The *benevolent health worm*: comparing Western human rights-based ethics and Confucian duty-based moral philosophy

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Abstract. Censorship in the area of public health has become increasingly important in many parts of the world for a number of reasons. Groups with vested interest in public health policy are motivated to censor material. As governments, corporations, and organizations champion competing visions of public health issues, the more incentive there may be to censor. This is true in a number of circumstances: curtailing access to information regarding the health and welfare of soldiers in the Kuwait and Iraq wars, poor health conditions in Aboriginal communities, downplaying epidemics to bolster economies, and so forth. This paper will look at the use of a computer worm (the *benevolent health worm*) to disseminate vital information in situations where public health is threatened by government censorship and where there is great risk for those who ‘speak out’. The discussion of the *benevolent health worm* is focused on the Peoples’ Republic of China (China) drawing on three public health crises: HIV/AIDS, SARS and Avian Influenza. Ethical issues are examined first in a general fashion and then in a specific manner which uses the duty-based moral philosophy of Confucianism and a Western human rights-based analysis. Technical, political and legal issues will also be examined to the extent that they better inform the ethical debate.

Key words: access to information, censorship, computer worms, Confucius, freedom of expression, hacker, human rights, illegal technology, Internet, malware, moral philosophy, public health, virus

Introducing the *benevolent health worm*

Censorship in the area of public health has become increasingly important in many parts of the world for a number of reasons. Groups with a vested interest in public health policy are motivated to censor material. This may include governments, corporations, professions, and organizations. The censorship may be direct (legal sanctions) or indirect (corporate and individual self-censorship). As experts in the field, NGOs and other citizen movements champion competing visions of public health issues, the more incentive there may be to censor. This is true in a number of circumstances. For example, curtailing access to information regarding the health and welfare of soldiers in the Kuwait and Iraq wars, poor health conditions in Aboriginal communities, downplaying epidemics to bolster economies, and so forth. This paper will look at the use of a computer worm (the *benevolent health worm*) to disseminate vital information in situations where public health is

threatened by government censorship and where there is great risk for those who ‘speak out’.

While there are many examples along the spectrum of public health censorship, this paper’s discussion of the *benevolent health worm* will be limited to that of the Peoples’ Republic of China (China) drawing on three public health crises: HIV/AIDS, SARS and Avian Influenza. In each of these situations, Chinese citizens faced a public health epidemic (which then spread to the international community). In each of these situations the Chinese government heavily censored information, allowing the disease to unnecessarily spread faster in an uncontained manner. And in each of these situations individuals who vocalized or published unauthorized news articles on the epidemic (many prominent experts, doctors and activists) were detained without reason serving time in prison. Some were threatened or charged with divulging a state secret. The author uses China by way of example due to the extremity of the example, as well as her experience and familiarity with politics,

copyright strategy and legal developments in the region.¹

The use of a controversial technology such as a computer worm to disseminate uncensored, sanctioned public health information in China presents contentious ethical issues worth examining. When is the use of an illegal technology ethical? Does the dual use of a computer worm for malicious or benevolent reasons play a part in the analysis? If so, at what point? Is motivation the determining factor? Intended use? Actual consequences? Is there a moral duty to write and disseminate public health information which differs from authorized accounts? Is the duty a general duty or is it specific to certain members of society? Does the mode of information delivery play a part in an ethical analysis? Are anonymous modes of dissemination less ethical than methods which provide accountability? To what extent does the source of the information factor into the equation? What role does risk of criminal sanction play in ethics? Does the risk of criminal sanction depend on the actual use or potential consequences of the technology? Does the violation of human rights justify the illegal activity? If so, is the Chinese context justifiable? Is the use of a benevolent worm compatible with Western ethical traditions? Chinese ethical traditions? The above questions are raised to illustrate the abundance of ethical queries triggered by the topic, and are not meant to be fully covered in this paper.

For the purpose of this paper, an account will be given of the censorship environment in China both in general and in the specific context of public health. This will be followed by an account of technical aspects of the benevolent health worm inasmuch as it will inform and frame the debate on ethical issues. A further account will be given examining the use of an illegal technology such as a computer worm to disseminate non-authorized public health information. The core of the paper will examine ethical issues in a general fashion, and then in a specific manner drawing on the moral philosophy of Confucianism and Western notions of civil liberties/human rights. Confucianism is often thought to be incompatible with Western rights-based theories (democracy, civil liberties, human rights and other autonomous rights based theories). The point is not to justify the benevolent health worm through either a 'western' or 'eastern' lens. The point, rather, will be to examine

many of the ethical issues from multiple perspectives. In particular, the perspective of Chinese moral philosophy – Confucianism – which is rooted within the framework of values and duties – will be used alongside a Western human rights-based analysis.²

The use of Western rights-based theories (human rights) alongside the Eastern duty-based theory of Confucian moral philosophy provides an interesting platform for an ethical analysis of the benevolent health worm. The author will suggest how human rights and Confucian moral philosophy may be used to better understand the ethical issues presented with the use of the benevolent health worm. The paper does not aim to justify the use of the benevolent worm. Instead, there is the modest aim to initiate ethical debate on the subject. The application of the analysis could extend to a broader examination of benevolent payloads, and, further along the spectrum, the ethical use of illegal technologies.

Freedom of expression, access to information and censorship in china

Governments in China have traditionally utilized censorship as a means for control. Using censorship as a control mechanism has historically been pitted against the Chinese promotion of intellectual growth.³ The rise of the Chinese Communist Party (CCP) brought with it the continued ideal of control over the dissemination of works and ideas. China continues to censor books, newspapers, and basically, most forms of publications that threaten the governing regime or criticize China's attitude towards human rights.⁴ Included in this overall censorship strategy is tight control of the media and the Internet.

Media censorship

All news agencies, including news websites and chatrooms, must be accredited. The redistribution

¹ For example, the author provided advice and coordinated a portion of the anonymous testing for the OpenNet Initiative study. OpenNet Initiative. *Internet Filtering in China in 2004–2005: A Country Study*, 2005, available at <http://www.opennet.net/china>.

² The author notes that many human rights based theories were based upon liberal political theory. Liberal political theory accounts of human rights are often centred round rights-based rhetoric. It is important to note, however, that the debate between rights and duties is not absolute nor is there necessarily a clear divide between Western and Eastern based philosophies. Many western philosophers, such as Kant, also emphasized duties.

³ K. Reed, From the Great Firewall of China to the Berlin Firewall: The Cost of Content Regulation on Internet Commerce. *Transnational Law*, 13: 458, 2000.

