

Animals & Society Institute



THE BIOETHICS OF GREAT APE WELL-BEING: PSYCHIATRIC INJURY AND DUTY OF CARE

POLICY PAPER

The scientific and legal basis for why psychological harm suffered by chimpanzees compels banning their use in research and testing

**Theodora Capaldo
G.A. Bradshaw**



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The Animals and Society Institute is an independent research and educational organization that advances the status of animals in public policy and promotes the study of human-animal relationships. We are a think tank as well as a producer of educational resources, publications and events. Our objectives are to promote new and stricter animal protection laws, stop the cycle of violence between animal cruelty and human abuse, and learn more about our complex relationships with animals.

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1. Executive Summary

Chimpanzees (*Pan troglodytes*) possess many of the same psychological faculties and capacities that, when found in humans, motivate laws to protect our species from abuse. However, current U.S. regulations permit captive chimpanzees to be treated in ways that humans are not, such as use in biomedical research.

Recent diagnosis of Post-Traumatic Stress Disorder (PTSD) in chimpanzees who have been used in biomedical research requires us to re-examine the regulatory status quo for two reasons. First, the ability to evaluate great ape psychological well-being using the American Psychiatric Association criteria codified for assessing human mental states nullifies scientific arguments that defend a double ethical and legal standard for how individual chimpanzees and human beings should be treated. Second, the acknowledgement of psychiatric damage in great ape biomedical research subjects indicates that research institutions and related regulatory agencies fail to follow current regulations, and suggests that a breach of statutory duty of care has been committed.

From the perspectives of science and ethics, and whether or not great apes are conferred personhood, chimpanzee captivity and their use in experiments constitute a violation. This understanding compels the banning of great ape testing and captive breeding. Bioethical standards and regulations governing human research subjects such as the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct and Declaration of Helsinki should logically extend to great apes.

2. Introduction

It is not what a lawyer tells me I may do; but what humanity, reason, and justice tell me I ought to do.

— Edmund Burke, political theorist,
Second Speech on Conciliation, 1775

The existence of a foreseeable risk is the bedrock upon which the law of negligence is built.

— McFarlane & Bryant, 2007

Legal standards concerning nonhuman animals have conflicted with scientific evidence for more than a century. Data on human-animal comparability accumulated before Charles Darwin¹ have produced a veritable mountain of evidence culminating in science's open embrace of a unitary, trans-species model of brain, mind and behavior.^{2,3,4,5} Our intuitive connection with other animals is reflected in details of the mind: structures and processes governing consciousness, cognition, emotions, sense of self, and other faculties are shared among vertebrates. (Table 1)^{6,7} Critically, "a great deal of evidence now indicates impressive homologies in subcortically concentrated, genetically provided emotional and motivational systems (i.e., key brain areas and chemistries) among mammals" showing that there are "substantial cross-species consistencies."⁸ Cortical, limbic, and autonomic structures that process and regulate socio-affective information and associated psychophysiological and behavioral traits (e.g., maternal behavior, facial recognition, moral development, play, sexual behavior, fear, aggression, affect regulation) are consistent across species.⁹ Importantly, patterns of thinking, feeling, and behavior that are shaped through relationships and the associated brain structures affected by trauma (i.e., cortical and subcortical areas of the right brain, including the right orbitofrontal cortex, anterior cingulate, amygdala, hippocampus, and posterior areas of the right hemisphere) are also consistent across species. Evolution is conservative; the same structures and processes are found in otherwise very different species.^{10,11,12,13,14}

The most obvious similarities exist among humans and great apes, of whom chimpanzees – having 98-99 percent genetic overlap¹⁵ – are our closest relatives. In addition to possessing the broad spectrum of neuropsychological capacities once considered uniquely human, there is

evidence that certain cognitive capacities¹⁶ and moral inclinations exceed those of modern humans. While sharing with humans ancestral systems that rely on shared “basic mental capacities and social tendencies”¹⁷ and systems of moral development,¹⁸ great ape societies do not exhibit widespread socio-moral decline and “pathological” personalities, the nature and scale of which uniquely characterize modern humans.¹⁹ In cases where deviations from prosocial and empathetic behavior occur, such as those observed in Gombe, Tanzania, they have been linked to human intervention and disruptions.²⁰

However, it is insufficient to base discussion on blanket arguments of similarities and differences – a stance taken historically by both proponents and opponents of chimpanzee use in research, albeit in diametrically opposed ways.²¹ Unsurprisingly, there are in fact both similarities and differences between species. The use of animal models (including chimpanzees) is a long-standing research practice precisely because they are acknowledged as being so similar to humans in foundational ways.^{22,23} However, such differences as details in immune response and genetics exist. For instance, chimpanzees may differ from humans in areas such as specific cerebral gene expression.²⁴

Such variations on an underlying evolutionary theme are found across and within species, including humans. This understanding dates back to Darwin himself, who “uses differences to define species, [however] his scientific style of thought unifies apparently disparate phenomena under general principles, to emphasize similarity and continuity. . . Theory and genetics also emphasize continuity by demonstrating similarity at the biochemical level, in addition to the anatomical, physiological, and behavioral levels.”²⁵ The contemporary synthesis of Darwin’s theories and other science concur.

Notably, however, this scientific understanding of similarities and differences is not carried into scientific and ethical practice. The far-reaching implications for the usefulness or lack thereof of chimpanzees as human surrogates are ignored: science and knowledge are used selectively. It is acknowledged that chimpanzees share neuro-psychological structures and capacities that when found in humans motivate laws to protect our species.^{26,27} It is also recognized that chimpanzees are biogenetically different from humans in ways that render them poor research surrogates.^{28,29} Nonetheless, despite overwhelming

evidence and regulations that recognize their vulnerabilities, chimpanzees are denied comparable legal protection.³⁰

The U.S. Animal Welfare Act (AWA) states that the “Secretary [of Agriculture] shall promulgate standards [that] include minimum requirements . . . for a physical environment adequate to promote the psychological well-being of primates.”³¹ Critically, the AWA was “intended to promote the psychological well-being of nonhuman primates, not just prevent abnormal behaviors from occurring.”³² However, in practice, current regulations and their enforcement do not reflect this understanding; rather, they reflect a passé double standard that allows the continued use of chimpanzees. Researchers and regulatory agencies maintain that “animals are sufficiently similar to be a source of relevant data but not sufficiently similar in the attributes necessary for identical moral standing.”³³ They are considered enough like us to experiment on, but not enough like us to protect.

3. Post-Traumatic Stress Disorder (PTSD)

Recent studies present a fundamental challenge to the science-ethics impasse. Chimpanzee laboratory survivors have been diagnosed with PTSD and other psychiatric disorders.^{34,35,36,37,38} This finding breaks the stalemate for two reasons. First, diagnosis of PTSD clinically confirms standing science showing that great apes possess the full range of subjective experience that psyche implies and that is used to inform ethics and law concerning human well-being (Table 2). Psychiatric diagnosis provides evidence that contradicts what is promulgated in federal documents pertaining to great ape welfare, namely that it “is difficult to define [psychological well-being] and currently there are no ways to measure it directly.”³⁹ Psychological well-being of chimpanzees can be rigorously evaluated using the same criteria codified for assessing human mental states by the American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders. (Tables 3 and 4)^{40,41}

Second, PTSD’s unique etiology (and the related Reactive Attachment Disorder)⁴² link bioethics and science in another way. By depending on an identifiable external event, a diagnosis of PTSD provides an explicit link between cause (i.e., forced captivity and experimentation) and effect (i.e., psychological and bodily damage). Subsequently, because its deleterious effects are known and foreseeable by researchers and regulatory institutions charged with ensuring humane treatment of great apes in captivity,⁴³ widespread psychiatric damage in great apes used in biomedical research provides evidence that responsible parties have breached statutory duty of care and are in noncompliance with regulations specified by the AWA and 9CFR.⁴⁴

The diagnosis of chimpanzee PTSD emerges as an indictment of captivity as a tort of false imprisonment or even felony. It is not only the act of experimentation but also the forced confinement imposed on chimpanzees that forms a fundamental ethical breach. This opinion even applies within the context of existing animal law and is consistent with others proposing extended legal protection for nonhuman animals as “living property.”⁴⁵ Despite their lack of legal standing comparable to humans, great apes emerge parallel to human litigants including veterans, battered women and others who are recognized by the law as victims of negligence and/or criminal intent.^{46,47} From the perspective of both science and ethics – regardless of whether great apes are conferred le-

gal personhood – keeping chimpanzees in captivity and using them in experiments constitutes a violation of their physical and psychological well-being.

