Ann-Sophie Barwich

Abbreviated Curriculum Vitae

RESEARCH	Philosophy of Science; Cognitive Science; Philosophy of Perception; Philosophy
	of Neuroscience

EMPLOYMENT

2003 - 2009

EMIT LOT MIENT	
2018 – 2019	Indiana University Bloomington, USA Visiting Assistant Professor; Cognitive Science Program
2015 – 2018	Columbia University in the City of New York, USA Presidential Scholar in Society and Neuroscience; Center for Science and Society
2013 – 2015	Konrad Lorenz Institute for Evolution and Cognition Research, Austria Postdoctoral Research Fellowship
EDUCATION	
2010 – 2013	University of Exeter, UK, Ph.D., Philosophy; John Dupré and Michael Hauskeller (supervisors)

5 KEY REF PUBLICATIONS

Book	2019	(fortl	ncoming,	schedul	ed for	r Fall). Harvard	University Pres	S.
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German Literature Studies and Philosophy

Journal Articles 2018 (in press). "How to be Rational about Empirical Success in Ongoing Science: The Case of the Quantum Nose and its Critics." Studies in History and

Philosophy of Science. doi.org/10.1016/j.shpsa.2018.02.005 0039-3681

2017. With K. Bschir. "The Manipulability of What? The History of G-Protein

Coupled Receptors," *Biology & Philosophy* 32(6): 1317–1339.

Humboldt University Berlin, Germany, Magister Artium (MA),

2017. "Up the Nose of the Beholder? Aesthetic Perception in Olfaction as a Decision-Making Process," *New Ideas in Psychology* 47: 157-165.

2015. "Bending Molecules or Bending the Rules? The Application of Theoretical Models in Fragrance Chemistry," *Perspectives on Science* 23 (4): 443-465.

TEACHING

2007 - 08 (Fall)

rse Director. Indiana University Bloomington
rse Director. Co-taught with Stuart Firestein, Columbia University
st Lecturer, Co-taught with Andreas Mershin, MIT
duate TA, University of Exeter
duate TA, University of Exeter

Undergraduate TA, Humboldt University

Ann-Sophie Barwich

Full Curriculum Vitae

07/01/2018

CONTACT INFORMATION Cognitive Science Program 819 Eigenmann; 1900 E. 10th St.

Indiana University Bloomington, IN 47406-7512

Cell (+1) 917.407.1272 Email <u>as.barwich@gmail.com</u> Web <u>smellosophy.com</u>

AOS

Philosophy General Science; Cognitive Science; Philosophy of Neuroscience and

Perception

AOC

Philosophy of Biology; History of Science; Science & Technology Studies;

History of Philosophy; Literature Theory

EMPLOYMENT

2018 - 2019

Indiana University Bloomington, USA

Visiting Assistant Professor; Cognitive Science Program

2015 - 2018

Columbia University in the City of New York, USA

Presidential Scholar in Society and Neuroscience; Center for Science and Society

(Departments of Philosophy and the Biological Sciences)

Project: "From the Air to the Brain: Laboratory Routines in Olfaction." Mentors: Stuart Firestein (Neuroscience); Christopher Peacocke (Philosophy)

2013 - 2015

Konrad Lorenz Institute for Evolution and Cognition Research, Austria

Postdoctoral Research Fellowship

Project: "Scenes of Scientific Discovery: Modeling the Olfactory Mechanism at the Intersection of Experimental, Technological, and Conceptually Driven

Analysis."

Supervisor: Werner Callebaut

EDUCATION

2010 - 2013

University of Exeter, UK

Ph.D., Philosophy

Dissertation: Making Sense of Smell: Classifications and Model Thinking in

Olfaction Theory.

Supervisors: John Dupré; Michael Hauskeller

Examiners: Hasok Chang (external); Sabina Leonelli (internal)

2003 - 2009

Humboldt University at Berlin, Germany

Magister Artium (MA), German Literature Studies and Philosophy

Thesis: "Compossibilis. Leibniz' Kausalitätskonzept als heuristische Quelle für

Entwicklungsfragen in der modernen Biologie."