⁴ Reed, *ibid*, 459.

and sale of foreign news in China may only be purchased and published from the state-run government news agency, Xinhua. Review and enforcement of laws and regulations is performed by two agencies (one for press, radio, film and television, and the other for written publications including the Internet), both of which are run by the Communist Party's Central Propaganda Department (CPD). Against the backdrop of what could best be described as a labyrinth of laws and regulations, the CPD issues weekly informal directives to news agencies and Internet Service Providers (e.g. Google and Microsoft) on news items requiring restrictive coverage.

Virtually all statutes and regulations concerned with communications (news or otherwise) contain vague language allowing authorities sufficient flexibility in determining which publications are in breach of the law.⁵ Navigating through the ever-changing and complex media and Internet regulations is a seemingly never-ending process. While the regulations are ever-changing, there is a standard set of vaguely written provisions which appear in all such regulations: divulging state secrets; harming the honour or interests of the nation; spreading rumours which may disturb social order; and inciting illegal assemblies which could disturb social order – all punishable as a criminal offence. State secrets provisions are the most problematic as their wording and interpretation in practice has proven malleable to political will. It is difficult for writers (whether they be journalists or mere bloggers) to determine in advance whether their message would contravene the law.

Where writers publish illegal content they are subject to a number of punishments such as dismissal from employment, demotion, libel, fines, closure of business, and imprisonment. Imprisonment for illegal new stories extends to employees of foreign news agencies. For example, Hong Kong based journalist Ching Cheong (Singapore's *Straits Times*) and Zhao Yan (New York *Times*) were arrested and detained for reporting articles about Communist Party leaders.⁶

Public health news

News around sensitive topics such as a public health crisis is heavily censored and monitored. Historically,

individuals who reported and disseminated sanctioned public health news were often detained without reason and, in some cases, these individuals were charged with divulging a 'state secret'. Many academics and experts have written on the scope of 'state secret' in China. The notion of 'state secret' has traditionally been broad and deliberately ambiguous, while its scope of application is ever-changing.⁷ It remains impossible to ascertain whether a person's actions would fall within a 'state secret'. People have been charged with this serious offence for the dissemination of banned information related to human rights, revealing draft laws (white papers), publishing unauthorised news reports, and publishing information critical of governing authorities. The act of circumventing the "Great Firewall" for illicit purpose, and mere research on Internet censorship, could conceivably fall within the parameters of 'state secret'. The CCP's unpredictable use of broad, ambiguous laws to deter freedom of expression is heavily criticized in the international arena. While 'state secret' laws remain a potent threat, the CCP has a number of criminal provisions which it regularly uses to curtail the dissemination of sanctioned information. To paraphrase a prominent Malaysian journalist Steve Gan, "We have the right of freedom of expression. The problem is that we have no rights once such words are freely expressed."⁸ The same could be said of China.

Access to information may involve more than freedom of expression; timely information may have repercussions for the health and welfare of individuals. Indeed, there are three specific areas where censorship and a lack of accurate information distributed in a timely manner have had unrefuted consequences in China in recent history: AIDS, SARS and Avian Influenza (often referred to as bird flu).

HIV/AIDS

The Chinese government has suppressed and continues to suppress information on the spread of

⁵ C. Zissis, "Media Censorship in China" Council on Foreign Relations, 2006, available at <http://www.cfr.org/publication/11515/>.

⁶ Reporters without Borders. *Government Turns Deaf Ear to Call for Ching Cheong's Release*, 2005, available at http://www.rsf.org/article.php3?id_article=13957.

⁷ F. Hualing. *Counter-revolutionaries, Subversives, and Terrorists: China's Evolving national Security Law*. In *National Security and Fundamental Freedoms: Hong Kong's Article 23 Under Scrutiny*. Hong Kong University Press, 2005.

⁸ Steve Gan is co-founder of on-line news distributor Malayskini.com. Words spoken at a conference organized by the Friedrich Naumann Stiftung Institute, New Communication Technologies in Asia: Surveillance, Cyber Security and Privacy; and Asian Politics and New Technology: Poor Bedmates? (November 2002).

HIV/AIDS. By 1987 the government had reported only 4 known cases claiming that AIDS was a foreigners' disease.⁹ The lack of reporting and ineffective preventative measures led a number of people to become AIDS activists. These activists reported significant rates of people infected HIV and campaigned for the government to take proactive measures to reduce the spread of this debilitating disease. Many AIDS activists, including the famous activist Wan Yanhai, have been detained and charged with divulging a state secret.¹⁰ Infected blood supplies appear to have initially been the main source of the problem. Infected blood supplies, however, still taint China with many people in poorer areas donating blood for money while drug use, prostitution and a lack of educative measures continue to exacerbate the situation. The reality today is that China has one of the highest HIV/AIDS rates in the world outside of Africa. While we will never know the effect that accurate and timely information would have had in this epidemic, it is certainly plausible that access to such important information could have reduced the rate of infection.

SARS

Similar to the HIV/AIDS crisis, the Chinese government withheld critical health information on Severe Acute Respiratory Syndrome in 2002. China has a longstanding tradition of curtailing news deemed harmful to society and to China's image. In the case of SARS, it was thought that exercising tight media control would reduce public fear and lessen economic damage in the region.¹¹ The lack of reliable dissemination of information and the underreporting of infected SARS patients to the World Health Organization allowed the disease to spread more readily from Guangdong province to other provinces in China, to Hong Kong and to other countries in the world.¹² The SARS health crisis can be partially attributable to nondisclosure of pertinent information.

⁹ China Aids Survey, available <http://www.casy.org/chronpage.htm>.

¹⁰ A. Chen. The Limits of Official Tolerance: The Case of Aizhixing. In Human Rights Watch China, editors, AIDS and Article 23. *China Rights Forum*, 3: 51, 2003.

¹¹ S. Kalathil. *Battling SARS: China's Silence Costs Lives*. International Herald Tribune, 2003.

¹² World Health Organization. *Severe Acute Respiratory Syndrome*, 2004, available at http://www.who.int/csr/don/archive/disease/severe_acute_respiratory_syndrome/en.

Avian influenza (also referred to as bird flu)

While avian influenza has not yet reached the level of crises of HIV/AIDS or SARS in China, historical events give clear signs that any information provided by Chinese officials should be perceived with caution.¹³ It is believed that Quiao Songju, a Chinese farmer, was arrested and detained for reporting a potentially infectious bird in the Anhui province.¹⁴ Prominent Hong Kong virologist, Guan Yi, was invited by the Chinese government to study ABF. His account of the disease was vastly different from the official version reported by the Chinese Government. Guan's publications are censored in China while it has been made known to the prominent virologist that he should not return to China. It is rumoured that Guan has been threatened with detainment and there is further speculation that he may be in violation of having disclosed a 'state secret'.