This paper reviews the history of PTSD and its unique relationship to ethics and the law, and, based on standing science, discusses the harm suffered by great apes maintained and used in research laboratories and the governance of their welfare. Several conclusions arise: The body of evidence leaves no scientific rationale for preventing great apes from receiving standards of protection afforded to humans; those responsible for guaranteeing great ape psychological well-being do not comply with regulations and law; resolution of intrinsic conflicts of interest (i.e., those responsible for guaranteeing humane care are aligned with and/or identical to those who inflict the trauma) is necessary; and regulations and the law concerning chimpanzee treatment must reflect current scientific knowledge to prevent further harm. As a result, great ape welfare issues must be redefined from a question of humane treatment to one of rights where the scope of human bioethical standards logically expands to include great apes by force of science's own criteria. Overwhelming evidence obviates an obligation "to establish the necessity for change"; instead it illustrates that "change is justified."⁴⁸

3.1 PTSD and the Law

PTSD first became a valid diagnosis in 1980 when it was included in the APA Diagnostic and Statistical Manual of Mental Disorders (DSM). PTSD refers to a traumatic event where a "person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others" and/or experienced "intense fear, helplessness, or horror."⁴⁹ Clinical observations correlate with neural substrates (e.g., hippocampus).^{50,51} To accommodate the experiences of prisoners and others who have sustained trauma over extended periods of time, the diagnosis of PTSD has expanded to include complex PTSD (C-PTSD).⁵² PTSD and C-PTSD are now part of a comprehensive classification system in which trauma and symptoms range along a continuum.⁵³

Legal responsibility for psychiatric damage has been awarded for diverse psychological conditions including pathological grief disorder, chronic fatigue syndrome, morbid depression, and PTSD. Three elements of liability must be met: (1) the responsible party must owe the patient a

“duty of care” to act to avoid or prevent foreseeable harm or damage; (2) it must be shown on the balance of probabilities that the responsible person breached the duty of care by falling below the standard of care expected of a reasonable person in the position of the defendant and (3) that as the result of the breach, the damage or harm materialized.⁵⁴

“Duty of care” is a legal concept that defines the nature of a social contract – the legal obligation of an individual to provide a standard of care. “Foreseeable harm” is defined as the harm that a reasonable person would have anticipated as a result of his or her conduct unless care was taken to avoid or alleviate it.⁵⁵ Duty of care is not restricted by spatial or temporal proximity; those legally responsible may be separated from those potentially harmed by considerable time or distance. Proximity includes circumstantial, causal and relational proximity as well as proximity based upon policy considerations.⁵⁶ Further, the plaintiff’s symptoms of PTSD must conform to a formal psychiatric diagnosis and the condition must be shown to be the fault of someone other than the person with the disorder – that is, the cause or agent of psychological illness derives from the action of someone other than the patient. By linking an external agent to symptoms, PTSD conforms to these criteria.

The criteria for statutory compensation for U.S. military personnel require that PTSD be medically diagnosed and present; that there must be evidence that the stressor existed; and the present condition must be related to the stressor experienced while serving in the military.⁵⁷ Percentages of compensation received are determined by symptom severity. In 2010, the criteria were modified so that it is no longer necessary to show proof of combat (e.g., being in a combat location, awarding of specific medals) as a means of identifying the particular stressor responsible for precipitating PTSD.⁵⁸ This modification of military policy reflects a significant shift in public and professional opinion; namely, that PTSD is a natural response to unnatural conditions.

There has been a concurrent development of case law that involves PTSD as a relevant diagnosis in other arenas (e.g., World Trade Center, firemen, child abuse, police).⁵⁹ The use of PTSD as argument in tort and contract law rests on the requirement that the patient has the psychiatric disorder and that acquisition of the disorder was foreseeable. In contract law, foreseeability is used to “limit the award of special or consequential damages to those that are the predictable consequence of the breach of contract” and in tort law is used to “limit the liability of a party to those acts

that carry a risk of foreseeable harm, meaning that a reasonable person would be able to predict or expect the ultimately harmful result of their actions.”⁶⁰ If the responsible party fails to intervene or avoid foreseeable injury to the person for whom they have duty, then they are considered liable. Negligence of the employer is based not only on the criterion that s/he is responsible for exposing the victim to trauma that led to PTSD, but also his/her knowledge of the potential of stress and trauma and subsequent failure to monitor the victim’s state of health and/or perform a satisfactory intervention.⁶¹ This includes a failure to determine an individual’s vulnerability to subsequent traumatic exposures. Knowledge of the causes of stress disorders without making appropriate precautions for prevention or treatment constitutes a case for negligence liability.

4. Laws and Regulations Governing Nonhuman Primates

Ten countries have passed their own laws either banning or severely limiting use of great apes in research and biomedical testing, while one country (Spain) has already granted non-human great apes rights.^{62,63} The use of great apes in experiments has been banned or severely limited in the United Kingdom (1997), Sweden (2003), the Netherlands (2004), Japan (2006) and Austria (2006). Germany, Italy and Norway have discontinued their use for more than 15 years. In 2010, the European Commission passed legislation to prohibit the use of great apes in biomedical research. Invasive research on chimpanzees is prohibited in Australia and New Zealand. The United States is the only country that continues wide-scale housing of chimpanzees in laboratories and permits their use in invasive research.

Today there are approximately 600 chimpanzees in U.S. sanctuaries, 264 in American Zoological Association-accredited zoos, 250 privately owned as “pets” or used in entertainment, and 1,060 (of which some 745 are federally owned) in U.S. laboratories.⁶⁴ As of late 2011, 73 percent of those chimpanzees were held at three facilities: 372 at the New Iberia Research Center in Louisiana; 182 at the Alamogordo Primate Facility in New Mexico; and 178 at MD Anderson Bastrop in Texas. The remaining 25 percent were housed at the Southwest Foundation for Biomedical Research in Texas (174) and the Yerkes National Primate Center in Georgia (96). While the overall number of chimpanzees in captivity has decreased to an estimated 10-20 percent of the 1,060 chimpanzees, the National Institutes of Health (NIH) permits multiple and repeated uses of those individuals.

Chimpanzee welfare in the United States is covered by four main laws: the Convention on International Trade in Endangered Species (CITES), the Animal Welfare Act (AWA), the Endangered Species Act (ESA), and the Chimpanzee Health Improvement, Maintenance and Protection (CHIMP) Act.

The AWA governs the treatment of chimpanzees in captivity and sets minimum standards for animal care in commerce, trade, exhibition and research pertaining mainly to regulations concerning transportation, housing, feeding and other basic requirements. Under the ESA, once a

species is listed as endangered, any person subject to the jurisdiction of the United States is prohibited from “taking” that species (i.e., harming, harassing, wounding, shooting or killing) as well as banned from possessing, selling, delivering, carrying, transporting or shipping any endangered species that is unlawfully “taken,” or from delivering, receiving, carrying, transporting or shipping in interstate or foreign commerce in the course of a commercial activity (16 U.S.C. § 1538).

In 1990, the ESA elevated the status of free-ranging chimpanzees from threatened to endangered. At the same time, the U.S. Fish & Wildlife Service issued a special rule that excluded chimpanzees currently in captivity in the U.S., the progeny of such chimpanzees, and those legally imported after the effective date of the rulemaking from any of the protections their wild relatives were afforded. Buying and selling chimpanzees is permitted in the U.S. but prohibited in African states. The U.S. government decided that while chimpanzees in the wild are “endangered,” they may be downlisted in U.S. captivity to a “threatened” status. It is this strategic decision that has allowed researchers and the entertainment industry to continue to use chimpanzees without restriction.

The CHIMP Act was signed into law in 2000 and required the establishment of sanctuaries for chimpanzees who are no longer needed for research and testing. However, there are serious limitations to the law, notably the lack of criteria set by an independent body (other than the laboratory itself) to evaluate when individuals should be retired from experimentation. In 2007, the Chimp Haven Is Home Act amendment afforded “retired” chimpanzees permanent protection from future research – something not offered by the CHIMP Act.

The CHIMP Act provided chimpanzees a moral status not afforded to any other species; they could not be killed as a matter of convenience nor because they were no longer needed, and instead had to be retired to sanctuary. Nonetheless, despite the fact that there “is a paucity of evidence to demonstrate the positive contribution or successful translation of chimpanzee research to human medicine” (Bailey, 2005), little has changed for experimental subjects. Recently, almost 200 government-owned chimpanzees – some of whom are now in their fifties – were scheduled to be transferred to a private facility receiving government funding so that they would be more readily available for invasive research. After more than a decade of being warehoused in

a government-owned facility where no research took place, these chimpanzees have not yet been afforded sanctuary or protection.⁶⁵

Various regulatory bodies implement the laws related to chimpanzees used or confined for research. The USDA Animal and Plant Health Inspection Service (APHIS) administers the Animal Welfare Act.⁶⁶ It is in charge of facility inspections and enforcement of these federal regulations. In addition to APHIS, all research institutions (e.g., pharmaceutical companies, private research firms and primate research centers) are required to form Institutional Animal Care and Use Committees (IACUC). NIH's Office of Laboratory Animal Welfare is charged with developing policy that dictates the role of each IACUC, a self-regulating committee comprising at least five members appointed by the research institution.^{67,68} This specialized, site-specific oversight ostensibly provides greater scrutiny of research operations. Researchers and their institutions must have protocols approved by their IACUC before implementation. Each IACUC is charged with ensuring that approved research projects conform to these requirements.⁶⁹ Further, researchers are themselves accountable for following regulations.

