

EDITORIAL

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A four-part working bibliography of neuroethics: Part 4 - Ethical issues in clinical and social applications of neuroscience

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Abstract

Background: As a discipline, neuroethics addresses a range of questions and issues generated by basic neuroscientific research (inclusive of studies of putative neurobiological processes involved in moral and ethical cognition and behavior), and its use and meanings in the clinical and social spheres. Here, we present Part 4 of a four-part bibliography of the neuroethics literature focusing on clinical and social applications of neuroscience, to include: the treatment-enhancement discourse; issues arising in neurology, psychiatry, and pain care; neuroethics education and training; neuroethics and the law; neuroethics and policy and political issues; international neuroethics; and discourses addressing "trans-" and "post-" humanity.

Methods: To complete a systematic survey of the literature, 19 databases and 4 individual open-access journals were employed. Searches were conducted using the indexing language of the U.S. National Library of Medicine (NLM). A Python code was used to eliminate duplications in the final bibliography.

Results: When taken with Parts 1-3, this bibliography aims to provide a listing of international peerreviewed papers, books, and book chapters published from 2002 through 2016. While seeking to be as comprehensive as possible, it may be that some works were inadvertently and unintentionally not included. We therefore invite commentary from the field to afford completeness and contribute to this bibliography as a participatory work-in-progress.

Keywords: Neuroethics, Neuroscience, Neurology, Psychiatry, Bibliography

Introduction

In *A Theory of Justice*, philosopher John Rawls proposed that the ethico-legal structure of society is based those ways that constructs of rightness or wrongness are applied to any situation [1]. The citations in this fourth part of a bibliography of neuroethics reflect works that focus upon the social aspects of research and clinical advances in the brain sciences. To be sure, neuroscience is not confined to the laboratory, as the demand for, and concomitant concerns about "bench-to-bedside" translation are increasing. Questions about the use of neuroscientific approaches to define normality; the meaning and relevance of what constitutes (and who receives) treatment or enhancement; the ability and validity of using neuroimaging to depict consciousness; and the trajectory of human biology and society, each and

all arise from the interfluence of neuroscientific advancement and social expectation(s) and anxieties. Addressing these questions is, and will not be, simple or easy. As Illes et al. have noted, "...frontier technology that is able to touch on our personhood, especially in bioscience and information science, is shaping our future" [2].

The direction of brain science can, and arguably should be guided by neuroethics. The neuroethics literature "... seeks to give neuroscience what bioethics and the ethical, legal and social implication (ELSI) programs provided for the human genome project: a platform for scientists, lawyers, philosophers, sociologists, other scholars and the general public to interact and discuss the future of neuroscience" [3]. In this way, the literature – and this bibliography – provide a view to the discourse to date, and the foundation upon which to build engagement at present and in the future. To be sure, this future will ever more involve, and affect the world stage, as brain science becomes an increasingly international enterprise. Viewed

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from an international vantage point, neuroethics has the potential to go beyond “...absolutism, cultural essentialisms, and unrealistic ethical philosophies, [and] arrives at a small set of principles about proper human flourishing that are more culturally inclusive and cosmopolitan in spirit...empowerment, non-obsolescence, self-creativity, and citizenship” [4].

The inclusion of “citizenship” is important, because both professionals (in the natural, physical, life and social sciences, medicine, and government) and various publics “...must have the power — defined by quality of knowledge and ease of access — to help shape that future”. ... It is in this spirit that a consistent goal of this bibliographic series is to invite ongoing professional and public participation in contributing to its further development, and in so doing bolstering the informational groundwork upon which the future of neuroscience can stand.

The following bibliographies provide neuroethics’ literature on the clinical and social implications of neurological advances from 2002–2016. The bibliographies cover a range of topics, to include:

- I. Health care
 - a) issues in/of the treatment-enhancement discourse
 - b) ethical issues in neurology (including neuro-rehabilitation)
 - c) ethical issues in psychiatry (including gender and LGBT issues)
 - d) ethical issues in anesthesiology/pain medicine (including addiction)
- II. Neuroethics education/training
- III. Neuroethics and law
- IV. Neuroethics and policy and politics
- V. International neuroethics
- VI. “Trans”/“post” human issues

Methods for systematically searching relevant literature devoted to neuroethics are identical to those utilized in the first 3 parts of this bibliography [5–7]. The United States National Library of Medicine’s (NLM) indexing language—MeSH (Medical Subject Headings)—was used to generate the basic search strategy for each topic. MeSH contains ethics-related terms developed for BIOETHICSLINE, a specialty database devoted to bioethical issues produced for NLM by the Kennedy Institute of Ethics from 1975–2000.

Citations were retrieved from the following databases:

- 1) U.S. National Library of Medicine’s PubMed and NLM Catalog
- 2) Academic Search Premier
- 3) Proquest Research Library
- 4) JSTOR
- 5) WorldCat

- 6) Philosopher’s Index
- 7) Embase
- 8) BELIT
- 9) Web of Knowledge/Web of Science
- 10) Digital Public Library of America
- 11) Directory of Open Access Journals
- 12) Hathi Trust Digital Library
- 13) Internet Archive
- 14) Globethics.net
- 15) Neuroethics-Wikiography

These listings of citations are “participatory bibliographies” in that readers are encouraged to submit additional cites via the “Comments” section of this document or by contacting the bibliographic manager at bioethics@georgetown.edu.

Health Care

Issues in/of the treatment-enhancement discourse

Articles:

Alberini CM, Chen DY: **Memory enhancement: consolidation, reconsolidation and insulin-like growth factor 2.** *Trends Neurosci* 2012, **35**(5):274-283. doi:10.1016/j.tins.2011.12.007.