China's newly drafted censorship rules compound the situation. The newly drafted law states that it is a criminal act to publish any information on 'sudden events' without prior authorization from the Chinese Government. 'Sudden events' are defined as 'industrial accidents, natural disasters, health and public security issues'.¹⁵ The government claims that the law is aimed at irresponsible journalists who report untruths potentially causing panic among the public. Critics have claimed that the draft law is aimed at preventing future disclosures of embarrassing news.¹⁶ Public health epidemics would fall under the category of sudden events.

The Internet factor

The Internet and wireless technologies have been heralded as vehicles of free expression. It has generally been thought that no government could control information on the Internet, hence the expression "the Internet routes around censorship." In China,

¹³ See Washington United Press International. *Is China Hiding Avian Influenza?* 2005, available at http://www.terraily.com/reports/Is_China_Hiding_Avian_Influenza.html. See also World Health Organization. *WHO Urges Member States to be Prepared for a Pandemic*, 2006, available at http://www.wpro.who.int/media_centre/press_releases/pr_20060919.htm.

¹⁴ United Press International, *Is China Hiding Avian Influenza?* 2005, available at http://www.terraily.com/reports/Is_China_Hiding_Avian_Influenza.html.

¹⁵ H. Qinglian, New Regulations in China Target Foreign Media, *The Epoch Times*, 2006, available at <http://www.en.epochtimes.com/news/6-9-28/46453.html>.

¹⁶ F. Ching, China's Media Censorship, *Korea Times*, available at <http://www.asiamedia.ucla.edu/article.asp?parentid=48789>, 2006.

this is increasingly no longer true. The Chinese Government erected, through its Golden Shield Project, what has become known as the 'Great Firewall of China'.

Access, control and censorship of Internet content in China is most often attributed to the 'Great Firewall of China'. This is, however, something of a misnomer; the firewall is merely one path in a maze of controlling technologies and non-technological means in an overall Internet censorship strategy. This censorship strategy is comprehensive, incorporating sophisticated technologies, numerous regulatory measures, market influences, and aggressive policing and surveillance of Internet activity, resulting in an atmosphere of self-censorship.

Laws regulating free speech and the Internet are implemented out of concern for the potential harm posed by unfettered access to sites that contain political, ideological, social, or moral content that the CCP perceives as harmful. China has adopted a comprehensive Internet censorship strategy utilizing a range of control mechanisms. Mechanisms of control include laws and regulations pertaining to physical restrictions, regulations of use, ownership and operation of Internet Service Providers (ISPs), Internet Access Providers (IAPs), and Internet Content Providers (ICPs).¹⁷ Similar to media regulations, a series of ever-changing Internet regulations are also relevant to the dissemination of information. Authorized access entails individuals having to obtain licenses for Internet access. In order to obtain a license, individuals are required to register with the local police and provide their names, the names of their service provider, their e-mail addresses, and list any newsgroups in which they participate. This, of course, does not mean that anonymity and pseudonymity cannot be achieved for Chinese cybersurfers. Users have flocked to cybercafés and universities to access the web. The CCP has responded by shutting down many cybercafés, then later by requiring all cybercafés and universities to obtain user identification, and to keep detailed logs of user activities (the regulations are complex and comprehensive). The extent to which such entities have fully complied with the law in practice has not been explored, but the threat of surveillance continues to lead to an environment of self-censorship. The ability to access banned documents and to communicate anonymously is challenged.

Information flows from the Internet subscriber (home, cybercafé) to the Internet Service Providers

(ISPs) to four gateways controlled by the Ministry of Posts and Telecommunications.¹⁸ ISPs are regulated through a myriad of laws which are, again, ambiguous and complex. It is difficult for any party to know if they are in compliance with the law. The regulations require ISPs to restrict and control access to harmful/banned websites, allow surveillance software on their systems, and keep logs of user activity.¹⁹ Email is neither private nor anonymous when using an ISP regardless of whether a domestic or foreign service is used. ISPs must and do comply with requests to reveal personal information of the true identity of users as well as information about email content. For example, both Yahoo!China and Yahoo!HK have disclosed confidential user information of prominent journalists by releasing Internet protocol addresses to Chinese authorities. Many journalists deliberately have email accounts in jurisdictions such as Hong Kong with a strong rule of law tradition in order to shield their identities from Chinese authorities. Yahoo!HK handed over the Internet protocol address (not the user's name) of journalist Shi Tao to Chinese authorities based merely on an informal request. As such, Yahoo!HK circumvented formal judicial requirements of a court order compelling the disclosure of confidential information. Yahoo!HK claims that they disclosed the information in compliance with a criminal investigation in Mainland China. The dispute has become one of many disputes over the scope of Chinese jurisdiction in Hong Kong. Disclosure of an Internet protocol address is not classified as personal information under Hong Kong law making it safe for ISPs to circumvent their otherwise legal obligation to keep personal information confidential under the Privacy Ordinance. The securing of Shi Tao's Internet protocol address led the Chinese authorities directly to a specific computer port number, and directly to Shi Tao's computer. The information was classified in China as state secret. Shi Tao was arrested and sentenced to 10 years in jail.²⁰

Recent popular methods for dissemination of taboo/illegal documents include spam, weblogs and chatrooms – all delivery methods involving the Internet which allow for some degree of anonymity or

¹⁸ The precise number of gateways has not been established. Some report 3, others 4, and others 5. The author has taken the middle figure as an average only. This ambiguity illustrates the cloud that shrouds accurate information pertaining to the 'Great Firewall'.

¹⁹ Liang, footnote 17.

²⁰ For a short article on the Privacy Commissioner's ruling see, <http://www.reuters.com/article/worldNews/idUSSHA24136320070315>.

¹⁷ C. Liang. Red Light, Green Light: Has China Achieved Its Goals Through the 2000 Internet Regulations. *Vanderbilt Journal Transnational Law*, 34: 1417, 1428, 2001.

pseudonymity. Chinese officials have recently begun to crack down on weblog and chatroom use, introducing a host of new regulations directly targeted at information deemed harmful to Chinese society. China's filtering/anti-spam technology has likewise greatly evolved so that spam has become a less effective means of communicating information. Those who continue to engage in the exchange of banned communications, whether it be via spam, weblogs, text message or other fora, potentially face criminal charges. As the regulations are written in the traditional fashion of ambiguously overbroad provisions, the reality is that merely opening a spam message known to contain harmful material, or forwarding the message *could* be a contravention of the law.

Is it possible to route around censorship in China? Circumventing the 'Great Chinese Firewall' is achievable using a number of different methods which range from the use of web proxies (Tor, Anonymizer, Dynapass, Psiphon) to accessing the Internet in peak times (State surveillance requires a large amount of bandwidth), to the use of encryption services. Proxies such as Tor may still be blocked at the node level (although currently they are not). While State surveillance requires large amounts of bandwidth, the threat of legal and economic sanction plus self-censorship – ISPs restricting access to potentially contentious sites, cybercafés and universities discouraging banned websurfing, individuals refraining from accessing even potentially illegal material – effectively fills the gap left by technological constraints.