Despite what the agencies claim officially,⁷⁰ faithful evaluation and implementation of regulations is considered unreliable.^{71,72} Most of the complaints issued against the USDA's implementation of the AWA center on two key failings: inadequacies in regulation standards (e.g., failure to address the ecological and ethological criteria specific and vital to chimpanzees) and the inability of penalties to prevent violations and repeat offenses.⁷³ The ability to accurately monitor protocols and enforce regulations is also limited. Because government employees conduct APHIS inspections, these records are open to public scrutiny. However, unless the institution is a state- or federally owned and operated facility (and although IACUCs are federally mandated bodies), animal welfare regulations do not require public access to IACUC records other than annual reports. Understaffing undermines the resolution of what are considered to be systemic problems: achieving appropriate monitoring and keeping and obtaining accurate current counts of animals and health reports. The limits of auditing capabilities and personnel therefore significantly impair the efficacy of nonhuman primate welfare assessment. For example, more than 100 alleged violations of the AWA regarding chimpanzees were discovered at the New Iberia Research Center in Louisiana.⁷⁴ When asked to review conditions at New Iberia, chimpanzee expert Jane Goodall stated, "Congress passed a bill that

called on those responsible for the care of captive chimpanzees to address their psychological welfare. There was no evidence that I saw that this requirement is addressed in this lab.”⁷⁵

In her 2011 testimony before the Institute of Medicine’s committee on “The Use of Chimpanzees in Biomedical and Behavioral Research” (convened in response to a request by the National Institutes of Health to study current and future needs for chimpanzees as a “research resource”), Dr. Goodall testified that “From [the chimpanzees’] point of view it [laboratory use and confinement] is like torture. . . .They are in prison and they have done nothing wrong.”⁷⁶

Discovery of violations was revealed not through APHIS or an IACUC but from a Humane Society of the United States (HSUS) undercover investigation. Following the investigation, “inspectors also found problems with New Iberia’s Institutional Animal Care and Use Committee (IACUC)” including “incomplete descriptions of protocols and insufficient consideration of alternatives to procedures that may cause distress.”⁷⁷ Nevertheless, few evidenced complaints were considered citable violations by the USDA, and fines were meager compared to laboratory expenses and income.

4.1 Great Ape Care and Conditions in Biomedical Research

Given this background, we now examine whether researchers and the governing welfare bodies might meet the elements of liability: having duty of care to the patient (i.e. chimpanzees in laboratories), if this duty has been breached, and if there is psychiatric damage. By definition, APHIS and every IACUC are charged with duty of care to great apes used in research to provide humane care. However, before judging whether there is a breach of duty in using great apes as biomedical research subjects, we first explore whether great apes have sustained psychiatric damage while under the duty of care by IACUC, APHIS, and the researchers and facilities involved.

Captivity is well known to cause severe stress and abnormal mental states and behaviors in animals used for research.⁷⁸ Laboratory conditions and experiences involving diverse experimental procedures and frequent anesthetics commonly lead to acute and long-term mental and physical breakdown. While many symptoms may be common with

other diagnoses (e.g., generalized anxiety disorder, major depression),⁷⁹ the fact that their genesis is identified with an external stressor (i.e., captivity, experimental procedures) renders a diagnosis of PTSD/C-PTSD conforming to DSM IV-TR criteria.^{80,81,82}

Cross-species psychiatric evaluation is considered valid and symptoms qualify as pathological when behavior and psychological states are (1) relatively persistent and express exclusive of any given specific context; (2) cause an interruption or significant change in an individual's life arc; (3) constitute identifiable psychological and somatic distress; and/or (4) constitute significant behavioral alterations relative to an understood norm.⁸³ Below is a detailed case study that typifies chimpanzee research conditions and the associated psychophysiological health of the study subject.⁸⁴

5. Case Study: Jeannie (Ch-562)⁸⁵

Jeannie, a female chimpanzee born in 1975, arrived at the Fauna sanctuary in Quebec, Canada, in 1997 from the New York Laboratory for Experimental Medicine and Surgery in Primates (LEMSIP) at the age of 22, and died in sanctuary on Jan. 1, 2007, at the age of only 31. In 1981, at age 6, Merck, Sharpe and Dohme (Merck) pharmaceuticals had sent her to the Buckshire Corporation, and seven years later in 1988, she was sent to LEMSIP.



Jeannie

Jeannie spent nine years at LEMSIP undergoing intensive and invasive research, including repeated vaginal washes; multiple cervical, liver punch, wedge and lymph node biopsies; and infection with HIV and hepatitis NANB and C virus.⁸⁶ She experienced more than 200 “knockdowns” (i.e., anesthetization by dart gun) at LEMSIP alone. After seven years at LEMSIP, personnel documented that she suffered “a nervous breakdown” characterized by serious emotional and behavioral problems, whereupon she was removed from all future studies (LEMSIP staff, pers. comm.). Attempts were made to control her symptoms through psychotropic medications (e.g., clomipramine). Her symptoms included self-injury, seizure-like episodes, screaming and alternating trance-like and highly anxious states.

While living at LEMSIP, Jeannie had a history of severe weight loss from recurring anorexia. She would often take her food and arrange each piece ritualistically in a circle around her. Jeannie had multiple medically diagnosed and observed problems including pelvic pain, skin problems, autoimmune disorders, upper respiratory distress, seizure-like episodes that fit no known physiological pattern consistent with neurological damage, and recurring tremors of her hands and feet, as well as poor motor coordination and excessive, painful, blood flow that occurred with her cycles, and intense self-injurious behavior. Her symptoms overlap consistently with other chimpanzees hand-reared by humans (as “pets,” used in the entertainment industry or kept in laboratory settings) who suffer from significant psychological disorders with persistent neuropsychological compromise.⁸⁷

6. Regulation Compliance and Statutory Duty

It is generally assumed that researchers follow the IACUC proscriptions. However, that is not the case, as the recent New Iberia Research Center and other investigations have revealed.^{88,89} The primary concern is whether governing bodies, laws and regulations adequately protect great apes, given what is known scientifically and the legally expressed commitment to “humane” treatment.

As science establishes that great apes possess psychological and physiological capacities comparable to humans, it is logical to evaluate the treatment of great apes based on ethical and legal criteria that have been developed to protect human well-being and dignity.⁹⁰ For example, the Geneva Convention (Convention (IV) relative to the Protection of Civilian Persons in Time of War, Geneva, 12 August 1949 (e.g., Paragraph 1, sentence 2; enjoining respect for essential rights and fundamental liberties) defines “humane” treatment this way:⁹¹

Protected persons are entitled, in all circumstances, to respect for their persons, their honour, their family rights, their religious convictions and practices, and their manners and customs. They shall, at all times, be humanely treated, and shall be protected, especially against all acts of violence or threats thereof and against insults and public curiosity. Women shall be especially protected against any attack on their honour, in particular against rape, enforced prostitution, or any form of indecent assault. Without prejudice to the provisions relating to their state of health, age and sex, all protected persons shall be treated with the same consideration by the Party to the conflict in whose power they are, without any adverse distinction based, in particular, on race, religion or political opinion.

Based on this criteria, the Geneva Convention would conclude that Jeannie was subjected to “indecent assault,” “public curiosity,” unprotected from “acts of violence,” denied her “manners and customs,” stripped of her “family rights” and certainly not “treated with the same consideration [as] those in power.” The minimal acceptable lab standards for food, housing, transportation, and treatment may only minimally meet or may not meet at all the needs of chimpanzees’ “health, age, and sex.” Further, while the AWA requires that the “physical environment in [their] primary enclosures must be enriched by providing means of

expressing non-injurious species-typical activities,”⁹² the vast physical and social complexity of free-ranging chimpanzee life cannot be met in laboratory captivity. Diagnosis of PTSD confirms the presence of a normal response to an abnormal situation.⁹³

Nearly all governing regulations provide generic standards with minimal attention to species differences —dogs, cats, primates, rabbits, and hamsters are lumped together with only an occasional distinction in subsections being made despite physiological, social, and psychological differences across species. Chimpanzees can be housed alone if deemed necessary by researchers, separated from friends and family—a situation that does not resemble normative chimpanzee social needs. Social enrichment and cage sizes fail to meet normative environmental conditions⁹⁴ for free-ranging chimpanzees.⁹⁵ The cage size allowed to keep a full-grown chimpanzee (i.e., 5’x5’x7’), makes it impossible for a large male to even fully extend his arms and legs without hitting the bars. However, laboratories are allowed to keep chimpanzees in cages the size of a small closet for their entire lives and permit isolation of a chimpanzee for the laboratory’s handling or for a specific protocol’s needs. A single tire hanging from the center of an otherwise barren cage currently meets the law’s requirement that an “enrichment” plan be in place.

