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A Brief Examination of the Ethical Concerns Associated with Language and Communication Impairments in Legal Proceedings

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The Suffering of Mice and Men: A Utilitarian Approach to Animal Experimentation

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A Brief Examination of the Ethical Concerns Associated with Language and Communication Impairments in Legal Proceedings

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Introduction

The emergent "Neurolaw" field has generated a considerable amount of scholarship and discussion about a number of important ethical issues that spring from the intersection of neuroscience and the law. These issues include the use of neuroimaging techniques to detect lies (Farah et al., 2014; Brown & Murphy, 2010; Moriarty, 2008), the use of neuroscientific information to evaluate instances of pain and addiction (Volkow & Baler, 2014; Elman et al., 2013; Becker et al., 2012); and the use of neuroscience-related information to make decisions about criminal culpability (Steinberg, 2013). Generally (and conspicuously) absent from these issues, however, is a consideration of the ethical quandaries that can arise from language and communication impairments in individuals in legal proceedings. This paper, then, hopes to briefly discuss why the ethical and legal consequences of language impairments should be included within Neurolaw's purview.

Ethical Concerns associated with Language and Communication Impairments in the legal system

Language and communication are fundamentally important components of meaningful participation in the United States legal system, and many legal standards raise serious ethical concerns about the ability of an individual with language and communication problems to effectively participate in legal proceedings. The Constitution's standard for competency to undergo criminal proceedings includes the ability to "communicate effectively with counsel" (Cooper v. Oklahoma, 1996), making language and communication critically important for due process consideration The usual legal standard for waiving various legal rights, such as the so-called Miranda Rights and the right to enter legal pleas, is "knowingly and willingly," (Miranda v. Arizona, 1966; Godinez v. Moran, 1993), which necessarily requires that the individual has language and communication skills that allow him or her to understand his or her due process rights. Language and communication are equally important consideration for civil law matters, which tend to use legal standards comparable to those of criminal law matters. For example, if an individual is to be found legally competent to make a contract or other binding legal transaction, then he or she will need to have the language and communication abilities necessary to understand the nature of the transaction (Guardianship of O'Brien, 2014). Similar abilities are generally required for creating wills or entering marriage (Wisconsin Statutes, 2013-2014; Estate of Laubenheimer, 2013). Because so many important legal outcomes rely on language and communication, then, it is not difficult to conclude that there is a real risk of serious ethical concerns when individuals with language and communication impairments undergo both criminal and civil proceedings.

Relatedly, professional and ethical standards for practicing lawyers also make language and communication impairments an important ethical consideration. The American Bar Association's Model Rules of Professional Conduct indicate that a lawyer has a duty to communicate with his client so that the client can participate in the legal matter (ABA Rules, 2014). The Model Rules also require a lawyer to provide reasonably competent legal representation and to make reasonable efforts to maintain a normal lawyer-client relationship with clients who have a "diminished capacity" to make decisions about the matter (ABA Rules, 2014). In combination, then, the Model Rules appear to suggest that competent lawyering requires a reasonable effort to accommodate individuals with language and communication impairments. Because violations of the professional rules can result in professional disciplinary proceedings, the ethical concerns associated with language and communication disorders affect not just clients but also their representing lawyers.

The legal and ethical concerns associated with language and communication impairment are clearly a problem in the abstract, but an increasing amount of scholarship indicates that they are a disturbingly prevalent phenomenon. Conservative estimates suggest that at least half of all criminal offenders (both adult and adolescent) have a diagnosable speech or language impairment (Gregory & Bryan, 2011; LaVigne & Van Rybroek, 2011). Many conditions that are likely overrepresented in offender populations, such as traumatic brain injury, psychopathy, and mental illness, can all affect an individual's ability to effectively communicate (Wszalek & Turkstra, 2015; Kiehl et al., 2004). To further compound these problems, there is compelling evidence to suggest that legal language is particularly difficult to understand, particularly for individuals with neuropsychological impairments, suggesting that the legal system presents inherently greater risks of language and communication mistakes (Rogers et al., 2008; O'Connell et al., 2005). It is clear, then, that the prevalence and challenges of language and communication impairments amongst individuals within the legal system is in direct conflict with the ethical and legal concerns established by the law's standards for language and communication.

