

COURSE ON SCIENTIFIC CULTURE

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Understanding How the Public Acquires Scientific Culture: A Learning Perspective

Historically most efforts to understand how the public acquires scientific culture have focused on specific resources - print and broadcast media, schools, informal education. However, science culture is rarely, if ever, gained from a single source, at a single point in time. Rather it is continuous process involving the accumulation of experiences from multiple sources, across time and space. In this talk, Falk will review research that reinforces this more ecological view of where, when and why children and adults acquire their knowledge of, interest in and values related to science.



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Science Communication: negotiating battlegrounds in understanding science in culture

This presentation will explore the challenge of exploring science communication, addressing whether, in fact, science communication is a field of study. Starting from challenges faced in defining science communication, as uncovered in an international project in which the author is involved, the presentation will move on to consider the diversity of disciplines that inform research into science communication and the associated disciplinary clashes that emerge. The presentation will also address a perceived disconnect between the ways in which academics might theorise about science communication and how practitioners undertake and evaluate their activities.

'Junkyards,' 'Shoes,' 'Fearless': Youth Perspectives on Scientific Culture

Using participatory research, this study explores how/why US youth in marginalized communities engage with free-choice/informal science learning (ISL) in their daily lives. Paid youth researchers shared critical ISL experiences, connections between and among experiences, mentors and tools supporting pathway-building, and created Personal Meaning Maps of "Me" and "STEM/ STEAM." These activities and the co-interpretation of the resulting artifacts, bring youth voices to the fore: how do they define ISL and do they construct ISL pathways? If they do, how, and if not, why. These data provide rich insights into how youth perceive Scientific Culture and their relationship to it.



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Teaching and developing critical thinking: the role of scientific culture and education, the contributions of cognitive science

Critical thinking is the flavour of the month in education, but its definitions are wide and varied, and the cognitive processes behind it are seldom addressed. After discussing the possibility of a naturalisation of critical thinking in terms of its cognitive building blocks, I will discuss how scientific culture and education could help develop natural critical thinking skills and attain advanced and expert performances.



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Conveying Scientific Culture to the Lay Public Via Informal Education

I address educational aspects of fostering an understanding of scientific culture with an eye towards considering how we might convey that understanding via informal education for the lay public. The talk will revolve around four questions. Why do we want to teach scientific culture in the first place? The reasons are many. Some are high-minded harking back to our ancient Greek forefathers. Others are utilitarian. What are we going to convey? We should know what scientific culture is and what parts of it are fundamental because that is what we will be attempting to teach. Who is our audience? We should make a determination about who in the lay public we will likely be addressing. How might we teach scientific culture in informal education? I present ideas about ways we could foster understanding of aspects of scientific culture for our intended audience.



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Spiderwebs and neurons. Art & Science at the National University in Mexico. The experience of the Aleph Festival and ACT Program on Art, Science and Technologies

One of my main concerns as a writer and cultural promoter has been to boost a greater closeness between science, literature and art. I directed the 2015 edition of the Cervantino festival, which was dedicated to the relationship between the performing arts and the sciences. As the coordinator of Cultural Difussion at the National Autonomous University of Mexico (UNAM) I have been responsible for two particularly successful projects in this field. In the first place, the Aleph Festival of Science and Art, which in three editions has congregated thousand of students around topics of arts, physics, neuroscience and complexity, and that next year will be devoted to the life sciences. Moreover, we run the ACT (Art, Science and Technology) program which holds annual calls for collaborations between hundreds of artists and scientists in specific projects, and that also organizes conferences, seminars and graduate programs in these fields. I will share our experience in these projects.

The Catalyst Collaborative at MIT (CC@MIT): Science and Theater, a Study in Bilingualism

The Catalyst Collaborative is a program of cooperation between MIT and the Central Square Theater in which a professional theater produces at least one play a season that is focused on some aspect of science - a biography, an inquiry into an ethical dimension of scientific inquiry, the impact of a discovery, the social impact of a particular methodology or discovery, science as a reflection of a historical or contemporary culture at large.

Participatory science communication for immersion in scientific culture

In the last decade there have been increasing calls for more participatory science communication. This is particularly true when deficit and dialogue means of science communication are perceived to fail in practice, especially when communicating about controversial science issues such as climate change.

This talk will examine how participatory science communication provides a platform for more effective dissemination and dialogue about controversial science issues. I will use an example, the Australian Climate Champion Program, to demonstrate how farmers and scientists built relationships of trust through participation that enabled them to more effectively share knowledge and openly discuss scientific risk.



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Nurturing a culture of science in an African context - contrasts, challenges and champions

The talk will reflect (very) briefly on the advances we have made with science communication in South Africa since democracy, but also highlights some of the persistent challenges related to cultural clashes and language barriers. Some examples of formats that work well for engaging diverse audiences - with a focus on informal science learning and creative approaches - are also provided.



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Scientific and ethical thinking beyond the confines of different cultures: A trial toward a generalized ethics based on the evolution of empathy

The hierarchy of empathy has been clarified through the recent progress of molecular biology and neuroscience. Sympathy (warmheartedness), positioned at the highest tier of evolution, is considered to have been acquired at the evolutionary stage of human beings that needed sophisticated sociability. Also, from the aspect of developmental cognitive neuroscience, the developmental process to achieve mutual understanding through distinction between self and others, as well as via third parties and objects, has been clarified biologically. I am seeing the emergence of the possibility that the conclusion made by Immanuel Kant in his "Die Metaphysik der Sitten (The Metaphysics of Morals)," one of his last publications, could correspond with the approach of the natural sciences. Furthermore, if the concept of "Tomoiki, or coexistence of self and others," which is beyond time and space, is positioned at the starting point, the birth of scientific and highly generalized ethics might be possible.

