & Rodríguez-Oroz, M.C. (2020). Functional inhibitory control dynamics in impulse control disorders in Parkinson's disease. *Movement Disorders*, 35(2):316-325. Doi:10.1002/mds.27885
69. Pejovic, J., Yee, E., & Molnar, M. (2020). Speaker Matters: Natural inter-speaker variation affects 4-month-olds' perception of audio-visual speech. *First Language*, 40(2), 113-127. Doi:10.1177/0142723719876382
70. Piitulainen, H., Ilman, M., Jousmäki, V., & Bourguignon, M. (2020). Feasibility and reproducibility of electroencephalography-based corticokinematic coherence. *Journal of Neurophysiology*, 124(6), 1959-1967. Doi:10.1152/jn.00562.2020
71. Polyanskaya, L., Busa, M.G., & Ordin, M. (2020). Capturing cross-linguistic differences in macro-rhythm: the case of Italian and English. *Language and Speech*, 63(2), 242-263. Doi:10.1177/0023830919835849
72. Rahnev, D., Desender, K., Lee, A.L.F., Adler, W.T., Aguilar-Lleyda, D., Akdoğan, B., Arbuzova, P., Atlas, L.Y., Balci, F., Bang, J.W., Bègue, I., Birney, D.P., Brady, T.F., Calder-Travis, J., Chetverikov, A., Clark, T.K., Davranche, K., Denison, R.N., Dildine, T.C., Double, K.S., Duyan, Y.A., Faivre, N., Fallow, K., Filevich, E., Gajdos, T., Gallagher, R.M., de Gardelle, V., Gherman, S., Haddara, N., Hainguerlot, M., Hsu, T.Y., Hu, X., Iturrate, I., Jaquiere, M., Kantner, J., Koculak, M., Konishi, M., Koß, C., Kvam, P.D., Kwok, S.C., Lebreton, M., Lempert, K.M., Ming Lo, C., Luo, L., Maniscalco, B., Martin, A., Massoni, S., Matthews, J., Mazancieux, A., Merfeld, D.M., O'Hara, D., Palser, E.R., Paulewicz, B., Pereira, M., Peters, C., Philastides, M.G., Pfuhl, G., Prieto, F., Rausch, M., Recht, S., Reyes, G., Rouault, M., Sackur, J., Sadeghi, S., Samaha, J., Seow, T.X.F., Shekhar, M., Sherman, M.T., Siedlecka, M., Skóra, Z., Song, C., Soto, D., Sun, S., van Boxtel, J.J.A., Wang, S., Weidemann, C.T., Weindel, G., Wierzbach, M., Xu, X., Ye, Q., Yeon, J., Zou, F., & Zylberberg, A.(2020). The confidence database. *Nature Human Behaviour*, 4(3), 317-325. Doi:10.1038/s41562-019-0813-1

73. Ríos-López, P., Molinaro, N., Bourguignon, M., & Lallier, M. (2020). Development of neural oscillatory activity in response to speech in children from 4 to 6 years old. *Developmental Science*, 23(6). Doi:10.1111/desc.12947
74. Ristic, B., Mancini, S., & Molinaro, N. (2020). Finding identity in the midst of ambiguity: case and number disambiguation in Basque. *Language, Cognition and Neuroscience*, 35:10, 1272-1282. Doi:10.1080/23273798.2020.1734639
75. Rodrigo, M.J., Leon, I., Garcia-Penton, L., Hernandez-Cabrera, J.A., & Quinones, I. (2020). Neglectful maternal caregiving involves altered brain volume in empathy-related areas. *Development and Psychopathology*, 32(4), 1534-1543. Doi:10.1017/S0954579419001469
76. Rodríguez-Chinchilla, T., Quiroga-Varela, A., Molinet-Dronda, F., Belloso-Iguerategui, A., Merino-Galan, L., Jimenez-Urbiet, H., Gago, B., & Rodríguez-Oroz, M. C. (2020). [18F]-DPA-714 PET as a specific in vivo marker of early microglial activation in a rat model of progressive dopaminergic degeneration. *European journal of nuclear medicine and molecular imaging*, 47(11), 2602-2612. Doi:10.1007/s00259-020-04772-4
77. Samuel, A.G. (2020). Psycholinguists should resist the allure of linguistic units as perceptual units. *Journal of Memory and Language*, 111. Doi:10.1016/j.jml.2019.104070
78. Sarrett, M., McMurray, B., & Kapnoula, E.C. (2020). Dynamic EEG analysis during language comprehension reveals interactive cascades between perceptual processing and sentential expectations. *Brain and Language*, 211. Doi:10.1016/j.bandl.2020.104875
79. Soto, D., Sheikh, U.A., Mei, N., & Santana, R. (2020). Decoding and encoding models reveal the role of mental simulation in the brain representation of meaning. *Royal Society Open Science*, 7:192043. Doi:10.1098/rsos.192043
80. Tozzi, L., Staveland, B., Holt-Gosselin, B., Chesnut, M., Chang, S.E., Choi, D., Shiner, M.L., Wu, H., Lerma-Usabiaga, G., Sporns, O., Barch, D., Gotlib, I.H., Hastie, T.J., Kerr, A.B., Poldrack, R.A., Wandell, B.A., Wintermark, M., & Williams, L.M. (2020). The human connectome project for disordered emotional states: Protocol and rationale for a research domain criteria study of brain connectivity in young adult anxiety and depression. *NeuroImage*, 214. Doi:10.1016/j.neuroimage.2020.116715.
81. Vandermosten, M., Correia, J., Vanderauwera, J., Wouters, J., Ghesquière, P., & Bonte, M. (2020). Brain activity patterns of phonemic representations are atypical in beginning readers with family risk for dyslexia. *Developmental Science*, 23:e12857. Doi:10.1111/desc.12857
82. Zheng, Y., & Samuel, A.G. (2020). The Relationship Between Phonemic Category Boundary Changes and Perceptual Adjustments to Natural Accents. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 46(7):1270-1292. Doi:10.1037/xlm0000788

Conference Paper

1. Moia, S., Stickland, R. C., Ayyagari, A., Termenon, M., Caballero-Gaudes, C., & Bright, M. G. (2020). Voxelwise optimization of hemodynamic lags to improve regional CVR estimates in breath-hold fMRI. In 2020 42nd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), 1489-1492. Doi:10.1109/EMBC44109.2020.9176225
2. Uruñuela, E., Jones, S., Crawford, A., Shin, W., Oh, S., Lowe, M., & Caballero-Gaudes, C. (2020). Stability-based Sparse Paradigm Free Mapping algorithm for deconvolution of functional MRI data. In 2020 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), 1092-1095. Doi:10.1109/EMBC44109.2020.9176137

Book chapters/books

1. Caffarra, S., & Carreiras, M. (2020). Electrophysiological correlates of second language acquisition: from words to sentences. In Grimaldi, M., Y. Shtyrov, and E. Brattico, (Eds.): *Language Electrified: Techniques, Methods, Applications, and Future Perspectives in the Neurophysiological Investigation of Language*. Springer.
2. Caffarra, S., Dias, P., & Costello, B. (2020). The learnability of complex constructions from a cross-linguistic perspective. In Marcel Schlechtweg (Ed.): *Trends in Linguistics. Studies and Monographs*. De Gruyter Mouton. Doi:10.1515/9783110695113-008
3. Finisguerra, A.*, Amoruso, L.*, & Urgesi, C. (2020). Beyond Automatic Motor Mapping: New Insights into Top-Down Modulations on Action Perception. In Noceti et al.(Eds.), *Modelling human motion: From human perception to robot design*. Springer Nature Switzerland AG. Doi:10.1007/978-3-030-46732-6_3



4. Martorell, J., Morucci, P., Mancini, S., & Molinaro, N. (2020). Sentence processing: How words generate syntactic structures in the brain. In: Grimaldi, M., Y. Shtyrov, & E. Brattico, (eds.), *Language Electrified. Techniques, Methods, Applications, and Future Perspectives in the Neurophysiological Investigation of Language*. Springer. <https://doi.org/10.31234/osf.io/3utpv>



2021

Journal Articles

1. Alemán Bañón, J., & Martín, C.D. (2021). The role of crosslinguistic differences in second language anticipatory processing: An event-related potentials study. *Neuropsychologia*, 155:107797. Doi:10.1016/j.neuropsychologia.2021.107797
2. Alzueta, E., Perrin, P., Baker, F. C., Caffarra, S., Ramos-Usuga, D., Yuksel, D., & Arango-Lasprilla, J. C. (2021). How the COVID-19 Pandemic Has Changed Our Lives: A Study of Psychological Correlates across 59 Countries. *Journal of Clinical Psychology*, 77: 556– 570. Doi:10.1002/jclp.23082
3. Amoruso, L., Geng, S., Molinaro, N., Timofeeva, P., Gisbert-Muñoz, S., Gil-Robles, S., Pomposo, I., Quiñones, I., & Carreiras, M. (2021). Oscillatory and structural signatures of language plasticity in brain tumor patients: A longitudinal study. *Human Brain Mapping*, 42:1777–1793. Doi:10.1002/hbm.25328.
4. Antúñez, M., Mancini, S., Hernandez-Cabrera, J.A., Hoversten, L., Barber, H., & Carreiras, M. (2021). Cross-linguistic semantic preview benefit in Basque-Spanish bilingual readers: Evidence from fixation-related potentials. *Brain and Language*, 214, 104905. Doi:10.1016/j.bandl.2020.104905
5. Antzaka, A., Acha, J., Carreiras, M., & Lallier, M. (2021). The deployment of young readers' visual attention across orthographic strings: the influence of stems and suffixes. *Scientific Studies of Reading*, 25:3, 193-214. Doi:10.1080/10888438.2020.1747470
6. Baus, C., Calabria, M., Duñabeitia, J. A., Hernandez, M., Ivanova, I., Mahon, B., Martín, C., Navarrete, E., Rodríguez-Caudraro, S., Romero-Rivas, C., Runnqvist, E., Santesteban, M., & Strijkers, K. (2021). Memories: Albert Costa's legacy. *Journal of Neurolinguistics*, 58. Doi:10.1016/j.jneuroling.2020.100967 (editorial)
7. Beekhuizen, B., Armstrong, B.C., & Stevenson, S. (2021). Probing lexical ambiguity: Word vectors encode number and relatedness of senses. *Cognitive Science*, 45(5):e12943. Doi:10.1111/cogs.12943
8. Blanco, B., Molnar, M., Carreiras, M., Collins-Jones, L.H., Vidal, E., Cooper, R.J., & Caballero-Gaudes, C. (2021). Group-level cortical functional connectivity patterns using fNIRS: assessing the effect of bilingualism in young infants. *Neurophotonics*, 8(2), 025011. Doi:10.1117/1.NPh.8.2.025011
9. Bogaerts, L., Siegelman, N., & Frost, R. (2021). Statistical learning and language impairments: Toward more precise theoretical accounts. *Perspectives on Psychological Science*, 16(2) 319–337. Doi:10.1177/1745691620953082
10. Borraran, M., De Bruin, A., Havas, V., De Diego-Balaguer, R., Vulchanova, M. D., Vulchanov, V., & Duñabeitia, J. A. (2021). Differences in word learning in children: Bilingualism or linguistic experience? *Applied Psycholinguistics*, 42, 345–366. Doi:10.1017/S0142716420000594
11. Brice, H., Frost, S. J., Bick, A. S., Molfese, P. J., Rueckl, J. G., Pugh, K. R., & Frost, R. (2021). Tracking second language immersion across time: Evidence from a bi-directional longitudinal cross-linguistic fMRI study. *Neuropsychologia*, 154, 107796. Doi:10.1016/j.neuropsychologia.2021.107796
12. Caffarra, S., Lizarazu, M., Molinaro, N., & Carreiras, M. (2021). Reading-related brain changes in audiovisual processing: cross-sectional and longitudinal MEG evidence. *Journal of Neuroscience*, 41(27):5867–5875. Doi:10.1523/JNEUROSCI.3021-20.2021.
13. Cámara, S., Contador, I., Herrero, P., Ruisoto, P., Sánchez, A., Cuellar, L., Lopez R., Fournier M.C., & Ramos, F. (2021). The role of education in executive functions, behavioral problems and functional performance in people with schizophrenia. *Neuropsychology*, 35(4), 366-373. Doi:10.1037/neu0000679
14. Carrera Arias, F.J., Aenlle, K., Abreu, M., Holschbach, M.A., Michalovicz, L.T., Kelly, K.A., Klimas, N., O'Callaghan, J.P., & Craddock, T.J.A. (2021). Modeling Neuroimmune Interactions in Human Subjects and Animal Models to Predict Subtype-Specific Multidrug Treatments for Gulf War Illness. *International Journal of Molecular Sciences*, 22(16), 8546. Doi:10.3390/ijms22168546
15. Carrion-Castillo, A., Estruch, S.B., Maassen, B., Franke, B., Francks, C., & Fisher, S.E. (2021). Whole-genome sequencing identifies functional noncoding variation in SEMA3C that cosegregates with dyslexia in a multigenerational family. *Human Genetics*, 140(8), 1183-1200. Doi:10.1007/s00439-021-02289-w
16. Cerda-Oñate, K., Toledo Vega, G., & Ordin, M. (2021). Speech rhythm convergence in a dyadic reading task. *Speech Communication*, 131, 1-12. Doi:10.1016/j.specom.2021.04.003
17. Cespón, J. (2021). Neural processing underlying executive functions in bilinguals: "Heads I win, tails you lose". *Frontiers in Human Neuroscience*, 15:710905. Doi:10.3389/fnhum.2021.710905.
18. Contador, I., Sánchez, A., Kopelman, M. D., González de la Aleja, J., & Ruisoto, P. (2021). Accelerated forgetting in temporal lobe epilepsy: When does it occur? *Cortex*, 141, 190-200. Doi:10.1016/j.cortex.2021.03.035



19. Costello, B., Caffarra, S., Fariña, N., Duñabeitia, J.A., & Carreiras, M. (2021). Reading without phonology: ERP evidence from skilled deaf readers of Spanish. *Scientific Reports*, 11:5202. Doi:10.1038/s41598-021-84490-5
20. de Lange, P., Boto, E., Holmes, N., Hill, R. M., Bowtell, R., Wens, V., De Tiège, X., Brookes, M.J., & Bourguignon, M. (2021). Measuring the cortical tracking of speech with optically-pumped magnetometers. *NeuroImage*, 233, 117969. Doi:10.1016/j.neuroimage.2021.117969
21. Fernández-López, M., Marcet, A., & Perea, M. (2021). Does orthographic processing emerge rapidly after learning a new script? *British Journal of Psychology*, 112, 52–91. Doi:10.1111/bjop.12469
22. Ezama, L., Hernández-Cabrera, J.A., Seoane, S., Pereda, E., & Janssen, N. (2021). Functional connectivity of the hippocampus and its subfields in resting-state networks. *European Journal of Neuroscience*, 53(10), 3378–3393. Doi:10.1111/ejn.15213
23. Frances, C., Navarra-Barindelli, E., & Martin, C.D. (2021). Inhibitory and facilitatory effects of phonological and orthographic similarity on L2 word recognition across modalities in bilinguals. *Scientific Reports*, 11, 12812. Doi:10.1038/s41598-021-92259-z
24. Gau, R., Noble, S., Heuer, K., Bottenhorn, K.L., Bilgin, I.P., Yang, Y.F., Huntenburg, J.M., Bayer, J.M.M., Bethlehem, R.A.I., Rhoads, S.A., Vogelbacher, C., Borghesani, V., Levitis, E., Wang, H.T., Van Den Bossche, S., Kobeleva, X., Legarreta, J.H., Guay, S., Atay, S.M., Varoquaux, G.P., Huijser, D.C., Sandström, M.S., Herholz, P., Nastase, S.A., Badhwar, A.P., Dumas, G., Schwab, S., Moia, S., Dayan, M., Bassil, Y., Brooks, P.P., Mancini, M., Shine, J.M., O'Connor, D., Xie, X., Poggiali, D., Friedrich, P., Heinsfeld, A.S., Riedl, L., Toro, R., Caballero-Gaudes, C., Eklund, A., Garner, K.G., Nolan, C.R., Demeter, D.V., Barrios, F.A., Merchant, J.S., McDevitt, E.A., Oostenveld, R., Craddock, R.C., Rokem, A., Doyle, A., Ghosh, S.S., Nikolaidis, A., Stanley, O.W., Uruñuela, E., Anousheh, N., Arnatkeviciute, A., Auzias, G., Bachar, D., Bannier, E., Basanisi, R., Basavaraj, A., Bedini, M., Bellec, P., Benn, R.A., Berluti, K., Bollmann, S., Bollmann, S., Bradley, C., Brown, J., Buchweitz, A., Callahan, P., Chan, M.Y., Chandio, B.Q., Cheng, T., Chopra, S., Chung, A.W., Close, T.G., Combrisson, E., Cona, G., Constable, R.T., Cury, C., Dadi, K., Damasceno, P.F., Das, S., De Vico Fallani, F., DeStasio, K., Dickie, E.W., Dorfschmidt, L., Duff, E.P., DuPre, E., Dziura, S., Esper, N.B., Esteban, O., Fadnavis, S., Flandin, G., Flannery, J.E., Fournoy, J., & Forkel, S.J. The Brainhack Community. (2021). Brainhack: Developing a culture of open, inclusive, community-driven neuroscience. *Neuron*, 109(11), 1769–1775. Doi:10.1016/j.neuron.2021.04.001
25. Gisbert-Muñoz, S., Quiñones, I., Amoruso, L., Timofeeva, P., Geng, S., Boudela, S., Pomposo, I., Gil-Robles, S., & Carreiras, M. (2021). MULTIMAP: Multilingual picture naming test for mapping eloquent areas during awake surgeries. *Behavior Research Methods*, 53, 918–927. Doi:10.3758/s13428-020-01467-4.
26. Güldener, L., Jüllig, A., Soto, D., & Pollmann, S. (2021). Feature-based Attentional Weighting and Re-weighting in the Absence of Visual Awareness. *Frontiers in Human Neuroscience*, 15:610347. Doi:10.3389/fnhum.2021.610347
27. Guediche, S., de Bruin, A., Caballero-Gaudes, C., Baart, M., & Samuel, A.G. (2021). Second-language word recognition in noise: interdependent neuromodulatory effects of semantic context and crosslinguistic interactions driven by word form similarity. *NeuroImage*, 237, 118168. Doi:10.1016/j.neuroimage.2021.118168
28. Henríquez, M. B., & Fuentes, D. G. (2021). Are there differences between [ə] and [w] formants in mapudungun spoken by bilingual children from alto bío-bío? [¿Existen diferencias entre los formantes de [ə] y [w] en el mapudungun hablado por niños bilingües del Alto Bío-Bío?]. *Onomazein*, (51), 185–203. Doi:10.7764/onomazein.51.10
29. Heunis, S., Breeuwer, M., Caballero-Gaudes, C., Hellrung, L., Huijbers, W., Jansen, J. F., Lamerichs, R., Zinger, S., & Aldenkamp, A.P. (2021). The effects of multi-echo fMRI combination and rapid T2*-mapping on offline and real-time BOLD sensitivity. *NeuroImage*, 238, 118244. Doi:10.1016/j.neuroimage.2021.118244
30. Joo, S. J., Tavabi, K., Caffarra, S., & Yeatman, J. D. (2021). Automaticity in the reading circuitry. *Brain and Language*, 214, 104906. Doi:10.1016/j.bandl.2020.104906
31. Kalashnikova, M., Pejovic, J., & Carreiras, M. (2021). The effects of bilingualism on attentional processes in the first year of life. *Developmental Science*, 24:e13011. Doi:10.1111/desc.13011
32. Kapnola, E.C. (2021). On the locus of L2 lexical fuzziness: Insights from L1 spoken word recognition and novel word learning. *Frontiers in Psychology*, 12:689052. Doi:10.3389/fpsyg.2021.689052
33. Kapnola, E.C., Edwards, J., & McMurray, B. (2021). Gradient activation of speech categories facilitates listeners' recovery from lexical garden paths, but not perception of speech-in-noise. *Journal of Experimental Psychology: Human Perception and Performance*, 47(4), 578–595. Doi:10.1037/xhp0000900
34. Klimovich-Gray, A., Barrena, A., Agirre, E., & Molinaro, N. (2021). One way or another: cortical language areas flexibly adapt processing strategies to perceptual and contextual properties of speech. *Cerebral Cortex*, 31(9), 4092–4103. Doi:10.1093/cercor/bhab071