RESEARCH

My research looks at the sense of smell as a new philosophical model for theories about perception and the brain. Modern theories of perception were built predominantly on the workings of the visual system. Can talk about its central concepts, such as the representational character of perceptual objects, also be applied to the chemical senses? The chemical senses have been vital to cultural evolution and human society, but have been widely neglected in philosophical analysis. What may we learn from smell regarding the role of the senses in human behavior? And does it matter? Popular opinion has it that human olfaction is in evolutionary decline and a primitive, unsophisticated sensation that carries little importance to studies of the human mind. Nothing could be further from the truth! Over the past three decades, scientific insight has proven such pejorative beliefs about human olfaction wrong. In fact, it turns out that smell might be essential to understanding the intricate workings of central cognitive processes; including language, memory, and learning.

My work on smell partakes in a unique opportunity for philosophers. Scientific research on olfaction currently stands at a crossroad because its contemporary questions about odor perception resonate deeply with philosophical concerns: What actually *are* odors? Does smell present us with representations of material features in the world, or does it embody an object-less state of mind? How can smell influence and modify conscious experience?

In particular, my work engages with two areas of focus:

As a philosopher of science, I ask: How do scientists study the material basis of the mind? What are the epistemological, technological, and social conditions that underpin current theorizing in neuroscience? (Plus, how do these conditions then feed back into broader public understanding of the mind and the brain?) Here, I am especially interested in what defines scientific expertise in laboratory-based research, and how cognitive and behavioral patterns influence scientific decision-making. My work develops a philosophical framework that addresses the dynamic nature of ongoing inquiry that renders the evaluation empirical success and evidence flexible.

As a philosopher of cognitive science, I ask: How are the different processes involved in perception, cognition, and judgment intertwined? Are smells merely subjective sensations, or do we need to rethink philosophical understanding of perceptual objectivity? The central thesis of my work on smell is that perception is a skill that involves observational refinement. In this context, I am interested in the impact on top-down processes on odor perception (for example, regarding the role of expertise in perfumery and wine tasting).

DISSERTATION

If all roses smell the same, is this because of their material origins or their name? In my dissertation, "Making Sense of Smell: Classifications and Model Thinking in Olfaction Theory," *I asked* what odors are by analyzing changing conceptualizations of the olfactory stimulus. From the 18th to the 20th century, the sense of smell was investigated through several theoretical frameworks that concerned its affective nature and psychological effects by analogy with other sensory qualities such as taste, color, and sound. Abstracting from these classifications in perfumery, chemistry, and biology this dissertation inquires whether odors constitute natural kinds and form distinct qualitative groups.

My argument runs against the intuition that odors are subjective in their perception and lack a basis for objective comparison. I advocate a realist position as grounded in the scientific practices that have successfully linked odors to materials through botanical, chemical, molecular-biological, and neurophysiological practices.

PUBLICATIONS

Book

2019 (forthcoming, scheduled for Fall). Harvard University Press.

Journal Articles

2018 (in press). "How to be Rational about Empirical Success in Ongoing Science: The Case of the Quantum Nose and its Critics." Studies in History and Philosophy of Science. doi.org/10.1016/j.shpsa.2018.02.005 0039-3681. (Open Access)

2017. With K. Bschir. "The Manipulability of What? The History of G-Protein Coupled Receptors," *Biology & Philosophy* 32(6): 1317–1339.

2017. "Up the Nose of the Beholder? Aesthetic Perception in Olfaction as a Decision-Making Process," *New Ideas in Psychology* 47: 157-165.

2016. "Making Sense of Smell," The Philosophers' Magazine 73, 41-47.

2015. "What is so special about smell? Olfaction as a model system in neurobiology," *Postgraduate Medical Journal* 92: 27-33.

2015. With H. Chang. "Sensory Measurements: Coordination and Standardization," *Biological Theory* 10 (3): 200-211.

2015. "Bending Molecules or Bending the Rules? The Application of Theoretical Models in Fragrance Chemistry," *Perspectives on Science* 23 (4): 443-465.

2014. "A Sense So Rare: Measuring Olfactory Experiences and Making a Case for a Process Perspective on Sensory Perception," *Biological Theory* 9 (3): 258-268.

2013. "Science and Fiction: Analysing the Concept of Fiction in Science and its Limits," *Journal for General Philosophy of Science* 44 (2): 357-373.

