

Ethics and Incentives for Patient Compliance

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Abstract

Patient non-compliance, the failure of people to act on medical advice, such as taking prescribed medications, reduces the potential benefits of healthcare and increases costs to the public healthcare system. It is therefore socially desirable to reduce these costs by methods that are both legal, moral and publicly acceptable.

There have been a number of programs of the use of financial and other incentives to aid patient compliance in both the developed and developing world, with various degrees of success. As well, numerous studies, including randomised trials, of the effects of financial incentives on patient compliance have been undertaken in the past three decades. In general, these studies, subject to various limitations, show that financial incentives, usually modest rewards, are effective in the short-term of securing simple well-defined instances of patient-behaviour change, such as increased levels of cancer screening. There is though, considerable debate about whether financial incentives are effective in producing long-term behavioural changes, or even changes beyond the intervention period.

Beyond the issue of the sustainability of any alleged positive benefit from the use of financial incentives, either in the short or long-term, is the more controversial issue that incentive use in general is viewed by significant numbers of healthcare professionals and the general public, as either outrightly unethical, or in some aspects ethically problematic. The use of financial incentives for patient compliance is felt to be exploitative, coercive, lacking respect for the vulnerable and undermining patient autonomy, or alternatively, viewed from another political perspective, paying people to do what other people do anyway, is unjust to the unpaid, opening the path to corrupt exploitation of public resources and undermining intrinsic motivation for people to self-manage and change.

This work aims to give a comprehensive overview of the patient incentives debate, an outline of the main ethical objections to financial incentives and a refutation of those objections. It will be argued that most patient financial incentives are in general ethically defensible and with careful monitoring, are one method that can be used to improve patient healthcare, primarily in the short-term. However, financial incentives have their clear limitations and are far from being any sort of “magic bullet” for enhancing patient compliance to act on medical advice or follow prescribed medications and behavioural practices.

Modestly, financial incentives are merely one option in the “tool box” to help patients achieve health care goals, among other options. Financial and other incentives should be tried in carefully designed and scrutinised programs, evaluated for any ethical problematic ramifications, and suitably corrected, and used if successful, or promising of success, but if not, abandoned and replaced by more suitable strategies that are more efficient in the context of the healthcare situation to aid patient health and wellbeing.

While this work is primarily in the field of the ethics of health care, its philosophical focus, weaved into the narrative, is much wider, and provides a platform for the author’s expression of the limits of the hyper-rationalism that characterises modern analytic philosophy, which the author has been arguing against since the 1980s. Ethics remains in a state of epistemological crisis because philosophy itself has perhaps always has been in such a state, one made even more precarious by the power of analytic techniques to produce refutations and counter-examples to almost all principles, from symbolic logic to ethics. This foundational problem will also be tackled in this work, with the incentives issue being used as a case study about how we may proceed in an epistemological minefield.

Declaration

I certify that this thesis does not incorporate without acknowledgement, any material previously submitted for a degree or diploma in any university, and that to the best of my knowledge and belief, it does not contain any material previously published or written by another person, except where due reference is made in the text.

Dr Joseph Wayne Smith

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Preface

Patient non-compliance is the failure of a person to act on medical advice such as taking prescribed medicines or keeping appointments. It has been long observed by physicians, beginning perhaps with Hippocrates in the 4th century BCE, that there were patients who did not take their prescribed medicines, or follow treatments, either intentionally or unintentionally.¹

Early research indicated that 6-20 percent of all primary care prescription are not filled or taken,² but more recent research has it that almost one-in-three patients are not filling prescriptions.³ It is estimated that over 50 percent of people diagnosed with schizophrenia, do not take their prescribed medications.⁴ Appointment compliance failure rates are from 19-28 percent.⁵ Patient non-compliance reduces the potential benefits of healthcare and represents a major cost to the public healthcare system. It is a cost that is obviously socially desirable to reduce, and strategies for doing so are of merit to evaluate. This work will examine one such strategy; the use of financial and other reward incentives as an aid to enhance patient compliance across a range of healthcare situations, and its ethical significance.

Chronic health conditions, such as coronary heart disease, type 2 diabetes and various types of cancers are significantly affected by lifestyle choices, including lack

¹ P. M. Haddad (et al.), “Nonadherence with Antipsychotic Medication in Schizophrenia: Challenges and Management Strategies,” *Patient Related Outcomes Measures*, vol. 5, 2014: doi: 10.2147/PROM.S42735.eCollection (2014).

² A. Giuffrida and H. Gravelle, “Paying Patients to Comply: An Economic Analysis,” *Health Economics*, vol. 7, 1998, pp. 567-579.

³ R. Tamblyn (et al.), “The Incidents and Determinants of Primary Nonadherence with Prescribed Medication in Primary Care: A Cohort Study,” *Annals of Internal Medicine*, vol. 160, 2014, pp. 441-450. In this study of 15,961 patients in Quebec, Canada, it was found that of the 37,506 prescriptions written, 31.3 percent were not filled. The study was not able to measure the rationale for the failure to fill prescriptions, but it was hypothesised that drug costs may be one factor. There was thought to be a need for increased follow-ups by physicians for patients with chronic conditions.

⁴ T. Kendall, “Paying Patients with Psychosis to Improve Adherence,” *British Medical Journal*, vol. 347, 2013: f5782; doi: 10.1136/bmj.f5782.

⁵ As above.

of exercise, substance abuse, consumption of unhealthy food/ lack of consumption of healthy food options such as fresh fruit and vegetables, as well as non-adherence to medical recommendations and prescribed medications.⁶ In the United States, for example, 86 percent of 2010 health care spending was devoted to people having one or more chronic illnesses, such as heart disease, cancer and diseases caused by obesity. The total cost of heart disease and stroke was US \$315.4 billion; cancer care, US \$157 billion; diagnosed diabetes (in 2012 dollar terms), US \$ 245 billion; arthritis and related conditions, US \$ 128 billion (in 2003 dollar terms); obesity US \$147 billion (2008 dollar terms); the economic cost of smoking US \$289 billion a year and alcohol consumption US \$223.5 billion (2006 dollar terms).⁷ By comparison, the total US military budget for 2015, the most expensive in the world, was US \$601 billion.⁸

Financial and other incentives for patient compliance are one method that has been used to attempt to reduce this public health cost in both the developed and developing worlds.⁹ In the United States, for example, since the passage of the *Patient Protection and Affordable Care Act* in 2010 (“Obamacare”), employees can be reimbursed 50 percent of their health insurance premiums for achieving healthy behaviour goals, although on January 20, 2017, President Donald J. Trump began the repeal of this Act by an executive order, *Minimizing the Economic Burden of the Patient Protection and Affordable Care Act Pending Appeal*.¹⁰ Nevertheless, today the vast

⁶ S. T. Higgins (et al.), “Incentives and Health: An Introduction,” *Preventive Medicine*, vol. 55, 2012, pp. s2-s6.

⁷ Centers for Disease Control and Prevention, “Chronic Diseases: The Leading Causes of Death and Disability in the United States,” at http://journals.lww.com/joem/Abstract/2015/12000/The_Portion_of_Health_Care_Costs_Associated_With.5.aspx.

⁸ See, S. Gould and J. Bender, “Here’s How the US Military Spends its Billions,” August 26, 2015, at <http://www.businessinsider.com.au/how-the-us-military-spends-its-billions-2015-8>.

⁹ L. S. Chapman (et al.), “The Changing Role of Incentives in Health Promotion and Wellness,” *American Journal of Health Promotion*, vol. 23, no. 1, 2008, Suppl. pp. 1-11; S. Stock (et al.), “Financial Incentives in the German Statutory Health Insurance: New Findings, New Questions,” *Health Policy*, vol. 96, 2010, pp. 51-56; H. Schmidt, “Bonuses as Incentives and Rewards for Health Responsibility: A Good Thing?” *Journal of Medicine and Philosophy*, vol. 33, 2008, pp. 198-220.

¹⁰ See: <https://www.whitehouse.gov/the-press-office/2017/01/20/executive-order-minimizing-economic-burden-patient-protection-and...>

majority of large US firms are offering incentives for employees to engage in wellness programs.¹¹

In developing countries, financial and other reward-based incentive programs have been used to confront serious social problems such as the problem of intergenerational poverty, often by use of conditional cash transfers.¹² A notable example of this is the PROGRESA program, the Education, Health and Nutrition program of Mexico, which began in 1997, and had its name changed to “Oportunidades” in the year 2000. The project, focussing on women has reached 25 million people in primarily rural municipalities. Mexico’s National Institute of Public Health, in a 2004 study, found an increase of 35 percent in rural areas, and 20 percent in urban areas, for regular check-ups by families participating in Oportunidades.¹³ Oportunidades was directed toward some of the poorest people on Earth, living on less than US \$1 a day, so it is not unreasonable to suppose that a financial incentive would have a positive influence on behaviour, especially as education and nutritional incentives benefitting children were offered based on conditional cash transfers (CCT). The program encouraged poor people to invest in their children’s health, with monthly payments to participating families of scholarships and free or low-priced medical services.

Other programs like this have been tried with success in South America, such as Nicaragua’s Red de Protección Social, for poor rural households. This program, although successful, was discontinued for a variety of political reasons.¹⁴ Nevertheless, the South American successes have inspired the implementation of conditional cash transfer programs in Africa, including Malawi, Morocco, Ghana, Kenya and Burkina

¹¹ N. Ries, “Financial Incentives for Weight Loss and Healthy Behaviors,” *Healthcare Papers*, vol. 7, 2012, p. 5.

¹² M. Largarde (et al.), “Conditional Cash Transfers for Improving Uptake of Health Interventions in Low-and Middle-Income Countries,” *JAMA*, vol. 298, 2007, pp. 1900-1910.