35. León, I., Rodrigo, M.J., Quiñones, I., Hernández-Cabrera, J.A., & García-Pentón, L. (2021). Distinctive frontal and occipitotemporal surface features in neglectful parenting. *Brain Sciences*, 11, 387. Doi:10.3390/brainsci11030387
36. Lerma-Usabiaga, G., Winawer, J., & Wandell, B. (2021). Population receptive field shapes in early visual cortex are nearly circular. *The Journal of Neuroscience*, 41(11):2420-2427. Doi:10.1523/JNEUROSCI.3052-20.2021.
37. Lizarazu, M., Carreiras, M., Bourguignon, M., Zarraga, A., & Molinaro, N. (2021). Language proficiency entails tuning cortical activity to second language speech. *Cerebral Cortex*, 31(8):3820-3831. Doi:10.1093/cercor/bhab051
38. Lizarazu, M., Lallier, M., Bourguignon, M., Carreiras, M., & Molinaro, N. (2021). Impaired neural response to speech edges in dyslexia. *Cortex*, 135, 207-218. Doi:10.1016/j.cortex.2020.09.033
39. Lizarazu, M., Scotto di Covella, L., van Wassenhove, V., Rivi re, D., Mizzi, R., Lehongre, K., Hertz-Pannier, L., & Ramus, F. (2021). Neural entrainment to speech and nonspeech in dyslexia: conceptual replication and extension of previous investigations. *Cortex*, 137, 160-178. Doi:10.1016/j.cortex.2020.12.024
40. Lucena G mez, G., Peigneux, P., Wens, V., & Bourguignon, M. (2021). Localization accuracy of a common beamformer for the comparison of two conditions. *NeuroImage*, 230, 117793. Doi:10.1016/j.neuroimage.2021.117793
41. Luthra, S., Peraza-Santiago, G., Beeson, K., Saltzman, D., Crinnion, A.M., & Magnuson, J.S. (2021). Robust lexically mediated compensation for coarticulation: Christmash time is here again. *Cognitive Science*, 45(4):e12962. Doi:10.1111/cogs.12962
42. Martin, C.D., & Nozari, N. (2021). Language control in bilingual production: Insights from error rate and error type in sentence production. *Bilingualism: Language and Cognition*, 24, 374–388. Doi:10.1017/S1366728920000590
43. Martorell, J. (2021). Elliot Murphy, The oscillatory nature of language. Cambridge: Cambridge University Press, 2020. Pp. xiii 321. *Journal of Linguistics*, 57(2), 453-457. Doi:10.1017/S0022226721000074
44. Moia, S., Termenon, M., Uru uela, E., Chen, G., Stickland, R. C., Bright, M. G., & Caballero-Gaudes, C. (2021). ICA-based Denoising Strategies in Breath-Hold Induced Cerebrovascular Reactivity Mapping with Multi Echo BOLD fMRI. *NeuroImage* 233, 117914. Doi:10.1016/j.neuroimage.2021.117914
45. Molinaro, N., Lizarazu, M., Baldin, V., P rez-Navarro, J., Lallier, M., & R os-L pez, P. (2021). Speech-brain phase coupling is enhanced in low contextual semantic predictability conditions. *Neuropsychologia*, 156:107830. Doi:10.1016/j.neuropsychologia.2021.107830
46. Nara, S., Lizarazu, M., Richter, C.G., Dima, D.C., Cichy, R.M., Bourguignon, M., & Molinaro, N. (2021). Temporal uncertainty enhances suppression of neural responses to predictable visual stimuli. *Neuroimage*, 239, 118314. Doi:10.1016/j.neuroimage.2021.118314
47. Ordin, M., & Polyanskaya, L. (2021). The role of metacognition in recognition of the content of statistical learning. *Psychonomic Bulletin and Review*, 28(1), 333–340. Doi:10.3758/s13423-020-01800-0
48. Ordin, M., Polyanskaya, L., & Samuel, A. (2021). An evolutionary account of intermodality differences in statistical learning. *Annals of the New York Academy of Sciences*, 1486(1), 76-89. Doi:10.1111/nyas.14502
49. Pinet, S., & Nozari, N. (2021). The role of visual feedback in detecting and correcting typing errors: A signal detection approach. *Journal of Memory and Language*, 117. Doi:10.1016/j.jml.2020.104193
50. Qui ones, I., Amoroso, L., Pomposo Gastelu, I.C., Gil-Robles, S., & Carreiras, M. (2021). What Can Glioma Patients Teach Us about Language (Re)Organization in the Bilingual Brain: Evidence from fMRI and MEG. *Cancers*, 13, 2593. Doi:10.3390/cancers13112593
51. Ries, S.K., Pinet, S., Nozari, N., & Knight, R.T. (2021). Characterizing multi-word speech production using event-related potentials. *Psychophysiology*, 58:e13788. Doi:10.1111/psyp.13788
52. Rodella, C., Cesp n, J., Repetto, C., & Pellicciari, M.C. (2021). Customized application of tDCS for clinical rehabilitation in Alzheimer's Disease. *Frontiers in Human Neuroscience*, 15:687968. Doi:10.3389/fnhum.2021.687968
53. Samuel, A.G., & Dumay, N. (2021). Auditory selective adaptation moment by moment, at multiple timescales. *Journal of Experimental Psychology: Human Perception and Performance*, 47(4), 596-615. Doi:10.1037/xhp0000841
54. Sheikh, U.A., Carreiras, M., & Soto, D. (2021). Neurocognitive Mechanisms Supporting the Generalization of Concepts Across Languages. *Neuropsychologia*, 153, 107740. Doi:10.1016/j.neuropsychologia.2020.107740

55. Stickland, R. C., Zvolanek, K. M., Moia, S., Ayyagari, A., Caballero-Gaudes, C., & Bright, M. G. (2021). A practical modification to a resting state fMRI protocol for improved characterization of cerebrovascular function. *NeuroImage*, 239, 118306. Doi:10.1016/j.neuroimage.2021.118306
56. Vergara-Martínez, M., Gutierrez-Sigut, E., Perea, M., Gil-López, C., & Carreiras, M. (2021). The time course of processing handwritten words: An ERP investigation. *Neuropsychologia*, 159, 107924. Doi:10.1016/j.neuropsychologia.2021.107924
57. Schilling, K., [...] Lerma-Usabiaga, G., [...] & Descoteaux, M. (2021). Tractography dissection variability: what happens when 42 groups dissect 14 white matter bundles on the same dataset? *Neuroimage*, 243:118502. Doi:10.1016/j.neuroimage.2021.118502
58. Yeatman, J.D., Tang, K.A., Donnelly, P.D., Yablonski, M., Ramamurthy, M., Karipidis, I.I., Caffarra, S., Takada, M. E., Kanopka, K., Ben-Shachar, M., & Domingue, B. W. (2021). Rapid Online Assessment of Reading Ability. *Scientific Reports*, 11, 6396. Doi:10.1038/s41598-021-85907-x
59. Yuksel, D., McKee, G.B., Perrin, P.B., Alzueta, E., Caffarra, S., Ramos-Usuga, D., Arango-Lasprilla, J.C., & Baker, F.C. (2021). Sleeping When The World Locks Down: Correlates Of Sleep Health During The Covid-19 Pandemic Across 59 Countries. *Sleep Health: Journal of the National Sleep Foundation*, 7(2), 134-142. Doi:10.1016/j.sleh.2020.12.008

Conference papers

1. Urnuela, E., Moia, S., & Caballero-Gaudes, C. (2021). A low rank and sparse paradigm free mapping algorithm for deconvolution of FMRI data. In 2021 IEEE 18th Proceedings - International Symposium on Biomedical Imaging, 1726-1729. Doi:10.1109/ISBI48211.2021.9433821

Book Chapters/Books

1. Fernandez-Coello, A., Gil-Robles, S., & Carreiras, M. (2021). Multilingual Naming. In E. Mandonet and G. Herbert (Eds.) *Intraoperative Mapping of Cognitive Networks* (pp. 219-231). Springer Nature. Doi:10.1007/978-3-030-75071-8_14
2. Giezen, M.R. (2021). Working memory in signers: Experimental perspectives. *The routledge handbook of theoretical and experimental sign language research* (pp. 664-684). Doi:10.4324/9781315754499-29
3. Harris, A.C., & Samuel, A.G. (2021). The suffixing preference: A preliminary report on processing affixes in georgian. *Current Issues in Linguistic Theory*, 353:14-168. Doi:10.1075/cilt.353.09har

In press

1. Betti, S., Finisguerra, A., Amoroso, L., & Urgesi, C. (In press). Contextual priors guide perception and motor responses to observed actions. *Cerebral Cortex*.
2. Biondo, N., Soilemezidi, M. & Mancini, S. (in press). Yesterday is history and tomorrow is a mystery: an eye-tracking investigation on the processing of past and future time reference during sentence reading. *Journal of Experimental Psychology: Learning, Memory and Cognition*.
3. Borrigan, M., Casaponsa, A., Antón, E., & Duñabeitia, J.A. (in press). Incidental changes in orthographic processing in the native language as a function of learning a new language late in life. *Language, Cognition and Neuroscience*. Doi:10.1080/23273798.2020.1784446
4. Bottini, R., Morucci, D'Urso, P.A., Collignon, O., & Crepaldi, D. (in press). The concreteness advantage in lexical decision does not depend on perceptual simulations. *Journal of Experimental Psychology: General*.
5. Caffarra, S. (in press). The impact of sentence context on the morphological processing of single words: electrophysiological evidence. In D. Crepaldi and G. Gaskell (Eds.): *Current issues in psychology of Language*. Routledge.
6. Caffarra, S., Joo, S. J., Bloom, D., Kruper, J., Rokem, A., & Yeatman, J. D. (in press). Development of the visual white matter pathways mediates development of electrophysiological responses in visual cortex. *Human Brain Mapping*.
7. Clark, C., Guediche, S., & Lallier, M. (In press). Compensatory cross-modal effects of sentence context on visual word recognition in adults. *Reading and Writing*. Doi:10.1007/s11145-021-10132-x
8. Davis, C.P., Paz-Alonso, P. M., Altmann, G.T.M., & Yee, E. (online 2021). Encoding and inhibition of arbitrary episodic context with abstract concepts. *Memory and Cognition*. Doi:10.3758/s13421-021-01212-y

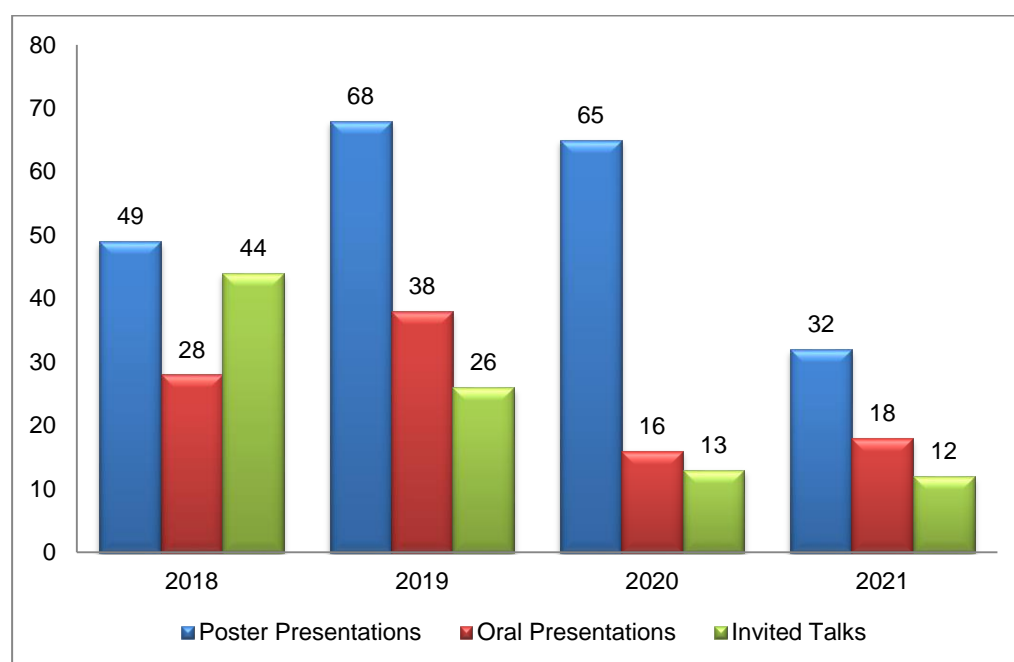


9. de Bruin, A., Dick, A., Carreiras, M. (in press). Clear theories are needed to interpret differences: Perspectives on the bilingual advantage debate. *Neurobiology of Language*. Doi:10.1162/nol_a_00038.
10. Dorsi, J., Rosenblum, L.D., Samuel, A.G., & Zadoorian, S. (in press). Selective Adaptation in Speech: Measuring the Effects of Visual and Lexical Contexts. *Journal of Experimental Psychology: Human Perception and Performance*.
11. Gosselin, L., Martin, C.D., Navarra-Barindelli, E., & Caffarra, S. (in press). The presence of a foreign accent introduces lexical integration difficulties during late semantic processing. *Language, Cognition and Neuroscience*. Doi:10.1080/23273798.2021.1909084
12. Guediche, S., & Fiez, J.A. (in press). Comprehension of Morse code predicted by item recall from working memory. *Journal of Speech, Language, and Hearing Research*.
13. Jones, C., Kalashnikova, M., Khamchuang, C., Best, C., Bowcock, E., Dwyer, A., Hammond, H., Hendy, C., Jones, K., Kaplun, C., K., Lam-Cassettari, C., Li, W., Mattock, K., Odemis, S., & Short, K. (in press). A short form version of the Australian English Communicative Development Inventory. *International Journal of Speech-Language Pathology*.
14. Kalashnikova, M., Burnham, D., & Goswami, U. (in press). The role of paired associate learning in acquiring letter-sound correspondences: A longitudinal study of children at family risk for dyslexia. *Scientific Studies of Reading*.
15. Kalashnikova, M., Onsuwan, C., & Burnham, D. (in press). Infants' sensitivity to lexical tone and word stress in their first year: A Thai and English cross-language study. *Language Learning and Development*.
16. Kocagoncu, E., Klimovich-Gray, A., Hughes, L.E., & Rowe, J.B. (in press). Evidence and implications of abnormal predictive coding in dementia. *Brain*, awab254. Doi:10.1093/brain/awab254
17. Kruper, J., Yeatman, J. D., Richie-Halford, A., Bloom, D., Grotheer, M., Caffarra, S., Kiar, G., Karipidis, I. I., Roy, E., & Rokem, A. (In press). Evaluating the reliability of human brain white matter tractometry. *Aperture*.
18. Lallier, M., Martin, C.D., Acha, J., & Carreiras, M. (In press). Cross-linguistic transfer in bilingual reading is item specific. *Bilingualism: Language and Cognition*. Doi:10.1017/S1366728921000183
19. Li, Z., Crinnion, A. M., & Magnuson, J.S. (In press). LexFindR: A fast, simple, and extensible R package for finding similar words in a lexicon. *Behavior Research Methods*.
20. Luthra, S., Li, M.Y.C., You, H., Brodbeck, C., & Magnuson, J.S. (in press 2021). Does signal reduction imply predictive coding in models of spoken word recognition? *Psychonomic Bulletin and Review*. Doi:10.3758/s13423-021-01924-x
21. Luthra, S., Saltzman, D., Myers, E.B., & Magnuson, J.S. (online 2021). Listener expectations and the perceptual accommodation of talker variability: A pre-registered replication. *Attention, Perception, & Psychophysics*. Doi:10.3758/s13414-021-02317-x
22. Molnar, M., Banon, J. A. Mancini, S., & Caffarra, S. (in press). The processing of Spanish article-noun gender agreement by monolingual and bilingual toddlers. *Language and Speech*.
23. Ostiz-Blanco, M., Bernacer, J., Garcia-Arbizu, I., Diaz-Sanchez, P., Rello, L., Lallier, M., & Arrondo, G. (in press). Improving reading through videogames and digital apps: a systematic review. *Frontiers in Psychology*. Doi:10.3389/fpsyg.2021.652948
24. Piazza, G., Calabria, C., Semenza, C., & Poletto, C. (in press). Processing of semantic and grammatical gender in Spanish speakers with aphasia. *Aphasiology*. Doi:10.1080/02687038.2021.1924355
25. Rassili, O., & Ordin, M. (in press). The effect of regular rhythm on the perception of linguistic and non-linguistic auditory input. *European Journal of Neuroscience*. Doi:10.1111/ejn.15029
26. Ray, D., Bezmaternykh, D., Mel'nikov, M., Friston, K. J., & Das, M. (in press). Altered Effective Connectivity in Sensorimotor Cortices: a Novel Signature of Severity and Clinical Course in Depression. *Proceedings of the National Academy of Sciences of the United States of America*
27. Ristic, B., Mancini, S., Molinaro, N. & Staub, A. (in press). Maintenance cost in the processing of subject-verb dependencies. *Journal of Experimental Psychology: Learning, Memory, and Cognition*.
28. Rivolta, C.L., Costello, B., & Carreiras, M. (in press). Language modality and temporal structure impact processing: sign and speech have different windows of integration. *Journal of Memory and Language*.
29. Stoehr, A., & Martin, C.D. (online 2021). Orthography affects L1 and L2 speech perception but not production in early bilinguals. *Bilingualism: Language and Cognition*. Doi:10.1017/S1366728921000523
30. Wang, L., Kalashnikova, M., Kager, R., Lai, R., & Wong, P. (in press). Lexical and prosodic pitch modifications in Cantonese infant-directed speech. *Journal of Child Language*.

Annex 6: Full list of Conference Proceedings 2018-2021

Participation in Conferences 2018-2021

	2018	2019	2020	2021	TOTAL
Poster Presentations	49	68	65	32	214
Oral Presentations	28	38	16	18	100
Invited Talks	44	26	13	12	95



2018

Poster Presentations

1. Abrahamse, E.L., Merhej, D., & Paz-Alonso, P.M. (July, 2018). Hippocampus: reading beyond the reading network. Poster presentation at the SEPEX-SEPNECA conference, Madrid, Spain.
2. Alemán Bañón, J.A., & Martin, C.D. (March, 2018). Can second language learners generate predictions at the level of the discourse? An event-related potentials study. Poster presentation at 31st CUNY Conference on Human Sentence Processing, Cuny 2018, Davis, USA.
3. Amoruso, L., & Urgesi, C. (November 15-17, 2018). Differential contribution of spatial frequency information in the comprehension of naturalistic actions. Poster presentation at the XXVI National Congress of the Italian Society for Psychophysiology, Turin, Italy.
4. Arnaez-Telleria, J., Carreiras, M., & Paz-Alonso, P.M. (March, 2018). Consolidated-like memories through testing. Poster presentation at the Cognitive Neuroscience Society (CNS 2018) annual meeting, Boston, USA.
5. Arredondo, M., May, L., Gervain, J., Carreiras, M., & Werker, J. (June, 2018). Left hemisphere specialization for familiar language at 4-months. Poster presentation at ICIS 2018, the International Congress of Infant Studies (ICIS), Philadelphia, USA.
6. Baart, M., Keetels, M., & Vroomen, J. (June, 2018). Recalibration of vocal affect by a dynamic or static face. Poster presentation at the 19th Annual International Multisensory Research Forum (IMRF), Toronto, Canada.
7. Baart, M., & Vroomen, J. (May, 2018). Lip-read speech but not sentential context produces top-up effect on lexical bias. Poster presentation at the Psychonomics International meeting, Amsterdam, the Netherlands.