7. Conclusions and Recommendations

Laws, regulations and the enforcement responsibilities and roles establish a statutory duty of care for great apes in research. Researchers and regulatory bodies are fully aware of the causes of stress disorders and the vulnerability of chimpanzees to PTSD, C-PTSD and other psychiatric disorders (Table 2). However, even if current regulations and laws were upheld, it is questionable whether there is sufficient commitment from those responsible for overseeing and enforcing regulations. For example, despite multiple references in regulations to “generally accepted professional and husbandry practices,” no objective and substantiated scientific sources are cited indicating where they can be found in the literature. Instead, the laboratory code of conduct exists as a closed system impervious and unaccountable to scientific standards of evidence.

Veterinarians and researchers, who have either a vested interest in keeping nonhuman primates in captivity and/or whose assessments of nonhuman primates are grounded in the two-tiered scientific and ethical perspective, form these “self-regulating” bodies.^{96,97} As a result, there is no real system of checks and balances to safeguard violations by the committees themselves or the day-to-day staff in whose care captive chimpanzees are placed.

NIH is the operating force and primary founder of the Office of Laboratory Animal Welfare and represents yet another example of where there is no objective third party that can judge whether humane treatment and care is being considered and truly required and appropriately administered. Training and standards are set by individuals belonging to organizations or government agencies involved in animal research and testing, with no objective body to oversee decisions or practices.

The present analysis suggests that the U.S. government’s regulatory agencies and individual laboratory facilities have violated statutory duty of care and are liable for several reasons, including a failure to intervene or avoid foreseeable injury to captive chimpanzees for whom they have duty of care; knowingly exposing these individuals to trauma that led to PTSD; having foreknowledge of the potential for stress and trauma and its resulting injury; and not providing adequate care and monitoring

methods that protect these individuals' physical and psychological well-being.

Similar to how war-related PTSD is now regarded in human beings (that it is a normal response to abnormal conditions), great ape PTSD emerges as a normal response to captivity and biomedical procedures. Such a scientifically based, moral and legally logical change provides ample justification for the complete banning of great ape research, testing, laboratory confinement and captive breeding.

There are two levels of implications. First, in accordance to precedence, laws and regulations concerning great ape treatment are compelled to reflect scientific knowledge to prevent further harm. Second, responsible parties are liable to penalties and chimpanzees are deserving of restitution. Concerning the latter, one might ask how a chimpanzee might bring suit. While it is maintained that great apes do not have an understanding of (human) law and are not considered capable of communicating their understanding of such formalisms, a plaintiff may be represented by an appointed guardian ad litem (e.g., conservator) where damages under the law of negligence are awarded to bring, insofar as money can do so, the wrongfully injured claimant to a position in which he/she had been before.⁹⁸

However, it is not far-fetched that chimpanzees may someday serve as plaintiffs. Substantive research shows that great apes indeed can “speak for themselves.” Similar to humans without verbal skills or ability, great apes communicate emotions, mental states and experiences through patterns of behaviors, physical scars and injuries, and other nonverbal testimony. They are able to understand complex human concepts, notably subjects that pertain to basic (human) rights, and can express themselves on these matters linguistically.^{99,100,101} Indeed, this line of reasoning is in keeping with proposals to change the juristic personhood status of animals using existing property law concepts that would permit equitable “self-ownership” for animals. By expanding such property rights, a self-owned animal such as Jeannie and other chimpanzees in captivity would “have tort law available to protect his or her interests.”¹⁰²

The implicit contradiction and ambivalence in current regulations and practices have been recognized elsewhere. In 2002, a state court issued an injunction that allowed two young chimpanzees born in a research lab and sold into entertainment to be transferred to a sanctuary. The court

order included reasoning that the transfer was necessary not because of physical abuse but because of psychological harm; namely, that current care would have a “detrimental effect on their appropriate development and socialization.”¹⁰³ More recently, stimulated by a multiparty petition, the U.S. Fish & Wildlife Service announced that it is reviewing the status of chimpanzees to investigate whether more protective listing under the Endangered Species Act is warranted. If such a decision was made, it would encourage banning chimpanzees from use in experiments.¹⁰⁴

The Great Ape Protection Act of 2009 was reintroduced in 2011 as the Great Ape Protection and Cost Savings Act in the U.S. Congress, with strong bipartisan support in both the House and Senate. If passed and signed into law, this precedent-setting legislation will end the use of all great apes (i.e., gorillas, orangutans, chimpanzees, bonobos, and gibbons) in invasive research, prohibit their transport or breeding for research and retire all federally owned and supported chimpanzees to lifetime sanctuary care. The bill represents the first time in U.S. history that a species other than *Homo sapiens* would be prohibited from use in harmful research. Further, it would provide chimpanzees formerly used or held in laboratories restitution in sanctuary.¹⁰⁵ In late 2011, in response to the NIH's request that was prompted by legislators, the National Academy of Sciences' Institute of Medicine (IOM) issued recommendations from its nine-month study to assess the current and future necessity of chimpanzees in research. The IOM concluded that “most current biomedical research use of chimpanzees is not necessary” – an unprecedented declaration by a scientific body.¹⁰⁶

Our ultimate recommendation is that great ape care and treatment be removed from the oversight of self-regulation and animal research advocates and instead reside under the umbrella of those laws and regulatory agencies established to protect humans, namely the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct,¹⁰⁷ the Declaration of Helsinki,¹⁰⁸ and the Geneva Convention.¹⁰⁹

8. Works Cited

¹Darwin, C. (1872). *The expression of the emotions in man and animals*. London: Penguin.

²Panksepp, J. (1998). *Affective neuroscience: The foundations of human and animal emotions*. New York: Oxford University Press.

³Bradshaw, G.A. & Finlay, B. (2005). Natural symmetry. *Nature*, 435, 149.

⁴Bradshaw, G.A., & R. M. Sapolsky (2006). Mirror, mirror. *American Scientist*, 94(6), 487-489.

⁵Northoff, G. and J. Panksepp, (2008). The trans-species concept of self and the subcortical-cortical midline system. *Trends in Cognitive Sciences*, 12 (7), 259-264.

⁶Critically, “a great deal of evidence now indicates impressive homologies in subcortically concentrated, genetically-provided emotional and motivational systems (i.e., key brain areas and chemistries) among mammals” showing that there are “substantial cross-species consistencies”(Narvaez, Panksepp, Schore, & Gleason, in press). Cortical, limbic, and autonomic structures that process and regulate socio-affective information and associated psychophysiological and behavioral traits (e.g., maternal behavior, facial recognition, moral development, play, sexual behavior, fear, aggression, affect regulation) are highly conserved evolutionarily (Panksepp 1998; Table 1). Importantly, socially mediated neuroethological patterns and neurobiological structures affected by trauma (cortical and subcortical areas of the right brain, including the right orbitofrontal cortex, anterior cingulate, amygdala, hippocampus, and posterior areas of the right hemisphere) are also conserved across species (Schore 2002; 2003; Bremner, 2005; Bradshaw & Schore, 2007).

⁷Bradshaw, G.A. (2009). *Elephants on the edge: What animals teach us about humanity*. New Haven: Yale University Press.

⁸Narvaez, D., Panksepp, J., Schore, A., & Gleason, T. (in press). The value of the environment of evolutionary adaptedness for gauging children’s well-being. *Human Nature, Early Experience and the Environment of Evolutionary Adaptedness*. New York: Oxford University Press.

⁹Panksepp 1998; Table 1

¹⁰Schore, A. N. (2002). Dysregulation of the right brain: a fundamental mechanism of traumatic attachment and the psychopathogenesis of posttraumatic stress disorder. *Australian and New Zealand Journal of Psychiatry*, 36, 9-30.

¹¹Schore, A.N. (2003). *Affect dysregulation and disorders of the self*. Mahwah, N.J.: Erhbaum.

¹²Bremner, J. D. (2005). Effects of traumatic stress on brain structure and function: relevance to early response. *Journal of Trauma and Dissociation*, 6(2), 51-68.

¹³Bradshaw, G.A. & A.N. Schore (2007). How elephants are opening doors: Developmental neuroethology, attachment, and social context. *Ethology*, 113, 426–436.