¹³ World Health Organization, “Reaching Mexico’s Poorest,” *Bulletin of the World Health Organization*, at <http://www.who.int/bulletin/volumes/84/8/news/10806/en/>.

¹⁴ C. Moore, *Nicaragua’s Red de Protección Social: An Exemplary but Short-Lived Conditional Cash Transfer Programme*, (International Policy Centre for Inclusive Growth, United Nations Development Programme, New York, 2009).

Faso, with general success.¹⁵ While the major criticism of the use of financial incentive programs in the developed world is that the programs do not generate long-term behavioural change for complex health issues such as addictions, in the context of developing societies, this criticism may not be as relevant, because many of the behaviours which are to be “nudged,” such as lowering the rate of teen pregnancies or getting more children to attend school, are of short-term relevance and the rewards will need to be on a continual basis to reinforce their behaviour. This, though, is a general aspect of financial and other incentives, which appeal to people’s “present bias,” the bias of people to seek present rewards, which may be small, instead of future rewards which may be more valuable.¹⁶ The evidence indicates that conditional cash transfers are more effective than unconditional cash transfers.¹⁷

Incentive schemes to influence individual health behaviour also occur in the developed world, with Germany being a notable example.¹⁸ Here, incentives for healthy behaviour were first introduced in 1989 in Germany’s statutory health insurance scheme. The first area where incentives operated were co-payments for people attending regular dental check-ups. Since then provisions of the *Social Security Code* have provided a legal basis for various sickness funds to offer bonuses to participate in health promotion schemes, with the provision of incentives such as cash or a reduction in insurance contributions. Incentives are offered for health-conscious behaviour, complying with dental check-ups, for the early detection and treatment of chronic diseases, for minimising healthcare utilisation, and many other interventions. For each intervention reward points are typically offered, with rewards offered when a certain

¹⁵

See:

https://www.poverty-action.org/sites/default/files/publications/evaluations_of_cash_transfer_programs_in_african_settings_policy_memo.pdf.

¹⁶ T. M. Marteau (et al.), “Using Incentives to Achieve Healthy Behaviour,” *British Medical Journal*, vol. 338, 2009; b1415; K. Sutherland (et al.), “Impact of Targeted Financial Incentives on Personal Health Behavior: A Review of Literature,” *Medical Care Research and Review*, vol. 65, 2008, pp. 36-78s.

¹⁷ S. Baird (et al.), “Cash or Condition? Evidence from a Cash Transfer Experiment,” *Quarterly Journal of Economics*, vol. 126, 2011, pp. 1709-1753.

¹⁸ H. Schmidt (et al.), “What Can We Learn from the German Health Incentive Schemes?” *British Medical Journal*, vol. 339, 2009; b3504; H. Schmidt, “Bonuses as Incentives and Rewards for Health Responsibility: A Good Thing?” *Journal of Medicine and Philosophy*, vol. 33, 2008, pp. 198-220.

number of points are reached.¹⁹ Schmidt concludes that there is evidence of short-term savings from the scheme, but there is debate and controversy about whether healthcare costs will be curbed in the long term, and that future evaluation of long-term viability will need to be made.²⁰

Despite a body of evidence, including randomised trials, indicating that financial and other incentives are effective in securing simple well-defined instances of patient-behaviour change (such as cancer screening and vaccinations, on the basis of modest rewards), the use of such incentives has been viewed as ethically problematic. This work will address the issue of the alleged ethically problematic nature of incentives for patient compliance. Although there is a considerable literature dealing with the experimental basis of incentives for patient compliance, there is relatively little discussion of the ethical, philosophical and jurisprudential aspects of this subject, a matter which this work intends to correct.

The issue of the use of financial incentives to enhance patient compliance, or what is alternatively described as paying for other people's risky behaviour,²¹ is publicly controversial, and strongly criticised in the media.²² Matters though are more favourable in the peer-reviewed literature. For example, in a study based on a sample of the general population of London (July-August, 2011), it was examined if people agreed or disagreed with the NHS covering the health care costs of risky health behaviours, including overeating, unhealthy diet, a sedentary lifestyle, excess alcohol consumption and smoking.²³ There was found to be an almost exact split between the agrees and disagrees, with 54 percent agreeing on the NHS paying costs related to smoking; sedentary lifestyle, 49 percent; alcohol abuse, 48 percent; unhealthy diets, 46 percent, and overeating, 43 percent. It was noted in the study that "with the exceptions of alcohol drinking and sedentary life, there seems to be an almost one-to-one

¹⁹ Schmidt, "What Can We Learn from the German Health Incentive Schemes?" As above.

²⁰ As above.

²¹ M. Miraldo (et al.), "Should I Pay for Your Risky Behaviours? Evidence from London," *Preventive Medicine*, vol. 66, 2014, pp. 145-158.

²² H. Parke (et al.), "Financial Incentives to Encourage Healthy Behaviour: An Analysis of U.K. Media Coverage," *Health Expectations*, vol. 16, 2013, pp. 292-304.

²³ Miraldo (et al.), cited note 21.

relationship between the agreement that the NHS should bear the healthcare costs associated to one risk behaviour, and the respondent's actual engagement in that specific behaviour."²⁴

Other studies have indicated that the public is concerned that financial incentive schemes are open to abuse, and should only be used if there are checks and balances imposed to prevent corruption, close monitoring and evaluation, and that the schemes are effective and cost-efficient.²⁵ Ethical issues were a major concern.²⁶

The concept of an "incentive" is itself contested. The concept in the early part of the 20th century used to refer all types of motivations, but today, as Grant notes, the term "is used so widely and indiscriminately today that the boundaries of the concept are blurred."²⁷ Grant offers the following definition of "incentive": "(1) [A]n extrinsic benefit or bonus that is neither the natural or automatic consequence of an action nor a deserved reward or compensation; (2) a discrete prompt expected to elicit a particular response; and (3) an offer intentionally designed to alter the status quo by motivating a person to choose differently than he or she would be likely to choose in its absence."²⁸ Thus, an incentive "is the added element without which the desired action probably would not occur."²⁹ This definition has been criticised by Murray who points out that it is highly restrictive and rules out classifying intrinsic motivational phenomenon, such as obligations to perform well in one's studies, or to raise children with a sound work ethic, as well as market prices such as wages.³⁰ Further, the extrinsic/intrinsic

²⁴ As above, p. 151.

²⁵ P. Promberger (et al.), "'Pay Them If It Works': Discrete Choice Experiments on the Acceptability of Financial Incentives to Change Health Related Behaviour," *Social Science and Medicine*, vol. 75, 2012, pp. 2509-2514; E. L. Giles (et al.), "Acceptability of Financial Incentives for Encouraging Uptake of Healthy Behaviors: A Critical Review Using Systematic Methods," *Preventive Medicine*, vol. 73, 2015, pp. 145-158; E. L. Giles (et al.), "Acceptability of Financial Incentives and Penalties for Encouraging Uptake of Healthy Behaviors: Focus Groups," *BMC Public Health*, vol. 15, 2015:58

²⁶ D. Claassen (et al.), "Money for Medication: Financial Incentives to Improve Medication Adherence in Assertive Outreach," *Psychiatric Bulletin*, vol. 31, 2007, pp. 4-7.

²⁷ R. W. Grant, *Strings Attached: Untangling the Ethics of Incentives*, (Russell Sage Foundation/Princeton University Press, Princeton, 2012), p. 31.

²⁸ As above, p. 43.

²⁹ As above.

³⁰ P. Murray, "The Morality of Incentives," *Regulation*, Fall, 2014, pp. 67-69, cited p. 68.

distinction is far from clear. For example, a breakfast cereal producer may give more cereal in the packet for the same price, and advertise this fact on the box, which intuitively is an incentive to buy, but not an extrinsic benefit. Therefore, the issue of what is an “incentive” will need to be addressed, but it is best done in the context of looking at examples, which chapter 1 aims to do, rather than engage in the analytic philosophy task of attempting to come up with some counter-example proof definition.³¹

In the literature, it is sometimes alleged that reward-base incentives that are addressed to behavioural processes, such as losing weight, are ethically fairer than those programs addressing outcomes, such as actually succeeding in reaching weight loss goals.³² Schmidt (et al.) argue that the divide between process and outcomes is less sharp than is conventionally thought because all incentive programs require having targets to be meaningfully directed, and that the moral implications of programs needs to be considered on an independent basis because the distinction between process and outcome does not in itself establish an unambiguous moral threshold.³³

Although human behaviour is in part reason- and reflection-based, there are well known deviations from ideal rationality, as human behaviour is heavily influenced by an affective system that often has a stronger and more immediate impact,³⁴ a fact well known to the advertising and marketing industry.³⁵ The *behavioural economics* tradition, questions the assumption made by traditional neo-classical economics, that people are ideal decision-makers who make well-informed choices that maximise their expected utility; rather people frequently make poorly informed and irrational choices

³¹ As above.

³² K. M. Madison (et al.), “The Law, Policy, and Ethics of Employers’ Use of Financial Incentives to Improve Health,” *Journal of Law, Medicine and Ethics*, vol. 39, 2011, pp. 450-468.

³³ H. Schmidt (et al.), “Fairness and Wellness Incentives: What is the Relevance of the Process-Outcome Distinction?” *Preventive Medicine*, vol. 55, 2012, pp. s118-s123.

³⁴ T. Marteau (et al.), “Judging Nudging: Can Nudging Improve Population Health?” *British Medical Journal*, vol. 342, 2011, pp. 263-265.

