

‘A world moved by creative and critical thinking’:

Ar | Respire conosco, an innovative science communication initiative in Lisbon

Anna Hobbiss¹

anna.hobbiss@neuro.fchampalimaug.org

Bruno Afonso^{1,2}

bruno.afonso@neuro.fchampalimaud.org

Eric Dewitt¹

eric.dewitt@neuro.fchampalimaud.org

Scott Rennie¹

scott.rennie@neuro.fchampalimaud.org

Tiago Marques¹

tiago.marques@neuro.fchampalimaud.org

Zachary Mainen¹

zmainen@neuro.fchampalimaud.org

Catarina Ramos¹

catarina.ramos@neuro.fchampalimaud.org

¹ Champalimaud Neuroscience Programme,
Champalimaud Centre for the Unknown, Lisbon, Portugal

² Instituto Gulbenkian de Ciência, Portugal

Abstract

Ar | Respire conosco is a science communication initiative run by a team of students and researchers from the Champalimaud Neuroscience Programme, in Lisbon, Portugal. Ar, “Air” in Portuguese, captures how pervasive and fundamental science is to our daily lives. This initiative runs free public events combining world-renowned speakers, interactive multimedia and audience participation to explore fundamental scientific themes, intertwining work from scientists, artists, chefs, and storytellers among others. Events are held in the 400-seater Champalimaud Foundation auditorium by the Tejo River. Besides these in house events, the Ar team also has collaborations in other science communication initiatives, both nationally and internationally. Supporting the events, a range of online resources has also been implemented, including a webpage for live streaming and a webzine, enabling the engagement of an extensive audience worldwide. Ar ultimately aims to reach an international audience with provocative content, generating discussion of important issues in a critical and creative manner.

Background

In 2007, the Champalimaud Neuroscience Programme (CNP) was founded, as one of the core components of the newly established Champalimaud Foundation based in Lisbon, Portugal. It aims to create an environment that fosters ground breaking neuroscience research in a strongly collaborative and open environment, enabling easy communication and discussion, and the germination of new ideas. In this spirit, **Ar | Respire conosco** was created by a group of CNP students and researchers with the desire to make science accessible and engaging to the public. Ar’s slogan is “A Ciência está no Ar: Respire Conosco” (translation “Science is in the Air: Breathe with us”) – epitomising the wish to make science and scientific thought free, accessible and omnipresent. This self-organised group has a flexible, bottom up structure, giving us the freedom to experiment with a range of different communication strategies. The events (see Table 1 for a complete list) produced by the Ar team reflect this informal enthusiasm-driven approach. Ar enjoys full financial and institutional support from the Champalimaud Foundation.

13th International Public Communication of Science and Technology Conference
5-8 May 2014, Salvador, Brazil

Table 1. List of all Ar | Respire conosco activities. Ar events shown in red, SeminAr sessions in white and activities outside the Champalimau Centre for the Unknown (CCU) in blue.