¹⁴Critically, “a great deal of evidence now indicates impressive homologies in sub-cortically concentrated, genetically-provided emotional and motivational systems (i.e., key brain areas and chemistries) among mammals” showing that there are “substantial cross-species consistencies”(Narvaez, Panksepp, Schore, & Gleason, in press). Cortical, limbic, and autonomic structures that process and regulate socio-affective information and associated psychophysiological and behavioral traits (e.g., maternal behavior, facial recognition, moral development, play, sexual behavior, fear, aggression, affect regulation) are highly conserved evolutionarily (Panksepp 1998; Table 1). Importantly, socially mediated neuroethological patterns and neurobiological structures affected by trauma (cortical and subcortical areas of the right brain, including the right orbitofrontal cortex, anterior cingulate, amygdala, hippocampus, and posterior areas of the right hemisphere) are also conserved across species (Schore 2002; 2003; Bremner, 2005; Bradshaw & Schore, 2007).

¹⁵Fujiyama, A., Watanabe, H., Toyoda, A., Taylor, T.D., Itoh, T., Tsai, S.F., et al. (2002). Construction and Analysis of a Human-Chimpanzee Comparative Clone Map. *Science*, 4, 295(5552), 131-134.

¹⁶See Table 1, e.g., numerical memory in Inoue, S. & Matsuzawa, T. (2007). Working memory of numerals in chimpanzees, *Current Biology*, 17(23), R1004-R1005.

¹⁷See p. 23 in Flack, J. & F.B.M.deWaal (2000). “Any animal whatever:” Darwinian building blocks of morality in monkeys and apes. *Journal of Consciousness Studies*, 7:1–29.

¹⁸Narvaez, D. (2008) Triune ethics: The neurobiological roots of our multiple moralities. *New Ideas in Psychology*, 26, 95–119.

¹⁹Narvaez, Panksepp, Schore, & Gleason, (Eds.) in press, *Human Nature, Early Experience and the Environment of Evolutionary Adaptedness*. New York: Oxford University Press.

²⁰Ferguson, R. B. (2011). Born to live: Challenging killer myths. In R.W. Sussman, C.R. Cloninger (eds.), *Origins of Altruism and Cooperation, Developments in Primatology: Progress and Prospects* 36, 249-270 , Springer.

²¹Opponents to chimpanzee use in research contend that they are similar enough cognitively and emotionally to make their use ethically unjustifiable and that they are dissimilar enough biologically – in particular in gene expression with all its implications for immune function, and so forth, to render data from their use of little, erroneous, dangerous or non-relevance to humans. Proponents assert that chimpanzees are similar biologically and presume validity of their use as “models” for humans. At the same time they argue that chimpanzees are dissimilar enough cognitively and emotionally to pose few ethical problems in their use.

²²Shapiro, K. J. (1998). *Animal models of human psychology: Critique of science, ethics and policy*. Cambridge, MA: Hogrefe and Huber Publishing.

²³Orlans, F.B., Beauchamp, T.M., Dresser, R., Morton, D.B., Gluck, J.P. (1998). *The human use of animals: case studies in ethical choice*. Oxford: Oxford University Press.

²⁴Bailey, J. (2011). Lessons from Chimpanzee-based Research on Human Disease: the Implications of Genetic Differences. *Alternatives to Laboratory Animals (ATLA)*, 39(6).

²⁵Darwin (1872), p. 406.

²⁶Bradshaw, G.A., T. Capaldo, L. Lindner, & G. Grow (2008). Building an inner sanctuary: Trauma-induced symptoms in non-human great apes. *Journal of Trauma and Dissociation*. 9(1), 9-34.

²⁷Bradshaw, G.A., T. Capaldo, L. Lindner, & G. Grow (2009). Developmental context effects on bicultural post-trauma self repair in chimpanzees. *Developmental Psychology*, 45, 1376-1388.

²⁸Bailey, J. (2005). Non-human primates in medical research and drug development: A critical review. *Biogenic Amines*, 19, 235–255.

²⁹Bailey, J. (2011).

³⁰Wise, S. (2001). *Rattling the cage: Toward legal rights for animals*. New York: Perseus Publishing.

³¹Animal Welfare Act of 1966, 54 U.S.C. §§ 2131, 2143 (2009). Retrieved 5/16/2011 from <http://www.gpo.gov/fdsys/pkg/USCODE-2009-title7/html/USCODE-2009-title7-chap54.htm>

³²USDA/APHIS (1999). Appendix A. 9 CFR Section 3.81 in Final report on environmental enhancement to promote the psychological wellbeing of non-human primates. Retrieved December 1, 2011 from http://www.nal.usda.gov/awic/enrichment/Enviromental_Enhancement_NonHuman_Primates.htm#promote.

³³Gluck, J. Personal communication, March 17, 2011.

³⁴Brüne, M., Brüne-Cohrs, & McGrew, W.C. (2004). Psychiatric treatment for great apes? *Science*, 306, 2039.

³⁵Brüne, M., Brüne-Cohrs, U., McGrew, W.C., & Preuschoft, S. (2006). Psychopathology in great apes: Concepts, treatment options and possible homologies to human psychiatric disorders. *Neurosci. Biobehav. Rev.* 30, 1246–1259.

³⁶Bradshaw, Capaldo, Lindner, & Grow, 2008.

³⁷Bradshaw, Capaldo, Lindner, & Grow, 2009.

³⁸Ferdowsian, H., Durham, D., Kimwele, C., Kranendonk, G., Otali, E., et al. (2011) Signs of Mood and Anxiety Disorders in Chimpanzees. *PLoS ONE* 6(6): e19855. doi:10.1371/journal.pone.0019855

³⁹USDA/APHIS, 1999.

⁴⁰American Psychiatric Association (2002). *Diagnostic and Statistical Manual of Mental Disorders—Text Revision*, 4th ed. (Washington, D.C.: American Psychiatric Association).

American Psychological Association. (2010). Ethical principles of psychologists and code of conduct; Retrieved April 2, 2011 from <http://www.apa.org/ethics/code/index.aspx>

⁴¹See Bradshaw et al., 2008, 2009, respectively.

⁴²APA, 2002.

⁴³U.S. laboratory regulatory bodies responsible for implementing and monitoring these laws include the National Institute of Health (NIH), the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), and institution-specific Institutional Animal Care and Use Committees (IACUC; see Appendix A). According to USDA (2011), APHIS is “a multi-faceted Agency with a broad mission area that includes protecting and promoting U.S. agricultural health, regulating genetically engineered organisms, administering the Animal Welfare Act and carrying out wildlife damage management activities.” http://www.aphis.usda.gov/about_aphis/

⁴⁴USDA, 1999.

⁴⁵Favre, D. (2000). Equitable self-ownership for animals. *Duke Law Journal*, 50 (2), 473-502.

⁴⁶Adamou, M.C. & Hale, A. S. (2003). PTSD and the law of psychiatric injury in England and Wales: Finally coming closer? *J. Am. Acad Psychiatry Law*, 31, 327–32, 2003.

⁴⁷McFarlane, A.C. & R.C. Bryant (2007). Post-traumatic stress disorder in occupational settings: Anticipating and managing the risk. *Occupational Medicine (London)*, 57(6), 404-410.

⁴⁸Favre, 2000, p. 475.

⁴⁹APA, 2002

⁵⁰Yehuda, R. & LeDoux, J. (2007). Response variation following trauma: A translational neuroscience approach to understanding PTSD. *Neuron*, 56(1), 19-32.

⁵¹Tarr, B.A., Rabinowitz, J.S., Imtiaz, M.A. and DeVoogd, T.J. (2009) Captivity reduces hippocampal volume but not survival of new cells in food-storing bird. *Developmental Neurobiology* 69(14):972

⁵²Herman, J. L. (1992). Trauma and recovery. New York: Basic Books.

⁵³Briere, J., & Spinazzola, J. (2003). Phenomenology and assessment of complex PTSD. *Journal of Traumatic Stress*, 18, 401–412.

⁵⁴Adamou & Hale, 2003.

⁵⁵Foreseeable is used somewhat differentially depending on which type of law is being considered. For example, tort law uses the concept of foreseeable to “limit the liability of a party to those acts which carry a risk of foreseeable harm”. Contract law uses foreseeable to limit awards “to those that are the predictable consequence of the breach of contract.” Negligence law, the “duty to act reasonably to avoid foreseeable risks of physical injury extends to any person.” <http://definitions.uslegal.com/f/foreseeable/>

⁵⁶Mendelson, D. (1994). The law of torts. John C. Fleming. *Deakin Law Review*, 1(2), 255-261. Retrieved November 25, 2011, from <http://www.austlii.edu.au/au/journals/DeakinLRev/1994/14.html>

⁵⁷Institute of Medicine and National Research Council. (2007). *PTSD compensation and military service*. Washington, DC: The National Academies Press.

⁵⁸Veterans Administration, (2010). Veterans Disability Lawyers (2010). PTSD new rules veteran compensation. http://www.veteransdisabilitylawyersite.com/ptsd_new_rules_va.html, retrieved February 2, 2011.