2013. "A Pluralist Approach to Extension: The Role of Materiality in Scientific Practice for the Reference of Natural Kind Terms," *Biological Theory* 7 (2): 100-108.

Book Chapters

2018. "Measuring the World: Towards a Process Model of Perception," in: *Everything Flows: Towards a Processual Philosophy of Biology*, ed. by D. Nicholson, and J. Dupré. Oxford University Press. (Open Access)

2018. "Is Captain Kirk a natural blonde? Do X-Ray crystallographers dream of electron clouds? Comparing model-based inferences in science and fiction," in: *Thinking about Science and Reflecting on Art: Bringing Aesthetics and the Philosophy of Science Together*, ed. by Steven French, Otavio Bueno, and Dean Rickles. Routledge, 62-79.

2014. "Fiction in Science? Exploring the Reality of Theoretical Entities," in: Defending Realism: Ontological and Epistemological Investigations. Proceedings of the International Conference, ed. by Guido Bonino, Javier Cumpa and Greg Jesson. De Gruyter, 291-309.

2006. "Das Wundenmotiv in Tolkiens 'Der Herr der Ringe' unter dem Blickwinkel der traumatischen Erfahrung," in: *Inklings. Jahrbuch für Literatur und Ästhetik.* Bd. 24, ed. by D. Petzold. Brendow.

Digital Edition

2019. "Sleight of Hand in Ms. Fr. 640, fols. 33r-36r, 43v." Critical online publication of *The Making & Knowing Project*, ed. by Pamela H. Smith.

Editorials

2012. With S. Leonelli. "Editorial," The Reasoner 6 (3).

Book Reviews

Forthcoming. "J.D. Trout. Wondrous Truths: The Improbable Triumph of Modern Science." *Philosophy*.

2015. "Astrid Schwarz. Experiments in Practice (History and Philosophy of Technoscience 2.)." *Isis* 106 (4): 898-899.

2010. "Leibniz-Forschungsstelle der Universität Münster (Ed.) Gottfried Wilhelm Leibniz. Philosophischer Briefwechsel, Bd. 1: 1663–1685, Bd. 2: 1686–1694." In: *Zeitschrift für Germanistik* 3: 675-677.

2007. "Arbeitsgemeinschaft Literarischer Gemeinschaften und Gedenkstätten E.V. (Ed.): Literatur vor Ort. Literarische Gesellschaften, Museen und Gedenkstätten." In: Zeitschrift für Germanistik 3.

Conference Reports

2013. With T. Baetu, D. Brooks, S. Dutreuil, and P. Germain. "Model Thinking in the Life Sciences: Complexity in the Making, Second European Advanced Seminar in the Philosophy of the Life Sciences, 'In Vivo, ex Vivo, in Vitro, in Silico: Models in the life sciences' Hermance, Switzerland, 10–14 September 2012." Biological Theory 8 (1): 121-124.

2011. With A. Amilburu. "Bridging Disciplines? An Enquiry on the Future of Natural Kinds in Philosophy and the Life Sciences." *Biological Theory* 6 (2): 187-190.

Popular & Media

2018 ().Interview in the online magazine *Fatherly*: "Why Preteens Smell Bad as Puberty Gets Started." URL= https://www.fatherly.com/health-science/why-preteens-smell-bad-puberty/

2017. Podcast about the senses on *Tell Me Something I Don't Know*. http://tmsidk.com/2017/10/senses/

2017 (November 10). Interview in the online magazine Fatherly: "The Importance of Playing with A Child's Sense of Smell A smell researcher on why playing with a kid's sense of smell can help develop their taste and language." https://www.fatherly.com/parenting/importance-playing-childs-sense-smell/

2017. Blog post "Is Smell an Aesthetic Sense?" *Imperfect Cognitions*. http://imperfectcognitions.blogspot.com/2017/07/is-smell-aesthetic-sense.html

2017 (May 11). Interview in the online magazine *Fatherly* about a publication on the human sense of smell in *Science*. https://www.fatherly.com/health-science/myth-humans-poor-sense-smell-debunked/

2017 (April 11). Interview in *Inside Science* on a study on computing odor images. https://www.insidescience.org/news/do-you-smell-what-i-smell