8. Biondo, N., Bergamini, E., & Vespignani, F. (March, 2018). Distance matters during adverb-verb tense processing: evidence from ERPs. Poster presentation at 31st CUNY Conference on Human Sentence Processing, CUNY 2018, Davis, USA.
9. Blanco, B., Molnar, M., & Caballero-Gaudes, C. (October, 2018). Effect of prewhitening in resting state functional near infrared spectroscopy data. Poster presentation at the fNIRS 2018 biennial meeting of the Society for fNIRS, Tokyo, Japan.
10. Blanco, B., Molnar, M., Caballero-Gaudes, C., & Carreiras, M. (October, 2018). Cortical network development in monolingual and bilingual infants. Poster presentation at the fNIRS 2018 biennial meeting of the Society for fNIRS, Tokyo, Japan.
11. Burgering, M. A., Baart, M., & Vroomen, J. (June, 2018). Audiovisual recalibration and selective adaptation for vowels and speaker sex. Poster presentation at the 19th Annual International Multisensory Research Forum (IMRF), Toronto, Canada.
12. Caballero-Gaudes, C., Bandettini, P., & Gonzalez-Castillo, J. (April 5, 2018). A temporal deconvolution algorithm for multiecho functional MRI. Poster presentation at IEEE International Symposium of Biomedical Imaging, ISBI 2018, Washington DC, USA.
13. Caballero-Gaudes, C., Gonzalez-Castillo, J., & Bandettini, P. (June 16-21, 2018). Improved detection of neuronal-related BOLD events of unknown timing with Multi-Echo Sparse Paradigm Free Mapping. Poster presentation at the Annual Meeting of the International Society of Magnetic Resonance in Medicine, ISMRM 2018, Paris, France.
14. Caballero-Gaudes, C., Moia, S., Bandettini, P., & Gonzalez-Castillo, J. (September 16-20, 2018). Quantitative deconvolution of fMRI data with Multiecho Sparse Paradigm Free Mapping. Poster presentation at MICCAI 2018, Granada, Spain.
15. de Bruin, A., Kapnoula, E., & Duñabeitia, J. A. (November, 2018). Examining conflict adaptation across Stroop and semantic interference tasks: An eye-tracking study. Poster presentation at Poster presentation at the 59th Annual Meeting of the Psychonomic Society (Psychonomics 2018), New Orleans, USA.
16. de Dios-Flores, I. (September, 2018). Interference in the processing of grammatical sentences: the case of multiple negation. Poster presentation at Architectures and Mechanisms for Language Processing, AMLaP 2018, Berlin, Germany.
17. Frances, C., De Bruin, A., & Duñabeitia, J.A. (September 21-23, 2018). Learning Emotional Concepts in a Foreign or a Native Language. Poster presentation at CoNSALL Conference, Bangor, UK.
18. Geng, S., Amoruso, L., Timofeeva, P., Gil Robles, S., Pomposo, I., Molinaro, N., & Carreiras, M. (August, 2018). Oscillatory dynamics during lexico-semantic retrieval: Evidence for neuroplasticity of language in patients with left-hemisphere temporal tumors. Poster presentation at 10th Anniversary of the Society for the Neurobiology of Language (SNL 2018), Québec, Canada.
19. Gisbert-Muñoz, S., Quiñones, I., & Carreiras, M. (August, 2018). Network selectively responding to bilingual sentence comprehension vary as a function of the L2 age of acquisition. Poster presentation at the 2018 meeting of the Society for the Neurobiology of Language (SNL 2018), Québec, Canada.
20. Gonzalez-Castillo, J., Caballero-Gaudes, C., & Bandettini, P.A. (November, 2018). Pseudo-Quantitative Deconvolution of Neuronal-related BOLD events with unknown timing. Poster presentation at the 2018 annual meeting of the Society for Neuroscience (SfN 2018), San Diego, USA.
21. Guediche, S., Baart, M., & Samuel, A.G. (November 15-18, 2018). How changes in brain activity are modulated by semantic priming, crosslinguistic phonological overlap, and their interaction, during second language (L2) word recognition in noisy listening conditions. Poster presentation at Poster presentation at the 59th Annual Meeting of the Psychonomic Society (Psychonomics 2018), New Orleans, USA.
22. Guediche, S., de Bruin, A., Baart, M., & Samuel, A.G. (November 3-7, 2018). L2 word recognition in noise: modulatory effects of semantic and crosslinguistic overlap on brain activity. Poster presentation at the 2018 Meeting of the Society for Neuroscience (SfN 2018), San Diego, USA.
23. Gurunandan, K., Carreiras, M., & Paz-Alonso, P.M. (August, 2018). Neural plasticity of speech and reading networks associated with language learning. Poster presentation at the 2018 meeting of the Society for the Neurobiology of Language (SNL 2018), Québec City, Canada.
24. Gurunandan, K., Rueda, M.R., Guerra, S., Carreiras, M., & Paz-Alonso, P.M. (March, 2018). Metacognitive training induces neurodevelopmental changes in prefrontal regions. Poster presentation at the Cognitive Neuroscience Society (CNS 2018) annual meeting. Boston, USA.



25. Herrero-Roldán, S., Quiñones, I., Rodrigo, M.J., Hernandez-Cabrera, J.A., & León, I. (10-12 May, 2018). Altered crying face processing as a common neural link between childhood maltreatment and neglectful mothering. Poster presentation at the Psychonomics International meeting, Amsterdam, The Netherlands.
26. Iglesias, J.E., Insausti, R., Lerma-Usabiaga, G., Artacho-Figueroa, G., Van Leemput, K., Ourselin, S., Fischl, B., Caballero-Gaudes, C., & Paz-Alonso, P.M. (February 18 - 23, 2018). A probabilistic atlas of the thalamic nuclei combining ex vivo MRI and histology. Poster presentation at the Thalamocortical Interactions Gordon Research Conference, Lucca, Italy.
27. Jevtović, M., Duñabeitia, J. A., & de Bruin, A. (December, 2018). How do bilinguals switch between languages in different interactional contexts? Poster presentation at the Conference on Multilingualism, Ghent, Belgium.
28. Lallier, M., Martin, C., Acha, J., & Carreiras, M. (April, 2018). Bilingualism modulates the orthographic grain size: Evidence in early Basque bilingual children. Poster presentation at the International Conference of the British Dyslexia Association, Telford, UK.
29. Lerma-Usabiaga, G., Carreiras, M., & Paz-Alonso (July, 2018). Multimodal characterization of ventro-occipito-temporal reading regions. Poster presentation at the SEPEX-SEPNECA conference, Madrid, Spain.
30. Lerma-Usabiaga, G., Glozman, T., & Wandell, B. (November 3-7, 2018). Interhemispheric similarities between diffusion measures of human brain white matter tracts. Poster presentation at the 2018 Meeting of the Society for Neuroscience (SfN 2018), San Diego, USA.
31. Lindborg, A., Baart, M., & Andersen, T. S. (June, 2018). Electrophysiological evidence for differences between fusion and combination illusions in audiovisual speech perception. Poster presentation at the 19th Annual International Multisensory Research Forum (IMRF), Toronto, Canada.
32. Lopez-Zunini, R.A., Armstrong, B.C., Baart, M., & Samuel, A.G. (May, 2018). Processing dynamics of hearing and seeing words under (no) time pressure: Insights from behaviour, ERPs and mixed-effect models. Poster presentation at the Psychonomics International meeting, Amsterdam, the Netherlands.
33. Mancini, S., Wolpert, M., Scarinci, D., & Caffarra, S. (March, 2018). Impact of interlocutor identity on grammatical processing: the case of Basque allocutive. Poster presentation at 31st CUNY Conference on Human Sentence Processing, CUNY 2018, Davis, USA.
34. Mancini, S., Wolpert, M., Scarinci, D., & Caffarra, S. (September, 2018). Addressee identity and grammatical processing: the case of basque allocutive agreement. Poster presentation at Architectures and Mechanisms for Language Processing, AMLaP 2018, Berlin, Germany.
35. Marin-Garcia, E., & Paz-Alonso, P.M. (Mach, 2018). Neural interactions between memory and language: The role of language profile on semantic processing leading to true and false memories. Poster presentation at the Cognitive Neuroscience Society (CNS 2018) annual meeting. Boston, USA.
36. Martin, C., Quiñones, I., & Carreiras, M. (August, 2018). Being in love changes brain activity during speaking. Poster presentation at 10th Anniversary of the Society for the Neurobiology of Language (SNL 2018), Québec, Canada.
37. Morucci, P., Barilari, M., Collignon, O., Crepaldi, D., & Bottini, R. (May, 2018). The concreteness effect is independent of visual experience. Poster presentation at the Workshop on Concepts, Actions, and Objects (CAOS 2018), Rovereto, Italy.
38. Nara, S., Zarraga, A., Bourguignon, M., & Molinaro, N. (June 20-22, 2018). Neural correlates of Predictable and Non-Predictable targets in Visual Predictions. Poster presentation at 1st International Workshop on Predictive Processing (WoPP), Donostia-San Sebastian, Spain.
39. Navarra Barindelli, E., Caffarra, S., Guediche, S., & Martin, C.D. (July, 2018). Cognate effect in noise. Poster presentation at the SEPEX-SEPNECA conference, Madrid, Spain.
40. Ostiz-Blanco, M., Lallier, M., Grau, S., Rello, L., Bigham, J.P., & Carreiras, M. (October 22-24, 2018). Jellys: Towards a Videogame that Trains Rhythm and Visual Attention for Dyslexia. Demo presentation at the Proceedings of the 20th International ACM SIGACCESS conference on Computers & Accessibility - ASSETS '18, Galway, Ireland.
41. Ostiz-Blanco, M., Pina, A., Lizaso, M., Astráin, J.J. & Arrondo, G. (October 22-24, 2018). Using the musical multimedia tool ACMUS with people with severe mental disorders: a pilot study. Demo presentation at the Proceedings of the 20th International ACM SIGACCESS conference on Computers & Accessibility - ASSETS '18, Galway, Ireland.
42. Paz-Alonso, P.M., Gurunandan, K., & Carreiras, M. (March, 2018). Convergence of speech-print networks as a marker of language learning. Poster presentation at the Cognitive Neuroscience Society (CNS) annual meeting. Boston, US.



43. Pérez-Navarro, J., Molinaro, N., & Lallier, M. (May, 2018). Speech-brain entrainment in children at risk of Specific Language Impairment. Poster presentation at the Summer Neurolinguistics School, Moscow, Russia.
44. Perez-Serrano, C., Arnaez-Telleria, J., & Paz-Alonso, P.M. (July, 2018). Ventral and dorsal white matter pathways contributions to the testing effect. Poster presentation at the SEPEX-SEPNECA conference, Madrid, Spain.
45. Ristic, B., Mancini, S., & Molinaro, N. (June 20-22, 2018). Predicting syntax: Establishing subject-verb agreement through active maintenance. Poster presentation at 1st International Workshop on Predictive Processing (WoPP), Donostia-San Sebastian, Spain.
46. Sarrett, M., Kapnoula, E.C., & McMurray, B. (2018). Realtime integration of acoustic cues and semantic expectations in speech processing: Evidence from EEG. Poster presentation at the 176th Meeting of the Acoustical Society of America (ASA 2018), Victoria, Canada.
47. Scarinci, D., Carreiras, M., & Mancini, S. (March 15-17, 2018). Processing non-argumental dependencies: tense and aspect in Spanish. Poster presentation at 31st CUNY Conference on Human Sentence Processing, Cuny 2018, Davis, USA.
48. Sheikh, U.A., Carreiras, M., & Soto, D. (June, 2018). Decoding the Meaning of Non-conscious Words with fMRI-based MVPA. Poster presentation at 22nd Annual Meeting of the Association for the Scientific Study of Consciousness, Kraków, Poland.
49. Vespignani, F., Bergamini, E., & Biondo, N. (March, 2018). Verb class is early used during the processing of subject-verb agreement (in Italian). Poster presentation at 31st CUNY Conference on Human Sentence Processing, Cuny 2018, Davis, USA.

Oral Presentations

1. Alemán Bañón, J., & Martin, C.D. (Sept 6-8, 2018). L2 learners predict at the level of the discourse: Evidence from ERP. Oral Presentation at Architectures and Mechanisms for Language Processing, AMLaP 2018, Berlin, Germany.
2. Aguasvivas, J.A., Duñabeitia, J.A., & Carreiras, M. (August, 2018). Bilingual experience effects on statistical learning: Preliminary results. Oral presentation at Statistical Learning Workshop in Quebec City. Quebec, Canada.
3. Antzaka, A., Acha, J., Carreiras, M., Lallier, M. (April, 2018). Does morphological grain size affect the role of the Visual Attention Span in reading? Oral presentation at BDA international conference, Telford, UK.
4. Antzaka, A., Lallier, M., Carreiras, M., Valdois, S. (April, 2018). Can playing Action Video Games modulate attentional components involved in reading? Oral presentation at BDA international conference, Telford, UK.
5. Arnaez-Telleria, J., Carreiras, M., & Paz-Alonso, P.M. (November, 2018). Neurodevelopmental correlates of the testing effect. Oral presentation at the 2018 annual meeting of the Society for Neuroscience (SfN 2018), San Diego, USA.
6. Baart, M., Keetels, M., & Vroomen, J. (November, 2018). Aftereffects of Emotional Affect: Crossmodal Learning, Bias, and Adaptation. Oral presentation at the 59th Annual Meeting of the Psychonomic Society (Psychonomics 2018), New Orleans, USA.
7. Baese-Berk, M.M., & Samuel, A.G. (November 15-18, 2018). The role of timing in perceptual learning of non-native speech sounds. Oral presentation at the 59th Annual Meeting of the Psychonomic Society (Psychonomics 2018), New Orleans, USA.
8. Caballero-Gaudes, C., Moia, S., Bandettini, P., & Gonzalez-Castillo, J. (September 16-20, 2018). Quantitative deconvolution of fMRI data with Multiecho Sparse Paradigm Free Mapping. Oral presentation at MICCAI 2018, Granada, Spain.
9. Caffarra, S., Motamed Haeri, A., Michell, E. & Martin, C.D. (June, 2018). Who makes you laugh? Impact of foreign accent on irony interpretation. Oral presentation at XPRAG, Pavia, Italy.
10. Cespón, J. (February, 2018). Potencial utilidad de la estimulación magnética transcraneal en pacientes con deterioro cognitivo y enfermedad de Alzheimer. Oral presentation at X Jornadas de Neuropsicología CNC, Bilbao, Spain.
11. Costello, B. (February, 2018). Agreement in sign languages: what processing studies add to the debate on spatial grammar. Keynote talk at II Meeting on Morphosyntax of Portuguese Sign Language and other sign languages, Universidade do Porto, O Porto, Portugal.
12. Costello, B., & Carreiras, M. (April, 2018). El procesamiento de la lengua de signos española [Processing of Spanish Sign Language]. Oral presentation as part of the Panel Discussion on Signolingüística at the XXXVI



International Conference of the Spanish Association of Applied Linguistics (AESLA), Universidad de Cádiz, Cádiz, Spain.

13. de Bruin, A., & Martin, C. (December, 2018). Choosing your language: How do personal preferences and external primes affect bilingual language choice? Oral presentation at the Conference on Multilingualism, Ghent, Belgium.

14. de Bruin, A., & Della Sala, S. (July, 2018). The bilingual advantage debate: How publication biases affect the literature and systematic reviews. Oral presentation at the 20th International Congress of Linguists, Cape Town, South Africa.

15. de Dios Flores, I. (October, 2018). Interference in Sentence Processing: When Multiple Negations Render Grammatical Sentences Unacceptable. Oral presentation at the AEDEAN Conference, Córdoba, Spain.

16. Frances, C., De Bruin, A., & Duñabeitia, J.A. (July, 2018). Foreign language does not hinder learning emotional concepts. Oral presentation at the Sepex - Sepneca - Aipexperimental joint conference, Madrid, Spain.

17. Frances, C., Sevilla, Y., Planelles Almeida, M., & Duñabeitia, J.A. (September 21-23, 2018). GPS: Latin lover or naggy spouse? Science Slam presentation at CoNSALL Conference, Bangor, UK.

18. Gonzalez-Castillo, J., Caballero-Gaudes, C., & Bandettini, P. (June 16-21, 2018). Quantitative deconvolution of neuronal-related BOLD events with Multi-Echo Sparse Free Paradigm Mapping. Oral presentation at the Annual Meeting of the International Society of Magnetic Resonance in Medicine, ISMRM 2018, Paris, France.

19. Gurunandan, K., Carreiras, M., & Paz-Alonso, P.M. (August, 2018). Neural plasticity of speech and reading networks associated with language learning. Oral presentation at the 2018 meeting of the Society for the Neurobiology of Language (SNL 2018), Québec City, Canada.

20. Hoversten, L.J., & Martin, C.D. (December, 2018). Parafoveal processing in bilingual readers within and across languages. Oral presentation at the 2018 Conference on Multilingualism (COM), Ghent, Belgium.

21. Hoversten, L.J., & Traxler, M. J. (March, 2018). Zooming in on zooming out: Dynamic tuning of bilingual language control during reading. Oral presentation at 31st CUNY Conference on Human Sentence Processing, CUNY 2018, Davis, USA.

22. Lallier, M., & Ordin, M. (April, 2018). Dichotic listening: a window onto bilingualism reading development. Oral presentation at the International Conference of the British Dyslexia Association, Telford, UK.

23. Morucci, P., Barilari, M., Collignon, O., Crepaldi, D., & Bottini, R. (May, 2018). The concreteness effect is independent of visual experience. Oral presentation at the Workshop on Concepts, Actions, and Objects (CAOS 2018), Rovereto, Italy.

24. Paz-Alonso, P.M. (July, 2018). Visual imagery strengthens mnemonic control. Oral presentation at the SEPEX-SEPNECA conference, Madrid, Spain.

25. Rastle, K., Myers, E., Schapiro, A., Batterink, L.J., Armstrong, B.C., & Gareth Gaskell, M. (November 15-18, 2018). Generalization in Language and Memory. Oral presentation at the 59th Annual Meeting of the Psychonomic Society (Psychonomics 2018), New Orleans, USA.

26. Rosenthal, C.R., Mallik, I., Caballero-Gaudes, C., Sereno, M.I., & Soto, D. (June, 2018). Explicit and implicit learning of multiple concurrent higher-order sequences in human V1. Oral presentation at the 22nd Annual Meeting of the Association for the Scientific Study of Consciousness, Kraków, Poland.

27. Samuel, A.G., Choi, W., & Tong, X. (November 15-18, 2018). Better than native: Cantonese-English bilinguals outperform native English speakers on judging English lexical stress. Oral presentation at the 59th Annual Meeting of the Psychonomic Society (Psychonomics 2018), New Orleans, USA.

28. Villameriel, S. (October 26, 2018). La lengua de signos en el cerebro. Oral presentation at "De cañas con el Ateneo", Palencia, Spain.

Invited Talks

1. Aguasvivas, J.A. (March 21, 2018). Medición del léxico a través de plataformas digitales. Invited talk at Primer Encuentro Hispano-Dominicano de Alfabetización en Español, Madrid, Spain.

2. Amoroso, L. (August 26-30, 2018). Contextual effects in perceiving others' actions. Invited talk at the 41st European Conference on Visual Perception (ECVP), Trieste, Italy.