The use of encryption is able to circumvent filtering and keyword sniffing technology at the router level, but this does not provide a safety net for those wishing to disseminate contraband information. As stated previously, ISPs must and do comply with requests to disclose personal information. Many ISPs have also built censorship functions into their encryption technology. Activists using the encrypted Skype technology, for example, have been cautioned against its use due to built-in censorship functions.²¹ Encrypted messages may arouse further suspicion which may lead from monitoring of general data traffic over the Internet to the surveillance of specific individuals and groups. Regardless of the method employed, the threat of criminal sanction is always a possibility.

The ability to use the Internet to publish sanctioned information is a risky proposition. Assuming

that there are strong ethical arguments in favour of disseminating sanctioned information in times of public health crises, a new mechanism will be required for large-scale information delivery. The benevolent health worm provides one possible solution.

Architectonics of the benevolent health worm

A benevolent computer worm is a form of malware. Malware typically includes the following types of computers programs: virus, worm, Trojan horse, spyware, adware, spam, bot/agent, zombie, exploit, bug, keylogging and so forth. Malware refers to computer software which either acts maliciously or whose effects are malicious – the two are not necessarily synonymous. In a wider context, malicious would extend to any type of computer code installed without consent regardless if any damage occurs to the computer. The theory is that the malicious component encompasses the use of bandwidth and again, that there is no consent. The idea of a benevolent virus or worm is not novel. Early research and debate focused on the use of a worm to patch existing security flaws in software.²² Expressed more precisely by leading IT expert Bruce Schneier, "Patching other people's machines without annoying them is good; patching other people's machines without their consent is not... Viral propagation mechanisms are inherently bad, and giving them beneficial payloads doesn't make things better."²³ Under this definition, no malware could be construed as benevolent. The weakness of this argument is that its discussion has been limited to patching and similar e-commerce activities, where consent is desirable from a corporate ethics perspective and is necessary in order to conclude a binding legal contract. Missing from this discussion is the application of a benevolent worm outside of the e-commerce realm, along with the discussion of the difference between consent and informed consent, the latter being the legal requirement in most jurisdictions.

The subject of informed consent in the digital age is contentious. It has been argued that consent is given in most Internet applications through checking the "I Agree" button of end-user license agreements

²¹ Human Rights Watch, *How Censorship Works in China: A Brief Overview*, 2006, available at <http://www.hrw.org/reports/2006/china0806/3.htm>.

²² For example, the Welchia worm was a patch used in an attempt to restore damage from the Blaster worm. See J. Aycock and A. Maurushat, *'Good' Worms and Human Rights*. Technical Report 2006-846-39. Department of Computer Science, University of Calgary, 2006.

²³ B. Schneier, *Benevolent Worms*, *Crypto-Gram Newsletter*, 2003, available at <http://www.schneier.com/crypto-gram-0309.html>.

and privacy policy statements. This is not representative of informed consent. Most users do not read end-user-license agreements (EULA). When they do, such licenses contain onerous obligations unilaterally imposed on them expressed in complex, aggressive legal rhetoric – most of these types of terms remain untested in law and run against the basic tenants of the law of contracts, namely consideration, meeting of the minds, and adequate notice of change of terms. This is perhaps best illustrated by way of example. Many corporations, such as Sony, release products with an end-user license term authorizing them to utilize rootkits, backdoors and digital rights management systems for a variety of unspecified purposes, all of which may be subject to change without notification to the user. The rootkits, in turn, render computers vulnerable to intruders to install malicious applications onto their computers. Digital rights management systems allow monitoring devices which track the use of a work (for example, a music c.d.), which could theoretically be used as evidence to bring legal suits against those who make illegal use of the copyrighted work. The author uses the example of consent to illustrate the discrepancy between tangential concepts of theory and practice. The author agrees that informed consent is a desirable feature in software distribution mechanisms. Concluding that consent is required in all contexts is to prematurely rule on an issue which has, so far, only been discussed in the limited context of electronic commerce.

If consent is gained, do benevolent payloads become ethical? If there is no consent, are benevolent worms precluded from becoming ethical? It appears as though the debate on consent and malware has inherited the intellectual baggage of assumptions surrounding consent. Nowhere is this better articulated than in the famous essay by Robin West, “Authority, Autonomy, and Choice: The Role of Consent in the Moral and Political Visions of Franz Kafka and Richard Posner.”²⁴ West exposes the fallacy in Posner’s theory that choice and consent in a legal system allow for an increase both in morality and autonomy. Within the confines of benevolent payloads, there is an assumption that lack of consent is inherently bad or unethical contrasted with acts where a vague notion of consent is obtained, thereby magically summoning the requisites of legal and ethical action. The presence of consent should be regarded as one component in an analysis of all factors contributing to an ethical framework.

An effects analysis would look to whether any tangible damage, other than use of bandwidth, has been done to the computer, webserver or user, or in the event that other types of damage are sustained, whether there are compelling reasons to derogate from the principles of user consent and avoiding damaging third party property. More importantly, an effects analysis would address the issues of when it is permissible to utilise bandwidth and install software on a user’s computer without their consent. When, if ever, does a benevolent payload become permissible or mandatory as a moral duty? In a larger sense, the issue is one of normative ethics drawing on effects-based analysis in consequentialism with that of moral duty in deontology.

While a robust examination of types of malware is not required to understand the benevolent health worm, a basic understanding of the differences between a virus and worm is essential, as the underlying technology of a worm alleviates some of the ethical and legal issues for its intended benevolent use.

A **virus** is a “block of code that inserts copies of itself into other programs”. Viruses generally require a positive act by the user to activate the virus. Such a positive act would include opening an email or attachment containing the virus. Viruses often delay or hinder the performance of functions on a computer, and may infect other software programs. They do not, however, propagate copies of themselves over networks. Again, a positive act is required for both infection and propagation.

A **worm** is a program that propagates copies of itself over networks. It does not infect other programs nor does it require a positive act by the user to activate the worm. In this sense, it is self-replicating.