2017. Blog post "Making Sense of Scents: The Science of Smell" *Auxiliary Hypotheses* | *The BJPS Blog*. http://thebjps.typepad.com/my-blog/2017/01/making-sense-of-scents-the-science-of-smell-ann-sophie-barwich.html

RESEARCH EXPERIENCE

2012 – 13	Research Assistant, The Centre for the Study of the Life Sciences, University of Exeter, supervisor: Christine Hauskeller
2008 – 09	Student Research Assistant , University Collections Project, Helmholtz-Zentrum für Kulturtechnik, HU Berlin, supervisor: Cornelia Weber
2008 – 09	Student Research Assistant , Department of German Literature, HU Berlin, supervisor: Lutz Danneberg
2008	Student Assistant , Berlin-Brandenburg School for Regenerative Therapies, Charité Berlin
2007	<i>Internship</i> , Berlin-Brandenburgische Akademie der Wissenschaften; Project "Functions of Consciousness"
2006 – 07	Internship, Journal Zeitschrift für Germanistik
TEACHING	
2018 – 2019	Course Director. Indiana University Bloomington; Cognitive Science Program
Fall 2016 & 2017	Course Director. Co-taught with Stuart Firestein, Columbia University; Departments of Philosophy, History, and Biological Sciences (cross-listed) Fall: Scientific Pluralism in Practice: Readings in the History and Philosophy of Science
Spring 2016	Guest Lecturer, MIT Co-taught with Andreas Mershin, Making Sense of Scent, January 27
2012	Graduate Teaching Assistant, University of Exeter; Philosophy Spring: Knowledge and Reality, Michael Hauskeller (Course Director) Fall: Philosophy of Nature, Jaume Navarro (Course Director)
2011	<i>Graduate Teaching Assistant</i> , University of Exeter; Philosophy Fall: <i>Philosophy of Nature</i> , Staffan Müller-Wille (Course Director)
2007 – 08	Undergraduate Teaching Assistant, Humboldt University; Philosophy Fall: Practical Philosophy, Oswald Schwemmer (Course Director)

AWARDS & GRANTS

2017

Teaching Grant: Course Development in Science and Society, Center for Science and Society at Columbia University, for *Scientific Pluralism in Practice: Readings in the History and Philosophy of Science*, co-taught with Stuart Firestein (cross-listed at the Departments of Philosophy, History, and the Biological Sciences)

2013 - 2015

Honorary Research Fellow, Egenis (The Centre for the Study of the Life Sciences), University of Exeter

2011 - 2012

Postgraduate Fellowship: College of Social Sciences and International Studies, University of Exeter

PRESENTATIONS

Invited Papers

Forthcoming

2018. "Technologies of Taste," Panel at the 2018 HSS Annual Meeting (History of Science Society) Nov 1-4, Seattle

2018

"The Nose as a Window to the Mind," Invited Speaker at the 40th meeting of AChemS (Association for Chemoreception Sciences); Symposium: "Back to the Future: From Past discoveries to Future Directions," Bonita Springs, Florida, April 18-21, 2018 (Co-panelists: Gordon Shepherd, Linda Bartoshuk, Stuart Firestein).

"The Odor of Things: The Sense of Smell as a New Model for Studies of Mind and Brain," University of Exeter, February 8

"The Odor of Things: The Sense of Smell as a New Model for Studies of Mind and Brain," San Francisco State University, January 18

Commentator "Smells as Secondary Qualities," APA Eastern Division Meeting (American Philosophical Association), Savannah, GA, January 3-6

2017

"Olfaction as a Model for Neuroscience: How Your Brain Is Making Scents – And Why It Matters." Department of History and Philosophy of Science, Indiana University Bloomington, Nov 9

"What are Odors: Qualitative Objects or Qualitative Relations?" UK Semiochemistry Network Workshop, Cambridge, July 18-19

"Scent Track: What can the History of Olfaction tell us about Theorizing in the Life Sciences?" New York City History of Science Consortium Lecture Series, April 26

"Smell as a Model System. A Philosophical Study at the Bench." (Talk in honor of Maria Inés Velazco), Firmenich SA, Princeton NJ, March 23

2016

"Whatever the Method? PCR and the Discovery of the Olfactory Receptors," Many Methods – One Biology, Center for Advanced Studies, Ludwig Maximilians University Munich, October 20-22