Year	Date	Theme	Type	Speakers (Field)	Special features
2011	Oct 27th	Engineering the mind	Ar Event	Joaquim Alves da Silva (Psychiatry) Albino Oliveira-Maia (Psychiatry) Ed Boyden (Neuroscience)	Round table 1st Open bar
	Nov 23rd	Emergence	Ar Event	Manuel Marques Pita (Collective Computation) José Leal (Computational Genomics) Deborah Gordon (Collective Behavior)	1st event teaser Pong played/controlled by the public
	Dec 11th	Suspicious coincidences in the brain	SeminAr	Terrence Sejnowski (Computational Neuroscience)	Q&A session
2012	Jan 24th	Creativity: the playground of the brain	Ar Event	Vik Muniz (Visual art) Rui Costa (Neuroscience)	Public overflow Post-event activities in the hall
	Mar 17th	How the brain got its wrinkles and other stories	Ar Event	Megan Carey (Neuroscience) Adam Kampff (Neuroscience) Susana Lima (Neuroscience) Marta Moita (Neuroscience) Rui Oliveira (Behavioural Biology)	Closed Brain Awareness Week in Portugal 1st event with online ticket reservation 1st event with online streaming Interactive activity with cell phones
	May 5th	Human 2.0	Ar Event	Domingos Henrique (Developmental Biology) Neil Harbisson (Cyborg, Artist) Miguel Nicolelis (Neuroscience)	Voxpop video, Robot on stage Post-event activities in the hall
	Jun 21st	Food for thought: tasting ideas	Ar Event	Carlos Ribeiro (Neuroscience) Stephen Simpson (Behaviour and Physiology) Paulo Morais (Asian and dietetic cuisine, sushi chef)	Pre-event with soccer match projection Sushi taste
	Jun 25th	Creativity, Art and Science	Outside CCU	7 CNP PhD Students	Celebrations of Museu Berardo's 5th anniversary in Lisbon
	Jul 5th	Think of a numb3r: from mind tricks to neuroscience	Ar Event	Christian Machens (Neuroscience) João Blumel (Mentalism, Mind Reading) Vince Lynch (Hypnotism)	Participation of public on stage Post-event activities at the amphitheatre
	Oct 25th	Mind invaders: will your brain be next?	Ar event	Luis Vicente (Adaptation Biology) António Câmara (Multimedia and Virtual Reality) Daphne Bavelier (Brain and Cognitive Sciences)	Post-event activities in the hall
	Oct 31st	Adventures in illegal art: creative media resistance and negativland	SeminAr	Mark Hosler (Creative activism)	Film projection "Adventures in illegal art" Q&A session
	Nov 12th	Misteries of the Brain at Semana de la Ciencia in Madrid	Outside CCU	4 CNP PhD Students	First performance outside Portugal
	Dec 14th	Society: an ongoing experiment	Ar Event	Iain Couzin (Collective Behaviour) Simo Routarinne (Improvisation, Group facilitation) Tamera (Community, Peace research project) Moderator: Zachary Mainen (Neuroscience)	Experimenting status with public Round table
2013	Jan 18th,19th	Ar Retreat at Praia da Areia Branca	Outside CCU	Ar Team	Vision statement
	Mar 26th	Futuring: Superhumans? In Pavilhão do Conhecimento	Outside CCU	Regan Brashear (Film Direction/Production) 3 practicing scientists Moderator: Alexandre Quintanilha (Science)	Film projection ("Fixed") Round table Post-event activities
	Apr 4th	Learning & Education	Ar Event	Escola da Ponte (Non-traditional schooling) Domingos Fernandes (Education) Paul Howard-Jones (Neuroscience) Moderator: Zachary Mainen (Neuroscience)	Debate based on questions written by the public Post-event activities in the hall
	May 22nd	Storytelling	Ar Event	Jonathan Gottschall (Literature and Evolution) Hélia Correia (Novelist, poet, playwright, essayist) Anna Hobbiss (Neuroscience)	Give away of tickets to everyone in the audience to visit Fundação José Saramago Book crossing after the event
	May 27th, 28th	SciCom Pt 2013 - Science communication congress in Lisbon	Outside CCU	Catarina Ramos (Postdoctoral fellow) Anna Hobbiss (PhD student)	Poster presentation Round table participation
	May 30th	The chemistry between us: the science of love and the implications for new treatments for autism	SeminAr	Larry Young (Social Neuroscience)	Selling "The chemistry between us" book signed by the author
	Oct 17th	Math sense: easier than you think	Ar Event	Ana Rita Pires (Mathematics) Richard Bisk (Mathematics) Eric Dewitt (Neuroscience)	Folding origamis with the audience
	Nov 30th	Playing with emotions: music and the brain	Ar Event	Stephen Bull (Music History) Ensemble Bonne Cord (Early Music) Marta Moita (Neuroscience)	Early music concert Guessing game with music and emotions
	Dec 5th	Mental time travel in rats and humans	SeminAr	David Redish (Computer Science, Neuroscience)	Q&A session
	Jan 31st	Alternative realities: how the insects perceive the world	SeminAr	Lars Chittka (Physiology, Evolutionary Ecology)	Q&A session
2014	Mar 27th	Attributing agency: towards a scientific concept of free will	SeminAr	Bjorn Brembs (Neurobiology, Neurogenetics)	Q&A session
	Apr 5th	Diving into Dance	Ar Programme	Megan Carey (Neuroscience) Capoeira Groups (Dance) Guido Orgs (Dance and Psychology)	pre-event activities with 3 dance workshops
	Apr 26th	Dancing your words away		Dance performance Nicky Clayton (Comparative Cognition) Clive Wilkins (Fine arts, Writer)	pre-event activities with 2 dance workshops
	May 7th	Dismantling the predictable: habits and improvisation		Satu Palokangas (Somatic embodied, improvisation) Rui Costa (Neuroscience) Stern Rudstrom (Dance, Performance, Improvisation)	(to be determined)