3. Baart, M. (June 13, 2018). Phonetic binding in audiovisual speech. University of Toronto, Toronto, Canada.



4. Biondo, N. (June 8, 2018). Agreement and Tense dissociation: new evidence from adults' sentence processing. Invited talk at workshop Linguistic Structure and Language Processing, 10th year anniversary of the Fondazione Marica De Vincenzi Onlus, Palazzo della Società Dante Alighieri, Roma, Italy.
5. Caballero Gaudes, C. (November 9, 2018). The importance of deconvolution for mapping the brain's time-varying activity with functional MRI: Algorithms and applications. Invited talk at a seminar in TECNUN, San Sebastian, Spain.
6. Caffarra, S. (May 10-13, 2018). The learnability of gender agreement in Spanish-Basque bilinguals and Spanish bimodal bilinguals. Invited talk at the XVIII International Morphology Meeting, Budapest, Hungary.
7. Caffarra, S. (November 24, 2018). Aprendizaje lectoescritor y su impacto en la reorganización cerebral. Invited talk at the 40th Anniversary of Fiapas Conference, Madrid, Spain.
8. Carreiras, M. (January 30, 2018). Brain Laterality and Bilingualism. Invited talk at Max-Planck-Institute, Nijmegen, the Netherlands.
9. Carreiras, M. (Marzo 3, 2018). El cerebro multilingüe. Invited talk at Ibercaja, Zaragoza, Spain.
10. Carreiras, M. (Abril 10, 2018). El cerebro bilingüe. Invited talk at Gobierno de Cantabria, Santander, Spain.
11. Carreiras, M. (Abril 17-18, 2018). El cerebro lector. Invited talk at Ministerio de Educación, Cultura y Deporte, Madrid, Spain.
12. Carreiras, M. (Abril 17-18, 2018). Dos lenguas en un cerebro. Invited talk at Ministerio de Educación, Cultura y Deporte Madrid, Madrid, Spain.
13. Carreiras, M. (June 1, 2018). Plasticidad y procesamiento en el cerebro bilingüe. Invited talk at Universitat Autònoma de Barcelona, Barcelona, Spain.
14. Carreiras, M. (June 21-23, 2018). El cerebro lector. Invited talk at ACIPE & Universidad de La Rioja, Logroño, Spain.
15. Carreiras, M. (June 22-23, 2018). Language representation and control in awake patient bilinguals. Invited talk at ELGGN, Lisbon, Portugal.
16. Carreiras, M. (July, 2018). El cerebro lector. Invited talk at Ayuntamiento de Bétera, Bétera, Spain.
17. Carreiras, M. (July, 2018). The bilingual brain: Plasticity and processing from cradle to grave. Invited talk at Huaqiao University, Xiamen, China.
18. Carreiras, M. (Septiembre 8, 2018). El cerebro lector. Invited talk at Intelexia, Ediciones Logos, Fundación INECO y Haskins Laboratories de Yale University, Buenos Aires, Argentina.
19. Carreiras, M. (Septiembre 28-29, 2018). The bilingual brain: Plasticity and processing from cradle to grave. Invited talk at Saint Petersburg State University, Saint Petersburg, Russia.
20. Carreiras, M. (Octubre, 1-2-16, 2018). Neurociencia, lenguaje y proceso educativo. Invited talk at Fundación Colegio Vizcaya Fundazioa, Bilbao, Spain.
21. Carreiras, M. (Octubre 22, 2018). La magia del lenguaje. Invited talk at El Museo de la Ciencia y el Cosmos del Organismo Autónomo de Museos y Centros del Cabildo de Tenerife, Tenerife, Spain.
22. Carreiras, M. (Octubre 28, 2018). Orthographic and lexical effects in visual recognition in Arabic. Invited talk at United Arab Emirates University, Al-Ain, Emiratos Arabes.
23. Correia, J., Carreiras, M., & Uludag, K. (October 2018). Prospects of laminar fMRI in ultra-high-field (7 tesla MRI) to unravel bottom-up and top-down representations of language. Invited talk at Sungkyunkwan University, Seoul, South Korea.
24. Costello, B. (May, 2018). Bilingüismo: lengua oral y lengua de signos. Invited talk at III Jornada sobre Audición y Lenguaje "El bilingüismo desde el desarrollo del lenguaje", Universidad de Deusto, San Sebastián, Spain.
25. de Bruin, A. (August, 2018). Language switching and inhibitory control in Spanish-Basque children and teenagers. Invited talk at the Bilingual Education Research Conference, Berlin, Germany.
26. Frances, C. (November, 2018). El impacto de las neurociencias en la investigación y la enseñanza de ELE: Las emociones en la lengua extranjera y su impacto en el aprendizaje. Invited talk at the IV Congreso Sicele, Rosario, Argentina.
27. Frances, C. (February, 2018). Introduction to OpenSesame Workshop. Invited talk at Bangor University, Wales, UK.



28. Galparsoro, N. (March 1, 2018). Construcción de una batería de evaluación para TEL. Invited talk at Congreso de la FANPSE, Valencia, Spain.
29. Lallier, M. (January 18, 2018). How does the sensitivity to rhythm shape the reading brain? Keynote speaker in the symposium "It's all about time: Auditory processing, speech perception, and reading", at ExpORL, Dept. Neurosciences, Leuven University, Leuven, Belgium.
30. Lallier, M. (May, 2018) Bilingüismo y Desarrollo del lenguaje Escrito. Keynote speaker at III Jornada sobre Audición y Lenguaje "El bilingüismo desde el desarrollo del lenguaje", Universidad de Deusto, San Sebastián, Spain.
31. Lallier, M. (May, 2018). Attention Auditive, Attention Dynamique et Troubles de Apprentissages. Keynote speaker at 6ème Congrès de la SOFTAL "Attention et Apprentissages, Approches Innovantes et Nouvelles Technologies". Université Grenoble-Alpes, Grenoble, France.
32. Martin, C.D. (May, 2018). Prediction in sentence comprehension. Invited talk at Centre for Research on Bilingualism, Stockholm University, Stockholm, Sweden.
33. Martin, C.D. (November 29, 2018). Language comprehension in accented speech. Invited talk at Distinguished Speaker Series, Pennsylvania State University's Centre for Language Science, Pennsylvania, USA.
34. Molinaro, N. (March 7, 2018). Delta vs. theta speech entrainment: MEG evidence from typical and atypical language users. Invited talk at IMPRS NeuroCom Lecture Series, Max Planck Institute for Human Cognitive and Brain Sciences, Munich, Germany.
35. Ostiz-Blanco, M. (June, 2018). Abordando la dislexia de un modo indirecto. Invited talk at "Herramientas tecnológicas frente a la dislexia", Instituto de Cultura y Sociedad, Universidad de Navarra, Pamplona, Spain.
36. Paz-Alonso, P.M. (July, 2018). Converging evidence for a functional and structural segregation within the left ventral occipitotemporal cortex in reading. Invited talk at the International Forum of Brain and Language, Huaqiao University, Quanzhou, China.
37. Paz-Alonso, P.M. (December, 2018). Converging evidence for a functional and structural segregation within the left vOTC in reading. Invited talk at the "V Encuentro Vasco-Chileno en Investigación Biomédica, Santiago, Chile.
38. Paz-Alonso, P.M. (December, 2018). Developmental trajectories of human thalamic nuclei and its relation to cognitive development. Invited talk at "Talleres de Trabajo con Estudiantes de Doctorado y Pregrado", Facultad de Medicina, Pontificia Universidad Católica de Chile, Santiago, Chile.
39. Paz-Alonso, P.M. (July, 2018). Differential reading and speech functional dynamics for highly contrasting languages. Invited talk at the National Taiwan Normal University, Taipei, Taiwan.
40. Quiñones I. (2018). Las emociones y el cerebro. Nuerociencia y Educación. Invited talk at KRISTAU ESKOLA, Bilbao, Spain.
41. Quiñones I., Duñabeitia J., & Carreiras M. (March 20, 2018). Cambios cerebrales asociados a la alfabetización de adultos. Invited talk at Nebrija University, Madrid, Spain.
42. Soto, D. (2018). Can non-conscious representations support high-level cognition? Invited talk at NeuroSpin, École des Neurosciences, Paris, France.
43. Stoehr, A., Benders, T., van Hell, J., & Fikkert, P. (July 26-27, 2018). What affects bilingual children's speech production? Evidence on the role of perception and accented input on Dutch-German bilingual children's VOTs. Invited talk at Current Issues in Child Bilingual Development, Macquarie University, North Ryde, Australia.
44. Villameriel, S. (April 13, 2018). La investigación en bilingües bimodales. Invited talk at Universidad de Oviedo, Oviedo, Asturias.

2019

Poster Presentations

1. Aguasvivas, J.A., Duñabeitia, J.A., & Carreiras, M. (April, 2019). Does previous linguistic experience facilitate novel language learning? Poster presentation at the Groningen Spring School on Cognitive Modeling, Groningen, The Netherlands.
2. Aguasvivas, J.A., Duñabeitia, J.A., & Carreiras, M. (September, 2019). Does bilingual experience facilitate novel morphology learning? Poster presentation at the AMLAP conference, Moscow, Russia.
3. Alcalá-López, D., & Soto, D. (June, 2019). Brain representations of social knowledge during mental simulation. Poster presentation at Human Brain Mapping (2019 OHBM), Rome, Italy.
4. Ansorena, X., Hernández, M., Carreiras, M., Quemada, J.I., & Mancini, S. (September 24-26, 2019). Short Term Memory and sentence processing in deep dysphasia. Poster presentation at 20th Science of Aphasia Conference, Rome, Italy.
5. Arnaez-Telleria, J., Mezer, A., & Paz-Alonso, P.M. (June, 2019). Neurodevelopmental changes in qMRI measures in hippocampal and cortical regions. Poster presentation at Human Brain Mapping (2019 OHBM), Rome, Italy.
6. Arnaez-Telleria, J. & Paz-Alonso, P.M. (March, 2019). Developmental changes and neural correlates of associative, spatial and temporal relational memory. Poster presentation at the Cognitive Neuroscience Society (CNS 2019) annual meeting. San Francisco, USA.
7. Bañón, J.A., & Martin, C.D. (August, 2019). Examining prediction at the level of the discourse: An ERP study. Poster presentation at the Eleventh Annual Meeting of the Society for the Neurobiology of Language (SNL 2019), Helsinki, Finland.
8. Bergouignan, L., Carreiras, M., & Paz-Alonso, P.M. (June, 2019). Our Inner-Speech Language interacts with Our Reality Tag in the Episodic Hippocampal System. Poster presentation at Human Brain Mapping (2019 OHBM), Rome, Italy.
9. Biondo, N., & Mancini, S. (August, 2019). The grammaticalization of different relations during adult second language (L2) acquisition. Poster presentation at the Eleventh Annual Meeting of the Society for the Neurobiology of Language (SNL 2019), Helsinki, Finland.
10. Biondo, N., & Mancini, S. (September, 2019). Tense-agreement dissociation in adult second language (L2) acquisition. Poster presentation at the Brain, Language & Learning conference, Siena, Italy.
11. Borrigan, M. (September, 2019). Changes throughout age in sensitivity to markedness. Poster presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
12. Caffarra, S., Haeri, A. M., Michell, E., & Martin, C.D. (March, 2019). When is irony influenced by communicative constraints? ERP evidence supporting interactive models. Poster presentation at 32nd Annual CUNY Conference on Human Sentence Processing (CUNY 2019), Colorado Boulder, USA.
13. Caffarra, S., Gonzalez, A., & Martin, C.D. (March, 2019). Syntactic interlanguage speech benefit: an ERP study. Poster presentation at 32nd Annual CUNY Conference on Human Sentence Processing (CUNY 2019), Colorado Boulder, USA.
14. Clark, C., Guediche, S., & Lallier, M. (October, 2019). Cross-modal effects of sentence context on visual word recognition in adults. Poster presentation at the International Workshop on Reading and Developmental Dyslexia, San Sebastian, Spain.
15. Costello, B., Giezen, M., Stutzman, L., Sampedro, M.A., Villameriel, S., & Carreiras, M. (September, 2019). Effects of familiarity, iconicity and phonological density in the LSE lexicon. Poster presentation at TISLR13 (Theoretical Issues in Sign Language Research), Hamburg, Germany.
16. de-Dios-Flores, I., Mancini, S., Acuña-Fariña, C. & Carreiras, M. (April, 2019). Eye-tracking the use of control information in null subject-antecedent dependencies. Poster presentation at the XIV International Symposium of Psycholinguistics, Tarragona, Spain.
17. Dueme, F., Stoeck, A., & Martin, C.D. (June, 2019). Does the orthography of a new L2 impact L1 production and perception? Poster presentation at the L2 Pronunciation Research Workshop (l2prw2019), Barcelona, Spain.
18. Dumay, N., & Nash, A. (September, 2019). Sleep makes perceptual memories more accessible: Evidence from Reicher-Wheeler. Poster presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
19. Frances, C., De Bruin, A., & Duñabeitia, J.A. (July, 2019). The effects of language and emotional context on learning. Poster presentation at SAMBA Conference, Salzburg Austria.



20. Frances, C., De Bruin, A., & Duñabeitia, J.A. (September, 2019). The Influence of Emotional and Foreign Language Context in Learning. Poster presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
21. Frances, C., Martin, C.D., De Bruin, A., & Duñabeitia, J.A. (November, 2019) The effects of contextual factors on learning in a native and a foreign language. Poster presentation at PhDay, Universidad Complutense de Madrid, Madrid, Spain.
22. Ferrer-Gallardo, V., Delgado, M., Navalpotro, I., Moia, S., Carreiras, M., Rodriguez-Oroz, M.C., & Caballero-Gaudes, C. (June, 2019). Impact of mild cognitive impairment in Parkinson's disease in the Functional connectome. Poster presentation at Human Brain Mapping (2019 OHBM), Rome, Italy.
23. Frances, C., Navarra-Barindelli, E., & Martin, C.D. (September, 2019). Oral Cognates. Poster presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
24. Furgoni, A., Stoehr, A., Dueme, F., & Martin, C. (October 2-4, 2019). Orthographic Consistency Effect: Evidence at the phonemic level. Poster presentation at International Workshop on Reading and Developmental Dyslexia, Donostia-San Sebastian, Spain.
25. Geng, S., Amoroso, L., Molinaro, N., & Carreiras, M. (August, 2019). Spatio-temporal dynamics of noun and verb naming in early bilinguals. Poster presentation at the Eleventh Annual Meeting of the Society for the Neurobiology of Language (SNL 2019), Helsinki, Finland.
26. Gisbert-Muñoz, S., Quiñones, I., Amoroso, L., Pomposo, I., Gil-Robles, S., & Carreiras, M. (September, 2019). MULTIMAP: Multilingual visual naming test for the mapping of eloquent areas during awake surgeries. Poster presentation at conference of the European Society for Cognitive Psychology (ESCOP 2019), Tenerife, Spain.
27. Guediche, S., de Bruin, A., Caballero-Gaudes, C., Baart, M., & Samuel, A.G. (August, 2019). Modulation of functional connections from temporal cortex during second language word recognition in noise: does L2 - L1 phonological similarity matter? Poster presentation at the Eleventh Annual Meeting of the Society for the Neurobiology of Language (SNL 2019), Helsinki, Finland.
28. Gurunandan, K., Carreiras, M., & Paz-Alonso, P.M. (March, 2019). Differential neuroplasticity of language systems in adult language acquisition. Poster presentation at the Cognitive Neuroscience Society (CNS 2019) annual meeting. San Francisco, USA.
29. Gurunandan, K., Ibarbia, M., Carreiras, M., & Paz-Alonso, P.M. (March, 2019). Structural changes induced by creativity training. Poster presentation at the Society for Neuroscience of Creativity (SfNC 2019) annual meeting. San Francisco, USA.
30. Gurunandan, K., Ibarbia, M., Carreiras, M., & Paz-Alonso, P.M. (June, 2019). Structural correlates of creativity training in chefs. Poster presentation at Human Brain Mapping (2019 OHBM), Rome, Italy.
31. Hartzell, J.F., & Paz-Alonso, P.M. (August, 2019). Tip-of-the-Tongue: A window into neural interactions between memory and language systems. Poster presentation at the Eleventh Annual Meeting of the Society for the Neurobiology of Language (SNL 2019), Helsinki, Finland.
32. Hoversten, L.J., & Traxler, M.J. (November, 2019). Asymmetric switch costs accompanied by symmetric suppression of the alternate language during bilingual reading. Poster presentation at the Psychonomic Society Meeting, Montreal, Canada.
33. Ibarbia, M., Gurunandan, K., Carreiras, M., & Paz-Alonso, P.M. (March, 2019). Functional contributions to general and specific creative problem solving. Poster presentation at the Society for Neuroscience of Creativity (SfNC 2019) annual meeting. San Francisco, USA.
34. Ibarbia, M., & Paz-Alonso, P.M. (March, 2019). Magnocellular and parvocellular contributions to reading. Poster presentation at the Cognitive Neuroscience Society (CNS 2019) annual meeting. San Francisco, USA.
35. Ibarbia, M., & Paz-Alonso, P.M. (June, 2019). Magnocellular and parvocellular contributions to visual object and word recognition. Poster presentation at Human Brain Mapping (2019 OHBM), Rome, Italy.
36. Kalashnikova, M., Goswami, U., & Burnham, D. (September, 2019). Infant directed speech to infants at family risk for dyslexia. Poster presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
37. Kalashnikova, M., Goswami, U., & Burnham, D. (June, 2019). Infant-directed speech and parent-directed signals in interactions with infants at family risk for dyslexia. Poster presentation at the Workshop on Infant Language Development (WILD), Potsdam, Germany.
38. Kapnola, E.C., & Samuel, G.A. (April, 2019). Disentangling the effects of production and speaker variability on word learning. Poster presentation at the XIV International Symposium of Psycholinguistics (ISP 2019), Tarragona, Spain.

39. Kapnoula, E.C., & Samuel, A.G. (November, 2019). Does saying a new word out loud help to learn it better? Poster presentation at the 60th Annual Meeting of the Psychonomic Society, Montreal, Canada.
40. Kapnoula, E.C., & Samuel, A.G. (September, 2019). Does saying a new word out loud help to learn it better? Disentangling the effects of production and speaker variability on word learning. Poster presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
41. Kartushina, N., & Martin, C. (August, 2019). Dynamic changes in bilingual production as a function of L3-English use: Insights from a longitudinal study in Spanish-Basque Erasmus students. Poster presentation at New Sounds 2019, Tokyo, Japan.
42. Lerma-Usabiaga, G., Mukherjee, P., Ren, Z., Perry, M., & Wandell, B. (June, 2019). Replication and generalization in applied neuroimaging. Poster presentation at Human Brain Mapping (2019 OHBM), Rome, Italy.
43. Liu, M., Wang, X., Zhang, X., Zhang, R., Paz-Alonso, P.M., & Yang, J. (August 20-22, 2019). Semantic Integration During Language Comprehension in Natural Contexts. Poster presentation at the Eleventh Annual Meeting of the Society for the Neurobiology of Language (SNL 2019), Helsinki, Finland.
44. Ludowicy, P., Arnaez-Telleria, J., Gurunandan, K., Czernochowski, D., Lachmann, T., & Paz-Alonso, P.M. (June, 2019). Neural modulation of the Testing Effect via test-potentiated encoding with feedback. Poster presentation at Human Brain Mapping (2019 OHBM), Rome, Italy.
45. Ludowicy, P., Paz-Alonso, P.M., Lachmann, T., & Czernochowski, D. (September, 2019). Performance feedback enhances test potentiated encoding: An event-related potential study on the testing effect. Poster presentation at the 21st ESCoP conference, Tenerife, Spain.
46. Martin, C.D., Goddard, K., Koutsogiannaki, M., & Kartushina, N. (August, 2019). Optimization in non-native speech sound production. Poster presentation at the Eleventh Annual Meeting of the Society for the Neurobiology of Language (SNL 2019), Helsinki, Finland.
47. Martin, C.D., & Nozari, N. (April, 2019). Language control in bilingual word production: Insights from error rate and error type in sentence production. Poster presentation at the XIV International Symposium of Psycholinguistics (ISP 2019), Tarragona, Spain.
48. Martorell, J., Alhama, R.G., Molinaro, N., & Mancini, S. (April, 2019). Predictive generation of syntax during sentence reading. Poster presentation at the XIV International Symposium of Psycholinguistics (ISP 2019), Tarragona, Spain.
49. Martorell, J., Alhama, R.G., Molinaro, N., & Mancini, S. (June, 2019). Preactivating syntactic information during reading. Poster presentation at Psycholinguistics in Iceland – Parsing and Prediction conference, Reykjavík, Iceland.
50. Mei, N., Sheikh, U., Santana, R., & Soto, D. (September, 2019). How the brain encodes meaning: Comparing word embedding and computer vision models to predict fMRI data during visual word recognition. Poster presentation at 2019 Conference on Cognitive Computational Neuroscience, Berlin, Germany.
51. Mei, N., & Soto, D. (September, 2019). Predicting human prospective beliefs and decisions to engage using multivariate classification analyses of behavioural data. Poster presentation at 2019 Conference on Cognitive Computational Neuroscience, Berlin, Germany.
52. Moia, S., Termenon, M., Uruñuela, E., Bright, M. G., & Caballero-Gaudes, C. (September, 2019). Comparison of ICA-based denoising approaches in breath-holding task with ME-fMRI data. Poster presentation at the ICP Network Symposium: Physiological and Functional MRI of the Brain: Emerging Techniques and Clinical Applications, Baltimore, USA.
53. Morucci, P., Giannelli, F., & Molinaro, N. (March, 2019). Native language affects visual processing by activating categorical template of objects via the modulation of alpha oscillations. Poster presentation at the Cognitive Neuroscience Society (CNS 2019) annual meeting. San Francisco, USA.
54. Morucci, P., Martin, C.D., & Molinaro, N. (September 2019). Language experience affects prediction during auditory rhythm perception. Poster presentation at the predictive brain conference, Marseille, France.
55. Muller, H., de-Dios-Flores, I., & Phillips, C. (March, 2019). Not (just) any licensors cause negative polarity illusions. Poster presentation at 32nd Annual CUNY Conference on Human Sentence Processing (CUNY 2019), Colorado Boulder, USA.
56. Navarra-Barindelli, E., Guediche, S., Caffarra, S., & Martin, C.D. (September, 2019). The Cognate Effect in Noise. Poster presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
57. Ordin, M., Polyanskaya, L., Gomez, D., & Samuel, A.G. (April 24-26, 2019). Universality and linguistic experience in the perception of speech rhythm, and its relevance for speech evolution. Poster presentation at the 14th European Human Behaviour and Evolution Association Conference, Toulouse, France.