⁵⁹See ER 907, 912, 922; Hinz v. Berry [1970] 2 QB 40; Brice v. Brown [1984] 1 All ER 997; Frost v. Chief Constable of South Yorkshire Police [1997]; Vernon v. Bosley (No 1) [1997] 1 All ER 577, C.A.; Page v. Smith [1996] AC 155; Reilly and Reilly v. Merseyside RHA [1995] 6 Med LR quoted in Adamou & Hale, 2003).

⁶⁰U.S. Legal (2011). Foreseeable law and legal definition. Retrieved February 12, 2011 from <http://definitions.uslegal.com/f/foreseeable/>.

⁶¹McFarlane & Bryant, 2007

⁶²Catan, T. (2008). Apes get legal rights in Spain, to surprise of bullfight critics. Retrieved April 10, 2011 from <http://www.timesonline.co.uk/tol/news/world/europe/article4220884.ece>

⁶³The Independent (2010, September 12). New EU rules in animal testing ban use of apes. Retrieved October 13, 2010 from <http://www.independent.co.uk/life-style/health-and-families/new-eu-rules-on-animal-testing-ban-use-of-apes-2077443.html>.

⁶⁴New England Anti-Vivisection Society (2011a). Who's There? Alamogordo Primate Facility. Retrieved November 25, 2011. from <http://www.releasechimps.org/uploads/Alamogordo-Primate-Research-Center.htm>

⁶⁵This decision has been temporarily delayed “pending an Institute of Medicine [the health arm of the National Academy of Sciences] in-depth analysis to reassess the scientific need for the continued use of chimpanzees....” The report is expected to take about two years and makes no mention of an assessment of the ethical concerns surrounding their use. (ReleaseChimps.org, 2011)

⁶⁶USDA (2011a). About APHIS, http://www.aphis.usda.gov/about_aphis/, retrieved March 2, 2011.

⁶⁷IACUC (2011). <http://www.iacuc.org/aboutus.htm> retrieved January 2, 2011.

⁶⁸IACUC is a “self-regulating” committee comprised of at minimum five members appointed by the research institution (IACUC 2011; <http://www.iacuc.org/aboutus.htm>).

and is not a member of the immediate family of a person who is affiliated with the institution (USDA 2011; <http://grants.nih.gov/grants/olaw/references/phspol.htm#AnimalWelfareAssurance>).

⁶⁹USDA (2011b). IACUC charged with ensuring that approved research projects conform to these requirements (USDA 2011; <http://grants.nih.gov/grants/olaw/references/phspol.htm#AnimalWelfareAssurance>; see Table 2), retrieved March 2, 2011.

⁷⁰USDA (2000). USDA employee survey on the effectiveness of IACUC regulations. U.S. Department of Agriculture Animal and Plant Health Inspection Service, Animal Care Riverdale, MD.

⁷¹Plous, S., & Herzog, Jr., H.A. (1999). Should AWA coverage be broadened? Results from a survey of animal care and use committees. *Lab Animal*, pp. 38–40.

⁷²Plous, S., & Herzog, H. A., Jr. (2001). Reliability of protocol reviews for animal research. *Science*, 293, 608-609.

⁷³Bradshaw, G.A. (2007). Elephants in captivity: analysis of practice, policy, and the future, *Society & Animals* 1-48.

⁷⁴HSUS, (2009). The HSUS investigates primate use at the New Iberia Research Center (NIRC) New Iberia, Louisiana. Humane Society of the United States Report.

⁷⁵USDA (2009). USDA Completes inspection of New Iberia Research Center, News Release, May 11, 2009. <http://www.aphis.usda.gov/newsroom/content/2009/05/newiberia.shtml>

⁷⁶Keim, B. (2011). Captive Chimps Could Be Declared Endangered Species. *Wired Science*, September 1, 2011. <http://www.wired.com/wiredscience/2011/09/chimp-status/>

⁷⁷USDA (2009). USDA completes inspection of New Iberia Research Center. Retrieved May 11, 2011 from <http://www.aphis.usda.gov/newsroom/content/2009/05/newiberia.shtml>

⁷⁸Table 2 in Morgan, K. N. & C.T. Tromborg (2007). Sources of stress in captivity, *Applied Animal Behaviour Science*. 102(3) 262-302.

⁷⁹APA 2002.

⁸⁰Bradshaw et al. 2008.

⁸¹Bradshaw et al. 2009.

⁸²Ferdowsian et al, 2011

⁸³Fabrega, H., Jr. (2006). Making sense of behavioral irregularities of great apes. *Neurosci. Biobehav., Rev.* 30, 1260-1279.

⁸⁴Bradshaw, Capaldo, Lindner, & Grow, 2008.

⁸⁵In clinical studies, participant anonymity is protected. Researchers are required to procure their consent and, where competency is uncertain, the approval of their guardian or supervising physician. Protection holds even for deceased subjects. In the case of nonhuman animals consent cannot be obtained. We use their given names in lieu of the practice of anonymity in an effort to discontinue their objectification. We also include their assigned laboratory numbers.

⁸⁶Bradshaw, Capaldo, Grow, & Lindner 2008

⁸⁷Bradshaw, Capaldo, Lindner, & Grow, 2008

⁸⁸HSUS, 2009.

⁸⁹USDA, 2009.

⁹⁰Quigley, M. (2007). Non-human primates: The appropriate subjects of biomedical research? *Journal of Medical Ethics*, 33(11), 655-658.

⁹¹Convention (IV) relative to the Protection of Civilian Persons in Time of War. Geneva, 12 August 1949, Part III : Status and treatment of protected persons #Section I : Provisions common to the territories of the parties to the conflict and to occupied territories, <http://www.icrc.org/ihl.nsf/COM/380-600032?OpenDocument>.

⁹²USDA, APHIS 1998: 9 CFR 3.81(b) as quoted in USDA 1999.

⁹³Fassin, D. & R. Rechtman (2007). *L'empire du traumatisme. Enquête sur la condition de victime*. Paris: Editions Flammarion.

⁹⁴CFR "The conditions appropriate for one species do not necessarily apply to another. Accordingly, these minimum specifications must be applied in accordance with the customary and generally accepted professional and husbandry practices considered appropriate for each species". Minimum size for primary enclosure for great apes is determined by height and weight. An adult female chimpanzees who averages 130 cm (51.2 inch) in height and weighs 45 kg (99 pounds), the floor size is only 8 square feet (less than 3 x 3 feet) and height of 36 inches. For a full grown male chimpanzee who averages 170 cm (66.9 inches) in height and 80 kg (176 pounds) minimum floorspace is 25 square feet and cage height is 84 inches. Since brachiating species such as chimpanzees are grouped together, additional space is provided to permit: species-typical behaviour: "great apes weighing over 110 lbs. (50 kg) an additional volume of space in excess of that required for Group 6 animals as set forth in paragraph (b)(2)(i) of this section, to allow for normal postural adjustments." <http://www.nal.usda.gov/awic/pubs/noawicpubs/educ.htm>

⁹⁵Goodall, J., (1986). *The chimpanzees of the Gombe: Patterns of behavior*. Cambridge: Harvard University Press.

⁹⁶IACUC, 2011.

⁹⁷Schuppli, C.A. & D. Fraser. (2007). Factors influencing the effectiveness of research ethics committees. *Journal of Medical Ethics*, 33(5): 294–301.

⁹⁸Favre, D. (2010). *Living property: A new status for animals within the legal system*, *Marquette L. Rev.*,93, 1021-1071.

⁹⁹Savage-Rumbaugh, S., K. Wamba, P. Wamba & N. Wamba. (2007). Welfare of Apes in Captive Environments: Comments On, and By, a Specific Group of Apes. *Journal of Applied Animal Welfare Science*.10(1), 7–19; p. 15.

¹⁰⁰Bradshaw. G.A. (2010a). We, Matata: Bicultural living amongst apes, *Spring*, 83, 162-182.

¹⁰¹Bradshaw, G.A. (2010b). An ape among many: Animal co-authorship and trans-species epistemic authority. *Configurations*, 18(1-2), 15-30.

¹⁰²Favre 2000, p. 501.

¹⁰³State of New Hampshire (2002). Notice of Decision, 02-E-0348, Diamond Action Inc. vs. Greenville Wildlife Park et al, November 11, 2002.

¹⁰⁴Eilperin, J. 2011. Federal officials to weigh new protections for captive chimpanzees. *Washington Post*, September 1, 2011.
www.washingtonpost.com/national/health-science/federal-officials-to-weigh-new-protections-for-captive-chimpanzees/2011/08/31/gIQAmbbosJ_story.html

¹⁰⁵New England Anti-Vivisection Society (2011b), Great Ape Protection Act. <https://secure3.convio.net/neavs/site/Advocacy?cmd=display&page=UserAction&id=136>. Retrieved April 8, 2011. <http://www.releasechimps.org/mission/change-laws/the-great-ape-protection-act/#axzz1MYO0dwr>

¹⁰⁶Institute of Medicine, 2011. *Chimpanzees in biomedical and behavioral research: Assessing the necessity*. Washington, DC: The National Academies Press.