Unfortunately, these concerns appear to slip through the cracks of the legal process, to the ethical detriment of both the individual with language and communication impairments and the lawyer. For example, competency evaluations often do not contain a dedicated language and communication assessment (Ryba, 2003). This suggests that legal proceedings not only are ill-equipped to even detect language and communication impairments, but also risk misinterpreting those impairments as a character flaw or a behavioral choice, which could further prejudice the individual. Relatedly, practicing lawyers generally bear the burden of ensuring that their clients can understand and participate in the proceedings, despite the fact that these lawyers are generally not trained to deal with language and communication impairments and often lack the time and resources to do so. (LaVigne & Van Rybroek, 2014). In practice, then, legal proceedings can inadvertently force both lawyers and their clients into ethically challenging positions: a lawyer who is incapable of providing the professionally mandated level of representation because of the client's language and communication impairment must nevertheless represent the client even though the client's impairments likely create a greater risk of an undesirable outcome. This arrangement is obviously objectionable from an ethical standpoint, but it is, unfortunately, not uncommon practice within legal proceedings.

In summation, legal and professional standards create ethical concerns related to language and communication impairments for both adjudicated individuals and their lawyers. The likely prevalence of language and communication impairments within the legal system, and the difficult ethical situations in which both lawyers and clients are frequently forced to interact, all suggest that these ethical concerns are not mere hypotheticals but rather pressing ethical problems that directly affect legal outcomes. Because of the enormous societal costs associated with legal proceedings (Wszalek & Turkstra, 2015), and because of the fundamental importance of the legal rights that are implicated, it behooves the Neurolaw field to reflect upon these ethical concerns as it attempts to resolve pressing ethical issues relevant to both law and neurosciences.

Directions for Future Discussion

In order for Neurolaw to successfully consider the ethical concerns associated with language and communication impairments in legal proceedings, however, there are three important factors that this consideration should contain. While these factors are by no means exhaustive, they nevertheless will help Neurolaw's discussion of this important ethical issue by better reflecting the parallel interests of the adjudicated individual, the lawyer, and the legal system itself.

First, it is important to remember that the ethical concerns impact both the individual and the representing lawyer. Although there are many reasons why the adjudicated individual's rights and interests are generally of greater concern, particularly in a criminal case (e.g., because the individual's rights and freedoms are implicated, because the individual generally has less knowledge of the legal proceedings, and because of the resource imbalance between the individual and the state), Neurolaw must remember that language and communication impairments risk implicating professional rules that govern lawyer conduct as well. Because practicing lawyers generally do not have the training or resources to fully accommodate their clients' language and communication impairments, the rules and standards imposed on the lawyers risk forcing them into ethically problematic positions. Therefore, Neurolaw should keep in mind the ethical outcomes for both the individual and the representing attorney in order to fully consider the ethical concerns created by language and communication impairments in legal proceedings.

Second, it is important to remember that some of the applicable legal standards are less flexible than others. For example, the ABA Model rules are drafted by the legal profession and do not themselves represent binding legal authority, so it is comparably easier to amend or reconsider the professional rules that create ethical standards for lawyers. Constitutional standards and state laws, on the other hand, are binding legal authority and, as the product of the judicial and legislative branches of government, are comparably more difficult to amend or reconsider as a source of ethical standards. Therefore, certain legal standards and their corresponding ethical concerns are more "permanent" than others, and any Neurolaw consideration of these ethical concerns should keep the dynamics of the various sources of "law" in mind in order to better reflect the nuances of the various legal standards.

Third and finally, it is important to remember that the legal standards discussed in this essay are applicable only within the United States. Nevertheless, language and communication impairments affect humans all around the world (Hyter, 2014). While the specific ethical concerns that arise from the United States' legal standards are generally salient only within the United States, many of the underlying ethical notions (e.g., fairness, due process, the proper role of the lawyer, etc.) are salient in all legal jurisdictions. Therefore, while Neurolaw should be mindful of the specific ethical concerns that arise from the legal standards in the United States, Neurolaw should be equally willing to consider similar ethical concerns in other legal jurisdictions as well.

Conclusion

Although the nascent Neurolaw field has already begun to ponder a number of challenging and important ethical issues, the ethical concerns created by language and communication impairments within legal proceedings are not among the field's foremost interests. This oversight ignores a series of ethical quandaries that can, and in all likelihood do, affect individuals with language and communication impairments and their lawyers, and the Neurolaw field is in a unique position to use and interpret neuroscientific data and research in order to address these important ethical concerns.