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Discussion and conclusions

It is our intent that this bibliography will provide background resources that can foster a greater understanding of recent ethical issues in translational neurosciences, facilitate deeper discourse about such issues, and contribute to a more complete view of the literature in neuroethics, if not the field, at large. In regarding this work, it becomes clear that neuroethics is a sub-field of bioethics, and thus as a focused aspect of ethics in general [8–10]. The “substrates” of such ethical address and analyses are research and applications of brain science, and both are involved, to some extent, with a contingent understanding of the relationships of brain structure to functions of thought, emotion and behavior. Thus, it could be argued that many (if not all) of the questions of this field are either directly or indirectly entwined with what Chalmers has called the “hard problem” of neuroscience [11]. Does this make neuroethics somewhat different from other domains of ethical analysis? Perhaps, in that there are persistent unknowns that pervade

attempts at neurological and psychiatric assessments and interventions, and the meanings and values that are derived from neuroscientific information [12, 13]. Neuroethics may not be the only field that encounters and deals with these types of ambiguities; ethical discourse about research and applications of genetics and nanoscience and technology are also plagued by such questions and issues.

But the philosophical and practical implications of the relationship of the brain to the mind (and whatever it is construed to be), self, and ontology may also raise other questions about what neuroethics is, and what it is posturing to achieve [14]. Review of the literature presented in the four parts of this bibliography will reveal that neuroethics is not epistemologically or ideologically unified in terms of considering the relationship of brain to mental functions and experiences. Studies in neuroethics tend, at the very least, to bracket reductionist views as a parochial perspective, or at most assume a deep intimacy between mental processes and the brain as an organ embodied in socially embedded – and responsive – individuals. Axiomatically, as a domain of ethics, neuroethics deals with exploring, defining and advancing the “good” of neuroscientific research and its uses, and as such cannot ignore or negate sociology, anthropology, psychology and/or human self-understanding [15, 16].

Indeed, as a discipline, and in its practice(s), neuroethics can remain on firmer scientific ground by taking into consideration mind-brain relations where they are empirically confirmed. The current stance is that this confirming evidence is not derived from the use of a single tool, such as the newest techniques of brain imaging or stimulation; and neuroethical discourse has much to do with establishing that stance. The body of neuroethical literature has included much work about the tensions between oppositional positions regarding the validity and value of certain neurological diagnostics and the relevance of those diagnostics for disputing folk psychology. Critically detached perspectives on neuroscience are not scarce. That same literature is also not lacking in scrutiny from ethicists or social scientists.

Granting all this, philosophical discussions in neuroethics have, and can still become somewhat preoccupied with the pros and cons of reductionisms of many sorts, but this is – and arguably should be – recognized as just that: philosophical discourse that offers speculations about the aforementioned “hard questions and problems,” and what these infer for views, validity, and uses of neuroscientific information and tools. In aspiring to establish neuroethics both as a sub-discipline of bioethics and ethics at large, it becomes important to demarcate its subject matter(s) and methods of inquiry. There is an adage that “...if you wish to know what something *is*, look closely at what it *does*”. So, some

fifteen years after its nominal establishment, we may now look to the literature to assess what neuroethics has done, and in this way, infer what it is, and perhaps what it may become (or need to become). In this approach, we might also ask if the speculative aspects of neuroethical discourse (i.e. – in proposing what brain science might incur for the conduct of medicine and various realms of social activity) create something of a performative disposition (both for the field, and its practitioners). Surely, there are some – both within the field and external to it – who have made claims about the future impact of brain science on various dimensions of human existence (and admittedly, we have speculated upon such trajectories, as well) [17, 18]. But there have been, and continue to be calls within the neuroethical literature to avoid exaggerative assertions, and instead to focus upon clear and present questions, issues and problems [19, 20]. This does not compel completely dismissing the discipline of neuroethics, or some of its scholars for posing concerns about envisioned directions and effects of brain science. Indubitably, some presumed problems will likely dissipate for lack of scientific warrant or social relevance, while other problems will consolidate into definitive issues of looming importance that demand attention (and in the event, current speculation about such future trajectories may enable early address and intervention).

As a discipline that is focused upon science and its conduct and applications in society, neuroethics must define itself in terms of such real problems and appropriate methods. Given that both science and society change, and often in reciprocity as a consequence of their interaction, it therefore remains open, if not necessary, for neuroethics to continually reconstruct itself. The literature will be the vector and testimonial to this ongoing review and revision. Through such evolving discourse, neuroethics may address, critique and guide the brain sciences, and equally examine, critically evaluate and revise its own stances and practices. It may be, of course, that neuroethics will fail to fully achieve the status of a discrete discipline, and instead, will “revert” to being the work of a group of scholars who focus upon ethical issues in brain research, clinical neurology and psychiatry, and the employment of neuroscientific techniques in the social sphere. Or, it may be that the field’s agendas may be better handled jointly by other, established disciplines. Multi-disciplinary fields are far more numerous than unified disciplines for good reasons. So while it is certainly possible that the genuinely practical problems of brain science in society may not suffice to maintain the need for neuroethics as a discrete multidisciplinary field, we posit that they most probably will. Our hope is that this bibliography will provide a basis to both look back upon and assess the foci, scope and efforts of neuroethical discourse to date, and from this

vantage point develop and enhance the discipline and practices of neuroethics and its value to brain science and society both at present, and in the future.

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Authors' contributions

KB and MD were responsible for data collection; MD, JRS and JG were responsible for data interpretation and manuscript preparation, and JG was responsible for study design, and revision and critical review of the manuscript. The authors have approved the final version of the manuscript.

Competing interests

The authors declare that they have no competing interests.

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