¹⁰⁷American Psychiatric Association (2010). *Ethical Principles of Psychologists and Code of Conduct*. <http://www.apa.org/ethics/code/index.aspx>

¹⁰⁸World Medical Association. (2008). *Declaration of Helsinki*. Retrieved April 2, 2011 from <http://www.wma.net/en/20activities/10ethics/10helsinki/>

¹⁰⁹ICRC (2011) *The Geneva Conventions of 1949 and their Additional Protocols* <http://www.icrc.org/eng/war-and-law/treaties-customary-law/geneva-conventions/index.jsp>

9. TABLE 1

EXAMPLES OF HUMAN/NONHUMAN ANIMAL COMPARABILITY

Attributes Comparable to Humans	Species	Representative References
Infant-maternal attachment	All Primates	Kalcher, Cornelia, Crailsheim, & Preuschoft (2008); Bowlby (1969)
Culture, tool-use, linguistic capabilities	Chimpanzees	Gardner, Garder, & Nichols, 1989; McGrew (1992); Savage-Rumbaugh & Fields (2000); Wrangham et al (1996); Sapolsky (2006);
Cognition, (including the ability to infer the mental and emotional states of others, tactical deception, semanticity, theory of mind, perception-goal)	Chimpanzees and other species	Parr (2001); Flack & DeWaal (2000); Savage-Rumbaugh (2000; 2007); Tomasello, Call, & Hare (2003); Brune & Brune-Cohrs (2005).
Psychiatric symptom, PTSD, psychopathology, trauma	Chimpanzees and other primates	Reimers, Schwarzenberger, & Preuschoft (2007); Bradshaw et al. 2008; 2009 Brüne, Brüne-Cohrs, McGrew, & Preuschoft (2006); Ferdowsian et al. (2011)
Self-Awareness	Chimpanzees Rhesus Monkeys and other species	Bard, Todd, Bernier, Love, & Leavens (2006)
Empathy, emotion altruism, and prosocial behavior	Primates	Preston & de Waal (2002);
Ability to use personal pronouns	Chimpanzees	Gardner, Gardner, & Nichols, 1989; Itakura (1992).
Math skills/memory of quantity	Chimpanzees	Inoue & Matsuzawa (2007)
Intentional gesturing to communicate with conspecifics	Chimpanzees	Leavens & Hopkins, 1998; Hobaiter & Byrne (2011)

10. TABLE 2

SYMPTOMS ASSOCIATED WITH CAPTIVITY/EXPERIMENTATION

Symptoms	Reference
Post-Traumatic Stress Disorder (PTSD) and Complex PTSD (C-PTSD)	Bradshaw, Capaldo, Grow, & Lindner (2008); (2009).
Suppressed immune system response due to chronic repetitive social stress.	Cohen, Kaplan, Cunnick, Manuck, & Rabi (1992).
Self-injurious behavior and noninjurious self-abuse, aggression to conspecifics, extreme anxiety	Coleman (2011); Van Hooff (1974); Brent et al (1989); Brüne, Brüne-Cohrs, McGrew & Preuschoft (2006); Nash et al. (1999); Alford et al. (1995)
Stereotypic behavior (motor movements, unnatural, repetitive posturing, self-stimulation), learning difficulties	Coleman (2011); Bourgeois et al. (2007); Turner, Davenport, & Rogers (1969); Nash et al. (1999); Davenport (1979); Brent et al. (1989).
Abnormal behavioral patterns for their unusual frequency, severity or gross anomaly, (e.g., bizarre postures, hand clapping, coprophagy, eye poking, hair pulling, head banging, head shaking, head wiping, flipping of the lower lip, rocking, self-clasping, regurgitation and reingestion of food.)	Morgan, Menkhus, Howell and Fritz (1993); Pomerantz & Terkel (2009)
Maternal compromise	Brüne, M., Brüne-Cohrs, McGrew, & Preuschoft (2006)

11. TABLE 3

PSYCHIATRIC/PSYCHOLOGICAL ASSESSMENT OF CHIMPANZEES

(Adapted from McIntyre, K. M., Norton, J. R., McIntyre, J. S. (2009). Psychiatric interview, history, and mental status examination, In Sadock, B.J., Sadock, V. A.; Ruiz, P. (eds) Kaplan and Sadock's Comprehensive Textbook of Psychiatry (9th ed.) Hagerstown, MD: Lippincott Williams & Wilkins.)

Elements	Description
Identifying data	Name, age, gender, significant relationships, species
Source and reliability	Identify the source of all information and any associated uncertainties
Chief complaint	Problem description and primary symptoms as reported by caregivers
History of current symptoms	A description of what (symptoms), how much and long (severity), and associated factors; previous treatments; triggering factors and setting; chronological description of the evolution of the symptoms; changes in interests, relationships, behaviors, habits, and physical health; duration and variability of symptoms; stressors; summary review of symptoms, including mood, anxiety, affect, psychosis, and other (e.g., eating disorder)
Mental health history	All known mental health issues (how about) symptoms (to be consistent) and their course over the patient's lifetime, including interventions and treatments
Medical history	Known medical history including potential causes of or contributors to current emotional behavioral symptoms (e.g., anxiety from hyperthyroidism) or confounding factors that affect choice of treatment options and their efficacy; an account of major medical illnesses, conditions, and treatments (past and present), as well as surgeries and other invasive procedures (where possible note if such procedure was performed for the benefit of the patient or as part of a research protocol); record of procedures and medications received; note current medical conditions as well as a review of current medications
Developmental, family, and social history	A review of the stages of the patient's life to identify context of mental health and physical symptoms and current and past psychosocial stressors; childhood/family and social environment, number, quality and nature of relationships; natural chimpanzee and/or human cultural influences on the patient's life; and any known information on family-related risk factors

Mental status examination	Identify areas of mental functioning and record evidence of signs and symptoms of mental illnesses (See Table 4 (MSE) for details).
Physical examination	Any and all known information from the patient's most recent (within a year of the assessment) physical examination, clarifying if the information came from a routine exam or an exam performed to treat an illness, injury or other condition—if results of a recent physical examination are not available, the assessor should determine when and by whom the patient's last physical examination was performed and inquire about abnormal findings)
Formulation	A narrative that contains an analysis and synthesis of data and observations leading to a biopsychosocial understanding of the patient's condition; include diagnosis, prognosis, recommendations for medical and behavioral interventions, and other treatment planning; include discussion of biological factors (medical, social, and medication history), psychological factors (childhood circumstances, upbringing, interpersonal interactions and individual temperament) and social factors (external stressors and contextual circumstances such as living environment and interpersonal relationships).
DSM multiaxial diagnoses	A diagnostic assessment modeled on the DSM-IV-TR that includes (1) major psychiatric diagnoses (PTSD, major depression, etc.), (2) medical conditions; (3) past and current contributing psychosocial stressors; and (4) global assessment of functioning based on the patient's ability to integrate into chimpanzee society, maintain their social status within that society, mitigate his/her own symptoms in an adaptive or maladaptive manner (e.g. seeking comfort from others vs isolating from the group), ability to assimilate rehabilitative interventions, etc.
Treatment recommendations	Given the overall assessment of the individual, a summary of treatment options to be explored in the course of developing a formal and individual specific treatment plan, including contingencies and comparative benefit and risk assessment for each treatment strategy

12. TABLE 4

MENTAL STATUS EXAMINATION FOR CHIMPANZEES

(Adapted from McIntyre, K. M., Norton, J. R., McIntyre, J. S. (2009). Psychiatric interview, history, and mental status examination, In Sadock, B.J., Sadock, V. A.; Ruiz, P. (eds) Kaplan and Sadock's Comprehensive Textbook of Psychiatry (9th ed.) Hagerstown, MD: Lippincott Williams & Wilkins.)