Irrespective of the characterization nearly all computer viruses and worms infect either software or hard-drives without the authorization of the computer owner. Similarly, all computer viruses and worms utilize bandwidth imposing a strain on traffic and resource demands. All computer viruses and worms may inadvertently cause unexpected damage to a computer system and may contain bugs. The benevolent health worm is no exception. There are ways to minimize damaging effects of the worm through technical design. Such elements include: (1) slow-spreading, (2) utilize geo-location technology to limit its propagation within a region (“.cn” and its equivalent for the Internationalized Domain Name in Chinese characters), (3) installation of short and reasonable shut-down mechanisms to avoid perpetual replication, (4) use methods requiring

²⁴ R. West. Authority, Autonomy, and Choice: The Role of Consent in the Moral and Political Visions of Franz Kafka and Richard Posner. *Harvard Law Review*, 99(2), 1985.

low-demand bandwidth, and (5) undergo professional debugging standards.²⁵

The benevolent health worm would be an information delivery method with worm-like characteristics. A computer worm is a self-replicating computer program containing a tailor-designed payload. The payload would be programmed to spread from computer to computer in China with the specific function of displaying the information in a pop-up window, or override a user's default web page with one displaying information.

In the case of the benevolent health worm, the message would contain vital information relating to a public health crisis otherwise unavailable through traditional media sources. The information would ideally come from a trusted source containing accurate and truthful information (see discussion in following sections). The payload would be carefully programmed to prevent any deliberate or positive technical action by the recipient. The recipient would, therefore, have no knowledge or control of the worm. The latter points require elaboration. The self-replication method of worms is ideal in this situation as it is only the infected computer which takes part in the dissemination of sanctioned information; the person whose computer is infected is technically prohibited from any deliberate or accidental positive acts, and has no control or knowledge of the worm. In order to achieve this, the pop-up message generated by the worm must have the following features:

- must not be a virus in that it must be self-replicating,
- not contain links to additional sources of information,
- the user would not be able to save the information to his or her computer,
- the user could not forward the message to others, and
- the information would disappear from the system altogether after a specified amount of time.

In the case of the latter, the pop-up would appear for a specified time (e.g. 10 min) and re-appear each time a person turned on their computer for a programmed length of time (e.g. 2 weeks). At the end of a short period of time (e.g. 2 weeks) the worm would completely disappear from the user's computer system – all technically feasible through the programming of the payload. These features greatly reduce if not eliminate any risk to the recipients of the information. All elements necessary to prove a criminal act are removed: positive act, knowledge or foreseeable knowledge, mens rea, and motive.

A chief criticism of the use of viruses and worm for benevolent purposes is that there are safer alternative means of achieving the same goal.²⁶ The same cannot be true with the benevolent worm. Alternative means of health distribution would include: illegal news reporting; illegal dissemination of news domestically through a blog, chatroom or spam; spam techniques from a foreign jurisdiction; and access to materials outside of China through anonymizing technologies such as web proxies. A common flaw of these methods is the necessity of a *positive act by both the sender and recipient* of information. This is especially so for the first two means. A positive act, whether it is through technical (e.g. virus) or manual (e.g. forward spam message) would allow for the possibility of dual criminal charges. Meanwhile there are further challenges with the latter two distribution means of foreign spam and web proxies. As pre-eminent human rights activist Sharon Om has noted, human rights spamming lists are potentially illegal under the United States Can Spam Act.²⁷ The use of anonymizing technologies such as web proxies is by no means fool proof. Such technologies are capable of being blocked (policy choice not a technical feat), even trust-enabled web proxies such as psiphon.²⁸

In the case of the benevolent health worm, only the sender of the information would perform a positive act. These acts would still be illicit on many fronts but the sender would bear a greater risk than the recipient.

The programmer of the human rights worm will be in violation of computer misuse law. In the event that the computer programmer is not necessarily the person or group who distributes the worm, those individuals responsible for “letting the worm loose” could face criminal and civil charges. Finally, the authors of the actual information appearing in the pop-up screen may be charged with a number of criminal acts including state secret and possibly the new law on disclosure of non-authorized news on ‘sudden events.’ Positive acts are performed by those actors along the sender chain while recipients of information remain removed from the process short of reading the content displayed in the window. Stated another way, the benevolent worm potentially offers a way to restore an individual's right to

²⁶ V. Bontchev. Are “Good” Computer Viruses Still a Bad Idea? In *Proceedings of the EICAR '94 Conference*, 1994.

²⁷ S. Hom, A. Tai and G. Nichols. Human Rights and Spam: A China Case Study. *Spam 2005: Technology, Law and Policy*, 63, 2005.

²⁸ Psiphon, available at <http://www.psiphon.civisec.org/faq1.html>.

²⁵ Aycock and Maurushat, footnote 22.

physical and mental well-being through a method that reduces the risk of persecution for those who disseminate un-authorized information and reduces and possibly removes the risk for those who receive the information.

The above scenarios, however, envision the propagation of the worm and information writing to be performed by individuals within China. Such risks could be greatly reduced by creating the worm outside of China. While it is true that computer misuse is illegal in most jurisdictions, the threat of sanction depends greatly on political will. With open American support of projects which address human rights and democracy in suppressed regions, Congressional hearings on Internet censorship in China and, more specifically, US corporate compliance and aid in censorship; and the passing of the Global Internet Freedom Act, it is hard to believe that, at least in the United States, that there would be political will to prevent the benevolent worm. If anything, there may be available funding.

There is a strong psychological and political element to the creator (and disseminator) of the worm. A worm created inside China would have the distinct advantage of appearing to be change from within; a worm created outside China raises issues of external meddling, sovereignty, imperialism, or worse yet, information warfare. These issues will be more fully integrated into the ethical discussion below.

Ethical benevolent payloads?

The ethical dimensions of the benevolent worm encompass several layers. A more sophisticated approach would be to treat the layers as information branches in the total infosphere.²⁹ For the purpose of this paper I will adopt a simpler approach referring to the author/producer, sender/distributor, recipient, content, delivery method and medium of communication.

One great concern in the propagation of public health information through a computer worm is that of trusted source. Trusted sources may be divided into two groups. The first involves the content of the information. The second relates to the information producers – authors and distributor. The ‘who’ in ‘who says what’ may be more important than the ‘what’. In this sense, a worm released by a national state could be

construed as interference with sovereignty and may not carry the same weight as a worm released by a trusted NGO working in the region. The reality, however, is that there is no full-proof method between distinguishing between a trusted and deceptive source. All electronic commerce applications suffer from the same ambiguity of trusted and deceptive sources. The following analysis, therefore, assumes that it is possible to utilize trusted sources. Indeed it may be a great leap of faith. The analysis further assumes that the issue of public health endemics is sufficiently grave to warrant deviation from traditional paths of information dissemination (as discussed in the previous sections).

Human rights

Western-based rights treatises, in particular human rights frameworks, may provide *some* justification of a benevolent health worm. Human rights or civil liberties frameworks operate on two theoretical models. The first is one related to public international law where States bind themselves to legal obligations contained in treaties. The second involves the universality principle of human rights based on moral rights as opposed to legal rights.

