Conference Report

SCNAT Ethics Series on Recognizing and Overcoming Bias

Sandra Hofmann*

*Correspondence: Dr. S. Hofmann, E-mail: chemistry@scnat.ch
SCNAT, Platform Chemistry, Haus der Akademien, Bern

The Ethics Series is a workshop tour on the wide-ranging topic of ethics in chemistry organized on a regular basis by the Platform Chemistry of the Swiss Academy of Sciences (SCNAT). The Ethics Series addresses all researchers in chemistry and has the aim to sensitize the audience for timely topics on issues such as the previously addressed topics of scientific integrity, social responsibility or overselling in publications. Internationally renowned speakers are invited to give a series of lectures at Swiss universities and federal institutes of technology, jointly with local speakers.

The format is similar to the 'world café' style: short introductory lectures, break-out sessions to discuss specific topics, reports to the plenary followed by a discussion with audience participation. This year's topic was on '*Recognizing and Overcoming Bias*' and took place from June 7–9, 2023. Prof. Lee Penn and local panellists discussed a variety of questions arising around bias.

Recognizing and Overcoming Bias

Prof. Lee Penn started with introducing what bias, and particularly implicit bias, entails: it refers to the unconscious attitudes and stereotypes that individuals hold towards certain groups of people.

Imagine the following scenarios:

- *At the annual department event, a female student was talking about how she had just joined a group with a newly appointed female professor. She was asked by another student, "Oh, did you join her group because she is a woman?"*
- *A professor compliments a black German student on their command of the German language – "Ah - you speak German (or primary language of the region) so well!"*
- *A student in your section comes to your office hours. They tell you that during lab they often hear racist (islamophobic or anti-immigrant) jokes and it makes them uncomfortable.*

These situations are all recognisable and all come along with an uncomfortable feeling. In addition, implicit biases can influence the ways in which ideas and contributions are evaluated and recognized, obstructing the inclusion of diverse individuals (Fig. 1).

In these discussions, it became clear how recognizing and addressing our own implicit biases can help us remove barriers and become allies that foster a culture of inclusivity and respect.

Implicit Bias in Experimental Research

And what implicit biases can we have in experimental research? *Kaila Yallum* gave examples on how we as scientists are both contributing to and are subject to implicit bias, for example when it comes to funding and resources, experimental design, the interpretation of results or peer review (Fig. 2). To increase the audience's awareness of bias, the audience was asked for a test. They were shown images of bugs and flowers and asked to label them with either 'pretty' or 'ugly'. The results showed that because brains like to sort concepts into categories, it was way easier to label bugs with 'ugly' and flowers with 'pretty' than the other way round.

Fig. 1. Prof. Lee Penn on the importance of diversity in chemical sciences, here at ETHZ. Photo by Marie Francine Lagadec.

There is also good news: thanks to social movements, implicit bias based on sexual orientation has decreased by 60% between 2007 and 2020 in the U.S.[1]

Experimental Design and Data Presentation

Finally, **Dr. Frédéric Schütz** highlighted how experimental design and bias are connected. One example he presented was based on a systematic review that showed how animal studies are susceptible to study quality biases:[2] It was shown that lower-

Fig. 2. Kaila Yallum on implicit bias in experimental research, here at University Bern. Photo by Sandra Hofmann.

quality studies that had limitations in randomization or blinding resulted in a better estimation of treatment efficacy.

Clearly, researchers are also not immune to confirmation bias, the tendency to favor information that confirms or strengthens their beliefs or values. Or, as Prof. Adriano Aguzzi once stated: "*Don't fall in love with your hypothesis!*"

Summary

Throughout the Ethics Series, discussions centered around best practices, effective responses, potential consequences of not responding, the power of language, and identifying resources when the situation requires expertises beyond our own. Gains were skills in terms of how to promote a welcoming and inclusive climate and how to handle instances of bias when they arise.

Speakers

Prof. Dr. Lee Penn

Professor and the Director of Undergraduate Studies in the Department of Chemistry at the University of Minnesota – Twin Cities and has taught general and upper level chemistry courses, seminars about bikes and nanotechnology, and more. Prof. Penn's research group works with nanoparticles, focusing on their synthesis and characterization, how they behave in environmental systems, and how to synthesize materials using the principles of green chemistry.

Kaila Yallum

PhD student at the FemtoMat Research Group at University of Bern and President of the PhD Coalition. When not considering topics around bias, she uses multiple spectroscopic techniques to investigate charge generation in organic photovoltaic materials such as Transient Absorption, Electromodulated Differential Absorption, and Excitation Correlation Spectroscopy.

Dr. Frédéric Schütz

Senior researcher at the University of Lausanne, responsible for the Biostatistics platform of the Faculty of Biology and Medicine, and group leader at the Swiss Institute of Bioinformatics; he has also worked as a science journalist/writer. In these positions, he provides support to researchers on topics such as experimental design and data analysis, as well as training, lectures and workshops on many topics, including data visualization, communication, popular writing and critical thinking.

Fig. 3. Dr. Frédéric Schütz on Bias in Experimental Design, here at University of Fribourg. Photo by Sandra Hofmann.

[1] T. E. S Charlesworth, M. R. Banaji, *Psychological Science* **2022,** *33***,** 9, https://doi.org/10.1177/09567976221084257.
[2] M. R. Macleod, H. B. van der Worp, E. S. Sena, D. W. Howells, U. Dirnagl, G. A. Donnan, *Stroke* **2008**, *39*, https://doi.org/10.1161/STROKEAHA.108.515957