COMPONENT OF MSE	DESCRIPTION
Appearance and behavior	A general description of how the patient looks, including color, texture and health of hair and skin, facial coloring, weight, posture, effects of appropriate or inappropriate grooming, willingness to approach (e.g., front of enclosure, spitting, etc.), physical indicators of self-injury or injury by others. Behavioral disturbances, including food rituals, coprophagy. Other distinguishing features, signs of distress, agitation, disinhibition, disinterest, etc.
Motor activity	Motor activity can be described as normal, slowed (bradykinesia), or agitated (hyperkinesia). Descriptions include gait, freedom of movement, any unusual or sustained postures, pacing, tics, jitteriness, tremor, apparent restlessness, startle upon waking, startle upon approach by or movement of others, noise, or other environmental changes (hypervigilance), any existing repetitive movements such as rocking, swaying, head-bobbing, etc. (stereopathies), over- or undergrooming, etc.
Calls	Identify frequency of alarm calling and whether it occurs in the absence of a perceivable threat; frequency of whimpering and whether it occurs after an external incident or in the absence of an identifiable external trigger, etc.
Affect	Describe patient's sustained emotional state and affect in terms of five parameters: quality, quantity, range, appropriateness and congruence, (relevant descriptors include dysphoric, happy, euthymic, irritable, angry, good tempered, agitated, tearful, labile, intense/reactive, flat, etc.)
Thought processes	Describe task and problem-solving behaviors, for example if they are clear, organized, and goal-directed, or conversely tangential, loose, perseverating, blocked, confused, or repetitious; note if patient's short-term memory is intact, and they are able and interested in attempting novel solutions which draw from previous experience

Perceptual disturbances	Include hallucinations, delusions, depersonalization, and derealization identifiable as the patient attacking his/her own hand, body as if it belonged to someone else or were a threat to them, withdrawing from appropriate social interaction in a trance-like state, inability to move without holding on to the walls, bars, etc. in the absence of any physiological need for such support; and other behaviors inconsistent with expectable behaviors
Cognition and judgment	Describe alertness, orientation, concentration, memory (both short and long term), calculation, fund of knowledge, abstract reasoning, insight, and judgment — the patient's capacity to make good decisions and act on them in particular regarding rules of chimpanzee social behavior that benefit his/her position within the group, foster alliances, exercises appropriate or inappropriate use of his/her power, and other evidence of ability to make both social and physical decisions that benefit the patient and/or his/her social group

13. Works Cited: Tables 1-4

- Bard, K. A., Todd, B. K., Bernier, C., Love, J., & Leavens, D. A. (2006). Self-awareness in human and chimpanzee infants: What is measured and what is meant by the mark and mirror test? *Infancy*, 9(2), 191-219.
- Bourgeois, S.R., Vazquez, M., & Brasky, K. (2007). Combination therapy reduces self-injurious behavior in a chimpanzee (*Pan troglodytes troglodytes*): a case report. *Journal of Applied Animal Welfare Science*. 10(2), 123-140.
- Bowlby, J., (1969). *Attachment and Loss*, vol. 1, *Attachment*, New York: Basic.
- Brent, L., Lee, D.R., & Eichberg, J.W. (1989). The effects of single caging on chimpanzee behavior. *Laboratory Animal Science*. 39, 345-346.
- Brune, M. & Brune-Cohrs, U. (2005). Theory of mind—evolution, ontogeny, brain mechanisms, and psychopathology. *Neuroscience and Biobehavioral Reviews*, 30(4), 437-455.
- Cohen, S., Kaplan, J. R., Cunnick, J. E., Manuck, S. B., & Rabin, B. S. (1992). Chronic social stress, affiliation, and cellular immune response in nonhuman primates. *Psychological Science* 3(5), 301-304.
- Coleman, K. (2011). Caring for nonhuman primates in biomedical research facilities: scientific, moral and emotional considerations. *American Journal of Primatology*, 73(3), 220-225.
- Davenport, R.K. (1979). Some behavioral disturbances of great apes in captivity. Pp. 341-357, In: *The Great Apes, Perspectives on Human Evolution*, Vol. V., Menlo Park, CA, Benjamin/Cummings Publishing Co.
- Bradshaw, G.A. and B. L. Finlay. (2005). Natural symmetry. *Nature*, 435, 149.
- Gardner, B.T. Gardner, R. A. & Nichols, S.G. (1989). The shapes and uses of signs in a cross-fostering laboratory. In R.A. Gardner, B.T. Gardner, & T.E. Vancantfort (eds.), *Teaching sign language to chimpanzees*. 55-80, Albany: SUNY press.
- Gombe National Park. (2011). Gombe National Park climatological sata. Retrieved April 10, 2011 from <http://weber.ucsd.edu/~jmoore/apesites/Gombe/GombeClimate.html>.

Herman, J. (2004). Complex PTSD: A syndrome in survivors of prolonged and repeated trauma. In D. Knafo (Ed.), *Living with terror, working with trauma*. Lanham, MD: Bowman & Littlefield.

Hobaiter, C. & Byrne, R. W. (2011). The gestural repertoire of the wild chimpanzee [Electronic version]. *Animal Cognition*. (Online First- Articles available before publication, 30 April 2011).

Itakura, S. (1992). A chimpanzee with the ability to use personal pronouns. *The Psychological Record*, 42(2), 157-172.

Kalcher, E., Cornelia, F., Crailsheim, K., & Preuschoft, S. (2008). Differential onset of infantile deprivation produces distinctive long-term effects in adult ex-laboratory chimpanzees. *Developmental Psychobiology*, 50, 777-788.

Leavens, D.A. & Hopkins, W.D. (1998) Intentional Communication by Chimpanzees: A Cross-Sectional Study of the Use of Referential Gestures, *Developmental Psychology*, 34(5), 813-822.

McGrew, W. C. (1992). *Chimpanzee Material Culture: Implications for Human Evolution*. Cambridge University press.

Morgan, L., Menkhus, S., Howell, & Fritz, J. (1993). Regurgitation and reingestion in a captive chimpanzee (*Pan troglodytes*), *Lab Animal*, 22, 42–45.

Morris, P.H., Doe, C., & Godsell, E. (2008). Secondary emotions in non-primate species? Behavioural reports and subjective claims by animal owners. *Cognition and Emotion*, 22(1), 3-20.

Nash, L.T., Fritz, J., Alford, P.A., & Brent, L. (1999). Variables influencing the origins of diverse abnormal behaviors in a large sample of captive chimpanzees (*Pan troglodytes*). *American Journal of Primatology*, 48, 15-29.

National Center for Research Resources (2007). Report on the chimpanzee management plan working group reported to National Center for Research Resources (NCRR) Council, March 9, 2007. Retrieved 12/15/11 from http://www.ncrr.nih.gov/compara-tive_medicine/chimpanzee_management_program/ChimP05-22-2007.asp

Nelson, E. E. & J.T. Winslow (2009). Non-human primates: Model animals for developmental psychopathology. *Neuropsychopharmacology*, 34(1), 90-105

New England Anti-Vivisection Society (2011a). Who's There? Alamogordo Primate Facility. Retrieved 12/15/11 from <http://www.releasechimps.org/uploads/Alamogordo-Primate-Research-Center.htm>

Parr, L.A. (2001). Cognitive and physiological markers of emotional awareness in chimpanzees (*Pan troglodytes*). *Animal Cognition*, 4:223–229

Pomerantz, O. & J. Terkel (2009). Effects of positive reinforcement training techniques on the psychological welfare of zoo-housed chimpanzees (*Pan troglodytes*). *American Journal of Primatology*, 71(8), 687-695.

Preuschoft, S., Brune-Cohrs, U., Brune, M., & McGrew, W. C. (2006). Reply to Horacio Fabrega's commentary: Making sense of behavioral irregularities of Great Apes. *Neuroscience and Biobehavioral Reviews*, 30(8), 1274-1277.

Preston, S. D., & de Waal, F. M. (2002). Empathy: Its ultimate and proximate bases. *Behavioral and Brain Sciences*, 25(1), 1-20.

Reimers, M., Schwarzenberger, F., & Preuschoft, S. (2007). Rehabilitation of research chimpanzees: Stress and coping after long-term isolation. *Hormones and Behaviour*, 51, 428-435.

Sapolsky, R. M. (2006). Culture in animals: The case of a non-human primate culture of low aggression and high affiliation. *Social Forces*, 85(1), 217-233.

Savage-Rumbaugh, E.S. & Fields, W.M. (2000). Linguistic, cultural and cognitive capabilities of bonobos (*Pan paniscus*). *Culture & Psychology* 6(2), 131-153

Schore, A.N. (2005). Attachment, affect regulation, and the developing right brain: Linking developmental neuroscience to pediatrics. *Pediatrics in Review*, 26 (6), 204-217.

Tomasello, M., Call, J., & Hare, B. (2003). Chimpanzees understand psychological states-the question is which ones and to what extent. *Trends in Cognitive Science*, 7(4), 153-156.

Tomasello, M. & J. Call (1997). *Primate Cognition*. Oxford University Press, USA

Turner, C.H., Davenport, R.K., & Rogers, C.M. (1969). The effect of early deprivation on the social behavior of adolescent chimpanzees. *American Journal of Psychiatry*, 125, 11, 1531-1536.

Van Hooff, J. A. R. A. M. (1974). A structural analysis of the social behavior of a semi-captive group of chimpanzees. In Mario Von Cranach and Ian Vine (Eds.). *Social Communication and Movement*, (pp. 75-162). New York: Academy Press.

Wrangham, R.C., W.C. McGrew, F.M.B. deWaal, &P. Heltne (1996). *Chimpanzee Cultures*. Harvard University Press: Cambridge, MA.

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