58. Ordin, M., Polyanskaya, L., & Soto, D. (September, 2019). Neural bases of statistical learning in artificial language. Poster presentation at the AMLAP conference, Moscow, Russia.
59. Pérez-Navarro, J., Molinaro, N., & Lallier, M. (September, 2019). Is the amount of exposure a good predictor of language development? Evidence from a bilingual population. Poster presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
60. Pérez-Navarro, J., Molinaro, N., & Lallier, M. (September, 2019). Exploring the relationship between speech-brain entrainment and language development in children at risk of developmental language disorder. Poster presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
61. Polyanskaya, L., Ordin, M., Gomez, D., & Samuel, A.G. (September, 2019). Universality and linguistic experience in the perception of speech rhythm. Poster presentation at the AMLAP conference, Moscow, Russia.
62. PourHashemi, F., Baart, M., & Vroomen, J. (December 19-21, 2019). Auditory learning of noise vocoded speech by lip-read information: Does reading skill matter? Poster presentation at the 17th Winterconference on Brain and Cognition (NVP), Egmond aan Zee, the Netherlands.
63. Quiñones, I., Molinaro, N., Caballero-Gaudes, C., Mancini, S., Barber, H., & Carreiras, M. (June, 2019). Integrating form and meaning in the left angular gyrus. Poster presentation at Human Brain Mapping (2019 OHBM), Rome, Italy.
64. Sheikh, U. A., Carreiras, M., & Soto, D. (June, 2019). Brain Mechanisms Underlying Generalization of Concepts Across Languages. Poster presentation at Human Brain Mapping (2019 OHBM), Rome, Italy.
65. Timofeeva, P., Amoroso, L., & Carreiras, M. (September, 2019). Investigating the time course of bilingual and monolingual linguistic control mechanisms: An MEG study. Poster presentation at the AMLAP conference, Moscow, Russia.
66. Timofeeva, P., Amoroso, L., & Carreiras, M. (August, 2019) Spatiotemporal signatures of linguistic control mechanisms in bilingual and monolingual contexts. Poster presentation at the Eleventh Annual Meeting of the Society for the Neurobiology of Language (SNL 2019), Helsinki, Finland.
67. Uruñuela-Tremiño, E., Moia, S., Zheng, C., González-Castillo, J., & Caballero-Gaudes, C. (May 15, 2019). Deconvolution of multi-echo functional MRI data with Multivariate Multi-Echo Sparse Paradigm Free Mapping. Poster presentation at the Annual Meeting of International Society Magnetic Resonance in Medicine, (ISMRM 2019), Montreal, Canada.
68. Williams, L., Kapnoula, E., & de Bruin, A. (March, 2019). Bilingual language mode is flexible: Evidence from a lexical decision task. Poster presentation at the 3rd Biennial International Convention of Psychological Science, Paris, France.

Oral Presentations

1. Aguasvivas, J.A., Duñabeitia, J.A., & Carreiras, M. (September, 2019). "Txakurra" is "perro" but also "dog": How input variability impacts bilingual language learning in different contexts. Oral presentation at the 6th Barcelona Summer School on Bilingualism and Multilingualism, Barcelona, Spain.
2. Amoroso, L., Molinaro, N., Geng, S., Quiñones, I., Timofeeva, P., Gisbert-Muñoz, S., Gil-Robles, S., Pomposo, I., & Carreiras, M. (June, 2019). Noun-verb dissociation in the brain: MEG evidence from healthy participants and patients with slow-growing brain tumors. Oral presentation at European Low Grade Glioma Network Meeting (ELGGN 2019), London, UK.
3. Amoroso, L., Molinaro, N., Geng, S., Quiñones, I., Timofeeva, P., Gisbert-Muñoz, S., Gil-Robles, S., Pomposo, I., & Carreiras, M. (September, 2019). An oscillatory model of noun-verb dissociations: MEG evidence from healthy participants and brain tumor patients. Oral presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
4. Baart, M., López Zunini, R.A., Samuel, A. G., & Armstrong, B.C. (December 19-21, 2019). Lexico-semantic access and audiovisual integration in the aging brain: Insights from single trial Event-Related Potentials. Oral presentation at the 17th Winterconference on Brain and Cognition (NVP), Egmond aan Zee, the Netherlands.
5. Biondo, N., Bergamini, E., & Vespignani, F. (June, 2019). An ERP study on the effect of distance during the processing of temporal concord violations. Oral presentation at Experimental Psycholinguistics Conference. Palma de Mallorca, Spain.
6. Borrigan, M. (August, 2019). Morpho-functional changes in the glottis after breathing in air with humidity. Oral presentation at Congress of the The Pan-European Voice Conference (Pevoc), Copenhagen, Denmark.
7. Cholin, J., Abad Bruzzo, K.F., Jorschick, A.B., & Carreiras, M. (September 2019). Proficiency shapes the representation and access of syllabic motor programs in bilingual speakers: Syllable-frequency effects in early



high-proficient Spanish-Basque bilinguals and late low-proficient Spanish-German bilinguals. Oral presentation at 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.

8. de Bruin, A., & Martin, C. (April, 2019). Bilingual language choice is affected by external primes and individual language preferences. Oral presentation at the XIV International Symposium of Psycholinguistics (ISP 2019), Tarragona, Spain.

9. Dumay, N., & Nash, A. (November, 2019). Sleep makes perceptual memories more accessible: Evidence from Reicher-Wheeler. Oral presentation at the 60th Annual Meeting of the Psychonomic Society, Montreal, Canada.

10. Dumay, N., Nash, A., & Starr, L. (September, 2019). Setting the alarm while you sleep. Oral presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.

11. Frances, C., De Bruin, A., & Duñabeitia, J.A. (April, 2019). The Influence of Emotional and Foreign Language Context in Learning. Oral presentation at the XIV International Symposium of Psycholinguistics (ISP 2019), Tarragona, Spain.

12. Frances, C., Martin, C., & Duñabeitia, J.A. (September, 2019). The effects of contextual diversity on foreign and native language vocabulary learning. Oral presentation at the 6th Barcelona Summer School on Bilingualism and Multilingualism, Barcelona, Spain.

13. Frances, C., Thierry, G., & Duñabeitia, J.A. (September, 2019). Investigating strategic language choice in fluent bilinguals during a deception inducing game. Oral presentation at the 6th Barcelona Summer School on Bilingualism and Multilingualism, Barcelona, Spain.

14. Furgoni, A., Stoehr, A., Dueme, F., & Martin, C.D. (November 28-29, 2019). The Orthographic Consistency Effect in language perception: Evidence at the phonemic level. Oral presentation at 1st International Conference for Young Researchers in Cognitive Linguistics (YRCL1), Madrid, Spain.

15. Guediche, S., & Caffarra, S. (September, 2019). Auditory comprehension under adverse listening conditions. Symposium at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.

16. Gisbert-Muñoz, S., Quiñones, I., Amoroso, L., Pomposo, I., Gil-Robles, S., & Carreiras, M. (June, 2019). MULTIMAP: Multilingual visual naming test for the mapping of eloquent areas during awake surgeries. Oral presentation at European Low Grade Glioma Network Meeting (ELGGN 2019), London, UK.

17. Heinzová, P., Carreiras, M. & Mancini, S. (May, 2019). Argument structure processing in bilingual speakers. Oral presentation at Psycholinguistics in Flanders workshop 2019, Antverps, Belgium.

18. Kalashnikova, M. (March, 2019). The acquisition of word learning strategies by monolingual and bilingual toddlers. Oral presentation at the Biannual Meeting of the Society for Research on Child Development (SRCD), Baltimore, USA.

19. Kalashnikova, M. (April, 2019). Acoustic qualities of bilingual infant directed speech. Oral presentation at the XIV International Symposium of Psycholinguistics (ISP 2019), Tarragona, Spain.

20. Kalashnikova, M. (June, 2019). Exaggerated prosody in infant directed speech facilitates infants' predictions of conversational turns. Oral presentation at the Workshop on Infant Language Development (WILD), Potsdam, Germany.

21. Kalashnikova, M. & Carreiras, M. (September, 2019). Early speech perception development in Spanish-Basque bilingual infants. Oral presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.

22. Kapnoula, E.C., & McMurray, B. (2019). What can continuous responses tell us about phoneme categorization? Oral presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.

23. Klimovich-Gray, A. (April, 2019). Domain-general and domain-specific processes in spoken word recognition. Oral presentation at the XIV International Symposium of Psycholinguistics (ISP 2019), Tarragona, Spain.

24. Mancini, S., Paz-Alonso, P., & Carreiras, M. (September, 2019). The cortical representation of left and right branching: evidence from Spanish and Basque. Oral presentation at Brain, Language & Learning Conference, Siena, Italy.

25. Martin, C.D. (April, 2019). Prediction in bilingualism: Lexical anticipation in L2 comprehension and in accented L1 comprehension. Oral presentation in Memoriam of Albert Costa. The XIV International Symposium of Psycholinguistics (ISP 2019), Tarragona, Spain.

26. Martin, C.D., & Scharff, C. (September 28, 2019). Communication Systems Across Species: How Research on Animals Inspires Research on Humans. Symposium at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.



27. Martin, C.D., Quinones, I., & Carreiras, M. (September, 2019). Humans speak as birds sing: Socially-mediated brain activity in language production. Oral presentation at the 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
28. Ordin, M., Polyanskaya, L., & Soto, D. (September, 2019). Metacognitive processing in statistical learning is modulated by bilingualism. Oral presentation at the AMLAP conference, Moscow, Russia.
29. Polyanskaya, L., Samuel, A., & Ordin, M. (April 24-26, 2019). Isochrony and meter convergence in speech as coalition signals. Oral presentation at the 14th European Human Behaviour and Evolution Association Conference, Toulouse, France.
30. Quiñones, I., Amoruso, L., Gisbert-Muñoz, S., Pomposo, I., Gil-Robles, S., & Carreiras, M. (June, 2019). Neural capacity to negotiate L1 and L2 language information after the removal of a language hub. Oral presentation at European Low Grade Glioma Network Meeting (ELGGN 2019), London, UK.
31. Quiñones, I., Molinaro, N., Caballero, C., Mancini, S., Hernández-Cabrera, J.A., Barber, H.A., & Carreiras, M. (September, 2019). Integrating form and meaning in the left parietal cortex. Oral presentation at 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
32. Ristic, B., Mancini, S., Molinaro, N., & Staub, A. (June, 2019). Maintain to pre-activate: Is subject-verb dependency proactive? Oral presentation at Psycholinguistics in Iceland – Parsing and Prediction conference, Reykjavík, Iceland.
33. Ristic, B., Mancini, S., Molinaro, N., & Staub, A. (April, 2019). Maintaining long-distance subject-verb dependency in sentence comprehension. Oral presentation at The XIV International Symposium of Psycholinguistics (ISP 2019), Tarragona, Spain.
34. Rivolta, C., Costello, B., & Carreiras, M. (September, 2019). Más allá del espacio: explorando la dimensión del tiempo en LSE. Oral presentation at the Congreso CNLSE 2019, Madrid, Spain.
35. Samuel, A.G. (November 17, 2019). Linguists are brilliant, but psycholinguists should be wary of shiny linguistic units. Oral presentation at the 60th Annual Meeting of the Psychonomic Society, Montreal, Canada.
36. Samuel, A.G., Choi, W., & Tong, X. (January 3-5, 2019). Better than native: Cantonese-English bilinguals outperform native English speakers on judging English lexical stress. Oral presentation at Auditory Cognitive Neuroscience Society, Florida, USA.
37. Scarinci, D., Carreiras, M., & Mancini, S. (April, 2019). A matter of time: parser sensitivity to time-related grammatical categories in Spanish. Oral presentation at the XIV International Symposium of Psycholinguistics (ISP 2019), Tarragona, Spain.
38. Uruñuela-Tremiño, E., Moia, S., Zheng, C., González-Castillo, J., & Caballero-Gaudes, C. (May 15, 2019). Deconvolution of multi-echo functional MRI data with Multivariate Multi-Echo Sparse Paradigm Free Mapping. Oral presentation at the Annual Meeting of International Society Magnetic Resonance in Medicine, (ISMRM 2019), Montreal, Canada.

Invited Talks

1. Biondo, N. (June, 2019). Are all concord relations grammaticalized in the same way during (adult) second language (L2) acquisition? Invited talk at the University of Trento, Rovereto, Italy.
2. Caballero-Gaudes, C. (May 11, 2019). Preprocessing. Invited talk at Educational Course "fMRI: Back to Basics" at Annual Meeting of International Society Magnetic Resonance in Medicine, ISMRM 2019, Montreal, Canada.
3. Caffarra, S. (February, 2019). The impact of speaker and addressee identity on sentence analysis. Invited talk at the "Giornate di Studi Scientifici sul Liguaggio", Rovereto, Italy.
4. Carreiras, M. (March, 2019). The Literate Brain. Invited talk at the Mind-Brain College of Universidade de Lisboa, Lisboa, Portugal.
5. Carreiras, M. (April, 2019). Neurociencia, lenguaje y proceso educativo. Invited talk at the Cátedra TECNOEDU de la Universidad de La Laguna, Tenerife, Spain.
6. Carreiras, M. (April, 2019). Neurociencia, lenguaje y proceso educativo. Invited talk at the Cátedra TECNOEDU de la Universidad de La Laguna, Las Palmas, Spain.
7. Carreiras, M. (April, 2019). The Literate Brain. Invited talk at XIV International Symposium of Psycholinguistics (ISP 2019), Tarragona, Spain.
8. Carreiras, M. (May, 2019). The Literate Brain. Invited talk at a Seminary. Beijing, China.



9. Carreiras, M. (May, 2019). Mechanisms of agreement. Invited talk at a Seminary. Beijing, China.
10. Carreiras, M. (May, 2019). The bilingual brain: Plasticity and processing from cradle to grave. Invited talk at a Seminary. Beijing, China.
11. Carreiras, M. (July, 2019). Neurociencia, lenguaje y proceso educativo. Invited talk at Jornadas 2019: ¿Estamos a la altura de los niños con diferencias de aprendizaje?. Fundación Ricardo Fisas Natura Bissé. Sant Cugat, Barcelona, Spain.
12. Carreiras, M. (September, 2019). Two Languages in one Brain. Invited talk at 21st ESCoP conference (ESCoP 2019), Tenerife, Spain.
13. Carreiras, M. (October, 2019). Las ilusiones del lenguaje. Invited talk at Semana de la Ciencia UPV/EHU. Bilbao, Spain.
14. Cespón, J. (March, 2019). Neuroplasticity in elderly during physiological and pathological ageing. Invited talk at II JORNADA SEMEG ACTUALIZACIÓN EN EL MANEJO DE LAS PERSONAS MAYORES QUE SUFREN CAÍDAS. ¿SON LAS CAÍDAS EL PRIMER SIGNO DE FALLO COGNITIVO? SEMEG Sociedad Española de Medicina Geriátrica, Madrid, Spain.
15. de Bruin, A. (June, 2019). How do bilinguals switch between their languages? Invited talk at the Universidad Nebrija, Madrid, Spain.
16. Frances, C. (January 29-30, 2019). La lengua extranjera no dificulta el aprendizaje de conceptos emocionales. Invited talk at Universidad de Nebrija, Madrid, Spain.
17. Kalashnikova, M. (May, 2019). Infant-directed speech facilitates neural encoding of speech during infants' first year of life. Invited talk in the Special session "Perception of speech directed toward infants and children" at the Acoustical Society of America 177th Meeting, Louisville, KY, USA.
18. Molinaro, N. (March 28, 2019). Predicting language in a multilingual society. Invited talk at Rutgers University, New Jersey, USA.
19. Paz-Alonso, P.M. (March, 2019). Converging evidence underlying the role of the thalamus in typical and atypical reading. Invited talk at the CIMCYC External Speakers series, University of Granada, Granada, Spain.
20. Paz-Alonso, P.M. (May, 2019). Reading within and beyond the classical reading network: Contributions of the ventral occipitotemporal cortex and thalamic nuclei to reading processes. Invited talk at the Achucarro Basque Centre for Neuroscience External Speakers series. Leioa, Spain.
21. Polyanskaya, L. (April 11-13, 2019). Error monitoring and error detection as possible mechanisms underlying metacognition. Invited talk at German-Spanish Interdisciplinary Workshop at Universidad Complutense de Madrid (UCM) and the German Embassy, Madrid, Spain.
22. Richter, C.G. (January, 2019). Spectral estimation of neural and behavioural time series data. Invited talk at the Hebrew University of Jerusalem, Jerusalem, Israel.
23. Soto, D. (February 1, 2019). A novel framework for understanding unconscious information processing. Invited talk at Institute of Neuroscience & Psychology, University of Glasgow, Glasgow, UK.
24. Villameriel, S. (April 12, 2019). La investigación en bilingües en lengua oral y lengua de signos. Invited talk at Universidad de Oviedo, Oviedo, Spain.
25. Villameriel, S. (May 28, 2019). Las lenguas orales y signadas en el cerebro. Invited talk at Escuela Universitaria de Enfermería, Palencia, Spain.
26. Villameriel, S. (June 28, 2019). La investigación en oyentes bilingües en LSE y castellano, ¿cómo procesamos las lenguas? Invited talk at Centro de Intérpretes de LS y Guías-Intérpretes de Castilla y León, Valladolid, Spain.

