Neuroethics Resources: Moving from "Invisibility" to High Usability

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Introduction

The rapid development and advancement of neuroscience and brain mapping technologies are constantly changing the ethics landscape and the need for ethics resources (1) (2). New challenges pose ever-greater demands on investigators to be prepared to answer questions about the ethical and societal implications of their work.

Purpose

To evaluate the knowledge and attitudes of neuroscientists in Canada about ethics resources and information available to them.

Methods

An online survey was sent to 1,200 researchers (Principal Investigators) in Canada (N=137) and the USA (N=1063) currently funded by CIHR, SSHRC, NSERC and NIH, whose project description contained one or more or the following keywords (or variation of those keywords): neuroimaging, deep brain stimulation, neurostimulation, imaging genetics/genomics, and transcranial magnetic stimulation. They were invited to participate with a request that they invite others in their research team (post-doctoral fellows, graduate students, and other research staff) to complete the survey as well. Survey completion was anonymous unless responders self-identified for participation in the follow-up focus group phase of the study.

Results

81 Canadian neuroscientists responded to the survey. The data reported here are based on their responses (Table 1).

Table 1. Demographics of Canadian Study Population

Age	N (%)	Research Area	N (%)
<30	20 (25%)	fMRI	53 (65%)
30-50	42 (52%)	EEG	26 (32%)
51+	14 (17%)	PET/SPECT	20 (25%)
Gender		Other	19 (23%)
Male	38 (47%)	TMS	9 (11%)
Female	40 (49%)	DBS	9 (11%)
Professional Level		MEG	7 (9%)
Faculty	37 (46%)	Imaging Genetics	6 (7%)
Graduate or Medical Student	24 (30%)	NIRS, other optical methods	1 (1%)
Research Staff	10 (12%)	Research Focus	
Post-doctoral Fellow	9 (11%)	Healthy Adults	55 (68%)
Resident or equivalent	1 (1%)	Adults with CNS disease	47 (58%)
Highest Degree Attained		Healthy children	21 (26%)
PhD and/or MD	51 (63%)	Children with CNS disease	16 (20%)
BA, BS or equivalent	17 (21%)	Animals	10 (12%)
MA, MS or equivalent	12 (15%)	Non-human primates	3 (4%)
Head of Research Group		Other	6 (7%)
Yes	32 (40%)		
No	49 (60%)		

Figure 1.
Knowledge of Institutional Ethics Centres

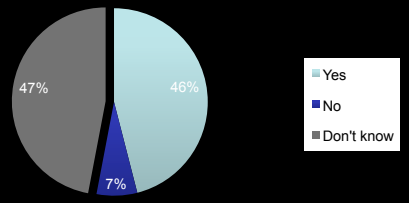


Figure 2.
Ethics Training

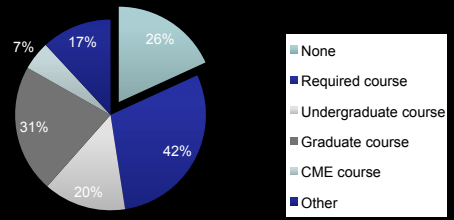


Figure 3.
Degree of Interest in Ethics Dialogue

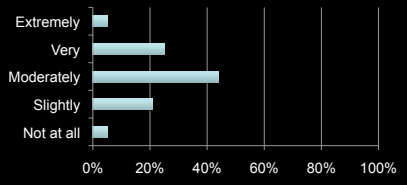
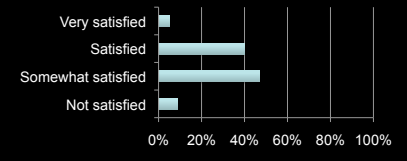


Figure 4.
Satisfaction with Current Ethics Resources



Results (continued)

- 47% (95% CI = 35% to 57%) did not know whether their institution had an ethics centre or program **(Figure 1)**.

- 26% (95% CI = 17% to 37%) reported no formal ethics training.
- 42% (95% CI = 31% to 53%) reported that they had fulfilled ethics certification, i.e., Tri-council or NIH online courses **(Figure 2)**.

- 30% (95% CI = 20% to 41%) were "extremely" or "very" interested in having more opportunities to discuss ethics issues related to their research **(Figure 3)**.
- 9% (95% CI = 4% to 18%) were not satisfied with the ethics resources available to them; 47% (95% CI = 36% to 58%) were somewhat satisfied **(Figure 4)**.

- Narratives suggest that the respondents are not satisfied with the research ethics review process and the role of ethics boards. "*…[REB/IRBs] tend to 'play it safe' while clinician scientists have to assume all the risks. The arrangement does not sound much like a partnership."*

Conclusions

Neuroscientists in Canada who use imaging techniques are open to more ethics content in their work but have moderate awareness of, and satisfaction with, ethics resources. Although the majority of respondents must have fulfilled the requirement of online ethics certification in order to conduct research, more than half did not view this as training *per se*.

In this two-way street, ethics centres and programs (including neuroethics centres) affiliated with research institutions should be more proactive in being visible and responding to the ethics needs of the neuroscience community. In partnership, neuroscientists and ethics scholars should actively engage in dialogue, hold joint educational programs including the development of ethics curricula for neuroscience graduate training, and collaborate on empirical research. Increasing the accessibility and usability of ethics resources is a key step to ensure harmony between neuroscience research and its societal benefits.

References

1. Illes J, De Vries R, Cho MK, Schraedley-Desmond P (2006) ELSI priorities for brain imaging. Am J Bioeth 6:W24-31.
2. Fins JJ, Shapiro ZE (2007) Neuroimaging and neuroethics: clinical and policy considerations. Curr Opin Neurol 20:650-654.

Acknowledgements

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