

## Book Reviews

**Nicole C. Nelson**, *Model Behavior: Animal Experiments, Complexity and the Genetics of Psychiatric Disorders* (Chicago, IL: Chicago University Press, 2018), pp. 272, \$30, paperback, ISBN: 9780226546087.

*Model Behavior* is a pleasure to read. This may not be a reader's initial expectation when embarking on an ethnography of mouse laboratory research. However, Nicole Nelson succeeds in making her examination of complexity in animal behaviour genetics research at once clear and compelling, as well as academically astute. She brings the reader inside the laboratory of Dr Daniel Smith at Coast University (both pseudonyms) and introduces us to scientists and student researchers at all levels, as they teach and learn about how to conduct and speak the language of behaviour genetics research in animals. Drawing on this narrative, Nelson examines the ways in which mice are made to stand in for humans in studies of alcohol consumption and addiction.

Early in *Model Behavior*, Nelson notes her surprise about how open and accepting the researchers she follows were to the complexity and uncertainty of presumptions and conclusions in their work. As she puts it, 'they seemed to relish conversations about all the ways in which their models were limited. I felt outwitted at my own game' (p. 8). Nelson adeptly turns this into a significant strength of her book. Rather than trying to point out what her scientific actors naively assume or overlook in their work, she focuses on how they manage and embrace complexity in their worldview of mouse behavioural genetics and alcoholism research. To the extensive Science and Technology Studies (STS) literature on genomics and laboratory practice, Nelson adds a valuable examination of 'complexity talk' (p. 9) among scientists, as they work to cautiously integrate variations in genetic and environmental factors in attempting to explain behaviour.

Nelson's exploration of complexity in *Model Behavior* is multidimensional. First, she examines efforts to make sense of the interactions between genes and behaviour. Though the scientists she follows remained hopeful that some more simple genetic correlations would be identified, they openly acknowledged and highlighted that complexity was likely to dominate. Nelson describes the at times contentious relationship between her subjects and molecular biologists. Behavioural geneticists viewed the work of molecular biologists in the area of behaviour as being overly simplistic in its worldview and assumptions, as well as inadequate in its uses of the experimental equipment of the behaviour field. At the same time, behaviourists depended on molecular mouse knockouts, and often needed to collaborate with molecular biologists to publish in the top journals. As a result, behavioural genetics researchers found it difficult to defend their field against simplistic 'overclaiming' (p. 79) of molecular biologists and the news media, while also needing to maintain a sense of near-future promise for clinical applications of their work.

In the second section of *Model Behavior*, Nelson focuses on the complexity of the behavioural laboratory research environment, including the equipment and settings in which experiments take place, as well as the presumed effects on mouse behaviour of the unique smells and sounds of individual scientists. Nelson highlights the lengths that researchers went to in maintaining a stable research environment and in questioning the validity of their own experimental instruments, such as the 'elevated plus maze' (p. 82) used in mouse anxiety studies. In these chapters, Nelson also develops her analytic

concept of 'epistemic scaffolds' (p. 85), which she describes as the initial evidence and arguments that researchers use to build up more far-reaching claims about the links between mouse research findings and human behaviour as well as clinical applications, like gene associations and pharmaceuticals. While building scaffolds are usually temporary in architecture, Nelson notes that the epistemic scaffolds of mouse behaviour researchers often remain unavoidably embedded in the products of their work.

In describing the unique research process of behavioural genetics researchers, Nelson also examines the frequent 'epistemic by-products' (p. 119) of this experimental work, which she equates with the sawdust produced by a lumber mill. These by-products do not fit with the initial presumptions of researchers, but they cannot be made to disappear by simply ignoring them. In fact, put to a seemingly extraneous purpose, they may even prove valuable. With this concept, Nelson calls into question the traditional emphasis in the STS literature on competition in science, suggesting that scholars of laboratory practice have not adequately accounted for the open engagement with epistemic by-products that she finds among behaviour genetics researchers. Rather than dismissing the sawdust of their work as unimportant or tacit-knowledge, Nelson cleverly highlights the desire of mouse behaviour genetics scientists to publish on these extraneous findings in part to further bolster the inherent complexity of their topic.

*Model Behavior* closes with a fascinating examination of the challenges that behavioural geneticists face in the process of translating their complexity worldview and research findings into media accounts of their work. Nelson notes that her research subjects often felt hopeless about the potential to adequately convey at once the complexity of mouse alcohol research while also demonstrating its inherent worth. Descriptions that were too dismissive of the value of research findings, the scientists feared, would only embolden animal rights activists to question why the work was being done in the first place. However, being too simplistic or engaging in inappropriate 'genohype' (p. 53), as many journalists looked to do, risked undermining the scientific rigour and value of the work, in favour of leaping forward to distant human applications. As Nelson accurately points out, these tensions have been missed in previous STS scholarship, which had focused on efforts to erase uncertainty in results, rather than to preserve it.

Nelson's clever decision to study the complexity narratives of the scientists she follows pays dividends in many ways. *Model Behavior* paints an intriguing picture of what it looks like when scientists take on a role as actors and collaborators in efforts by STS scholars to question the overly simplistic explanations of their work. While Nelson's book is primarily a work of sociology of scientific knowledge, rather than of medical history, historians of biomedicine have a lot to learn from her fascinating and insightful examination of the surprising embrace of complexity over simplicity, and the eschewing of one-to-one correlations, in behaviour and health.

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