A similar dichotomy is to distinguish between what is legal and what is legitimate. The law – that is, what is legal – is premised on the notion that there, “is a system of enforceable rules governing social relations and legislated by a political system.”³⁰ Breach of a rule results in an activity being classified as illegal. Legitimacy in this context is used in its broadest sense to reflect what is moral which need not be legal. Discussions of morality are naturally dependent on the framework of the analysis. The notion of morality as seen through the lens of natural law (e.g. Aquinas, Aristotle, Religion), would likely differ from morality as seen through the lens of normative jurisprudence (e.g. Virtue ethics, utilitarianism, deontology). The moral or ethical framework shapes the debate. This section of the paper does not use a specific ethical framework such as deontology to discuss issues of human rights. To the extent that any differentiation is made, there is some delineation between what is legal versus legitimate. The debate will mostly inter-mingle notions of legality with those of legitimacy, as well as notions of binding public international law with the universal principle of human rights. The aim is to initiate ethical debate on the subject, not to fully justify the use of a benevolent worm.

²⁹ L. Floridi. Information Ethics, Its Nature and Scope. In J. van den Hoven and J. Weckert, editors, *Moral Philosophy and Information Technology*. Cambridge University Press, Cambridge, forthcoming, available at <http://www.philosophyofinformation.net/pdf/itattotgw.pdf>

³⁰ C. Sypnowich, *Law and Ideology*, *Stanford Encyclopedia of Philosophy*, 2001, available at <http://www.plato.stanford.edu/entries/law-ideology>.

Under a legal rights based theory, specific rights and obligations are only provided to the extent of treaty provisions in international law. Such rights may or may not be entrenched in domestic/national law. Where rights are protected under international law, they may contradict and clash with domestic law. The nexus between national and international law has been discussed using the theories of dualism and monism. As the Honorable Justice Kirby writes:

“For the monist, international law is simply part of the law of the land, together with the more familiar areas of national law. Dualists, on the other hand, assert that there are two essentially different legal systems. They exist “side by side within different spheres of action – the international plane and the domestic plane.”³¹

The clash between national and international law is influenced by whether a court adopts a monist or dualist position. The Chinese government and courts use a dualist theory where human rights are viewed as a matter of ‘foreign affairs.’ As one human rights expert writes, “the Chinese government essentially views these obligations as a matter of foreign affairs, and seeks to insulate the domestic arena from the reach of international human rights law, both in symbolic and practical terms.”³²

International tribunals and courts also adopt a dualist approach. National law is treated as a fact. An obligation in international law cannot be avoided or excused due to a clash with domestic/national law.

Other governments and courts adopt a monist approach. This can be seen in the erosion of the dualist approach in many countries such as Australia and Canada. There have been many court decisions which integrate international law principles into the national landscape.

The second level relates to the universality of human rights. Universality is not a legal proposition but a moral one; that human rights are naturally acquired at birth regardless of the area of the world where you reside. Human rights subsist regardless of international and domestic legal obligations.

Regardless of the interpretation of human rights, the benevolent health worm represents undisputed legal and moral rights which may be stated in a simple form: everyone has the right of freedom of expression, and the right to the enjoyment of the

highest attainable standard of physical and mental health. These rights are legally protected in a number of international, regional, and United Nations Treaties to which China is party, and, according to the model of human rights one adheres to, are inherently entrenched regardless of the law.³³

The Constitution for the People’s Republic of China (PRC) recognizes “freedom of speech”, however, the concept of free speech is viewed differently in China than in western democracies. Reed, an expert on freedom of expression in China, notes:

“The PRC believes that rights are only instruments for realizing state objectives. Individual rights are merely residual freedoms found within the confines of the law. If necessary, all rights must be sacrificed for the good of the common collective. As a result, China traditionally keeps the dissemination of information and freedom of expression to a minimum. The CCP controls all facets of government, including the freedom of expression granted in the Constitution.”³⁴

Several distinct questions surface as a result of the above passage. Is China within its legitimate sovereign right to censor free speech on public health issues on the grounds that such discourse falls under the exemption of “national security”? Is civil disobedience justified in the context of disobeying the law for a higher purpose whether it be construed as a moral obligation or interpreted as for the greater good of the community (emphasis here on worm created within China)? Would a worm created outside of China be a deliberate act of interference with a nation’s sovereignty? Under what circumstances might the benevolent worm be construed as part of information warfare?

Public health as ‘national security’ threat

According to one view, national security always trumps individual rights because security, on a Hobbesian-type view, is necessary for a peaceful society in which persons can enjoy their liberty and rights. This view appears to be gaining adherents at least among legislators.

On the moderate viewpoint, free speech rights are defeasible, but only when appropriate justification for

³¹ M. Kirby, *The Growing Rapprochement Between International Law and National Law*, available at http://www.hcourt.gov.au/speeches/kirbyj/kirbyj_weeram.htm.

³² S. Woodman, Human Rights as “Foreign Affairs”: China’s Reporting Under Human Rights Treaties, *Hong Kong Law Journal*, 35(1): 179–203, 2005.

³³ China is party to the following international treaties relating to freedom of expression and public health: the Universal Declaration of Human Rights (UDHR), International Covenant on Economic, Social and Cultural Rights (ICESCR), Convention on the Rights of the Child (CRC), International Covenant on Cultural and Political Rights, and Convention on the Elimination of All Forms of Discrimination against Women (CEDAW).

³⁴ Reed, footnote 3.

ensorship is available. In order to protect free speech rights, legislative limitations on censorship powers are necessary. In a rights-respecting society, balancing involves prioritizing different rights in the case of conflicts between *prima facie* rights (e.g. Freedom of expression may conflict with freedom of religion). In the case of liberal democracies, there should be strong limitations on violations of freedom of expression and liberty. On the other hand, as we have seen in the quotation from Reed, above, from the perspective of the PRC, rights are merely instrumental to the common good, and balancing rights can be done by determining what maximizes the common good. Rights can be overridden whenever the common good requires.³⁵

Under public international law, governments are allowed to restrict the free flow of information to protect interests such as national security or public morals. National security ideology has, however, been used by authorities to justify human rights infringement. For this reason, international documents and principles were developed to keep rights exemptions confined to narrow determinations. For example, the *Johannesburg Principles on National Security, Freedom of Expression and Access to Information*³⁶ adopt a standard whereby freedom of expression and access to information may only be restricted where a number of conditions are met: prescribed by law, protects a legitimate national security interest, and is necessary in a democratic society. For example, a legitimate national security interest is incitement to violent overthrow of a government. National security restrictions are not justifiable in the case, for example, of “embarrassment or exposure of wrongdoing, or to conceal information about the functioning of its public institutions ...” (principle 2(b)). China’s restrictions on free speech and access to information clearly do not adhere to the Johannesburg Principles or other international standards for protecting the right to information. As Human Rights Watch notes,

“Prior censorship in particular is severely disfavoured in international law, and not permitted in many constitutional systems. A decision to block access to online material should be subject to the highest level of scrutiny, with a burden on the government to demonstrate that censorship would effectively avert a threat of irreparable, imminent,

and weighty harms, and that less extreme measures are unavailable as alternatives to protect the state interest at issue. At present, it seems apparent that China engages in no such scrutiny ...”³⁷

Moreover, the decision to punish certain speakers merely for exercising their right to speak frankly online (or off) is arbitrary and unpredictable with no opportunity for an individual or group to know in advance whether their actions comport with the law. The inability to comply with the law based on a lack of transparency severely undermines any attempt to posit a law as moral. Morality here is used in a procedural sense along the line of natural law theorist, Lon Fuller’s essential principle that the law should be written and promulgated in a fashion which guides behaviour.