³⁵ R. W. Belk (et al.), “The Fire of Desire: A Multisided Inquiry into Consumer Passion,” *Journal of Consumer Research*, vol. 30, 2003, pp. 326-351; J. L. Harris (et al.), “Priming Effects of Television Food Advertising on Eating Behavior,” *Health Psychology*, vol. 28, 2009, pp. 404-413.

that are often maladaptive.³⁶ Behavioral economics aims to devise interventions, including the use of incentives that “nudge” people’s behaviour, without, it is alleged, paternalistically coercing them, so that they are aided to make better informed decisions in accordance with their own set of values and priorities.³⁷ This work will attempt to address the philosophical implications of the behavioural economics philosophy of the limited role that reason and self-discipline has in human affairs, because the political significance of this is vast and is not as well appreciated as it should be in the academic literature in this field.

If society accepts that the advertising industry, for example, can “nudge” people to make sometimes unhealthy food choices, such as fast food, then is it ethically problematic to “nudge” people to change their behaviour to embrace more healthy behaviour so as to aid in the reduction of society’s health costs?³⁸ Is the strategy of nudging people, fundamentally inconsistent with the principle of autonomy, that people are free agents, who should be, ideally, able to make their own decisions about what is in their own interests, what is good for them, and what their good life actually is?³⁹ Are people free agents as classical liberal philosophy presupposes?

The term “nudge” is defined by Thaler and Sunstein to be “any aspect of the choice architecture that alters people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives.”⁴⁰ The concept is part of a libertarian paternalism, which holds that people should be free to opt out of that

³⁶ N. Wilkinson, *An Introduction to Behavioral Economics*, (Palgrave Macmillan, Basingstoke, 2007); T. Thorgeirsson and I. Kawachi, “Behavioral Economics: Merging Psychology and Economics for Lifestyle Interventions,” *American Journal of Preventive Medicine*, vol. 44, 2013, pp. 185-189; C. A. Roberta and I. Kawachi (eds), *Behavioral Economics and Public Health*, (Oxford University Press, Oxford, 2016).

³⁷ R. H. Thaler and C. R. Sunstein, *Nudge: Improving Decisions about Health, Wealth and Happiness*, (Penguin Books, New York, 2009).

³⁸ UK Department of Health, *Healthy Lives, Healthy People: Our Strategy for Public Health in England*, (UK Department of Health, 2010).

³⁹ J. Varelius, “The Value of Autonomy in Medical Ethics,” *Medicine, Health Care and Philosophy*, vol. 9, 2006, pp. 377-388.

⁴⁰ R. H. Thaler and C. R. Sunstein, *Nudge: Improving Decisions about Health, Wealth, and Happiness*, (Yale University Press, New Haven, 2008), p. 6. Marteau (et al.), note 34, say that there is “no precise, operational definition of nudging,” and they conclude that this is because “nudging is at best a fuzzy set intended to draw attention to the role of social and physical environments in shaping our behavior and not to inform a scientific taxonomy of behavior change interventions.” (p. 263)

which they do not like, although it is still justified for others to influence their choice architecture in a positive way, through organising “the context in which people make decisions.”⁴¹ The paternalistic policy aims to make people better off as they would judge themselves,⁴² thus making better health choices without compromising their liberty, or so the proposal goes.⁴³ As will be detailed in chapter 5 of this work, nudging includes a wide range of incentives to change behaviour that do not involve threats, “leverage,” legislation or regulation. Threats, or leverage measures,⁴⁴ such as claiming to remove support for a patient if he/she does not adhere to treatment, or not allowing patients to see their children, typically reduce a patient’s options making people who do not comply worse off compared to a baseline pre-treatment situation, and have been argued to be coercive, and unethical, as the professional is failing to uphold his/her duty.⁴⁵

Negative incentives, withdrawing a reward in the hope of motivating an individual, have however been used effectively in business motivational contexts, to attempt to get the best performance from eager young entrepreneurs, lawyers and high-level sales persons.⁴⁶ Thus, some law firms may offer bonuses as part of the annual salary, but the lawyer may lose the bonus if she/he fails to meet performance criteria.⁴⁷ Negative incentives or penalties, have been used in schemes ranging from workplace

⁴¹ As above, p. 3.

⁴² As above, p. 5.

⁴³ D. M. Hausman and B. Welch, “Debate: To Nudge or Not to Nudge,” *Journal of Political Philosophy*, vol. 18, 2010, pp. 123-136.

⁴⁴ J. Monahan (et al.), “Use of Leverage to Improve Adherence to Psychiatric Treatment in the Community,” *Psychiatric Services*, vol. 56, 2005, pp. 37-44.

⁴⁵ M. Dunn (et al.), “Threats and Offers in Community Mental Healthcare,” *Journal of Medical Ethics*, vol. 38, 2012, pp. 204-209. See also E. Blacksher, “Carrots and Sticks to Promote Healthy Behaviors: A Policy Update,” *Hastings Center Report*, vol. 38, no. 3, 2008, pp. 13-16, cited p. 143; M. Dunn (et al.), “The Use of Leverage in Community Mental Health: Ethical Guidance for Practitioners,” *International Journal of Social Psychiatry*, vol. 60, 2014, pp. 759-765.

⁴⁶ K. Goldsmith and R. Dhar, “Negativity Bias and Task Motivation: Testing the Effectiveness of Positively Versus Negatively Framed Incentives,” *Journal of Experimental Psychology, Applied*, vol. 19, 2013, pp. 358-366.

⁴⁷ P. Oliver, “Rewards and Punishments as Selective Incentives for Collective Action: Theoretical Investigations,” *American Journal of Sociology*, vol. 85, 1980, pp. 1356-1375.

injury avoidance⁴⁸ to environmental management of water resources.⁴⁹ In general, the people subject to negative incentive schemes, are not highly vulnerable people, but are some of society's most capable individuals, well equipped to face the psychological stress that failure may produce, and mentally and occupationally capable of dealing with the challenge that negative incentives may pose. Most importantly, as in the case of high-level lawyers, such people freely accept their challenge, and in principle can change their occupational position if they no longer desire to operate under a regime of negative incentives. They are therefore qualitatively different from the people considered in this work, patients, who are usually seeking healthcare assistance, and thus are vulnerable both physically and psychologically.

There has been some application of negative incentives to the healthcare context, such as "behavioural deposit contracts," where participants deposit a lump sum of money for some health program (such as a gym exercise program for weight loss, or reaching some personal health goal), but forfeit payment if they fail to reach the health goal.⁵⁰ However, the sanction/negative incentives approach, in healthcare, is even more controversial than the use of positive incentives for patient compliance, as negative incentives may reinforce already vulnerable individuals' senses of failure, and if they fail to meet goals, they may believe that they are being "punished," which in fact they are. In a study of weight loss, with a group offered positive and negative incentives, it was found that there was no statistically significant difference in weight loss between the two groups, but that people who had negative incentives by losing money, were more likely to drop out of the program.⁵¹ In a study of people participating in a

⁴⁸ R. K. McKelvey (et al.), "Performance Efficiency and Injury Avoidance as a Function of Positive and Negative Incentives," *Journal of Safety Research*, vol. 5, 1973, pp. 90-96.

⁴⁹ A. S. Mohamed and H. H. G. Savenije, "Water Demand Management: Positive Incentives, Negative Incentives or Quota Regulation?" *Physics and Chemistry of the Earth, Part B: Hydrology, Oceans and Atmosphere*, vol. 25, 2000, pp. 251-258.

⁵⁰ R. W. Jeffery (et al.), "An Empirical Evaluation of the Effectiveness of Tangible Incentives in Increasing Participation and Behaviour Change in a Worksite Health Promotion Program," *American Journal of Health Promotion*, vol. 8, 1993, pp. 98-100; J. Adams (et al.), "Carrots, Sticks and Health Behaviours; A Framework for Documenting the Complexity of Financial Incentive Interventions to Change Health Behaviours," *Health Psychology Review*, vol. 8, 2014, pp. 286-295.

⁵¹ B. Marvis and B. Stoffelmayr, "Multidimensional Evaluation of Monetary Incentive Strategies for Weight Control," *Psychological Record*, vol. 44, 1994, pp. 239-252.

urine/drug test, those penalised for failing the urine test were less successful than those given a positive incentive.⁵² In general, penalty-based weight loss programs for the overweight and obese, lack support.⁵³

Thus, there seems to be a material difference between such threats (the “stick” approach) and the offer of financial (or other) incentives (the “carrot” approach), which increase the patient’s range of options rather than decrease them.⁵⁴ However, not all agree with this, and there is a literature regarding incentives, and nudges in general, as ethically problematic. This work will seek to review these criticisms and rebut them. To do so will require first reviewing the evidence for the effectiveness of financial incentives for patient compliance, undertaken in chapter 1.

Before examining the ethics of financial incentives, it is first necessary to see if there are any legal arguments against the use of financial incentives, for if there are, much of this debate about ethics is beside the point. This jurisprudential investigation is undertaken in chapter 2.

Chapter 3 then looks at some of the ethical epistemological issues lying behind debates in ethics and bioethics, at a level generally not undertaken by moral philosophers who seem to work within defined paradigms. This is necessary to do given as Saenz rightly observes, “there is an increasing uncertainty as to the foundations and significance of bioethics itself.”⁵⁵

⁵² K. C. Kirby (et al.), “Schedule of Voucher Delivery Influences Initiation of Cocaine Abstinence,” *Journal of Consulting and Clinical Psychology*, vol. 66, 1998, pp. 761-767.

⁵³ H. Schmidt, “Carrots, Sticks, and False Carrots: How High Should Weight Control Wellness Incentives Be? Findings from a Population-Level Experiment,” *Frontiers in Public Health Services and Systems Research*, vol. 2, 2013: doi: 10.13023/FPHSSR.0201.02.