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The Suffering of Mice and Men:

A Utilitarian Approach to Animal Experimentation

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Non-human animals feature prominently in all areas of neuroscience research, ranging from drosophila to higher order primates. It is a problematic belief among many researchers that non-human animals are outside the scope of moral consideration, but that we ought to "reduce, refine, and replace" their use where possible.[1, 2] Drawing on Peter Singer's interpretation of utilitarianism,[3] I first seek to demonstrate that it is *capacity for suffering* that qualifies beings for moral consideration in a utilitarian framework, as opposed to intelligence, language, or any other arbitrary trait. I will then argue that various species' capacities to suffer can be reasonably estimated and expressed as a relative numeric "c-value." Based on these values, I propose a utilitarian model for animal experimentation which incorporates seven key considerations: capacity for suffering (c), degree of suffering inflicted (s), number of animals used (n), probability of positive experimental results (Pe), probability that practical medical treatments will arise from positive findings (Pb), value of individual human benefit from treatment (B), and number of humans benefitted (N). If the product of csn>PePbBN, I argue that the experiment in question is morally wrong, whereas the inverse signifies an experiment which is morally right (and ought to be done).

Within classical utilitarianism, the action resulting in the highest net utility (one's happiness, or the ability to further one's needs or desires) is the morally right action to take, while choices resulting in comparatively less utility are morally wrong.[4] Due to imperfect knowledge, the utility of a given outcome is often multiplied by the probability of that outcome occurring (as evaluated to the best of one's current knowledge).[5]

Utilitarianism is an appealing normative model for its simplicity and its fundamentally egalitarian premise. No one individual's well-being is weighted more than another, as every individual in the moral equation counts as one.[4, 6] But some would argue that the decision to only include human beings in moral considerations is an arbitrary one.[3, 6] Peter Singer and Jeremy

Bentham elegantly propose that one's *capacity to suffer* is the essential quality that ought to qualify a being for utilitarian consideration, not simply one's arbitrary status as a human being.[3,4] If adult monkeys are undoubtedly smarter, more conscious and more expressive than day-old human babies, how could we possibly prioritize all humans over all animals on the arbitrary basis of intelligence or language?[3] Nevertheless, non-human animals are incredibly varied in complexity - it seems intuitive that torturing a monkey and torturing a fruit fly should not have equal moral weighting. It seems highly plausible that capacity to appreciate suffering, like all cognitive processes, exists on an evolutionary spectrum, and ought to be weighted in a utilitarian equation accordingly.

I put forward two simple, candidate metrics that might serve as reasonable metrics for a species' capacity to suffer (in order to derive a theoretical "c-value"): a) cortical thickness and b) complexity of social behaviour. It has long been proposed that cortical thickness is a general indicator of general intelligence -- one's ability to detect patterns and solve novel problems.[11] While it is problematic to equate intelligence with capacity to suffer, it seems plausible that more intelligent animals have a better understanding of and memory for instances of pain, thus possibly adding dimensions to suffering that go beyond immediate stimulus-response pairings. For instance, complex pattern analysis might be a prerequisite for feeling anxious of future pain, and a sophisticated memory might be necessary to experience post-traumatic stress. This metric provides intuitively sound rankings, with C. elegans = Aplysia = Drosophila < mice < rats < squirrels < dogs < cats < rhesus monkeys < horses < gorillas < chimpanzees.[10, 11] Secondly, degree of social complexity may be able to provide a similarly plausible set of rankings for a species' capacity to suffer. It seems highly probable that empathy (including the ability to understand and abstract the suffering of other conspecifics) developed out of pure evolutionary necessity in social animals.[21] Such adaptations increase the chances of survival of individuals via reciprocal altruism, but likely also increase the capacity for understanding and abstracting one's own suffering, in addition to the suffering of others.

Most regulations protecting higher-order animals are mere guidelines, open to a wide range of subjective interpretations by any given review board.[8, 9] To illustrate how a more rigorous utilitarian approach can be applied on review boards based on theoretical c-values, let us examine the 2003 experiment by Carmena et al., in which two rhesus macaques were taught to control a closed brain-machine interface (BMIc). Experimenters read electrical activity in the frontoparietal cortex via surgically implanted electrodes. Repeated training with the BMIc allowed the monkeys to use visual feedback to reach and grasp with the robotic arm, without moving their own arm. These findings may contribute to technologies that would allow paralyzed patients to bypass their spinal cord injury to elicit voluntary, machine-mediated movements directly from the brain.[12]