The Emergence of Modern Science Communication: trends, shifts and movements

We have collected accounts of how modern science communication has developed in 39 countries. Eleven rank outside the top hundred in per capita wealth, with Uganda, Ghana and Pakistan the lowest. Four are Muslim-majority countries: Nigeria, Iran, Pakistan and Malaysia. Five are from Africa, seven from the Americas, 11 from Asia and the rest from Europe and Australasia. They use science communication to persuade, to change behaviours, to inform, and to engage. The aim is always to lift the social, environmental and economic standing of their people. Indeed, hurdles are equally varied. In some countries the movement has been led by a determined government. In other countries, private foundations, universities or individual scientists have taken the lead.



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The words expressing what one does and the words expressing what one thinks he does

This talk will present an analysis of the expressions as used by the various actors to describe, explain and conceptualize “science communication” practices (in their generic sense), i.e., as they mobilized them as symbolic operators, as a means to position themselves within this specific field and as a means to distinguish this field from all others which also have for object the circulation of scientific knowledges. These expressions will also be analyzed at a synchronic level and, when possible, at a diachronic level in order to grasp as much the “transformation” of practices in view of changing circumstances as the reformulations of the discursive device in which these transformations take place (and which they often mobilize as justification). The research underlying this talk rests upon the history of the development of “science communication” in forty or so countries. This research remains largely exploratory, because the authors who answered the call for articles all interpreted the writing instructions that were given to them. Nevertheless, we can delimit with some certitude the extent of the semantic universe of “science communication”, and this constitutes the object of this talk.



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Who put that spaceship in the cathedral? A UK perspective on science, culture and society

The vision driving the UK's Science Museum Group is of a society that celebrates science. Primarily a cultural institution, our origins lie in the Great Exhibition of 1851 – a century before the infamous “two-cultures” debate – and the resulting South Kensington Museum. But around the turn of the 19th century this split into the Science Museum and the Victoria and Albert Museum for art and design. This presentation draws on our long history to consider the notional two cultures of science and the humanities and then describes some of our contemporary research and practice in science learning and engagement.



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Communicatore traditore

Translators are traitors. So are map-makers. So are science communicators, and for the same reasons. It is well-known that you can never say “the same thing” in a different language. Something is inevitably lost in translation and a translator worth his salt knows to choose carefully at the outset what can be left out. It is also well-know, in cartography, that there is no projection without distortion, and map-makers choose what to distort in terms of the purpose of their map. Here I show how translation, cartography, and science communication are perfect metaphors of each other, and what this means for the profession.

Opportunities and difficulties in the communication of the evidence of neuroscientific studies of child poverty

The consequences of poverty on child development are a topic of social interest and concern at a global level. Its scientific study has been approached by different disciplines since the first half of the 20th century. With the advent of neuroimaging technologies, the neuroscientific approach was added to such efforts about two decades ago. The evidence generated indicates that the exposure to poverty is associated with changes in the structure and functioning of the nervous system, and that some of these associations can be modified through different intervention approaches. The preliminary nature of this evidence does not support claims related to the immutability of the effects of poverty on brain development. However, in the communication and use of this evidence by the media, governmental and multilateral organizations, the dissemination of misconceptions and over-generalizations -with the potential to influence public opinion and political decisions- is often verified. In this presentation I will illustrate such tensions with examples from media interviews, consultancies with multilateral organizations and exchanges with the participants of studies, which account for a matrix of difficulties but at the same time of opportunities to improve communication and the use of such evidence.

From the 'Culture of Science' to the 'Culture of Science in Society'

What are the key challenges for science communication in the age of digital media? Are they entirely new or rather occurring in a different communicative context of longstanding issues pertaining to the credibility and reliability of information and the role of expertise? The contemporary landscape poses relevant challenges for science in society research. At the same time, it offers opportunities to rethink some of the key concepts in this area, including the concept of "culture of science".



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MD (University of Buenos Aires). PhD (Psychology, Université de Paris). Former activities: Member of the Centre International d' Epistémologie Génétique, Geneva (Jean Piaget); Directeur Associé École Pratique des Hautes Études, Laboratoire de Psychologie Expérimentale et Comparée. Paris; Visiting Professor, Graduate School of Education, Harvard; Chief Education Officer, OLPC, One Laptop Per Child, President International Mind, Brain and Education Society, IMBES (2009). Current activities: Member of the Pontifical Academy of Sciences; Member of the National Academy of Education (Argentina); and Director of the International School on Mind Brain and Education, Ettore Majorana Foundation and Centre for Scientific Culture, Erice, Italy.

María Lourdes (Lula) Majdalani has a Degree in Political Science and International Relations from the Argentinian Catholic University (UCA), and a Master Degree in Education -concentration in Mind, Brain and Education- from Harvard University. She has directed the Center for Moral Development of the Majdalani Foundation for the past 20 years, an entity dedicated to research on the moral and emotional development of children, adolescents and adults. She co-designed the Values Project for children, a project designed to be implemented in the classroom by teachers. She has been a lecturer in workshops for teachers and parents on moral development and education. She wrote and published several articles on issues related to moral and emotional education. She runs the E-Classis virtual platform, meant to train teachers and parents on emotional issues, moral conflicts and educational practices. Since 2003, together with Dr. Antonio Battro, she has organized the Schools of IMBES - International Mind, Brain and Education Society - at the Ettore Majora Foundation and Centre for Scientific Culture, in Erice (Sicily) with scientists and educators from all over the world.

Mind, Brain and Education School

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Course on Scientific Culture

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