Conscientious objection and civil disobedience

I will refer to two general types of civil disobedience. The first is better known as ‘conscientious objection’ where the moral agent performs or abstains from performing an act to preserve the agent’s own moral integrity. There is only the duty to obey a just law. Fashioned in a similar vein, there may in fact be a moral obligation to disobey an unjust law.³⁸ In the case of the benevolent worm, a number of parties including the author/producer, and sender/distributor may feel morally compelled to send what they believe is vital, accurate health information otherwise not available within China. Conjecturing on the moral agent’s dilemma, the agent is motivated to break the law in order to achieve a number of possible goals such as informing the populace of important news related to the epidemic and to encourage behaviour associated with containing the disease in question.³⁹

³⁷ Human Rights Watch, footnote 21.

³⁸ Martin Luther King Junior, for example, writes: “How can you advocate breaking some laws and obeying others?” The answer is found in the fact that there are two types of laws: there are just and there are unjust laws. I would agree with Saint Augustine that “An unjust law is no law at all.” “... One who breaks an unjust law must do it openly, lovingly ... and with a willingness to accept the penalty. I submit that an individual who breaks a law that conscience tells him is unjust, and willingly accepts the penalty by staying in jail to arouse the conscience of the community over its injustice, is in reality expressing the very highest respect for law.” (1963) Letters From Birmingham Jail, available at http://stanford.edu/group/King/popular_requests/frequentdocs/birmingham.pdf.

³⁹ H.J. McCloskey. Conscientious Disobedience of the Law: Its Necessity, Justification, and Problems to Which it Gives Rise. *Philosophy and Phenomenological Research*, 40(4), 1980.

³⁵ G. Hagen and A. Maurushat, *Surveillance, Technology, and National Security: Issues in Civil Liberties, Course Materials*. Asia–America Institute in Transnational Law, 2005.

³⁶ Available at <http://hei.unige.ch/humanrts/instree/johannesburg.html>.

The other type of disobedience, on the other hand, is known as ‘civil disobedience’ in the sense that it, “is conscientious disobedience of the law directed primarily ... at bringing about a change in a law, policy, institution that is morally unjust or otherwise morally unacceptable ... or a law which may be acceptable in itself but which is disobeyed in order to protest against the offending law.”⁴⁰ The moral agent, in this instance, is motivated to affect change in the law. In the case of the benevolent worm, however, this would likely be a possible ancillary effect rather than a primary goal.

Conscientious objection and civil disobedience have been justified on a number of grounds.⁴¹ One thought is that disobedience of the law may be justified where there is no disrespect or harm to others. Another ground speaks to a utilitarian approach of bringing about useful reconsideration of public policy, respect for human rights, interests of minorities and disadvantages groups, and actual reform of the law. It has been shown that other methods such as news reporting and spam potentially create harm not only for the sender but also for the recipient of sanctioned health information. The benevolent worm has the goal of safely minimizing harm to the sender and attempts to eliminate harm to the recipient (realizing, of course, that unintended consequences are not always foreseeable). Many philosophers have specified that justifiable civil disobedience ought to be non-violent with the agent ready and willing to accept punishment as a consequence for breaking the law. This view seeks to disassociate civil disobedience from revolutionary disobedience. The author suggests that this dichotomy is more useful in a democratic state with rule of law whose political leaders and citizens first have respect for their Constitutions and second for human rights in general. The dichotomy, therefore, seems less appropriate for autocratic states with documented histories of human rights abuse.

Sovereignty

Would a worm created outside of China be a deliberate act of interference with a nation’s sovereignty? The answer to this question may lie in the meaning of sovereignty. In modern international law the notion of sovereignty is “people’s sovereignty rather than the sovereign’s sovereignty ... [whereby] no serious scholar still supports the contention that internal human rights are “essentially within the domestic jurisdiction

of any state” and hence insulated from international law.”⁴² The notion of sovereignty in human rights is, therefore, predominantly premised on democracy and rule of law. China is not a democratic nation adherent to the rule of law. It does not, however, follow that China is not entitled to sovereignty but rather, that issues of sovereignty are burdened with additional questions.

Yet sovereignty has generally been understood as one nation interfering with another nation’s legitimate right to run its affairs. One thinks of the invasion of Iraq and not generally of information on public health epidemics. Sovereignty issues may be affected by the ‘who’ in ‘who says what’. A worm released by the Canadian government, for example, could conceivably be construed as intentional sovereign interference. A worm released by a NGO, on the other hand, would be less likely to be perceived as sovereign interference; this would be further buttressed by a trusted NGO with strong links to China.

Information warfare

In an extreme circumstance the benevolent worm might be construed as part of information warfare (IW). Defined simplistically, information warfare refers to, “actions taken to affect an adversary’s information and information systems while defending one’s own information and information systems.”⁴³ There are six broad components to IW: physical attack/destruction, electronic warfare, computer network attack, military deception, psychological operations, and operations security. It is difficult to conceive how the benevolent worm in its described application in this paper would fit into any one of these categories. One cannot, however, rule out the possibility of a worm with false and potentially harmful information concerning an epidemic to be released as part of an overall IW strategy. A strategy of disinformation, however, is applicable in a number of contexts including conventional means of information dissemination such as false news reporting, spam, and so forth. Careful attention to trusted sources could reduce the risk of the worm being perceived as IW.

⁴² M. Reisman. Sovereignty and Human Rights in Contemporary International Law. *The American Journal of International Law*, 84(4): 866–876, 1990.

⁴³ T. Yoshihara, *Chinese Information Warfare: A Phantom Menace or Emerging Threat?* The Strategic Studies Institute, 2001, available at <http://www.strategicstudiesinstitute.army.mil/pubs/2001/chininfo/chininfo.htm>.

⁴⁰ McCloskey, *ibid*.