Capacity for suffering (c). Rhesus monkeys have 480 million cortical neurons, compared to 11 500 million in man and 160 million in dogs[11]. The social organization of this species is complex and well-documented. For instance, they are capable of producing at least five distinct types of scream vocalizations during agonistic encounters to elicit support from conspecifics, each denoting particular kinds of threats and levels of aggression.[16] Most notably, rhesus monkeys which were excluded from their social group quickly died in the absence of support, protection and resources from their conspecifics.[17, 18] Fear and suffering caused by social exclusion is therefore likely an important feature for survival in this species (as it has been in humans), and it seems plausible that they share with humans the deep pain associated with rejection and isolation. On this basis, let us assume a c-value of 0.75, which is to say the average rhesus macaque might have about 75% of the typical human's capacity for suffering.

Degree of suffering inflicted (s). In this particular experiment, the painful surgical implantation of brain electrodes coupled with the stress of social isolation, captivity, and forced physical restraint[12] might reasonably warrant an s-value of 3 out of a possible 4.[1]

Number of animals used (n). X utiles lost by 5 animals is a five-fold worse outcome than X utiles lost by only 1 animal. In this case, two adult female macaques were used.[12] Thus the total score for animal outcomes might be c*s*n = (0.75)(3)(2) = **4.5**.

Probability of positive experimental findings (Pe). Experiments which seek to fine-tune already well-researched treatments will be far more likely to succeed in their goal than those which seek to pioneer new treatments from scratch. The Pe term ought to reflect the probability that the experiment proposed is a reasonable one and will not simply result in negligibly beneficial negative findings, evaluated by the impact and number of related previous experiments in the field. The hypothesis that "drug X is not harmful for primate consumption" might have quite a high Pe if there is extensive pre-existing evidence that drug X is not harmful to mice or reptiles. In contrast, BMIcs were relatively uncharted territory at the time of this experiment (with only about three preceding studies of this kind having ever been done on primates),[13-15] yielding a low Pe, reflecting a relatively high chance of failure. Let us retrospectively assume a Pe of 0.1, multiplied by 0.95 to adjust for type I statistical error.[2]

Probability of benefit resulting from findings (Pb). It can be argued that there is intrinsic value in scientific knowledge itself (knowing for the sake of knowing), but utilitarianism would hold that this knowledge is only valuable insofar as it can be used to derive practical treatments or

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1 McGill's 2013 Animal Use Report (*see Appendix A*) categorizes animal experiments by degree of suffering, ranging from category B ("experiments causing little or no discomfort or stress") to category E ("procedures involving inflicting severe pain, near, at, or above the pain threshold of unanaesthetized, conscious animals"), providing a useful standard for numerical categorization.

2 We typically allow for a 0.05 (5%) margin of type-I statistical error; thus, at best, even if the hypothesis was corroborated by experimental findings, there is typically only up to a 0.95 probability that the findings indeed reflected true differences in the population at large.

benefits for actors at some point down the road.[3] For instance, experiments on animals for the purposes of educating undergraduates may have ramifications on student knowledge of biology, and some of these students may go on to benefit society as doctors or researchers. However, such links are tenuous and ought to reflect a relatively low Pb -- there are a number of interfering factors between a given educational experiment and a student giving back to her community. Conversely, experiments testing the safety and efficacy of pre-clinical stage pharmaceutical drugs may have a high relative Pb, as testing for adverse effects in animals can very immediately and directly save human lives. Experiments which seek to contribute to basic understanding of fundamental biological structures and functions without a direct practical benefit in mind ought to have a Pb value somewhere in between. In the case of the macaque experiment, there remain a number of scientific and financial barriers impeding the development of mechanical limbs for day-to-day use among paraplegics, and far more research will undoubtedly need to be conducted before this benefit can ever be practically realized.[12] Let us therefore assume that this particular study advanced the possibility of brain-machine interfaces for paraplegics by only 5%, or 0.05.

Treatment or benefit (B). To match the 4-point scale for animal suffering, one might propose an analogous 4-point scale for the value of the human benefit. In the field of public health, QALYs (quality-adjusted life years) attempt to assign numerical utility to particular ailments in a similar manner.[19, 20] Let us assume the B-value of a mechanical limb for the average paraplegic to be 3 out of a possible 4.