⁵⁴ Dunn (et al.), cited note 45, p. 205. See further on the question of treats: E. B. Elbogen (et al.), “Psychiatric Disability and the Use of Financial Leverage and Perceived Coercion in Mental Health Services,” *International Journal of Forensic Mental Health*, vol. 2, 2003, pp. 119-127; P. S. Appelbaum and A. Redlich, “Use of Leverage Over Patients’ Money to Promote Adherence to Psychiatric Treatment,” *Journal of Nervous and Mental Disease*, vol. 194, 2006, pp. 294-302; G. Szmukler and P. S. Appelbaum, “Treatment Pressures, Leverage, Coercion and Compulsion in Mental Health Care,” *Journal of Mental Health*, vol. 17, 2008, pp. 233-244; M. Jaeger and W. Rossler, “Enhancement of Outpatient Treatment Adherence: Patients’ Perceptions of Coercion, Fairness and Effectiveness,” *Psychiatry Research*, vol. 180, 2010, pp. 48-53; G. Szmukler, “‘Coercive’ Measures,” in H. Helmchen and N. Sartorius (eds), *Ethics in Psychiatry: European Contributions*, (Springer, Dordrecht, 2010), pp. 321-340. On the neurological effects of positive versus negative incentives see, F. M. Filbey (et al.), “Neural Effects of Positive and Negative Incentives During Marijuana Withdrawal,” *PLOS One*, vol. 8, 2013: e61470; doi: 10.1371/journal.pone.0061470.

⁵⁵ V. Saenz, “Bioethics and Disagreement: Organ Markets, Abortion, Cognitive Enhancement, Double Effect, and Other Key Issues in Bioethics,” *Journal of Medicine and Philosophy*, vol. 39, 2014, pp. 207-216, cited p. 207.

Chapter 4 then reviews the principal moral objections that have been made to the use of financial and other incentives to enhance patient compliance, and concludes, that such incentives, although having limitations, especially regarding changing behaviour in the long term, are still a useful tool that can be used with a wide range of other strategies including education and of course attempting to change social conditions so that the ill effects that doctors seek to address in the first place, either do not arise, or are not as socially problematic to the healthcare system.

This work will not address the related question of the merit and morality of pay for performance for health care professional: whether financial incentives for physicians to reward quality of care, is economically efficient, and morally sound. Does an increase in pay rates lead to an increase in care provision? Some studies conclude that this is so,⁵⁶ but the majority of studies, including systematic reviews, conclude that there is presently insufficient evidence to decide the question, with there being no evidence of the provision of financial incentives to primary care services improving patient's wellbeing and quality of care.⁵⁷ There may be negative impacts upon physician decisions about testing, diagnosis and treatment.⁵⁸ Although there are interesting legal and moral questions raised in this area, including conflict of interest issues, and the potential undermining of the physician care ethic,⁵⁹ the present work will not explore

⁵⁶ J. Clemens and J. D. Gottlieb, "Do Physicians' Financial Incentives Affect Medical Treatment and Patient Health?" *American Economic Review*, vol. 104, 2014, pp. 1320-1349.

⁵⁷ G. Flodgren (et al.), "An Overview of Reviews Evaluating the Effectiveness of Financial Incentives in Changing Healthcare Professional Behaviours and Patient Outcomes," *Cochrane Database of Systematic Reviews*, July 6, 2011: CD009255; doi: 10.1002/14651858; A. Scott (et al.), "The Effect of Financial Incentives on the Quality of Health Care Provided by Primary Care Physicians (Review)," *Cochrane Database of Systematic Reviews* (2011), Issue 9, Art No.: CD008451; doi: 10.1002/14651858.CD008451.pub2.

⁵⁸ E. C. Rich (et al.), "Paying the Doctor: Evidence-Based Decisions at the Point-of-Care and the Role of Fee-for-Service Incentives," *Journal of Comparative Effectiveness Research*, vol. 2, 2013, pp. 235-237; L. Wen, "Patients Can't Trust Doctors' Advice if We Hide Our Financial Connections to Drug Companies," *British Medical Journal*, vol. 348, 2014: g167; doi: 10.1136/bmj.g167. Wen cites a study that showed that 94 percent of US doctors have a close financial connection to drug and/or medical device companies, and may receive payments, lunches/dinners which could bias the doctor's prescribing practices. This is typically not disclosed to patients, representing a severe conflict of interest: E. G. Campbell (et al.), "A National Survey of Physician-Industry Relationships," *New England Journal of Medicine*, vol. 356, 2007, pp. 1742-1750.

⁵⁹ D. U. Himmelstein and S. Woolhandler, "Physician Payment Incentives to Improve Care Quality," *JAMA*, vol. 311, 2014, pp. 304-305; B. Serumaga (et al.), "Effect of Pay for Performance on the Management and Outcomes of Hypertension in the United Kingdom: Interrupted Time Series," *British Medical Journal*, vol. 342, 2011: d108.

this question further because of the lack of positive evidence in support of such incentive schemes.

There are limitations to the use of incentives to enhance patient compliance and financial incentives may not be the most effective form of reinforcement, with social and self-defined rewards perhaps being equal or more effective in various contexts.⁶⁰ This work does not undertake the task of investigating the merits of incentives (primarily financial), relative to all other programs of human behaviour modification, which would be an enormous undertaking. All that is attempted is to offer an ethical defence of the use of incentives in health care, recognising all of the limitations of such programs.

The issue of nudges and incentives to enhance patient compliance, and the limitations of such strategies, especially for long-term behaviour change, naturally leads to a consideration of the wider, more controversial issue of paternalism, both soft (e.g. libertarian paternalism), and hard (coercive paternalism), which is considered in chapter 5. Although there are limitations to both approaches, paternalism suitably restricted and restrained can be a valuable addition to incentives programs, thus producing a unified approach, which is summarised in the conclusion.

This work therefore takes a moderate, common sense approach to the incentives for patient compliance issue. Incentives are not immoral in any absolute sense, although no doubt specific programs may be, crossing the moral line. There is thus a need for very careful scrutiny of any incentives-based program, to not only attempt to make them as efficient as possible, but to ensure that the program is actually aiding the patient's autonomy and personal health. In short, incentive schemes to aid in patient compliance need to be examined on a case-by-case basis, as there are no sound *a priori* arguments against such proposals in *general*.

⁶⁰ M. Johnson and F. Sniehotta, "Financial Incentives to Change Patient Behaviour," *Journal of Health Services Research and Policy*, vol. 15, 2010, pp. 131-132; R. R. Wing (et al.), "A Self-Regulation Program for Maintenance of Weight Loss," *New England Journal of Medicine*, vol. 355, 2006, pp. 1563-1571.

CHAPTER 1

Incentives to Enhance Patient Compliance: The Evidence

Introduction

The aim of this chapter is to conduct a literature review examining the question of whether or not financial and other reward-based incentives are effective in the short or long-term to enhance patient compliance on a range of healthcare interventions. The chapter does not seek to conduct a detailed methodological or statistical examination of papers, but seeks only an overview, because as the aim of this work is to investigate the ethics of incentives, it is only relevant to the work that there is evidence for the effectiveness of incentives, that incentive use is not pointless and ineffective. If this were so, then there obviously would only be a narrow technical interest in conducting a study of the ethics of such incentive schemes.

The thesis argued for here is that there is positive evidence for the efficiency and effectiveness of some incentives programs, but there is limited evidence that these schemes are effective beyond the short-term, for the period after the incentive has been removed. This should not in itself be surprising because the incentives approach is based on the basic principles of operant conditioning, that the reinforcing behaviour tends to increase the future probability of performance of a specific behaviour, while punishments tend to decrease performance.¹

¹ M. E. Bouton, *Learning and Behavior: A Contemporary Synthesis*, (Sinauer Associates Inc., Sunderland, MA, 2007); S. T. Higgins (et al.), "Contingent Reinforcement Increases Cocaine Abstinence During Outpatient Treatment and 1 Year Follow-Up," *Journal of Consulting and*

The Evidence for Incentives for Promoting Health

There have been a number of systematic literature reviews conducted over the years, examining the evidence presented in numerous papers studying the question of whether incentives, primarily financial or monetary, effectively promote healthy lifestyles. In one recent review, Giles (et al.), concluded: “The majority of the included papers were scholarly pieces rather than empirical evidence, and most of the scholarly writing appear to lack an empirical evidence base. Where empirical evidence exists, it is largely in the form of survey data rather than qualitative data providing detailed opinions on the acceptability of HPFI [health promoting financial incentives]. Thus, most of the debate within the literature on the acceptability of financial incentives appears to be unsubstantiated and represent the opinions of authors, rather than being underpinned by evidence.”²

However, this sceptical conclusion seems to be at variance with another paper, published also in 2015 by Giles (et al.), where it was stated: “Financial incentives are effective in encouraging healthy behaviours, yet concerns about acceptability remain.”³ The literature cited by Giles (et al.), does in fact present, they state, evidence for the effectiveness of financial incentives for health promotion, evidence that is of mixed quality with respect to effect size, but still judged to be effective in encouraging individuals to engage in healthy behaviours.

Giles (et al.) cite their own study, a systematic review and meta-analysis, which concluded that financial incentives were from 1.5 to 2.5 times more effective

Clinical Psychology, vol. 68, 2000, pp. 64-72; S. T. Higgins (et al.), “Clinical Implications of Reinforcement as a Determinant of Substance Use Disorders,” *Annual Review of Psychology*, vol. 55, 2004, pp. 431-461; S. T. Higgins (et al.), *Contingency Management in the Treatment of Substance Use Disorders: A Science-Based Treatment Innovation*, (Guilford press, New York, 2008).

² E. L. Giles (et al.), “Acceptability of Financial Incentives and Penalties for Encouraging Uptake of Healthy Behaviours: Focus Groups,” *BMC Public Health*, vol. 15, 2015: 58.