"Philosophy at the Bench: Olfaction as a Model System for Neurobiology," Neuroscience Institute Special Seminar, NYU Langone Medical Center (Rinberg Lab), July 27

"Imagine there is a controversy and no one participates: Philosophical failures in science narratives" Model(ing) Controversies in Science, National University of Singapore, March 15 & 17

"Olfaction as a modern experimental system: a philosophical study at the bench", New York Medical College, February 3

2015

"Olfaction as a model system for neurobiology: GPCRs and Mapping Smells in the Brain," Center for Bits and Atoms, MIT (Mershin Lab), December 9

"Why we need to think about Failure in Science," University of Bristol, Department of Philosophy, December 2

"Success is not equal to progress: Why Failure is integral to Science," Wagner Conference 2015, University of Reno, November 12-14

2014

"Evo-Devo and Olfaction: Developing Process Categories for Perception," Process Philosophy of Biology, Egenis (Centre for the Study of the Life Sciences), University of Exeter, November 20-21

"How Philosophy matters to Science (And why you shouldn't listen to philosophers. Talk to them.)" Firestein Laboratory, Columbia University, November 12

"Is Captain Kirk a natural blonde? The limits of fiction and what they can tell us about modeling in science," Philosophy of science and aesthetics conference, University of Leeds, September 5-6

"The Standard Observer: Humans as Measurement Instruments for the Quantification of Qualities. The Case of Olfaction as a Diagnostic Tool for Neurodegenerative Diseases." Quality & Quantity: Limits of Quantification in the Sciences (30th Altenberg Workshop in Theoretical Biology), Konrad Lorenz Institute for Evolution and Cognition Research Institute, June 11-14

2013

"Modelling Evidence: Theory Assessment in Olfactory Research," Konrad Lorenz Institute for Evolution and Cognition Research, March 21

Symposia

2017

Organizer & moderator: "The Human Sense of Smell," Seminars in Society and Neuroscience, Columbia University, New York, April 13

Speakers: Barry Smith (University of London), Clare Batty (Kentucky), Donald Wilson (NYU), Avery Gilbert (smell scientist & author), Christophe Laudamiel (DreamAir, perfumer)

URL= https://youtu.be/DYO45ERk 3Q

2015

Organizer & moderator: "Understanding Cognition through Development: What Do Animals, Children, and Science Have in Common?" Seminars in Society & Neuroscience, Columbia University, November 2

Speakers: Kristin Andrews (York), Diana Reiss (Columbia), Peter Gordon (Columbia)

URL= https://www.youtube.com/watch?v=pit-HYsksUo

Organizer & Speaker: "Failure in Science," Ishpssb (The International Society for the History, Philosophy, and Social Studies of Biology), UQAM, Montreal, July 5-10

Stuart Firestein (Columbia): "Explicit failure"

Isabella Sarto-Jackson (KLI): "Intrinsic hidden constraints in dataintensive biology"

Ann-Sophie Barwich (KLI): "Simply" failure or delayed success? Mapping smells in the brain"

Selected Papers

2016

"The Imitation Game: What does 'Recognition' in Mechanisms of Molecular Recognition mean?" Philosophy of Science Association, Atlanta, November 3-5

"Fashion Fades, Only Chanel No. 5 Remains the Same: A Chemical History of Style and Technology," ISPC2016 (20th Annual Meeting of the International Society for the Philosophy of Chemistry), Florida Atlantic University, August 1-

With D. Bilak. "Vials and Vinaigrettes: The Manipulation of Odour in 18th-century French Science and Society," Dutch-Belgian Society of Eighteenth-Century Studies Annual Conference-Conference 'Flavours of the Eighteenth Century,' Brussels, March 10-11

With K. Bschir. "Manipulability and Entity Realism in Wet-Lab Research: The Story of G-Protein Coupled Receptors," The History of Science and Contemporary Scientific Realism, Indiana University-Purdue University, February 19-21

2015

With K. Bschir. "Reality as a relational property: The story of G-protein coupled receptors," EPSA (European Philosophy of Science Association), Center for Logic and Philosophy of Science, Heinrich Heine University Düsseldorf, September 23-27