Number of humans benefitted (N). Of the 85000 patients with paraplegia in Canada,[22] let us assume 1000 will be eligible and able to afford MBIs due to the high cost of the treatment. The probability-adjusted human utility for performing this experiment might therefore amount to Pe*Pb*B*N = [(0.95)(0.1)](0.05)(3)(1000) = **14.25**. According to these estimations, it was

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[3] McGill's annual Animal Use Report delineates 5 categories of purposes of animal use (PAUs) (*see Appendix A)* which may be useful in evaluating Pb.

morally correct to approve this experiment. Nevertheless, upon a more careful analysis of factors, one can easily imagine an increase or decrease in any one of these values, which might tip the scale in one direction or another.

Overall, it is highly reasonable to assume that capacity to suffer qualifies beings for ethical consideration, and that animals are capable of suffering. It follows that inflicting pain on animals through experimentation comes at a moral cost. It seems intuitive that this moral cost ought to be weighted according to a species' relative capacity to suffer, as fruit flies likely cannot experience the complex emotional suffering that monkeys can. "Capacity to suffer" times "suffering inflicted" times "number of animals" used is therefore a reasonable estimation for the negative utility produced in a given experiment. Moreover, ethics boards intuitively justify the suffering of animals by citing the possible societal benefits that might arise from scientific findings. "The probability of a given hypothesis being true" times "the probability of given findings resulting in a treatment" times "the utility of the treatment" times "the number of humans that will benefit from the treatment" is therefore a reasonable expression of net utility gained. While these values may never be objectively resolvable, such a model at the very least delineates the kinds of factors one ought to weigh when attempting to justify the moral status of an animal experiment. A standardized cost-benefit framework such as the present one ought to be employed as a decision aid to supplement intuitive decision-making on ethics review boards.

Appendix A. [provided by Jim Gourdon, Director of McGill's Animal Resources Centre and member of the McGill Animal Care Committee. (Feb 24, 2014)]

McGill

Animal Use Report 2013

Species/group	B	C	D	E	TOTAL	PAU 1 (%)	PAU 2 (%)	PAU 3 (%)	PAU 4 (%)	PAU 5 (%)
Amphibia - Frogs/Toads	45	390	0	0	**435**	90	0	0	0	10
Amphibia - Other	20	26	0	0	**46**	100	0	0	0	0
Cats	0	0	0	0	**0**	0	0	0	0	0
Dogs	0	2	0	0	**2**	0	0	0	100	0
Domestic Birds - Poultry	2107	0	0	0	**2107**	15	0	0	9	76
Domestic Birds - Others	0	88	24	0	**112**	100	0	0	0	0
Farm animals - Bovine	253	23	0	0	**276**	18	0	0	0	82
Farm animals - Swine	48	0	0	0	**48**	38	0	0	0	62
Farm Animals - Other	63	10	0	0	**73**	58	0	0	0	42
Fish	1002	1621	3608	0	**6231**	98	0	0	0	2
Gerbils	0	6	0	0	**6**	0	0	0	0	100
Guinea Pigs	0	0	0	0	**0**	0	0	0	0	0
Hamsters	0	0	0	0	**0**	0	0	0	0	0
Mice	11532	27992	64404	0	**103928**	63	36	0	0	1
Non-Human Primates	0	0	13	0	**13**	100	0	0	0	0
Rabbits	12	1	16	0	**29**	4	0	0	72	24
Rats	1102	1283	4174	0	**6559**	89	8	0	1	2
Wild Birds	5315	0	0	0	**5315**	100	0	0	0	0
Wild Fish	413	20079	623	0	**21115**	98	0	0	0	2
Wild Small Mammals	8	1245	0	0	**1253**	99	0	0	0	1
TOTAL	**21920**	**52766**	**72862**	**0**	**147548**					

Category of invasiveness B = Studies or experiments causing little or no discomfort or stress.
Category of invasiveness C = Studies or experiments involving minor stress or pain of short duration.
Category of invasiveness D = Studies or experiments that involve moderate to severe distress or discomfort.
Category of invasiveness E = Procedures that involve inflicting severe pain, near, at or above the pain threshold of unanaesthetized, conscious animals.

Purpose of animal Use 1 = Studies of a fundamental nature in sciences relating to essential structure or function (e.g., biology, psychology, biochemistry, pharmacology, physiolog
Purpose of animal use 2 = Studies for medical purposes, including veterinary medicine, that relate to human or animal disease or disorders.
Purpose of animal use 3 = Studies for regulatory testing of products for the protection of humans, animals, or the environment.
Purpose of animal use 4 = Studies for the development of products or appliances for human or veterinary medicine.
Purpose of animal use 5 = Education and training of individuals in post-secondary institutions or facilities.

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