⁴¹ D. Lyons. Moral Judgment, Historical Reality, and Civil Disobedience. *Philosophy and Public Affairs*, 27(1): 31–49, 1998.

Asian values

At its most base conception, 'Asian Values' emphasize the community as opposed to the individual or self. It has been argued that human rights are incompatible with 'Asian Values'. Expressed more poignantly by Samuel Huntington:

the traditionally prevailing values in East Asia have differed fundamentally from those in the West and, by Western standards, they are not favourable to democratic development. Confucian culture and its variants emphasize the supremacy of the group over the individual, authority over liberty and responsibility over rights.⁴⁴

Expressed somewhat differently, Western human rights-based rhetoric focus on rights of an individual whereas Eastern Confucian moral philosophy focuses on the duties of an individual to the community. The following analysis places ethical debate on the benevolent worm in the Confucian moral philosophy tradition.

Confucian moral philosophy

Confucian moral philosophy is often referred to as a duty-based philosophy. Confucian ethical teachings are grounded in five moral values: *Li* (ritual), *Hsia* (filial piety, duty to family), *Yi* (righteousness), *Xin* (honesty and trustworthiness), *Ren/Jen* (benevolence, social virtue, humaneness towards others), and *Chung* (loyalty to the state). Confucius' view of duty was not traditionally extended to all people but was limited to five relationships: ruler to subject, father to son, eldest brother to younger siblings, husband to wife, and friend to friend. There has never been a duty from human to human in traditional Confucian thought. Two contentious issues are raised in applying Confucius' teachings to the benevolent health worm. First, the values of *ren*, benevolence towards others, may compete with that of *chung*, loyalty to the state. Second, there is no general duty between humans outside of the five relationships.

The value of *chung* requires a person to be loyal to the state but not at any cost. Confucius writes, "If a ruler's words be good, is it not also good that no one oppose them? But if they are not good, and no one opposes them, may there not be expected from this one sentence the ruin of his country?" [Confucius, *The Analects*, Book 13 translated by Legge]. The most important value as espoused by Confucius was

ren. A major component of *ren* involved individual self-cultivation in virtuous action. It has further been suggested that *li* – norms of social ritual and interaction – is a critical component in analysing *ren*. *Li* is learned by socializing and interacting with persons who embody *ren*.⁴⁵ As Lai writes:

The paradigmatic man is a creator of standards rather than a follower ... and he possesses a keen sense of moral discrimination. Moral achievement reaches its culmination in those who have attained the capacity to assess events and who, being attuned to *li*, embody a sense of rightness.⁴⁶

Good governance and social order were derived from a hierarchical chain of individual virtuous action thus it is written that, "their hearts being rectified, their persons were cultivated. Their persons being cultivated, their families were regulated. Their families being regulated, their States were rightly governed. Their States being rightly governed, the whole kingdom was made tranquil and happy" [Confucius, *Great Learning*, translated by Legge]. What of the case where *ren* is not personally cultivated leading to poor governance? Loyalty to the State is loyalty to a righteous government who has fulfilled its duties to its citizens in the spirit of *ren*; loyalty to the State has never been an absolute.

By no means does the author suggest that the overall governance of China has been poor under the current administration. China has had to face many problems that other nations, and in particular wealthy democratic nations, have never had to address: starvation, extreme poverty, territory occupation, a devastated economy, and population explosion to name but a few. While China has overcome many hurdles to better provide for its people, its record on factors contributing to human dignity is poor (freedom of expression, protection of minorities, access to important and timely information, and so forth). It is within this limited latter context of human dignity that it is conceivable to characterize governance as poor. The manner in which public epidemics such as HIV/AIDs, SARs and Bird Flu has been handled is evidence that the government has not fulfilled its duties to the extent required under the spirit of *ren*. This resembles the notion of obeying just laws, and being further obliged to disobey unjust laws.

The formation of a person's character through virtuous action is strongly tied to a sense of community and to one's role in a community. For this

⁴⁴ S. Huntington. In R. Bartley et al., editors, *American Democracy in Relation to Asia: Democracy and Capitalism: Asian and American Perspectives*, p. 28. Institute of Southeast Asian Studies, Singapore, 1993.

⁴⁵ K. Lai, *Learning from Chinese Philosophies: Ethics of Interdependent and Contextualised Self*. Ashgate World Philosophies, 2006, p. 61.

⁴⁶ Lai, *ibid*.

reason, Confucius defined *ren* in different manners depending on the person asking the questions. Modern Confucian scholars have given new interpretations to many of Confucius' works. For example, Tu extends his interpretation to include ecological issues, O'Dwyer to include democracy, and Tsai to include bioethics.

Similarly, extension of duties beyond the classic five relationships has also been newly interpreted. It could be said that certain members of society may have the duty to disclose information on epidemics which could save lives, reduce the spread of the infectious disease, and perhaps altogether avoid a disease reaching the level of epidemic. Certain societal members may include scholars, doctors, journalist, experts, NGOs, and other international organizations. This bears a resemblance to justifications of the moral agent in conscientious disobedience. The dissemination of vital information is potentially a virtuous act whether it is through direct means of an Internet website, news publications, or whether it is less direct through a benevolent health worm. Of course, the opposite could be argued for those who adhere to a traditional view of Confucian moral philosophy. It becomes more difficult to justify the benevolent worm in the absence of one of the five relationships giving rise to duties. The most relevant relationship to the benevolent worm is that of ruler and subject. The ruler-subject relationship is predicated on the subject's respect for the ruler. This is similar to *chung*, loyalty to the State. Again, there is the assumption that the ruler will have *ren*, and will act as an example to his subjects. In the absence of *ren*, the subject duty to obey the ruler is lessened. Regardless of the framework adopted, the use of a benevolent worm does not seem to represent any clear abdication from Confucian moral philosophy.

Will the boat sink the water?⁴⁷

Water holds up the boat;

Water may also sink the boat.

Emperor Taizong (600–649, Tang Dynasty)

In much the same way, benevolent payloads have the potential to be destructive. They also have the potential to be beneficial. Benevolent payloads have in the past been analysed in the context of patches and e-commerce. Conclusion has been reached in the wider technological community that benevolent payloads are simply a 'bad idea' because there is no

consent, and there are safer methods available. There has been no analysis of benevolent payloads outside of the electronic commerce context. The benevolent health worm provides an interesting case study which undermines and challenges many of the ethical issues of benevolent payloads. This article has attempted to untangle many of the complex ethical issues surrounding the benevolent health worm, and benevolent payloads in general.

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⁴⁷ The title of a book banned in China. C. Guidi and W. Chuntao, *Will the Boat Sink the Water?* Public Affairs, Perseus Books Group, USA, 2006.

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