2020

Poster Presentations

1. Aguasvivas, J.A., Duñabeitia, J.A., & Carreiras, M. (2020). Does bilingual experience facilitate novel vocabulary learning? The role of orthographic similarity. Poster presentation at the AMLaP-Architectures and Mechanisms for Language Processing 2020. Potsdam, Germany, Virtual Conference.
2. Alcalá-López, D., & Soto, D. (May, 2020). Decoding social knowledge in the human brain. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
3. Alcalá, D., Ayyagari, A., Bright, M.G., Caballero-Gaudes, C., Ferrer Gallardo, V., Hayashi, S., Markello, R., Moia, S., Stickland, R., Uruñuela, E., & Zvolanek, K. (June, 2020). Physiopy/phys2bids: BIDS formatting of physiological recordings. Poster presentation at the 2020 meeting of the Organisation of Human Brain Mapping (2020 OHBM), Montreal, Québec, Canada.
4. Aleman Bañon, J., & Martin, C.D. (September, 2020). Cross-linguistic differences can obscure L2 learners' ability to generate predictions: Evidence from ERP. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
5. Ansorena, X., Carreiras, M., & Mancini, S. (October, 2020). Lexical, morphological and syntactic abilities at the discourse level: comparing elicitation methods. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
6. Bergouignan, L., Carreiras, M., & Paz-Alonso, P.M. (May, 2020). Cumulating negative experiences induces structural changes in the left hippocampal dentate gyrus-CA3 and self-related cortical areas. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
7. Blanco, B., Molnar, M., Arrieta, I., Caballero-Gaudes, C., & Carreiras, M. (October, 2020). Hemodynamic Correlates of Speech Processing in Monolingual and Bilingual Infants. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
8. Cheimariou, S., & Kapnoula, E.C. (March, 2020). Differential effects of print exposure on subphonemic sensitivity and lexical competition during spoken word recognition: An individual differences approach. Poster presentation at the 33rd Annual CUNY Conference on Human Sentence Processing, Amherst, Massachusetts, USA.
9. Costello, B., Villameriel, S., Giezen, M., & Carreiras, M. (October, 2020). Silent words and invisible signs: cross-language activation in bimodal bilinguals. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
10. de Bruin, A., Hoversten, L.J., Martin, C.D. (June 2020). Why does a trilingual's second language experience more interference from a third than first language? Examining cross-language intrusions and inhibition during trilingual production. Conference on Multilingualism (COM), Virtual Conference.
11. de Dios-Flores, I., Acuña-Fariña, C., Mancini, S., & Carreiras, M. (September, 2020). Processing lexically-based dependencies: an eye-tracking study on verbal control. Poster presentation at AMLaP-Architectures and Mechanisms for Language Processing. Potsdam, Germany. Online conference: <https://amlap2020.github.io/>
12. Frances, C., Navarra-Barindelli, E., & Martin, C. (October, 2020). Effect of speaker accent on auditory cognate processing by L2 learners of English. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
13. Frances, C., Navarra-Barindelli, E., Pinet, S., & Martin, C. (October, 2020). The effects of accent and likelihood on spellings of unknown words for L2 speakers of English. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
14. Frances, C., & Duñabeitia, J.A. (May, 2020). The effects of contextual diversity on reading measures in foreign and native language vocabulary learning. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
15. Ferrer-Gallardo, V., Delgado, M., Navalpotro, I., Moia, S., Carreiras, M., Paz-Alonso, P.M., Rodriguez-Oroz, M.C., & Caballero-Gaudes, C. (May, 2020). Characteristic Traits of Mild cognitive impairment in Parkinson's disease. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
16. Ferrer-Gallardo, V., Delgado, M., Navalpotro, I., Moia, S., Carreiras, M., Rodriguez-Oroz, M.C., & Caballero-Gaudes, C. (June, 2020). Characteristic functional Traits of Mild cognitive impairment in Parkinson's disease. Poster presentation at Human Brain Mapping (2020 OHBM), Montreal, Canada.

17. Furgoni, A., Stoehr, A., & Martin, C.D. (May, 2020). Speech production also involves orthographic representations: Evidence from Spanish adults and children. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
18. Furgoni, A., Stoehr, A., & Martin, C.D. (September, 2020). Early readers make use of orthographic representations in speech perception and production. Poster presentation at AMLaP-Architectures and Mechanisms for Language Processing. Potsdam, Germany. Online conference: <https://amlap2020.github.io/>
19. Garcia, M., Aguasvivas, J., Gisbert, S., Gil-Robles, S., Pomposo, I., Carreiras, M., & Quiñones, I. (October, 2020). Functional and structural biomarkers of cognitive outcomes after brain tumor resection. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
20. Garcia, M., Aguasvivas, J., Gisbert, S., Gil-Robles, S., Pomposo, I., Carreiras, M., & Quiñones, I. (May, 2020). Functional and structural biomarkers of cognitive outcomes after brain tumor resection. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
21. Gastaldon, S., Lizarazu, M., Peressotti, F., & Molinaro, N. (June, 2020). Reduced speech–brain entrainment in adult stutterers when listening for speaking. Poster presentation at the IMPRS Conference 2020: Interdisciplinary Approaches in the Language Sciences, Max Planck Institute for Psycholinguistics, Nijmegen, The Netherlands. [virtual conference due to COVID-10 pandemic]
22. Geng, S., Molinaro, N., Carreiras, M., & Amoroso, L. (May, 2020). Spatio-temporal dynamics of noun and verb naming in early bilinguals. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
23. Gisbert, S., Quiñones, I., Amoroso, L., Timofeeva, P., Geng, S., Gil-Robles, S., Pomposo, I., & Carreiras, M. (May, 2020). MULTIMAP: Multilingual visual naming test for the mapping of eloquent areas during awake surgeries. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
24. Gurunandan, K., Carreiras, M., & Paz-Alonso, P.M. (October, 2020). Functional specialisation and plasticity of language systems: converging evidence from language learning experiments. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
25. Heinzova, P., Mancini, S., & Carreiras, M. (October, 2020). Processing different levels of argument structure complexity: A behavioral study in balanced Basque-Spanish bilinguals . Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
26. Hoversten, L.J., & Martin, C.D. (March, 2020). The time course of bilingual lexico-semantic access within and across languages: Evidence from the boundary paradigm during reading. Poster presentation at the CUNY Human Sentence Processing Conference, Amherst, Massachusetts, USA.
27. Hoversten, L.J., & Martin, C.D. (May, 2020). Interplay between task demands and language mode in bilingual word recognition: Evidence from ERPs. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
28. Ibarbia, M., Gurunandan, K., Carreiras, M., & Paz-Alonso, P.M. (October, 2020). Contribution of semantic memory and fluid reasoning to creativity problem solving in Chefs. Poster presentation at the Society for the Neuroscience of Creativity Annual Meeting, virtual conference.
29. Ibarbia, M., & Paz-Alonso, P.M. (May, 2020). Role of magnocellular and parvocellular visual pathways in object and word recognition. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
30. Ibarbia, M., & Paz-Alonso P.M. (October, 2020). Developmental trajectories of magnocellular and parvocellular pathways and their contribution to reading. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
31. Jevtović, M., Stoehr, A., Antzaka, A., & Martin, C.D. (May, 2020). The effects of orthographic consistency at different levels of speech processing in Spanish beginning readers. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
32. Kalashnikova, M. (July, 2020). Effects of bilingualism on the encoding and discrimination of native and non-native speech contrasts. Poster presentation at the International Congress on Infant Studies, virtual conference.
33. Kalashnikova, M., Pejovic, J., & Carreiras, M. (July, 2020). Early attentional control abilities in monolingual and bilingual infants. Poster presentation at the International Congress on Infant Studies, virtual conference.
34. Kim, D., Samuel, A.G., Kapnoula, E.C., Nash, A., & Dumay, N. (November, 2020). Reconciling Subphonemic Mismatch Effects and Other Psycholinguistic Tests of Lexical Engagement. Poster presentation at the 61st Annual Meeting of the Psychonomic Society, Virtual Meeting.



35. Klimovich-Gray, A., & Molinaro, N. (October, 2020). Cortical language processing flexibly adapts to perceptual and contextual properties of speech. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
36. Koutsogiannaki, M., Simantiraki, O., Cooke, M., & Lallier, M. (January, 2020). Listening effort of natural speaking styles. Poster presentation at Speech In noise workshop, Toulouse, France.
37. Lerma-Usabiaga, G., Benson, N., Winawer, J., & Wandell, B. (May, 2020). Computational generalization of neuroimaging software: the case of population receptive fields. Poster presentation at 20th Annual Meeting of the Vision Sciences Society (VSS), St Pete Beach, Florida, USA.
38. Lerma-Usabiaga, G., Benson, N., Winawer, J., & Wandell, B. (May, 2020). A validation framework for neuroimaging software: the case of population receptive fields. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
39. Martorell, J., Mancini, S., Molinaro, N., & Carreiras, M. (October, 2020). The role of lexical information in oscillatory tracking of syntactic structure. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
40. Martorell, J., Mancini, S., Molinaro, N., & Carreiras, M. (September, 2020). Oscillatory tracking of syntactic structure across languages. Poster presentation at the AMLaP-Architectures and Mechanisms for Language Processing 2020. Postdam, Germany, virtual conference.
41. Moia, S., Ferrer Gallardo, V., Stickland, R., Uruñuela, E., Termenon, M., Caballero-Gaudes, C., & Bright, M.G. (June, 2020). Multi-session CVR variability within functional networks. Poster presentation at the 2020 meeting of the Organisation of Human Brain Mapping (2020 OHBM), Montreal, Québec, Canada.
42. Moia, S., Termenon, M., Uruñuela, E., Stickland, R., Bright, M.G., & Caballero-Gaudes, C. (June, 2020). ICA-based denoising strategies in highly motion correlated tasks with Multi Echo BOLD fMRI. Poster presentation at the 2020 meeting of the Organisation of Human Brain Mapping (2020 OHBM), Montreal, Québec, Canada.
43. Moia, S., Termenon, M., Uruñuela, E., Stickland, R.C., Bright, M.G., & Caballero-Gaudes, C. (April, 2020). Improving breath-hold cerebrovascular reactivity mapping with multi-echo BOLD fMRI. Digital poster presentation at ISMRM 2020, Sydney, Australia.
44. Moia, S., Stickland, R.C., Termenon, M., Uruñuela, E., Caballero-Gaudes, C., & Bright, M.G. (April, 2020). Assessment of longitudinal cerebrovascular reactivity measurements based on breath-hold and resting state BOLD multi-echo fMRI. Digital poster presentation at ISMRM 2020, Sydney, Australia.
45. Moia, S., Termenon, M., Uruñuela, E., Stickland, R.C., Bright, M.G., Caballero-Gaudes, C. (September, 2020). Evaluating multi-echo based denoising strategies for breath-hold induced cerebrovascular reactivity mapping. Poster presentation at The European Society for Magnetic Resonance in Medicine and Biology annual meeting (ESMRMB 2020), Virtual Conference.
46. Molinaro, N., Lizarazu, M., Baldin, V., Pérez-Navarro, J., & Ríos-López, P. (May, 2020). Contextual information modulates speech-aligned neural tracking. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
47. Ordin, M., Polyanskaya, L., Gomez, D., & Samuel, A. (April, 2020). Linguistic experience and universal design of the auditory system in speech rhythm perception: implications for speech evolution. Poster presentation at EvoLang XIII conference, Brussels, Belgium.
48. Pérez-Navarro, J.J., Lallier, M. (June, 2020). Amount of exposure and phonological abilities as predictors of general language development: Evidence from a bilingual population. Poster Presentation at 7th Annual Summer Neurolinguistics School, Online Conference.
49. Pinet, S., Alario, F.-X., Longcamp, M., Schön, D., & King, J.-R. (October, 2020). Decoding Typing from Electro-Encephalography Reveals how the Human Brain Simultaneously Represents Successive Keystrokes. Poster presentation at LiveMEEG 2020, virtual conference.
50. Pinet, S., Martin, C., & Paz-Alonso, P.M. (October, 2020). A systematic investigation of oral and written language production in fMRI. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
51. Pinet, S., & Nozari, N. (October, 2020). Timeline of monitoring during semantic and phonological interference in word production. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
52. Pinet, S., & Nozari, N. (July, 2020). Using signal detection theory to investigate the role of visual information in performance monitoring in typing. Poster Presentation at the 2020 meeting of Cognitive Science Society (CogSci 2020), virtual conference.

53. Quiñones I., Molinaro N., Caballero-Gaudes C., Mancini S., Hernandez-Cabrera J.A., Barber H., & Carreiras M. (May, 2020). Linguistic input drives brain network configuration during language comprehension. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
54. Ray, D., & Das, M. (October, 2020). Investigating Intero- and Exteroceptive predictive Processes in Major Depressive disorder. Interactive talk at Neuromatch conference 3.0, virtual conference.
55. Rivolta C.L., Costello B., & Carreiras, M. (October, 2020). Temporal processing of a signed language: effect of modality and language status. Poster presentation at the Society for the Neurobiology of Language Annual 12th Meeting (SNL 2020), virtual conference.
56. Rivolta, C., Costello, B., & Carreiras, M. (May, 2020). The impact of modality on temporal linguistic processing: a comparison of spoken and signed languages. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
57. Rivolta, C., Costello, B., & Carreiras, M. (September, 2020). How do visual modality and linguistic structure affect temporal processing of sign language?. Poster presentation at AMLaP-Architectures and Mechanisms for Language Processing. Potsdam, Germany. Online conference: <https://amlap2020.github.io/>
58. Souganidis, C., Molinaro, N., & Stoehr, A. (2020). Balanced Spanish-Basque bilinguals produce language-specific voice onset time in prevoiced plosives. Poster presentation at the 26th Architectures and Mechanisms for Language Processing Conference, Potsdam, Germany.
59. Stoehr, A., & Martin, C.D. (June, 2020). L1 grapheme-to-phoneme mappings influence L2 speech sound learning in production and perception. Poster presentation at the Conference on Multilingualism (COM) 2020, Reading, UK.
60. Taouki, I., Lallier, M., & Soto, D. (May, 2020). Metacognitive processing in early childhood. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
61. Termenon, M., Moia, S., Paz-Alonso, P., Molinaro, N., Mancini, S., Carrión-Castillo, A., Mazoyer, B., Tzourio-Mazoyer, N., Crivello, F., Carreiras, M., & Caballero-Gaudes C. (May, 2020). Covert sentence production in early bilinguals: A study in left and right handed participants. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
62. Termenon, M., Moia, S., Paz-Alonso, P.M., Molinaro, N., Mancini, S., Mazoyer, B., Tzourio-Mazoyer, N., Crivello, F., Carreiras, M., & Caballero-Gaudes, C. (June, 2020). Implications of handedness on language brain lateralization in early bilinguals. Poster presentation at Human Brain Mapping (2020 OHBM), Montreal, Canada.
63. Timofeeva, P., Carreiras, M., & Amoroso, L. (May, 2020). Linguistic control mechanisms in highly proficient bilinguals: An MEG study. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.
64. Uruñuela, E., Jones, S., Crawford, A., Shin, W., Lowe, M., & Caballero-Gaudes, C. (June, 2020). Improving deconvolution of fMRI signal with Sparse Paradigm Free Mapping using stability selection. Poster presentation at Human Brain Mapping (2020 OHBM), Montreal, Canada.
65. Villameriel, S., Costello, B., Giezen, M., & Carreiras, M. (May, 2020). Cross-language activation in bimodal bilinguals. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2020), Virtual Conference.

Oral Presentations

1. Baese-Berk, M., Haupt, Z., Jagers, Z., Samuel, A.G., Trebon, T., Wallace, M., & Wesson, A. (November, 2020). Production learning of non-native speech contrasts after training in perception or production. Oral presentation at the 61st Annual Meeting of the Psychonomic Society, Virtual Meeting.
2. Charoy, J., & Samuel, A.G. (November, 2020). Accommodation to foreign-accented speech: Different patterns for different accent strengths. Oral presentation at the 61st Annual Meeting of the Psychonomic Society, Virtual Meeting.
3. Dueme, F., Martin, C. & Stoehr, A. (January, 2020). The influence of L2 orthography on L1 speech production in immersed bilinguals. Oral presentation at the Conference of the Student Organisation of Linguistics in Europe (ConsOLE), Barcelona, Spain.
4. Esteban-Peñalba, T., Paz-Alonso, P.M., Navalpotro-Gomez, I., Boddy, P., Dacosta-Aguayo, R., Carreiras, M., & Rodriguez-Oroz, M.C. (December, 2020). Correlatos funcionales de inhibición de respuesta proactiva y contenida en la enfermedad de Parkinson con trastorno de control de impulsos. Oral presentation at the LXXII Annual Meeting of the Sociedad Española de Neurología, Virtual Meeting.



5. Furgoni, A., Stoehr, A., & Martin, C. (February, 2020). The influence of orthography on phonemic representations: Evidence from language perception and production. Oral presentation at 17th Old World Conference in Phonology (OCP17), Warsaw, Poland.
6. Heinzova, P., Mancini, S., & Carreiras, M. (October, 2020). Processing verb argument structure complexity in Basque-Spanish bilinguals. Oral presentation at Words in the World International Conference 2020 (WoW 2020), virtual conference.
7. Kim, D., Samuel, A.G., Kapnola, E., & Dumay, N. (November, 2020). Reconciling subphonemic mismatch effects and other psycholinguistic tests of lexical engagement. Oral presentation at the 61st Annual Meeting of the Psychonomic Society, Virtual Meeting.
8. Lerma-Usabiaga, G. (October 2020). The gradient of population receptive field stimulus-dependence in ventral visual cortex. Oral presentation at Neuromatch Conference, virtual conference.
9. Lerma-Usabiaga, G. (June 2020). Computational generalization of neuroimaging software: the case of population receptive fields. Oral presentation at 2020 Vision Sciences Society (VSS) meeting online.
10. Martorell, J., Mancini, S., Molinaro, N., & Carreiras, M. (December, 2020). Oscillatory tracking of syntactic structure and cross-linguistic variation. Oral presentation at International Conference of Psycholinguistic and Neurolinguistic Research: Methods, Materials, and Approaches, virtual conference.
11. Ordin, M. (April, 2020). Neuro-cognitive mechanisms of statistical learning in an evolutionary perspective. Oral presentation at EvoLang XIII, Special Theme "Evolution of the Extended Language System", Brussels, Belgium.
12. Ordin, M. (September, 2020). Re-synthesis and speech modification techniques in applied phonetics research. Oral presentation at workshop at the 3rd International Symposium on Applied Phonetics, Tarragona, Spain.
13. Ray, D., & Das, M. (October, 2020). Investigating Intero- and Exteroceptive predictive Processes in Major Depressive disorder. Interactive talk at Neuromatch conference 3.0, virtual conference.
14. Samuel, A.G., & Dumay, N. (November, 2020). What happens to sublexical and lexical representations after they have been used to understand speech? Oral presentation at the 61st Annual Meeting of the Psychonomic Society, Virtual Meeting.
15. Samuel, A.G., & Zheng, Y. (January, 2020). Is Lexically-Guided Phonetic Recalibration Critical for Accent Accommodation? Oral presentation at Workshop on Speech variation: Impact on perception and comprehension, Nice, France.
16. Stoehr, A., & Martin, C.D. (2020). Does orthography affect speech sound learning in production and perception? Oral presentation at the 2nd International Symposium on Bilingual and L2 Processing in Adults in Children (ISBPAC), Nijmegen, The Netherlands.

Invited Talks

1. Caballero-Gaudes, C., (June, 2020) Multi-echo beyond preprocessing. Invited talk at the 2020 meeting of the Organisation of Human Brain Mapping (2020 OHBM), Montreal, Québec, Canada.
2. Caffarra, S. (August, 2020). Linking neuroscience and education: Plastic brain changes related to reading acquisition. Invited talk at the Stanford ASEE's 2020 Summer Series, Stanford University, Stanford, USA.
3. Carreiras, M. (February, 2020) Neurociencia y Educación: Neuromitos, aprendizaje, y marcadores tempranos. Invited talk at 3º Congreso Mundial de Educación EDUCA 2020. Santiago de Compostela, Spain.
4. Carreiras, M. (October, 2020) El cerebro lector. Invited talk at Seminario "Leer con cabeza". Fundación Germán Sánchez Ruipérez. Virtual conference.
5. Costello, B. (October, 2020). Encoding in deaf readers: the role of phonology. Invited talk at the Brain Development & Education Lab, Stanford University, USA.
6. Lerma-Usabiaga, G. (November 2020). Replication, generalization and validation in Neuroimaging. Invited talk at the College of Biomed. Eng. Yuquan campus of Zhejiang University, China.
7. Lerma-Usabiaga G. (November 2020). A Validation framework for neuroimaging software. Invited talk at the Brainhack Donostia. San Sebastia, Spain.
8. Lerma-Usabiaga, G. (May 2020). Computational generalization of neuroimaging software. Invited talk at Vision and Perception Neuroscience Lab, Stanford University, Stanford, CA, USA.



9. Lerma-Usabiaga, G. (January 2020). A validation framework for neuroimaging software: the case of population receptive fields. Invited talk at Psychology Department, Stanford University, Stanford, CA, USA.
10. Mancini, S. (October 21-23, 2020). From features to relations: processing mechanisms at the syntax-discourse interface. Invited talk at Symposium on Linguistic Levels of Representations: Challenges at the Interfaces at the Society for the Neurobiology of Language Meeting, Philadelphia, USA.
11. Martin, C.D. (May, 2020). On-line sentence comprehension adaptation when listening to foreign-accented speakers. Keynote speaker at Bilingualism and the Brain workshop, Tromsø, Norway.
12. Paz-Alonso, P.M. (September, 2020). Functional specialization and plasticity in monolingual and bilingual populations. Invited talk at the 2nd Forum on Language Acquisition, Cognition and Brain Science. Beijing, China.
13. Ristic, B. (January, 2020). Lingvistika, koji psiho! Invited talk at the Linguistics seminar, Petnica Science Centre, Valjevo, Serbia.



