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Biocultural Biographies and Molecular Memories: A Study of Neuroepigenetics and How Trauma Gets under the Skull

Authors : Elsher Lawson-Boyd

Abstract : In the wake of the Human Genome Project, the life sciences have undergone some fascinating changes. In particular, conventional beliefs relating to gene expression are being challenged by advances in postgenomic sciences, especially by the field of epigenetics. Epigenetics is the modification of gene expression without changes in the DNA sequence. In other words, epigenetics dictates that gene expression, the process by which the instructions in DNA are converted into products like proteins, is not solely controlled by DNA itself. Unlike gene-centric theories of heredity that characterized much of the 20th Century (where the genes were considered as having almost god-like power to create life), gene expression in epigenetics insists on environmental 'signals' or 'exposures', a point that radically deviates from gene-centric thinking. Science and Technology Studies (STS) scholars have shown that epigenetic research is having vast implications for the ways in which chronic, non-communicable diseases are conceptualized, treated, and governed. However, to the author's knowledge, there have not yet been any in-depth sociological engagements with neuroepigenetics that examine how the field is affecting mental health and trauma discourse. In this paper, the author discusses preliminary findings from a doctoral ethnographic study on neuroepigenetics, trauma, and embodiment. Specifically, this study investigates the kinds of causal relations neuroepigenetic researchers are making between experiences of trauma and the development of mental illnesses like complex post-traumatic stress disorder (PTSD), both throughout a human's lifetime and across generations. Using qualitative interviews and nonparticipant observation, the author focuses on two public-facing research centers based in Melbourne: Florey Institute of Neuroscience and Mental Health (FNMH), and Murdoch Children's Research Institute (MCRI). Preliminary findings indicate that a great deal of ambiguity characterizes this infant field, particularly when animal-model experiments are employed and the results are translated into human frameworks. Nevertheless, researchers at the FNMH and MCRI strongly suggest that adverse and traumatic life events have a significant effect on gene expression, especially when experienced during early development. Furthermore, they predict that neuroepigenetic research will have substantial implications for the ways in which mental illnesses like complex PTSD are diagnosed and treated. These preliminary findings shed light on why medical and health sociologists have good reason to be chiming in, engaging with and de-black-boxing ideations emerging from postgenomic sciences, as they may indeed have significant effects for vulnerable populations not only in Australia but other developing countries in the Global South.

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