³ E. L. Giles (et al.), “Acceptability of Financial Incentives for Encouraging Uptake of Healthy Behaviours; A Critical Review Using Systematic Methods,” *Preventive Medicine*, vol. 73, 2015, pp. 145-158, cited p. 145.

than no intervention, or usual care, in promoting healthy behaviour.⁴ This paper conducted a meta-analysis of 17 papers reporting on 16 studies of smoking cessation, attendance for vaccination or screening, and one study on physical activity, the studies being either randomised controlled trials (RCTs) or cluster RCTs (where groups of individuals are randomised rather than individual subjects).⁵ Their conclusion was: “HPFI were more effective than no intervention, or usual care, in changing behaviours. This was seen for groups of similar

⁴ E. L. Giles (et al.), “The Effectiveness of Financial Incentives for Healthy Behaviour Change: Systematic Review and Meta-Analysis,” *PLOS One*, vol. 9, 2014, pp. 1-16. The papers referred to in this meta-analysis are: R. R. Debari (et al.), “Patient Compliance/Incentive Study” *Oncology Nursing Forum* vol. 34, 2007, p. 488; R. Donatelle (et al.), “Randomised Controlled Trial Using Social Support and Financial Incentives for High Risk Pregnant Smokers: Significant Older Supporter (SOS) Program.” *Tobacco Control* vol. 9, 2000, pp. 67-69; E. Finkelstein (et al.), “A Randomized Study of Financial Incentives to Increase Physical Activity Among Sedentary Older Adults,” *Preventive Medicine*, vol. 47, 2008, pp. 182-187; R. Glasgow (et al.), “Results of a Year-Long Incentives-Based Worksite Smoking-Cessation Program,” *Addictive Behaviors*, vol.18, 1993, pp. 455-464; L. A. Jason (et al.), “Assessing a Smoking Cessation Intervention Involving Groups, Incentives and Self-Help Manuals,” *Behavior Therapy*, vol. 26, 1995, pp. 393-408; L. A. Jason (et al.), “A Worksite Smoking Intervention: A 2-Year Assessment of Groups, Incentives and Self-Help,” *Health Education Research*, vol. 12, 1997, pp. 129-138; R. Jeffery (et al.), “Correspondence Programs for Smoking Cessation and Weight Control: A Comparison of Two Strategies in the Minnesota Heart Health Program,” *Health Psychology*, vol. 9, 1990, pp. 585-598; R. W. Jeffery (et al.), “The Healthy Worker Project: A Worksite Intervention for Weight Control and Smoking Cessation,” *American Journal of Public Health*, vol. 83, 1993, pp. 395-401; C. Malotte (et al.), “Tuberculosis Screening and Compliance with Return for Skin Test Reading Among Active Drug Users,” *American Journal of Public Health*, vol. 88, 1998, pp. 792-796; C. Malotte (et al.), “Monetary versus Nonmonetary Incentives for TB Skin Test Reading Among Drug Users,” *American Journal of Preventive Medicine*, vol. 16, 1999, pp.182-188; M. P. Nowalk (et al.), “Improving Influenza Vaccination Rates in the Workplace,” *American Journal of Preventive Medicine*, vol. 38, 2010, pp. 237-246; M. Stitzer (et al.), “Drug User’s Adherence to a 6-Month Vaccination Protocol: Effects of Motivational Incentives,” *Drug and Alcohol Dependence*, vol. 107, 2010, pp. 76-79; M. Stitzer and G. Bigelow, “Contingent Payment for Carbon Monoxide Reduction: Effects of Pay Amount,” *Behavior Therapy*, vol. 14, 1983 pp. 647-656; M. Stitzer and G. Bigelow, “Contingent Reinforcement for Reduced Breath Carbon Monoxide Levels: Target-Specific Effects on Cigarette Smoking,” *Addictive Behaviors*, vol. 10, 1985, pp. 345-349; K. Volpp (et al.), “A Randomized Controlled Trial of Financial Incentives for Smoking Cessation,” *Cancer Epidemiology, Biomarkers and Prevention*, vol.15, 2006, pp. 12-18; K. Volpp (et al.), “A Randomized Controlled Trial of Financial Incentives for Smoking Cessation. The *New England Journal of Medicine*, vol. 360, 2009, pp. 699-709; R. Windsor (et al.), “The Effectiveness of a Worksite Self-Help Smoking Cessation Program: A Randomized Trial,” *Journal of Behavioral Medicine*, vol. 11, 1988, pp. 407-421.

⁵ As above, p. 3.

behaviours (i.e. smoking cessation, attendance for vaccinations or screening) as well as when all behaviours were combined. There was no clear evidence that HPFI were more effective for ‘simple’ behaviours (e.g. attendance for vaccination or screening) than ‘complex’ ones (e.g. smoking cessation).”⁶ The same research team concluded in another paper this: “there is a growing body of research on the effectiveness of financial incentive interventions for helping individuals to change their health behaviours...[but] wide variations in the nature of these interventions make it difficult to draw firm conclusions about what makes an effective incentive, for whom and under what circumstances.”⁷

Earlier published review papers on the effectiveness of incentives, primarily financial incentives for enhancing health, have generally concluded that at least in the short-term, there was a positive impact upon adherence. Thus, a survey of 11 papers by Giuffrida and Torgerson in 1997 concluded that 10 out of the 11 papers examined had trials which found that financial incentives were of benefit.⁸ Furthermore, Wall (et al.), reviewed randomised controlled trials of the effect of financial incentives on food purchases, food consumption and weight loss, and found a positive effect from financial incentives, although, as is a common problem with studies in this field, the trials were of short duration and with small sample sizes.⁹

Martin (et al.) conducted a systematic survey of the literature on the impact of financial incentives on active travel, including incentives to promote the

⁶ As above, p. 12.

⁷ J. Adams (et al.), “Carrots, Sticks and Health Behaviours: A Framework for Documenting the Complexity of Financial Incentive Interventions to Change Health Behaviours,” *Health Psychology Review*, vol. 8, 2014, pp. 286-296, cited p. 287.

⁸ A. Giuffrida and D. J. Torgerson, “Should We Pay the Patient? Review of Financial Incentives to Enhance Patient Compliance,” *British Medical Journal*, vol. 315, 1997, pp. 703-707.

⁹ J. Wall (et al.), “Effectiveness of Monetary Incentives in Modifying Dietary Behavior: A Review of Randomized, Controlled Trials,” *Nutrition Reviews*, vol. 64, 2006, pp. 518-531; K. Volpp (et al.), “Financial Incentive-Based Approaches for Weight Loss: A Randomized Trial,” *JAMA*, vol. 300, 2008, pp. 2631-2637; N. M. Ries, “Financial Incentives for Weight Loss and Healthy Behaviours,” *Health Policy*, vol. 7, 2012, pp. 23-28.

increased use of bicycles for transport, to increase exercise levels, finding that financial incentives have great potential in promoting walking and cycling.¹⁰ One notable study cited in that review, is that of a randomised controlled study of Swedish women with abdominal obesity, which found a significant increase in the proportion of women undertaking cycling for more than 2 km per day, after a period of 18 months.¹¹

Financial incentives also proved to increase exercise session attendance, in a meta-analysis of 11 studies, undertaken by Mitchell (et al.),¹² and financial incentives were effective in a more recent study of increasing physical activity among overweight and obese adults.¹³ A review of financial incentives and weight control, of studies published between 1972 and 2010, found evidence generally for positive effects,¹⁴ but post-financial incentive studies were lacking and evidence of

¹⁰ A. Martin (et al.), “Financial Incentives to Promote Active Travel: An Evidence Review and Economic Framework,” *American Journal of Preventive Medicine*, vol. 43, 2012, pp. e45-e57. Another systematic review: C. C. M. Molema (et al.), “A Systematic Review of Financial Incentives Given in the Healthcare Setting: Do They Effectively Improve Physical Activity Levels?” *BMC Sports Science, Medicine and Rehabilitation* (2016): doi: 10.1186/s13102-016-0041-1, examined 1,395 papers published up until April 2015, but only three studies were included in the review, based on the exclusion reasons such as no individual study, no prospective study design, lack of an outcome measure and no incentives for an individual. The limited studies meant that no solid conclusions could be drawn. By contrast, the more recent study by J. C. M. Barte and G. C. Wanda Wendel-Vos, “A Systematic Review of Financial Incentives for Physical Activity: The Effects on Physical Activity and Related Outcomes,” *Behavioral Medicine*, October 2, 2015, pp. 1-12, found that unconditional incentives did not affect physical activity, while rewards had some positive effects, but the long-term effects of financial incentives were not known.

¹¹ E. Hemmingsson (et al.), “Increased Physical Activity in Abdominally Obese Women Through Support for Changed Commuting Habits: A Randomised Clinical Trial,” *International Journal of Obesity*, vol. 33, 2009, pp. 645-652.

¹² M. S. Mitchell (et al.), “Financial Incentives for Exercise Adherence in Adults: Systematic Review and Meta-Analysis,” *American Journal of Preventive Medicine*, vol. 45, 2013, pp. 658-667; M. S. Mitchell (et al.), “The Feasibility of Financial Incentives to Increase Exercise Among Canadian Cardiac Rehabilitation Patients,” *Journal of Cardiopulmonary Rehabilitation and Prevention*, vol. 36, 2016, pp. 28-32.

¹³ M. S. Patel (et al.), “Framing Financial Incentives to Increase Physical Activity Among Overweight and Obese Adults,” *Annals of Internal Medicine*, vol. 164, 2016, pp. 385-394; M. A. Farooqui (et al.), “Effects of Financial Incentives on Motivating Physical Activity Among Older Adults: Results from a Discrete Choice Experiment,” *BMC Public Health*, February 10, 2014; doi: 10.1186/1471-2458-14-141.