2021

Poster Presentations

1. Ansorena, X., Carreiras, M., & Mancini, S. (June, 2021). Discourse in aphasia: Sentence Complexity across elicitation methods. Poster presentation at the XV International Symposium of Psycholinguistics. Virtual Conference.
2. Antzaka, A., Jevtović, M., & Martin, C.D. (July, 2021). Learning written words in a first language: Is there an influence of the orthographic system of the second language? Poster presentation at the 28th Annual Meeting of the Society for the Scientific Study of Reading (SSSR2021), Virtual Conference.
3. Arrieta, I., Altuna, X., Betanzos, F.A., Carreiras, M., & Kalashnikova, M. (June, 2021). Predictors of language development in children with Cochlear Implants: Preliminary pre-implantation data. Poster presentation at Summer School ISOLDE: Infant Studies On Language Development in Europe, virtual event.
4. Caffarra, S., Joo, S., Bloom, D., Kruper, J., Rokem, A., & Yeatman, J. D. (June, 2021). Development of the visual pathways mediates development of electrophysiology in visual cortex. Poster presentation at the 27th Organization for Human Brain Mapping (OHBM) annual meeting. Virtual Conference.
5. Caffarra, S., Joo, S., Bloom, D., Kruper, J., Rokem, A., & Yeatman, J. D. (May, 2021). Development of the visual pathways predicts changes in electrophysiological responses in visual cortex. Poster presentation at the VSS virtual conference.
6. Caffarra, S., Joo, S., Bloom, D., Kruper, J., Rokem, A., & Yeatman, J. D. (April, 2021). Maturation changes of the visual pathways mediate development of visual electrophysiological responses. Poster presentation at the 12th Annual Stanford Pediatrics Research Retreat, virtual conference.
7. Clark, C., Guediche, S., & Lallier, M. (May, 2021). Compensatory cross-modal effects of sentence context on visual word recognition in adults. Poster presentation at the British Dyslexia Association's International Conference, Oxford, UK.
8. Esteban-Peñalba, T., Paz-Alonso, P.M., Navalpotro-Gomez, I., & Rodriguez-Oroz, M.C. (January, 2021). Functional correlates of response inhibition in impulse control disorders in Parkinson's disease. Poster presentation at the SfN Global Connectome, Virtual Conference.
9. Fernández-Merino, L., Lizarazu, M., Molinaro, N., & Kalashnikova, M. (June, 2021). Rhythmical cues and neural entrainment in Basque-Spanish bilingual infants. Poster presentation at Summer School ISOLDE: Infant Studies On Language Development in Europe, virtual event.
10. Frances, C., Navarra-Barindelli, E., & Martin, C. (March, 2021). Effect of orthographic and phonological similarity and speaker accent on auditory processing by L2 learners of English. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2021), Virtual Conference.
11. Garcia, M., Carreiras, M., Gil-Robles, S., Pomposo, I., & Quiñones, I. Presurgical assessment protocol for detecting cognitive decline in Diffuse Low-Grade Gliomas. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2021), Virtual Conference.
12. Gurunandan, K., Carreiras, M., & Paz-Alonso, P.M. (2021). Network interaction dynamics in language production. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2021), virtual conference.
13. Gurunandan, K., Carreiras, M., & Paz-Alonso, P.M. (June, 2021). Network Dynamics during Speech Production. Poster presentation at the 27th Organization for Human Brain Mapping (OHBM) annual meeting. Virtual Conference.
14. Jevtović, M., Antzaka, A., & Martin, C.D. (July, 2021). Orthographic skeletons: Do we constantly create orthographic representations of newly acquired spoken words? Poster presentation at the 28th Annual Meeting of the Society for the Scientific Study of Reading (SSSR2021), Virtual Conference.
15. Kapnola, E.C., & Samuel, A.G. (June, 2021). Individual differences in speech perception: Sources and consequences for second language learning. Poster presentation at the XV International Symposium of Psycholinguistics (ISP). Virtual Conference.
16. Klimovich-Gray, A., & Molinaro, N. (March, 2021). Language areas adjust processing strategies to the temporal properties of speech. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2021), Virtual Conference.
17. Lerma-Usabiaga, G., Le, R., Gafni, C., Ben-Shachar, M., & Wandell, B. (November, 2021). Interpreting sensory and cognitive signals in the cortical reading network. Poster presentation at the 2021 meeting of the Society for Neuroscience (SfN 2021). Chicago, IL, USA.



18. Lerma-Usabiaga, G., Le, R. Gafni, C. Ben-Shachar, M., & Wandell, B. (January 2021). The gradient of population receptive field stimulus-dependence in ventral visual cortex. Poster presentation at Society for Neuroscience's SfN Global Connectome. Virtual conference.
19. Mancarella, M., Antzaka, A., Bertoni, S., Facoetti, A., & Lallier, M. (February, 2021). Enhanced disengagement of auditory attention and phonological skills in action video gamers. Poster presentation at the European Conference On Digital Psychology, Milan, Italy.
20. Manso-Ortega, I.L., Quiñones, I., Gil-Robles, S.G., Pomposo, I., & Carreiras, M. (2021). How could we benefit from Bayesian statistics in predicting cognitive outcomes after tumor resection? Poster presentation at 2nd Bayesian Statistical Analyses for the Human, Social and Cognitive Sciences, online summerschool.
21. Manso-Ortega, I. L., Carreiras, M. , Pomposo, I. , Gil-Robles, S., Intracortical stimulation in bilingual left temporal tumour patients: Different cortical representations for L1 and L2. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2021), Virtual Conference.
22. Morucci, P., Martorell, J., & Molinaro, N., (July, 2021). Tracking hierarchical processes in minimal linguistic phrases. Poster presentation at Salzburg Mind-Brain Annual Meeting (SAMBA). Online meeting.
23. Navarra-Barindelli, E., Guediche, S., & Martin, C. (March, 2021). The cognate effect is modulated by auditory noise: implications for L1 co-activation during L2 auditory word recognition. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2021), Virtual Conference.
24. Pinet, S., Alario, F.X., Longcamp, M., Schön, D., & King, J.R. (October, 2021). Decoding Typing from Electro-Encephalography Reveals how the Human Brain Simultaneously Represents Successive Keystrokes. Poster presentation at the 2021 meeting of the Society for the Neurobiology of Language (SNL), online meeting.
25. Pinet, S., Liu, M., Martin, C., & Paz-Alonso, P.M. (March, 2021). Functional correlates of oral and written language production. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2021), Virtual Conference.
26. Quiñones, I., Menashe, B., Gisbert, S., Pomposo, I., Gil-Robles, S. & Carreiras, M. Neuroplasticity affects grey matter regions and white-matter tracts: Evidence from brain tumor patients. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2021), Virtual Conference.
27. Thomas, T., Martin, C., & Caffarra, S. (March, 2021). Towards a dynamic model of processing of native, dialectal, and foreign accented speech. Poster presentation at Cognitive Neuroscience Society annual meeting (CNS 2021), Virtual Conference.
28. Uruñuela, E., Moia, S., & Caballero-Gaudes, C. (May, 2021). Low-rank and sparse simultaneous blind estimation of global fluctuations and neuronal-related activity from fMRI data. Poster presentation at the 1st ISMRM 29th Annual Meeting & Exhibition, Virtual Conference.
29. Uruñuela, E., Moia, S., & Caballero-Gaudes, C. (June, 2021). Simultaneous blind estimation of global fluctuations and neuronal-related activity from fMRI data. Poster presentation at the 1st ISMRM Iberian Chapter annual meeting. Virtual Conference.
30. Uruñuela, E., Moia, S., & Caballero-Gaudes, C. (June, 2021). Synthesis-based Paradigm Free Mapping and analysis-based Total Activation are identical for temporal deconvolution of fMRI data. Poster presentation at the 1st ISMRM Iberian Chapter annual meeting. Virtual Conference.
31. Uruñuela, E., Moia, S., & Caballero-Gaudes, C. (June, 2021). Simultaneous blind estimation of global fluctuations and neuronal-related activity from fMRI data. Poster presentation at the 27th Organization for Human Brain Mapping (OHBM) annual meeting. Virtual Conference.
32. Uruñuela, E., Moia, S., & Caballero-Gaudes, C. (June, 2021). Synthesis-based Paradigm Free Mapping and analysis-based Total Activation operate identically. Poster presentation at the 27th Organization for Human Brain Mapping (OHBM) annual meeting. Virtual Conference.

Oral Presentations

1. Antzaka, A., & Martin, C.D. (June, 2021). Orthographic consistency effects in speech perception: Does covert production play a role? Oral presentation at the XV International Symposium of Psycholinguistics (ISP). Virtual Conference.
2. Caffarra, S. (April, 2021). How do we treat formal gender cues when we comprehend sentences? Oral presentation at the SEPEX jornadas virtuales.
3. Dueme, F., Stoehr, A., & Martin, C.D. (June, 2021). The impact of L2 orthography on the production of L1 speech sounds among French natives living in Spain. Oral presentation at The 30th Conference of the European Second Language Association (EuroSLA 30), Barcelona (virtual conference), Spain.



4. Ferrer-Gallardo, V.J., Bolton, T., Delgado, M., Paz-Alonso, P.M., Rodriguez-Oroz, M., & Caballero-Gaudes, C. (May, 2021). Distinct cognitive and anthropometric functional connectivity traits of cognitive decline in Parkinson's disease using partial least squares. Oral presentation at ISMRM 29th Annual Meeting & Exhibition, Virtual Conference.
5. Jevtović, M., Stoehr, A., Klimovich-Gray, A., Antzaka, A., & Martin, C.D. (June, 2021). The impact of phoneme-to-grapheme consistency on the production and perception of speech sounds in early Spanish readers. Oral presentation at the International Child Phonology Conference, Lethbridge, Canada.
6. Kalashnikova, M. (June, 2021). The role of early parent-infant interactions in promoting infants' lexical growth during the COVID-19 pandemic. Oral presentation at the XV International Symposium of Psycholinguistics (ISP). Virtual Conference.
7. Kapnola, E.C., & McMurray, B. (June, 2021). Individual differences in speech perception: Evidence for gradiency in the face of category-driven perceptual warping. Oral presentation at Acoustics in Focus: The 180th Meeting of the Acoustical Society of America. Virtual meeting.
8. Kapnola, E.C. & Samuel, A.G. (June, 2021). Effects of immediate versus delayed production on word learning. Oral presentation at the XV International Symposium of Psycholinguistics (ISP). Virtual Conference.
9. Kartushina, N., Soto, D., & Martin, C. (June, 2021). Self-confidence in perception and production on non-native sound. Oral presentation at the 4th Phonetics and Phonology Conference in Europe. Virtual Conference.
10. Mei, N., Santana, R., & Soto, D. (June, 2021). Informative neural representations of unseen objects during higher-order processing in human brains and deep artificial networks. Oral presentation at Association for the Scientific Study of Consciousness, Israel, Virtual Conference.
11. Moia, S. (March, 2021). Introduction to Git(Hub). Oral presentation at workshop at the OpenMR Virtual 2021.
12. Stoehr, A., & Martin, C.D. (June, 2021). Does orthography affect speech sound learning in production and perception? Oral presentation at the 2nd International Symposium on Bilingual and L2 Processing in Adults in Children (ISBPAC), Nijmegen, The Netherlands.
13. Stoehr, A., & Martin, C.D. (May, 2021). Orthography modulates speech perception in childhood bilinguals. Oral presentation at Psycholinguistics in Flanders (PiF 2021), Kaiserslautern, Germany.
14. Stoehr, A., & Martin, C.D. (June, 2021). Orthography's influence on speech production and perception: An artificial speech sound learning study. Oral presentation at the 30th Conference of the European Second Language Association (EUROSLA 30), Barcelona (virtual conference), Spain.
15. Taouki, I., Lallier, M., & Soto, D. (January, 2021). Metacognitive Processing in Early Readers: The role of metacognition in monitoring linguistic and non-linguistic performance and regulating students' learning. Oral presentation at ICCSEM 2021: International Conference on Cognitive Science, Education and Metacognition, Zurich, Switzerland, virtual meeting.
16. Taouki, I., Lallier, M., & Soto, D. (June, 2021). The role of metacognition in monitoring performance and regulating learning in early readers. Oral presentation at Association for the Scientific Study of Consciousness, Israel, Virtual Conference.
17. Uruñuela, E., Moia, S., & Caballero-Gaudes, C. (May, 2021). fMRI deconvolution with synthesis-based Paradigm Free Mapping and analysis-based Total Activation operate identically. Oral presentation at ISMRM 29th Annual Meeting & Exhibition, Virtual Conference.
18. Uruñuela, E., Moia, S., & Caballero-Gaudes, C. (June, 2021). Simultaneous blind estimation of global fluctuations and neuronal-related activity from fMRI data. Oral presentation at the 1st ISMRM Iberian Chapter annual meeting. Virtual Conference.

Invited Talks

1. Amoruso, L. (June, 2021). New insights into language plasticity in brain tumor patients: An MEG approach. Invited talk at the Centro de Neurociencias Cognitivas (CNC), Universidad de San Andrés, Buenos Aires, Argentina.
2. Antzaka, A. (April 2021). How do children learn to read? Invited Talk at the University of Mondragon (Grado en Educación Primaria).
3. Caffarra, S. (February, 2021). Brain changes in audiovisual processing during reading development. Invited talk at the PsychoShorts virtual conference, Ottawa, Canada.
4. Caballero-Gaudes, C. (April, 2021). Advances in fMRI BOLD denoising: A focus on multi-echo and phase-based methods. Invited seminar at Spinoza Centre for Neuroimaging, Amsterdam, Netherlands.



5. Kapnoula, E.C. (April, 2021). What's in a word? Insights from novel word learning. Invited talk at the Hull Psychology research colloquia, University of Hull, Hull, UK.
6. Lallier, M. (March, 2021). How the sensitivity to auditory rhythms shapes the reading brain. Invited talk at the MPI for Psycholinguistics colloquium series. (Virtual talk).
7. Lallier, M. (June, 2021). The impact of bilingualism on reading development. Invited talk at School of Psychology Seminar series, Bangor University, Wales, UK. Online talk.
8. Lizarazu, M. (May, 2021). Spatiotemporal dynamics of postoperative functional plasticity in patients with brain tumors in language areas. American Clinical MEG Society (ACMEGS), Virtual MEG Course.
9. Martin, C.D., Gosselin, L., Navarra, E., & Caffarra, S. (April, 2021). Processing of mispronunciations in foreign-accented speech. Invited talk at Symposium at APPE-SEPEX annual meeting, virtual conference.
10. Molinaro, N. (July, 2021). Top-down components involved in cortical speech tracking. Invited talk at SISSA, online event.
11. Piazza, G. (April, 2021). ¡Habla conmigo! Come parliamo a un straniero? Caratteristiche acustiche e implicazioni cognitive. Invited talk at seminar of Linguistics, University of Padova, Padova, Italy.
12. Zugarramurdi, C. (March, 2021). Longitudinal study of reading acquisition in a transparent orthography: a screener and a hypothesis. Invited talk at Haskins Laboratories, New Haven, USA.

Annex 7: Top 20 Journals 2018-2021

Top 20 Q1 journals ranked by number of publications in the source

We list selected Q1 journals, in which BCBL researchers published during the 2018-2021 period.

Scopus Source title	CiteScore2020*	number of papers
NeuroImage	10.6	28
Scientific Reports	7.1	16
Cortex	6.2	14
Neuropsychologia	5.1	12
Language, Cognition and Neuroscience	3.6	11
Brain and Language	5.1	9
Cognition	5.5	7
Journal of Memory and Language	7.7	7
Quarterly Journal of Experimental Psychology	3.9	7
Developmental Science	8	6
PLoS ONE	5.3	6
Annals of the New York Academy of Sciences	9.1	5
Behavior Research Methods	8.9	5
Bilingualism	4.9	5
Frontiers in Human Neuroscience	5.1	5
Journal of Neuroscience	10.3	5
Applied Psycholinguistics	2.5	4
Human Brain Mapping	8.4	4
Journal of Experimental Psychology: Human Perception and Performance	5.4	4
Journal of Experimental Psychology: Learning Memory and Cognition	5.3	4

Note: Journal metrics for 2020, taken from latest Scopus Citescore.

*Citescore of an academic journal is a measure reflecting the yearly average number of citations to recent articles published in that journal. This journal evaluation metric was launched in December 2016 by Elsevier as an alternative to the generally used JCR impact factors (calculated by Clarivate). CiteScore is based on the citations recorded in the Scopus database rather than in JCR, and those citations are collected for articles published in the preceding four years instead of two or five.

CiteScore is based on the number of citations to documents (articles, reviews, conference papers, book chapters, and data papers) by a journal over four years, divided by the number of the same document types indexed in Scopus and published in those same four years.

Top 20 most cited journals ranked by citations received

We list top 20 cited journals, in which BCBL researchers published during the 2018-2021 period.

Scopus Source title	citation sum	number of papers
NeuroImage	240	28
Psychological Bulletin	217	2
Cortex	106	14
Quarterly Journal of Experimental Psychology	90	7
Scientific Reports	81	16
Cognition	79	7
Proceedings of the National Academy of Sciences of the United States of America	66	3
Developmental Science	58	6
Movement Disorders	55	3
Journal of Memory and Language	53	7
Frontiers in Psychology	49	15
European Journal of Neuroscience	44	5
Behavioral Sciences	41	3
PLoS Computational Biology	41	3
Neuropsychologia	40	12
PLoS ONE	39	6
Cognitive Science	36	4
Ageing Research Reviews	35	1
Brain and Language	30	9
Psychonomic Bulletin and Review	30	4

Annex 8: Full list of Databases

1- **Chronset:** An automated tool for detecting speech onset.

The analysis of speech onset times has a longstanding tradition in experimental psychology as a measure of how a stimulus influences a spoken response. Yet the lack of accurate automatic methods to measure such effects forces researchers to rely on time-intensive manual or semiautomatic techniques. Chronset is a fully automated tool that estimates speech onset on the basis of multiple acoustic features extracted via multitaper spectral analysis. Using statistical optimisation techniques, we show that the present approach generalises across different languages and speaker populations, and that it extracts speech onset latencies that agree closely with those from human observations. Chronset is publicly available online at www.bcbi.eu/databases/chronset Roux, F., Armstrong, B.C., & Carreiras, M. (2017). **Chronset: An automated tool for detecting speech onset.** *Behavior Research Methods*, 49: 1864–1881. Doi:10.3758/s13428-016-0830-1
Citescore 2017: 5,8, Quartile 1, Decile 1

2- **LSE-Sign:** A database of 2,400 LSE (Spanish Sign Language) signs and 2,500 pseudo signs.

The LSE-Sign database is a free online tool for selecting Spanish Sign Language stimulus materials to be used in experiments. It contains 2,400 individual signs taken from a recent standardised LSE dictionary, and a further 2,700 related nonsigns. Each entry is coded for a wide range of grammatical, phonological, and articulatory information, including handshape, location, movement, and non-manual elements. The database is accessible via a graphically based search facility which is highly flexible both in terms of the search options available and the way the results are displayed. Gutierrez, E., Costello, B., Baus, C. & Carreiras, M. (2016). **LSE-Sign: A Lexical Database for Spanish Sign Language.** *Behavior Research Methods*, 48:950–962. Doi:10.3758/s13428-014-0560-1
Citescore 2016: 5,6, Quartile 1, Decile 1

3- **The eDom** software package was developed to facilitate the collection of dominance ratings -- the proportion of times each meaning of a word is encountered -- for ambiguous words like <river/money>.