Goal

Ar's mission statement is 'A world moved by creative and critical thinking'. We believe that the most valuable purpose of science communication is not to convey scientific facts, but instead to promote enthusiasm for science in general, and importantly the critical mode of thought which is an essential component of scientific research. We emphasise interactions with our audiences, to facilitate the learning and generation of new ideas for everyone involved, public, scientists and speakers alike. Ar has developed a number of formats (see Methods for details) to constantly experiment and develop new ways to encourage this interaction.

Methods

WHAT - Ar has created the following formats and tools:

Ar events - Ar's main output are free evening events for the public, held in the 400+ seater Champalimaud Auditorium. Each event focuses on a central theme which is explored from different perspectives, in the form of 2-3 talks, demonstrations or interactive games to the audience per event. Most events combine three speakers; from which at least one is a scientist (past speakers include Miguel Nicolelis, Ed Boyden, and Deborah Gordon), in conjunction with experts from other fields with a strong connection to the theme. To name just a few: a sushi chef (Paulo Morais) explained the composition of his food (Food for Thought, Jun 2012); an artist (Vik Muniz) described his creative process (Creativity, Jan 2012); a virtual reality entrepreneur (Antonio Câmara) shared novel projects (Mind invaders, Oct 2012); a cyborg (Neil Harbisson) showed how he perceives colour with a head-mounted camera (Human 2.0, May 2012) (**Table 1**).

Thus we aim to stimulate in the audience the two crucial parts of our mission – creative and critical thought – by challenging previous assumptions, providing new information and drawing bridges between seemingly disparate ideas.

SeminAr - The SeminAr sessions are a spin off format of the Ar events, with less production involved and only one invited speaker (**Table 1**, in white).

Other collaborations - We have entered into collaborations with other science communication organisations within Portugal, mutually benefitting from pooled expertise and resources. The audience targeted by these organisations differs significantly from

Ar's own, allowing us to reach a broader sector of society (**Table1**, Outside the CCU, in blue).

Online presence – A range of online resources are currently implemented. The webpage (ar.neuro.fchampalimaud.org) contains event details and a webzine linking events with relevant articles. A YouTube channel (www.youtube.com/user/ArBreatheWithUs) hosts the events' video archive, which includes teasers to promote the events and edited videos of the Ar events.

Online communication with the public is achieved through newsletters, social networking via a Facebook page (<https://www.facebook.com/ar.neuro.fchampalimaud>), a Twitter account (<http://www.twitter.com/ArBreatheWithUs>) and Google+ account (<https://plus.google.com/u/1/116633388676808703288>), and online streaming of events.

WHO - Basic structure of Ar team:

All the members of Ar are volunteers (majority PhD students or post-docs) who work at the CNP. A permanent Ar team is responsible for event production, publicity, design, and online presence. A rotating team of Creative Director(s) propose the original idea for each event, and then take creative control of it throughout the whole process.

HOW - details of how events are produced:

Step I - Planning: An Ar event is the end result of a long germination process. An idea is discussed in multiple open meetings ('Ar clubs', to which the public can attend), resulting in theme choice and speaker invitations. Striking poster designs (**Figure 1**) are used across all the different publicity channels, including to media outlets, social networks and newsletter. Ar events are completely free – however to control the numbers of attendees a free online ticketing system (www.eventbrite.com) is used. Events are also streamed live online, and recorded for our YouTube channel so all the technical details are set during this step.

Step II - On the day organisation: The events themselves require a team of about 20 volunteers to run. Ar events begin at 9pm, usually on a Thursday. Ar volunteers coordinate the audio-visuals, manage the online streaming, and collect questions from the audience and assist with other interactive features specific to the event (**Table 1**, Special

features). An event lasts on average 2h; afterwards, an open bar and organised activities promote the discussion outside of the lectures.