¹⁴ R. W. Jeffery, “Financial Incentives and Weight Control,” *Preventive Medicine*, vol. 55, 2012, pp. s61-s67; E. A. Finkelstein (et al.), “A Pilot Study Testing the Effect of Different Levels of

the long-term efficiency of financial incentives, after the incentive had been withdrawn, were found to be lacking.¹⁵

In a PhD thesis by M. Mitchell (2015),¹⁶ a comprehensive examination of the evidence of the use of incentives to promote long-term (>6 months) exercise adherence for cardiac rehabilitation, was conducted along with a meta-analysis of randomised trials. It was concluded from this research that incentives increased exercise adherence 80 percent of the time, with 12 percent on average, although the effectiveness of incentive programs was influenced by the design of the programs.¹⁷

Financial and other reward-based incentives have been successful in motivating “single shot” behavioural changes.¹⁸ A literature review on conditional and unconditional financial incentives for improving movement through the HIV treatment cascade, based on observational studies and one randomised study, indicate that financial incentives improve uptake of HIV testing and HIV test result

Financial Incentives on Weight Loss Among Overweight Employees,” *Journal of Occupational and Environmental Medicine*, vol. 49, 2007, pp. 981-989.

¹⁵ L. K. John (et al.), “Empirical Observations on Long-Term Use of Incentives for Weight Control,” *Preventive Medicine*, vol. 55, 2012, pp. s68-s74.

¹⁶ M. S. Mitchell, *Financial Health Incentives in Cardiac Rehabilitation*, PhD Thesis, Graduate Department of Exercise Sciences, University of Toronto, 2015.

¹⁷ As above, p. ii.

¹⁸ J. Q. Purnell (et al.), “A Systematic Review of Financial Incentives for Dietary Behavior Change,” *Journal of the Academy of Nutrition and Dietetics*, vol. 114, 2014, pp. 1023-1035; K. Cahill and R. Perera, “Competitions and Incentives for Smoking Cessation,” *Cochrane Database of Systematic Reviews*, (4), 2011: CD004307; K. Sutherland (et al.), “Impact of Targeted Financial Incentives on Personal Health Behavior: A Review of the Literature,” *Medical Care Research and Review*, vol. 65, 2008 (Suppl.), pp. s36-s78; R. Chunara (et al.), “Online Reporting for Malaria Surveillance Using Micro-Monetary Incentives, in Urban India,” *Malaria Journal*, vol. 11, 2012, p. 43; T. R. Talbot (et al.), “Sustained Improvement in Hand Hygiene Adherence: Utilizing Shared Accountability and Financial Incentives,” *Infection Control and Hospital Epidemiology*, vol. 34, 2013, pp. 1129-1136; M. Simunovic (et al.), “Uptake and Patient Outcomes of Laparoscopic Colon and Rectal Cancer Surgery in a Publicly Funded System and Following Financial Incentives,” *Annals of Surgical Oncology*, vol. 20, 2013, pp. 3740-3746.

receipt.¹⁹ There were, however, no significant results beyond the end of the financial incentive period.

Similar results were found for short-term effectiveness, but a lack of long-term evidence for STD infection testing uptakes in a clinical setting;²⁰ in the use of incentives and enablers to improve adherence to tuberculosis treatment;²¹ to improve treatment enrolment and re-enrolment rates in a syringe exchange program for IV drug users,²² and to enhance the adherence to the Hepatitis B vaccine among IV drug users.²³ As well, DeFulio and Silverman conducted a systematic review of peer-reviewed empirical studies of the use of incentives for patient medication adherence. They found few controlled studies, but the available evidence suggested that incentive-based medication adherence interventions were promising.²⁴

¹⁹ I. V. Bassett (et al.), “Financial Incentives to Improve Progression Through the HIV Treatment Cascade,” *Current Opinion in HIV and AIDS*, vol. 10, 2015, pp. 451-463; A. Pettifor (et al.), “Can Money Prevent the Spread of HIV? A Review of Cash Payments for HIV Prevention,” *AIDS and Behavior*, vol. 16, 2012, pp. 1729-1738; M. Arrivillaga and J. P. Salcedo, “A Systematic Review of Microfinance-Based Interventions for HIV/Aids Prevention,” *AIDS Education and Prevention*, vol. 26, 2014, pp. 13-27.

²⁰ R. Lee (et al.), “Incentivizing HIV/STI Testing: A Systematic Review of the Literature,” *AIDS and Behavior*, vol. 18, 2014, pp. 905-912.

²¹ E. E. Lutge (et al.), “Incentives and Enablers to Improve Adherence in Tuberculosis (Review),” *Cochrane Database of Systematic Reviews*, Issue 9, 2015, Art. No.: CD007952. Financial incentives were found to be superior to active outreach for latent TB treatment in drug users: C. K. Malotte (et al.), “Incentives vs Outreach workers for Latent Tuberculosis Treatment in Drug Users,” *American Journal of Preventive Medicine*, vol. 20, 2001, pp. 103-107; A. Sripad (et al.), “Effects of Ecuador’s National Monetary Incentive Program on Adherence to Treatment for Drug-Resistant Tuberculosis,” *International Journal of Tuberculosis and Lung Disease*, vol. 18, 2014, pp. 44-48.

²² M. Kidorf (et al.), “Improving Treatment Enrolment and Re-Enrollment Rates of Syringe Exchangers: 12 Month Outcomes,” *Drug and Alcohol Dependence*, vol. 124, 2012, pp. 162-166.

²³ K. H. Seal (et al.), “A Randomized Controlled Trial of Monetary Incentives vs. Outreach to Enhance Adherence to the Hepatitis B Vaccine Series Among Injection Drug Users,” *Drug and Alcohol Dependence*, vol. 71, 2003, pp. 127-131; L. Top (et al.), “A Randomised Control Trial of Financial Incentives to Increase Hepatitis B Vaccine Completion Among People Who Inject Drugs in Australia,” *Preventive Medicine*, vol. 54, 2013, pp. 297-303.

²⁴ A. DeFulio and K. Silverman, “The Use of Incentives to Reinforce Medication Adherence,” *Preventive Medicine*, vol. 55, 2012, pp. s86-s94.

Petry (et al.), did review 15 RCTs and six non-RCTs relating to financial reinforcers for the improvement of medication adherence, and concluded from a meta-analysis that financial incentives were effective.²⁵ Financial incentives have had short-term success in improving medication adherence, and to complete everyday tasks, in patients with schizophrenia and other psychoses, but again, studies have been short-term.²⁶

There are a number of other simple behavioural changes where financial incentives have proved to be effective. A small sample of studies are as follows:

- (1) an increase use of adult immunisation and cancer screening services;²⁷
- (2) an increased fruit juice consumption among low income pregnant women, by offering vouchers redeemable for fruit juice;²⁸

²⁵ N. M. Petry (et al.), “Financial Reinforcers for Improving Medication Adherence: Findings from a Meta-Analysis,” *American Journal of Medicine*, vol. 125, 2012, pp. 888-896.

²⁶ S. Priebe (et al.), “Effectiveness of Financial Incentives to Improve Adherence to Antipsychotic Maintenance Treatment with Antipsychotics: Cluster Randomised Controlled Trial,” *British Medical Journal*, vol. 347, 2013: f 5847; K. Moran and S. Priebe, “Better Quality of Life in Patients Offered Financial Incentives for Taking Anti-Psychotic Medication: Linked to Improved Adherence or More Money?” *Quality of Life Research*, vol. 25, 2016, pp. 1897-1902; E. Highton-Williamson (et al.), “Offering Financial Incentives to Increase Adherence to Antipsychotic Medication: The Clinician Experience,” *Journal of Clinical Psychopharmacology*, vol. 35, 2015, pp. 120-127; H. Pavlickova (et al.), “The Effect of Financial Incentives on Adherence to Antipsychotic Depot Medication: Does it Change Over Time?” *Journal of Clinical Psychiatry*, vol. 76, 2015, pp. e1029-e1034; C. Henderson (et al.), “Cost-Effectiveness of Financial Incentives to Promote Adherence to Depot Antipsychotic Medication: Economic Evaluation of a Cluster-Randomised Controlled Trial,” *PLoS One*, October 8, 2015; doi: 10.1371/journal.pone.0138816; R. Michalczuk and A. Mitchell, “Monetary Incentives for Schizophrenia,” *Cochrane Database of Systematic Reviews*, October 2009: CD007626; J. I. Robison, “To Reward? ... Or Not to Reward? Questioning the Wisdom of Using External Reinforcement in Health Promotion Programs,” *American Journal of Health Promotion*, vol. 13, 1998, pp. 1-3.

²⁷ E. E. Stone (et al.), “Interventions that Increase Use of Adult Immunization and Cancer Screening Services: A Meta-Analysis,” *Annals of Internal Medicine*, vol. 136, 2002, pp. 641-651.

²⁸ M. L. Burr (et al.), “The Effects of Dietary Advice and Vouchers on the Intake of Fruit and Fruit Juice by Pregnant Women in a Deprived Area: A Controlled Trial,” *Public Health Nutrition*, vol. 10, 2007, pp. 559-565.

- (3) increased adherence with outpatient HIV testing referrals from the emergency department;²⁹
- (4) an increase in low-income African Americans to attend appointments for treatment of depression;³⁰
- (5) increased employee participation in a worksite wellness program for the control of diabetes;³¹
- (6) an increase in the uptake of mammograms in low-income women aged 40-64 years;³²
- (7) the increased completion of a HPV vaccination program among 16-to 18-year-old girls, although the uptake was lower than the national target, but incentives still increased uptake of the vaccine by 10 percent;³³
- (8) improved adherence to isoniazid prophylaxis preventive therapy for tuberculosis among homeless adults in San Francisco;³⁴
- (9) an increase response rate to various health surveys and research;³⁵

²⁹ J. S. Haukoos (et al.), “The Effect of Financial Incentives on Adherence with Outpatient Human Immunodeficiency Virus Testing Referrals from the Emergency Department,” *Academic Emergency Medicine*, vol. 12, 2005, pp. 17-21.