Relative meaning frequency is a critical factor to consider in studies of semantic ambiguity. This work examines how this measure may change across the European and Rioplatense dialects of Spanish, as well as how the overall distributional properties differ between Spanish and English, using a computer-assisted norming approach based on dictionary definitions (Armstrong, Tokowicz, & Plaut, 2012, BRM). The results show that the two dialects differ considerably in terms of the relative meaning frequencies of their constituent homonyms and that the overall distributions of relative frequency vary considerably across languages, as well. These results highlight the need for localised norms to design powerful studies of semantic ambiguity and suggest that dialectal differences may be responsible for some discrepant effects related to homonymy. In quantifying the reliability of the norms, it was also established that as few as seven ratings are needed to converge on a highly stable set of ratings. This approach is therefore a very practical means of acquiring essential data in studies of semantic ambiguity relative to past approaches, such as those based on the classification of free associates. The norms also present new possibilities for studying semantic ambiguity effects within and between populations who speak one or more languages.

Armstrong, B. C., Zugarramurdi, C., Alvaro, C., Valle Lisboa, J., & Plaut, D. C. (2016). **Relative meaning frequencies for 578 homonyms in two Spanish dialects: A cross-linguistic extension of the English eDom norms.** *Behavior Research Methods*, 48:950–962. Doi:10.3758/s13428-015-0639-3. Citescore 2016: 5,6, Quartile 1, Decile 1

4- **ESPAL** (Web interface to Spanish word frequency data and other word properties based on written and subtitle corpora).

EsPal is a Web-accessible repository containing a comprehensive set of properties of Spanish words. EsPal is based on an extensible set of data sources, beginning with a 300 million token written database and a 460 million token subtitle database. Properties available include word frequency, orthographic structure and neighbourhoods, phonological structure and neighbourhoods, and subjective ratings such as imageability. Subword structure properties are also available in terms of bigrams and trigrams, biphones, and bisyllables. Lemma and part-of-speech information and their corresponding frequencies are also indexed. The website enables users either to upload a set of words to receive their properties or to receive a set of words matching constraints on the properties. The properties themselves are easily extensible and will be added over time as they become available.

Duchon, A., Perea, M., Sebastián-Gallés, N., Martí, A., Carreiras, M. (2013). **EsPal: One-stop Shopping for Spanish Word Properties.** *Behavior Research Methods*, 45: 1246-1258. Doi:10.3758/s13428-013-0326-1 Citescore 2013: 4,4, Quartile 1, Decile 2

Annex 9: External Speakers

SEMINARS

BCBL organises research seminars with participation of invited external speakers. All these seminars take place at the BCBL Auditorium and via zoom due to Covid 19. The access is free to the scientific community of the area and the announcements are posted at <https://www.bcbl.eu/en/conferences>

Please find below the list of seminars organised by the BCBL:

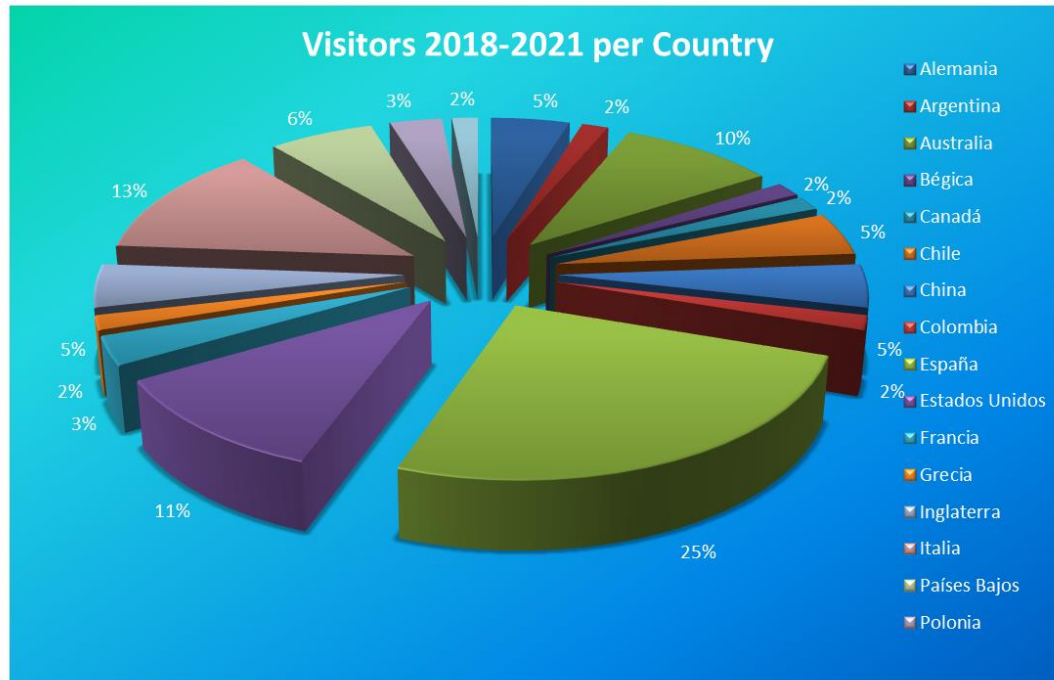
1. Darinka Trübutschek. Ecole des Neurosciences de Paris, France. February 8, 2018
2. Ram Frost. University of Jerusalem and BCBL affiliated researcher, Jerusalem and San Sebastian. February 15, 2018
3. Jan Theeuwes. Vrije Universiteit Amsterdam. The Netherlands. February 22, 2018
4. Rafael Rebolo. Institute of Astrophysics of Canary Islands. Canary Islands. Spain. February 23, 2018
5. Rafael Yuste. Columbia University, New York, US. March 20, 2018
6. David Boas. Massachusetts General Hospital Director, Optics Division, Martinos Centre, US. March 23, 2018
7. Harald Baayen and Elnaz Shafaei. Eberhard-Karls University Tübingen, Germany. April 9, 2018
8. Caren M. Rotello. University of Massachusetts Amherst, MA, US. April 19, 2018
9. Jyothika Kumar. University of Nottingham, UK. May 10, 2018
10. Andrea Facoetti. Università di Padova, Italy. May 17, 2018
11. Gina Kuperberg. Tufts University, Medford, MA, US. June 19, 2018
12. Özge Gürcanlı. McMurtry College, Rice University, Houston, TX, US. June 26, 2018
13. Simon Fischer-Baum. Department of Psychology, Rice University, Houston, TX, US. June 28, 2018
14. Joseph T. Devlin. Department University College London, UK. October 4, 2018
15. Ezequiel Di Paolo. University of Sussex, Brighton, UK. October 25, 2018
16. Arild Hestvik. University of Delaware, Delaware, USA. November 22, 2018
17. Christophe Pallier. Centre Neurospin, Gif-sur-Yvette, France. December 13, 2018
18. Thomas Bolton. School of Life Sciences, Lausanne, Switzerland. January 24, 2019
19. Fernando García- Moreno. Achucarro Basque Centre for Neuroscience, Bizkaia, Spain. February 28, 2019
20. Spyridoula Cheimariou. The University of Alabama Speech and Hearing Centre, Alabama, USA. April 5, 2019
21. Noa Ofen. Department of Psychology and Institute of Gerontology and the Merrill Palmer Skillman Institute, Wayne State University, Detroit, USA. May 13, 2019
22. Usha Goswami. University of Cambridge, UK. May 17, 2019
23. Denis Burnham. Western Sydney University, Sydney, Australia. June 7, 2019
24. Joaquín Goñi. College of Engineering, Purdue University, USA. June 18, 2019
25. Begoña Díaz. Universitat Internacional de Catalunya, Barcelona, Spain. June 20, 2019
26. Charan Ranganath. University of California at Davis, California, EEUU. September 19, 2019
27. Eider M. Arenaza-Urquijo. Barcelona Beta Brain Research Centre (BBRC), Spain. October 21, 2019
28. Eneko Agirre. University of the Basque Country. San Sebastian. Spain. November 7, 2019
29. Luis M. Liz-Marzán. CIC biomaGUNE and Ciber-BBN. Ikerbasque, Basque Foundation for Science, San Sebastian, Spain. November 19, 2019
30. Mario Archila-Melendez. Maastricht University, The Netherlands. November 28, 2019
31. Chotiga Pattamadilok. Centre National de la Recherche Scientifique (CNRS), Paris, France. December 12, 2019
32. Miguel Angel Sebastián. Instituto de Investigaciones Filológicas, UNAM, Mexico City. January 9, 2020
33. Romy Lorenz. Stanford University and the Max Planck Institute for Human Cognitive & Brain Science, UK. January 14, 2020
34. Amanda Sierra. Achucarro Basque Centre for Neuroscience, Leioa, Bizkaia, Spain. January 16, 2020
35. Sebastián Lipina. Universidad de San Martín (UNSAM), Director Unidad de Neurobiología Aplicada, Buenos Aires, Argentina. February 10, 2020
36. Raphael Kaplan. Norwegian University of Science & Technology, Trondheim, Norway. May 21, 2020
37. Molly Bright. McCormick School of Engineering, Northwestern University, IL, US. June 18, 2020



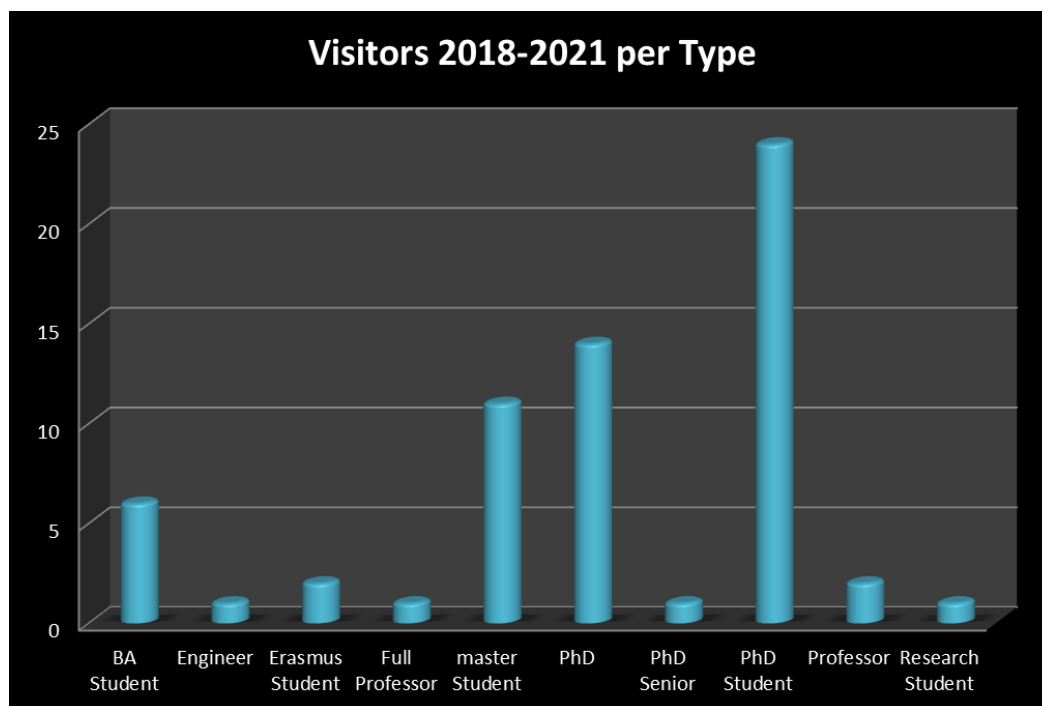
38. Boris Alexander Kleber. Centre for Music in the Brain, Department of Clinical Medicine- Aarhus University - Denmark. August 27, 2020
39. Manuela Ruzzoli. Institute of Neuroscience & Psychology, University of Glasgow, Scotland. September 3, 2020
40. Ane Gurtubay-Antolin. Crossmodal Perception and Plasticity laboratory (CPP-Lab), UCLouvain, Louvain-La-Neuve, Belgium. September 10, 2020
41. Elena Barbieri. Neural mechanisms of sentence processing and dynamics of its recovery in aphasia: a multimodal neuroimaging perspective. Centre for the Neurobiology of Language Recovery, Northwestern University, Chicago, IL, US. February 25, 2021
42. Katarzyna Jednoróg. Brain networks for speech and reading in typical and atypical readers. Head of Laboratory of Language Neurobiology, Nencki Institute of Experimental Biology, Polish Academy of Science, Warsaw, Poland. April 29, 2021.
43. Carmen Vidaurre. Brain-computer interfaces and sensorimotor oscillations. Universidad Pública de Navarra, Pamplona, Navarra. May 14, 2021.
44. Yamil Vidal. A general-purpose mechanism of visual feature association in visual word identification and beyond. Scuola Internazionale Superiore di Studi Avanzati - SISSA, Trieste, Italy. May 20, 2021.

Annex 10: Visiting Researchers 2018-2021

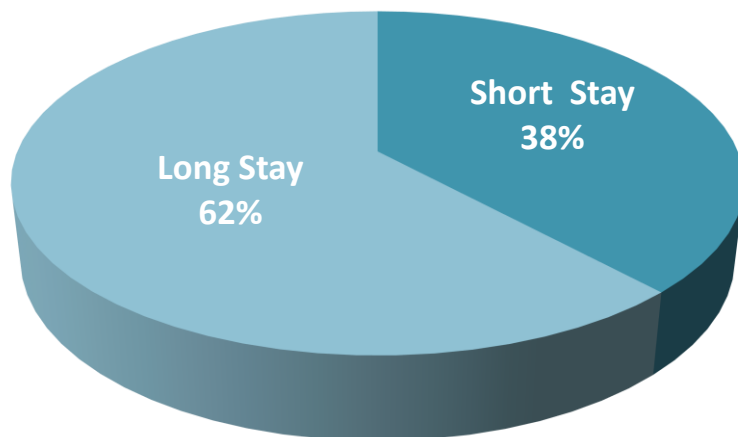
We receive 75% of international visitors from **countries** on four continents.



We have a wide range of **visitor types**, from Full Professors to BA Students.



Most of the visiting researchers spend more than a month at our centre.

Visitors 2018-2021 per Time

Annex 11: PhD Thesis 2018-2021

- 1) Statistical learning as an individual ability
 - a. Supervisor: Ram Frost
 - b. PhD student: Noam Siegelman
 - c. Defended in 2018 (No grading system)
- 2) The relationship between phonemic category boundary changes and perceptual adjustments to natural accents
 - a. Supervisor: Arthur Samuel
 - b. PhD student: Yi Zheng
 - c. Defended in 2018 (No grading system)
- 3) The visual attention span as a measure of orthographic grain size: effects of orthographic depth and morphological complexity
 - a. Supervisors: Marie Lallier & Manuel Carreiras
 - b. PhD student: Alexia Antzaka
 - c. Defended in 2018 (Summa cum laude)
- 4) Investigation of the Development of Neural and Behavioural Auditory Rhythmic Sensitivity and of its Contribution to Reading Acquisition
 - a. Supervisors: Marie Lallier & Nicola Molinaro
 - b. PhD student: Paula Ríos
 - c. Defended in 2018 (Summa cum laude)
- 5) The development of audiovisual vowel processing in monolingual and bilingual infants: A cross-sectional and longitudinal study
 - a. Supervisors: Monika Molnar & Eiling Yee
 - b. PhD student: Jovana Pejovic
 - c. Defended in 2019 (Excellent)
- 6) Depression and anxiety in the postnatal period: An examination of mother-infant interactions and infant language development
 - a. Supervisors: Marina Kalashnikova, Denis Burnham & Janet Conti
 - b. PhD student: Ruth Brookman
 - c. Awarded in 2019 (No grading system)
- 7) Jellys: Desarrollo y evaluación de un videojuego para mejorar la lectura en niños con dislexia a través del entrenamiento rítmico y de la atención visual
 - a. Supervisors: Javier Bernácer & Marie Lallier
 - b. PhD student: Mikel Ostiz
 - c. Defended in 2019 (Excellent)
- 8) Oscillatory characterization of sensory wordform pre-activation in the visual and auditory domains
 - a. Supervisors: Nicola Molinaro & Mathieu Bourguignon
 - b. PhD student: Irene Fernández
 - c. Defended in 2019 (Summa cum laude)
- 9) Mecanismos Fisiopatológicos del trastorno de control de impulsos en la enfermedad de Parkinson
 - a. Supervisor: Mari Cruz Rodríguez Oroz
 - b. PhD student: Irene Navalpotro
 - c. Defended in 2019 (Summa cum laude)
- 10) The Time-course of Semantic Ambiguity: Behavioural and Electroencephalographic Investigation
 - a. Supervisor: Blair Armstrong
 - b. PhD student: Joyse Vitorino de Medeiros
 - c. Defended in 2019 (Summa cum laude)



- 11) Subject-verb Agreement in Real Time: Active Feature Maintenance as Syntactic Prediction
 - a. Supervisors: Simona Mancini & Nicola Molinaro
 - b. PhD student: Bojana Ristic
 - c. Defended in 2020 (Summa cum laude)
- 12) The role of infant-directed speech in language development in infants with hearing loss
 - a. Supervisors: Marina Kalashnikova (principal), Denis Burnham, Pelle Soderstrom, & Yatin Mahajan
 - b. PhD student: Irena Lovcevic
 - c. Awarded in 2020 (No grading system)
- 13) The brain signature for reading in high-skilled deaf adults: behavioral and electrophysiological evidence
 - a. Supervisors: Brendan Costello & Manuel Carreiras
 - b. PhD student: Patricia Alves Dias
 - c. Defended in 2020 (Summa cum laude)
- 14) Sensitivity to letter sequences in word processing and word learning
 - a. Supervisors: Jon Andoni Duñabeitia & Angela de Bruin
 - b. PhD student: María Borrigan
 - c. Defended in 2020 (Excellent)
- 15) The relationship between context and conceptual access
 - a. Supervisors: Eiling Yee & Pedro M. Paz-Alonso
 - b. PhD student: Peter J. Boddy
 - c. Defended in 2020 (Summa cum laude)
- 16) Influence of Early Bilingual Exposure in the Developing Human Brain
 - a. Supervisors: Cesar Caballero & Monika Molnar
 - b. PhD student: Borja Blanco
 - c. Defended in 2020 (Summa cum laude)
- 17) Processing long-distance dependencies: an experimental investigation of grammatical illusions in English and Spanish
 - a. Supervisors: Carlos Acuña Fariña & Manuel Carreiras
 - b. PhD student: Iria de Dios Flores
 - c. Defended in 2021 (Summa cum laude)
- 18) Accommodation to non-native accented speech: Is perceptual recalibration involved?
 - a. Supervisors: Arthur Samuel & Susan Brennan
 - b. PhD student: Jeanne Charoy
 - c. Awarded in 2021 (No grading system)
- 19) Lexical access in bimodal bilinguals
 - a. Supervisors: Brendan Costello & Manuel Carreiras
 - b. PhD student: Saúl Villameriel
 - c. Defended in 2021 (Summa cum laude)
- 20) Semantic richness, semantic context, and language learning
 - a. Supervisors: Jon Andoni Duñabeitia & Clara D. Martin
 - b. PhD student: Candice Frances
 - c. Defended in 2021 (Summa cum laude)
- 21) Neural Plasticity of Language Systems: evidence from fMRI experiments with adult language learners
 - a. Supervisors: Pedro M. Paz-Alonso & Manuel Carreiras
 - b. PhD student: Khispra Gurunandan
 - c. To be defended September 7, 2021
- 22) Reading acquisition: from digital screening to neurocognitive bases in a transparent orthography



- a. Supervisors: Manuel Carreiras & Juan Carlos Valle Lisboa
 - b. PhD student: Camila Zugarramurdi
 - c. To be defended September 15, 2021
- 23) The impact of human language on perceptual categorization: electrophysiological insights
- a. Supervisors: Nicola Molinaro & Clara D. Martin
 - b. PhD student: Piermatteo Morucci
 - c. To be defended in November 2021
- 24) Advanced spatio-temporal deconvolution algorithms to investigate brain function with functional magnetic resonance imaging (fMRI)
- a. Supervisors: Cesar Caballero & Maite Termenon
 - b. PhD student: Stefano Moia
 - c. To be defended in 2021
- 25) Tracing the Algorithm of Bilingual Language Learning
- a. Supervisors: Manuel Carreiras
 - b. PhD student: Jose A. Aguasvivas
 - c. To be defended in 2021