Step III - Post event follow up: Afterwards a questionnaire is sent to our mailing list to assess the success of any strategies we have implemented. We place great importance on the dialogue between the Ar team and the public, as Ar is ultimately a collaborative enterprise. We also discuss extensively within Ar to optimise our approaches. Event videos and other relevant information are uploaded to the website/YouTube for our archives.



Figure 1. Top and from left to right: Examples of posters, used to publicize Ar events and to build the Ar brand: Emergence (Nov 2011); Human 2.0 (May 2012); Storytelling (May 2013) Dançar (April and May 2014). All posters were designed by PhD students and friends of Ar. Below Human 2.0 poster: Ar logo, designed by PhD students. Bottom and clockwise: Four representative photographs taken during Ar events: people in the hall, after checking in; speakers and moderator during round table session of Society (Dec 2012); the audience playing pong with read and blue cards during Emergence (Nov 2011); post-event activities for Creativity (Jan 2012).

Results

Events organized at the Champalimaud Centre for the Unknown (CCU)

Starting in October 2011, the Ar | Respire conosco team has organized sixteen Ar events and six SeminAr sessions (**Table 1**). Table 1 offers a summarized description of all Ar's activities in terms of: theme; names and fields of all speakers; and special features.

Themes: Both Ar events and SeminAr series have brought a wide range of engaging topics to the public, from human enhancement (Human 2.0, May 2012), brain myths (How the brain got its wrinkles and other stories, Mar 2012), to how animals choose what to eat (Food for Thought, Jun 2012), or how our minds can be tricked (Think of a Numb3r, Jul 2012).

Special features, We use a wide range of tools and formats to foster audience participation, from round tables, video teasers produced to promote the event, games and interactive pre- and post-event activities (**Figure 1**). These are theme specific, such as the giant pong game played by the audience to demonstrate emergent behaviour during Emergence (Nov, 2011), the book crossing after Storytelling (May 2013), the music concert, as part of Playing with emotions (Oct 2013), the round-table debate during Society (Dec 2012) or the series of dance workshops in the first Ar Programme of events in April and May 2014.

From the first event in October 2011, all Ar events have been full (around 420 attendees). Since Creativity (Jan 2012), when approximately twice the Auditorium capacity tried to attend, an online ticketing system as well as an online streaming service has been implemented. Tickets are frequently sold out in less than 30 minutes.

Activities outside the Champalimaud Foundation

The Ar | Respire conosco team has established partnerships with other science communication initiatives, both nationally and internationally (**Table 1**, Outside the CCU, in blue), including with Museu Berardo at Centro Cultural de Belém (one of the most visited Art Museums in Lisbon), Pavilhão do Conhecimento – the headquarters of Ciência Viva, National Agency for Scientific and Technological Culture headquarters, and Semana de la Ciencia (Madrid). The Ar initiative has also been represented in

conferences: the Society for Neuroscience meeting (2012), SciCom PT (2013, 2014) and PCST (2014).

Towards a characterization of the Ar public

Attending the Events: Data was collected through an online survey. A total of 89 replies were considered for this preliminary characterization (**Figure 2**).

Available data indicate that there is a gender imbalance towards women (**Fig 2A**), with a wide range of ages, though half fall between 23-39 years old (**Fig 3B**). It also shows that our public is mainly well-educated (**Fig 2C**) and has a high prior interest in science (80% claimed to be very interested in science, data not shown), although many work in diverse fields including a wide range of research fields, engineering, information technology, arts and media. (**Fig 2D**). Dissemination of Ar events is mainly through interpersonal contacts, with 40% finding out about Ar activities through word of mouth, 25% through social networks and the remaining 35% through email, posters, flyers and web (data not shown).