³⁰ E. Post (et al.), “Incentive Payments for Attendance at Appointments for Depression Among Low-Income African Americans,” *Psychiatric Services*, vol. 57, 2006, p. 414-416.

³¹ A. D. Misra-Hebert (et al.), “Financial Incentives and Diabetes Disease Control in Employees: A Retrospective Cohort Analysis,” *Journal of General Internal Medicine*, vol. 31, 2016, pp. 871-877.

³² J. S. Slater (et al.), “Effect of Direct Mail as a Population-Based Strategy to Increase Mammography Use Among Low-Income Underinsured Women Ages 40 to 64 Years,” *Cancer Epidemiology, Biomarkers and Prevention*, vol. 14, 2005, pp. 2346-2352.

³³ E. Mantzari and F. Vogt, “Financial Incentives for Increasing Uptake of HPV Vaccines: A Randomized Controlled Trial,” *Health Psychology*, vol. 34, 2015, pp. 160-171.

³⁴ J. Peterson Tulskey (et al.), “Adherence to Isoniazid Prophylaxis in the Homeless,” *Archives of Internal Medicine*, vol. 160, 2000, pp. 697-702.

³⁵ M. C. David and R. S. Ware, “Meta-Analysis of Randomized Controlled Trials Supports the Use of Incentives for Inducing Response to Electronic Health Surveys,” *Journal of Clinical Epidemiology*, September 9, 2014, pii:s50895-4356(14)00327-8; J. P. Bentley and P. G. Thacker, “The Influence of Risk and Monetary Payment on the Research Participation Decision Making Process,” *Journal of Medical Ethics*, vol. 30, 2004, pp. 293-298; P. Edwards (et al.), “Meta-Analysis of Randomised Trials of Monetary Incentives and Response to Mailed Questionnaires,” *Journal of Epidemiology and Community Health*, vol. 59, 2005, pp. 987-999.

- (10) inducing disability insurance (DI) recipients, aged between 18 and 49 years, to return to work;³⁶
- (11) a modest increase in the uptake of voluntary medical male circumcision in Kenya;³⁷
- (12) financial incentives were effective in reducing plasma HIV RNA load by ART adherence in HIV patients;³⁸
- (13) small financial incentives enhanced enrolment and participation in clinic-based HIV/STD prevention counselling;³⁹
- (14) financial incentives plus motivational interviewing significantly improved virological and immunological outcomes in a sample of adolescents with perinatal HIV;⁴⁰
- (15) financial incentives in the form of vouchers, led to a small but significant increase in chlamydia screening coverage in Primary Care Trusts (PCTs) in England;⁴¹

³⁶ A. R. Kostøl and M. Mogstad, “How Financial Incentives Induce Disability Insurance Recipients to Return to Work,” *American Economic Review*, vol. 104, 2014, pp. 624-655.

³⁷ H. Thirumurthy (et al.), “Effect of Providing Conditional Economic Compensation on Uptake of Voluntary Male Circumcision in Kenya: A Randomized Clinical Trial,” *JAMA*, vol. 312, 2014, pp. 703-711.

³⁸ S. Farber (et al.), “A Study of Financial Incentives to Reduce Plasma HIV RNA Among Patients in Care,” *AIDS and Behavior*, vol. 17, 2013, pp. 2293-2300.

³⁹ M. L. Kamb (et al.), “What About Money? Effect of Small Monetary Incentives on Enrolment, Retention, and Motivation to Change Behaviour in a HIV/STD Prevention Counselling Intervention,” *Sexually Transmitted Infections*, vol. 74, 1998, pp. 253-255.

⁴⁰ C. Foster (et al.), ““Payment by Results” – Financial Incentives and Motivational Interviewing, Adherence Interventions in Young Adults with Perinatally Acquired HIV-1 Infection: A Pilot Program,” *AIDS Patient Care and STDs*, vol. 28, 2014, pp. 28-32.

⁴¹ D. Zenner (et al.), “Should Young People be Paid for Getting Tested? A National Comparative Study to Evaluate Patient Financial Incentives for Chlamydia Screening,” *BMC Public Health*, vol. 12, 2012:261;doi: 10.1186/1471-2458-12-261. See also C. Niza (et al.), “Vouchers Versus Lotteries: What Works Best in Promoting Chlamydia Screening? A Cluster Randomised Control Trial,” *Applied Economic Perspectives and Policy*, vol. 36, 2014, pp. 109-124, where in a trial involving a voucher vs a £200 lottery, for students aged 18-24 years, it was found that the lottery increased chlamydia screening to 2.8 percent, but the voucher by 22.8 percent.

- (16) cash incentives given to women in Nepal, to give birth in health facilities led to a modest 17 percent increase in uptake;⁴²
- (17) small rewards increased fruit and vegetable consumption in elementary-school children,⁴³ increased the purchase of fresh fruit in low-income households,⁴⁴ and in a South African study, financial incentives in the form of a 25 percent cash-back rebate for healthy food purchases in supermarkets, led to an increase in the ratio of healthy to total food expenditure by 6 percent, an increase in the ratio of fruit and vegetables to total food expenditure by 5.7 percent, and a decrease of the ratio of less healthy food to total food expenditure by 5.6 percent.⁴⁵

The evidential situation involving incentives for health enhancing programs and more complex behaviours, such as addictive behavior, including smoking, is more complex. Although cigarette smokers respond less than non-smokers to non-drug incentives,⁴⁶ there are numerous short-term studies that have found that primarily financial incentives aid in promoting smoking cessation,⁴⁷ and that financial incentives

⁴² T. Powell-Jackson and K. Hanson, “Financial Incentives for Maternal Health: Impact of a National Programme in Nepal,” *Journal of Health Economics*, vol. 31, 2012, pp. 271-284.

⁴³ D. Just and J. Price, “Default Options, Incentives and Food Choices: Evidence from Elementary-School Children,” *Public Health Nutrition*, vol. 16, 2013, pp. 2281-2288.

⁴⁴ E. J. Phipps (et al.), “The Use of Financial Incentives to Increase Fresh Fruit and Vegetable Purchases in Low-Income Households: Results of a Pilot Study,” *Journal of Health Care for the Poor and Underserved*, vol. 24, 2013, pp. 864-874. See also S. Lindsay (et al.), “Monetary Matched Incentives to Encourage the Purchase of Fresh Fruits and Vegetables at Farmers’ Markets in Underserved Communities,” *Preventing Chronic Disease*, vol. 10, 2013: e188.

⁴⁵ R. Sturm (et al.), “A Cash-Back Rebate Program for Healthy Food Purchases in South Africa: Results from Scanner Data,” *American Journal of Preventive Medicine*, vol. 44, 2013, pp. 567-572.

⁴⁶ S. J. Wilson (et al.), “Weak Ventral Striatal Responses to Monetary Outcomes Predict an Unwillingness to Resist Cigarette Smoking,” *Cognitive, Affective and Behavioral Neuroscience*, vol. 14, 2014, pp. 1196-1207.

⁴⁷ S. C. Sigmon and M. E. Patrick, “The Use of Financial Incentives in Promoting Smoking Cessation,” *Preventive Medicine*, vol. 55 (Supp.), 2012, pp. s24-s32; C. H. Yu (et al.), “Incentivizing Health Care Behaviors in Emerging Adults: A Systematic Review,” *Patient Preference and Adherence*, vol. 10, 2016, pp. 371-38; S. D. Halpern (et al.), “Randomized Trial of Four Financial-Incentive Programs for Smoking Cessation,” *New England Journal of Medicine*, vol. 372, 2015, pp. 2108-2117; M. S. Businelle (et al.), “Small Financial Incentives Increase

were more effective than health messages alone to motivate smoking cessation.⁴⁸ Financial incentives have also been effective for smoking cessation among pregnant and newly postpartum women, including economically disadvantaged pregnant smokers.⁴⁹

However, even where cash incentives increased smoking cessation rates, there were high relapse rates.⁵⁰ For example, while financial incentives were successful in smoking cessation in one study based in Thailand, cessation tapered off after 14 months.⁵¹ A review of other studies, found that financial incentives did not enhance long-term smoking cessation.⁵² A comprehensive review of the evidence of the effectiveness of financial incentives for long-term smoking cessation by Troxel (et al.), concluded: “the existing evidence on financial incentives and smoking cessation is quite limited, and

Smoking Cessation in Homeless Smokers: A Pilot Study,” *Addictive Behaviors*, vol. 39, 2014, pp. 717-720; K. Volpp (et al.), “A Randomized, Controlled Trial of Financial Incentives for Smoking Cessation,” *New England Journal of Medicine*, vol. 360, 2009, pp. 699-709; J. S. White (et al.), “Commitment Contracts and Team Incentives: A Randomized Control Trial for Smoking Cessation in Thailand,” *American Journal of Preventive Medicine*, vol. 45, 2013, pp. 533-542; R. O’Connor (et al.), “Financial Incentives to Promote Smoking Cessation: Evidence from 11 Quit and Win Contests,” *Journal of Public Health Management and Practice*, vol. 12, 2006, pp. 44-51; L. Robertson (et al.), “Perceptions of Financial Incentives for Smoking Cessation: A Survey of Smokers in a Country with an Endgame Goal,” *Nicotine and Tobacco Research*, December 15, 2017: doi: 10.1093/ntr/ntx268. A systematic review of 17 trials on smoking cessation by K. Cahill and R. Perera, “Competitions and Incentives for Smoking Cessation,” *Cochrane Database of Systematic Reviews*, (4), 2008: CD004986, did not find that incentives resulted in a higher smoking cessation rate, although only small incentives were used, and the trials were all “underpowered.” Other trials, with larger financial incentives, have been more promising, with significant quit rates at one year e.g. Volpp (et al., 2009), cited above in this note.

⁴⁸ J. L. Sindelar and S. S. O’Malley, “Financial Versus Health Motivation to Quit Smoking: A Randomized Field Study,” *Preventive Medicine*, vol. 59, 2014, pp. 1-4.