"The Problem of Co-ordination ≠ The Problem of Standardisation: What Sensory Measurement Is (Not)," The Making of Measurement, University of Cambridge, July 23-24

2014

"A Fine Nose for Timeliness: The Discovery of the Olfactory Receptors and the Question of Novelty," Philosophy of Science Association, Chicago, November 6-9

"Sensing the Unknown: Historicising the Discoverability of the Olfactory Receptors within the Life on an Experimental System," Integrated History and Philosophy of Science 5 (&HPS5) conference, University of Vienna, June 26-28

"The Discovery of the Olfactory Receptors and the Question of Novelty," Philosophy of Science Conference, Dubrovnik, April 14-19

"What would MacGyver do? Experimental Tools and the Discovery of the Olfactory Receptors," Philosophy of Biology in the UK, University of Cambridge, March 30-April 1

2013

"If you can spray them, then they are real: Evidence Construction in Fragrance Chemistry," Ishpssb (The International Society for the History, Philosophy, and Social Studies of Biology), Montpellier, July 7-12

"The Application of Theoretical Models and Strategies of Evidence Construction in Fragrance Chemistry," The British Society for the Philosophy of Science (BSPS), University of Exeter, July 4-5

2012

"Making Sense of Smell: Models in Olfaction Theory," Ex vivo, in vivo, in vitro, in silico: Second Advanced Seminar in the Philosophy of the Life Sciences, Brocher Foundation, Geneva, September 10-14

"The Scientification of Scent: Modeling the Mechanism of Primary Odour Recognition," The British Society for the Philosophy of Science, University of Stirling, July 4-6

"Bending the Rules or Bending the Molecules: Contemporary Issues in Olfaction Theory," 7th annual integrated HPS workshop, UCL Department of Science and Technology Studies, June 28-29

"Get a whiff of this! Modelling the Mechanism of Primary Odor Recognition," Models and Simulations 5, University of Helsinki, June 14-16

2011

"Natural Kind Terms as Sign Functions," Natural Kinds in Philosophy and in the Life Sciences: Scholastic Twilight or New Dawn? University of Granada, September 7-9

"Science and Fiction: On the Reference of Model," Society for the Philosophy of Science in Practice, University of Exeter, 22-24 June

"Science and Fiction: On the Reference of Models," Defending Realism. Ontological and Epistemological Investigations, University of Urbino, June 20-22

"Representing Knowledge: On the Epistemic Condition of Reference," Integrated HPS workshop, University of Cambridge, April 18-19

Campus Presentations

2018 "The Science of Smell: Field(work) without a Discipline" Presidential Scholars Research Symposium: 3rd-Year Presentations and Reception. Columbia University, April 30 URL=https://www.voutube.com/watch?v=TIY2Ub9CTUM&index=2&li st=PLSYL9MBIDfZRiMXRzMbWY-N8TwoAuC9TA 2017 "The Science of Smell: A Philosophical Study at the Bench," Presidential Scholars in Society and Neuroscience Research Symposium, Columbia University, February 13 URL= https://youtu.be/fBwNqf8BHsg 2014 Respondent: "Ontologies of Protein-Ligand Binding Complexes," speaker: Isabella Sarto-Jackson, Ontological Issues in the Life Sciences (Third European Advanced Seminar in the Philosophy of the Life Sciences), KLI Institute, September 1-5 Keynote Talk: "The Descent of Scent: Model Thinking in Olfaction Theory," 2013 Egenis - Centre for the Study of the Life Sciences, University of Exeter, March 25

SERVICE TO PROFESION

2012 – Present *Journal Reviewer*

Mind; Philosophy of Science; Mind & Language Philosophical Quarterly; Synthese; New Ideas in Psychology; Biological Theory; The European Journal for Philosophy of Science; Studies in History and Philosophy of Science Part A; Studies in History and Philosophy of Biological and Biomedical Sciences; Journal for General Philosophy of Science; Philosophy, Theory and Practice in Biology; Journal of Applied Philosophy; Theoria; Open Philosophy

2014 Manuscript Reviewer

MIT Press

2013 – 15 *Committee Member*

Student Advisory Committee: The International Society for the History,

Philosophy, and Social Studies of Biology

2007 – 2008 Elected Representative

Student Advisory Committee: Humboldt University Berlin, Department of

Philosophy