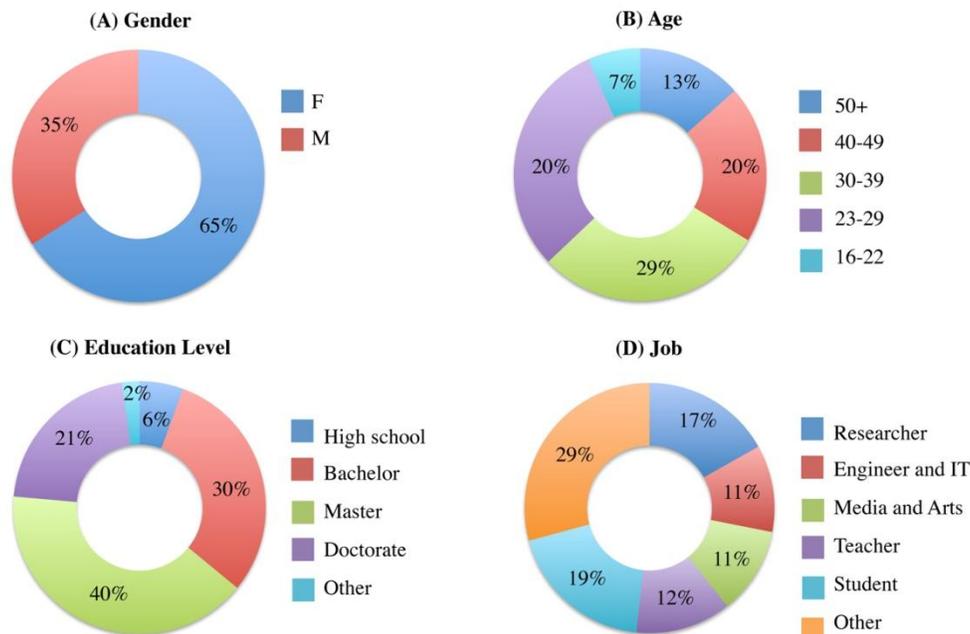


Figure 2. Preliminary characterization of Ar public in terms of: (A) gender; (B) age; (C) education level; and, (D) job. A total of 89 survey replies were considered.

Public feedback: Replies to the survey indicated that around one third of the public have been to more than half of the events (data not shown). The remaining two thirds come sporadically, indicating that the theme and speakers panel attracts a new audience every time.

Ar has been receiving positive feedback from the public. Comments include: ‘Interesting sessions, with scientific accuracy in a very relaxed and funny way’; ‘Love the fresh and dynamic atmosphere of these events’; ‘The events always make me think out of the box and learn new things’; ‘The complete experience: the suspense, the robot, the videos, interviews, the informal atmosphere, the complexity of the theme!’; ‘It helped me discover my dream job!’. Finally, Ar has also received several references in the blogosphere and in school’s webzines and magazines, showing that the events are triggering interest and enthusiasm from the public.

Online presence - numbers

Ar webpage (ar.neuro.fchampalimaud.org), has over 125.000 views. Ar events streamed online have between 50 and 150 viewers, with numbers steadily increasing. Around 75% of the viewers are from Portugal, and a growing number of people watching Ar events from Great Britain, Chile, United States of America and the Netherlands.

Media

Ar events have been drawing the attention from Portuguese Media. Ar activities have been covered several times and invited speakers are frequently interviewed both by TV channels and press (See “In the Press”: <http://ar.neuro.fchampalimaud.org/press>).

Discussion and Future

Ar occupies a previously unfilled niche within the intellectual and cultural society of Lisbon. Most other science communications initiatives target children and families, with little available for an adult audience. By focusing on broadly ranging science topics, presented from different angles in an accessible and informal way, Ar has created a ‘brand’ with enthusiastic support from a mainly adult professional audience. However, Ar is constantly seeking new ways to increase engagement and collaboration with the

public; one possibility that is starting to be explored is to have the participation from the public as external Creative Directors, meaning that the public becomes involved in all steps of event production.

As shown in **Fig 2**, Ar's audience is predominantly well educated and often already interested in science. To reach a wider audience and encourage deeper engagement we plan to improve some aspects of our setup. These include simultaneous translation into Portuguese to make the events accessible to a wider audience, especially targeting the younger demographic; increasing our online participation via event streaming and forum discussions, to engage a truly international audience; and new formats such as 'Ar in a Bar', inspired by the Café Scientifique movement, or partnerships with other institutions nationally and internationally where our formula could be replicated.