⁴⁹ S. T. Higgins and L. J. Solomon, “Some Recent Developments on Financial Incentives for Smoking Cessation Among Pregnant and Newly Postpartum Women,” *Current Addiction Reports*, vol. 3, 2016, pp. 9-18; D. J. Murphy, “Financial Rewards for Pregnant Smokers Who Quit,” *British Medical Journal*, vol. 350, 2015: h297; doi: 10.1136/bmj.h297; D. Tappan (et al.), “Financial Incentives for Smoking Cessation in Pregnancy: Randomised Controlled Trial,” *British Medical Journal*, vol. 350, 2015: h134.

⁵⁰ K. Volpp (et al.), “A Randomized, Controlled Trial of Financial Incentives for Smoking Cessation,” *New England Journal of Medicine*, vol. 360, 2009, pp. 699-709.

⁵¹ J. S. White (et al.), “Commitment Contracts and Team Incentives: A Randomized Controlled Trial for Smoking Cessation in Thailand,” *American Journal of Preventive Medicine*, vol. 45, 2013, pp. 533-542.

⁵² K. Hey and R. Perera, “Competitions and Incentives for Smoking Cessation (Review),” *Cochrane Database of Systematic Reviews*, Issue 2, 2005, Art. No.: CD004307.

the preponderance of negative studies is potentially quite misleading. None of the studies had sufficient statistical power to detect differences in smoking cessation rates anywhere near the minimum threshold of clinical significance, as most could not detect even a doubling or tripling of rates. Summaries of the literature really should highlight that the effectiveness of incentives for longer-term cessation remains a largely open question. The studies that have been conducted to date provide a good illustration of the common maxim, “Absence of evidence is not evidence of absence.” Rather than proving a lack of effectiveness, the studies to date simply have been inadequately powered to address the question of whether incentives increase long-term smoking cessation rates.”⁵³

This fundamental point about the lack of evidence of long-term effects of incentives, has been made by other researchers in a wide range of areas of study, such as weight control;⁵⁴ adherence to antipsychotic maintenance medication;⁵⁵ the failure of the UK’s P4P program to use financial incentives to achieve improvements in hypertension outcomes;⁵⁶ as well as numerous other studies where financial incentives were not effective, even in the short term, of enhancing health behaviours.⁵⁷

⁵³ A. B. Troxel (et al.), “Effectiveness of Financial Incentives for Longer-Term Smoking Cessation: Evidence of Absence or Absence of Evidence?” *American Journal of Health Promotion*, vol. 26, 2012, pp. 204-207, cited pp. 205-206.

⁵⁴ V. Paul-Ebhohimhen and A. Avenell, “A Systematic Review of the Use of Financial Incentives in Treatments for Obesity and Overweight,” *Obesity Reviews*, vol. 9, 2008, pp. 355-367.

⁵⁵ S. Priebe (et al.), “Financial Incentives to Improve Adherence to Antipsychotic Maintenance Medication in Non-Adherent Patients: A Cluster Randomised Controlled Trial,” *Health Technology Assessment*, vol. 20, 2016, pp. 1-122. “Once the incentives stop, the advantage is not maintained.” (p. vi)

⁵⁶ J. Wu, “Rewarding Healthy Behaviors – Pay Patients for Performance,” *Annals of Family Medicine*, vol. 10, 2012, pp. 261-263.

⁵⁷ N. Stocks (et al.), “Improving Attendance for Cardiovascular Risk Assessment in Australian General Practice: An RCT of a Monetary Incentive for Patients,” *BMC Family Practice*, vol. 13, 2012:54; E. Lutge (et al.), “Economic Support to Improve Tuberculosis Treatment Outcomes in South Africa: A Pragmatic Cluster-Randomized Controlled Trial,” *Trials*, vol. 14, 2013; doi: 10.1186/1745-6215-14-154; P. Dolan and C. Rudisill, “The Effect of Financial Incentives on Chlamydia Testing Rates: Evidence from a Randomized Experiment,” *Social Science and Medicine*, vol. 105, 2014, pp. 140-148; S. Wigham (et al.), “Parental Financial Incentives for Increasing Preschool Vaccination Uptake: Systematic Review,” *Pediatrics*, vol. 134, 2014, pp. e1117-e1128; J. T. Hultgren (et al.), “A Mixed-Methods Randomized Controlled Trial of Financial Incentives and Peer networks to Promote Walking Among Older Adults,” *Health Education and Behavior*, vol. 41 (1, Supp.), 2014, 43s-50s; H. M. Choe (et al.), “Impact of Patient Financial

It has been argued in the literature that although there is a general problem with financial and other reward-based incentives for enhancing health behaviours, for the long-term maintenance of changes, there are examples of positive health changes being maintained after the incentives have been withdrawn.⁵⁸ Examples include sustained smoking cessation rates six months after the incentive was removed,⁵⁹ and group-based incentives for weight loss, sustained six months after the incentive had been withdrawn.⁶⁰

Thus, while there is a small quantity of evidence indicating that in some instances health behaviour changes can be maintained after the incentive has been withdrawn, in general, the vast majority of evidence points against this, and this is a matter that requires further investigation.⁶¹

The Limits of Incentives for Promoting Healthy Behaviour

The general failure of incentive programs to produce sustainable long-term health behaviour changes may be due to the operation of a variety of factors, which may in

Incentives on Participation and Outcomes in a Statin Pill-Splitting Program,” *American Journal of Managed Care*, vol. 13, 2007, pp. 298-304; S. Kanters (et al.), “Interventions to Improve Adherence to Antiretroviral Therapy: A Systematic Review and Network Meta-Analysis,” *The Lancet HIV*, vol. 4, 2017, pp. e31-e40; J. C. Lo, “Financial Incentives Do Not Always work – An Example of Cesarean Sections in Taiwan,” *Health Policy*, vol. 88, 2008, pp. 121-129.

⁵⁸ M. C. Lynagh (et al.), “Keeping the ‘Goose’ on the Menu: Response to Commentaries on Financial Incentives in Health Behaviour Change,” *International Journal of Behavioral Medicine*, vol. 21, 2014, pp. 206-209.

⁵⁹ K. Volpp (et al.), “A Randomized, Controlled Trial of Financial Incentives for Smoking Cessation,” *New England Journal of Medicine*, vol. 360, 2009, pp. 699-709; S. T. Higgins (et al.), “A Pilot Study on Voucher-Based Incentives to Promote Abstinence from Cigarette Smoking During Pregnancy and Postpartum,” *Nicotine and Tobacco Research*, vol. 6, 2004, pp. 1015-1020.

⁶⁰ J. T. Kullgren (et al.), “Individual-Versus Group-Based Financial Incentives for Weight Loss: A Randomized, Controlled Trial,” *Annals of Internal Medicine*, vol. 158, 2013, pp. 505-514.

⁶¹ Studies on the alleged long-term sustainability of the health benefits from incentives, face as well the general statistical problem common to all the studies in this field, and most of the social sciences, of small sample sizes and trials of limited duration: S. A. Newell (et al.), “A Critical Review of Interventions to Increase Compliance with Medication-Taking, Obtaining Medication Refills, and Appointment-Keeping in the Treatment of Cardiovascular Disease,” *Preventive Medicine*, vol. 29, 1999, pp. 535-548; J. P. A. Ioannidis, “Why Most Published Research Findings are False,” *PLOS Medicine*, vol. 2, 2005: e124.

themselves compound and interact. First, there are always specific *contextual* factors which may have led to a failure.

For example, in a 2009 Scottish smoking cessation program which offered a weekly financial incentive of £12.50 over a 12-week period, a significant proportion of the registered participants dropped out, with many failing to even collect the financial incentive.⁶² A follow-up interview of 14 individuals found that the use of incentives had changed the individuals' perception of the client/health professional relationship by producing a sense of obligation on the part of the participants, so that the client effectively became the provider and was now being paid to quit smoking, thus making the relationship quasi-contractual. When participants failed to perform, they had an enhanced sense of guilt, and shame, post-relapse. Thus, they were reluctant to continue in the program. This is a case of the undermining of intrinsic motivation (motivational crowding).⁶³ There seems to be little that can be done in such situations and financial incentives, and perhaps all other reward-based incentives, may not be appropriate to use in such cases. A discussion of motivational crowding and incentives will be given later in this work.

From the perspective of behaviourism, it is not unusual for the failure of financial incentives to fail to produce long-term reinforcement, for if the reinforcing reward is withdrawn, the behaviour is predicted to cease, the technique of extinction.⁶⁴ In almost all trials, financial incentives are withdrawn, so it is expected that the behaviour would not persist. As Johnson and Sniehotta note, this is not a problem for short-term behaviours, such as attendance at medical appointments, or to meet some clearly defined vaccination schedule, but it is a problem for behaviours that need to endure for a lifetime:

⁶² C. Allan (et al.), "Paying the Price for an Incentive: An Exploratory Study of Smokers' Reasons for Failing to Complete an Incentives Based Smoking Cessation Scheme," *Journal of Health Services Research and Policy*, vol. 17, 2012, pp. 212-218.

⁶³ B. S. Frey and R. Jegen, "Motivation Crowding Theory: A Survey of Empirical Evidence," CESifo Working Paper No. 245, January 2000, at https://www.econstor.eu/bitstream/10419/75604/1/cesifo_wp245.pdf.

⁶⁴ M. Johnson and F. Sniehotta, "Financial Incentives to Change Patient Behaviour," *Journal of Health Services Research and Policy*, vol. 15, 2010, pp. 131-132, cited p. 132.

For lifelong behaviours one is seeking a change which becomes automatic and habitual, not requiring conscious decisions and self-regulatory effort. Dual process models theorize that not all behaviours are controlled by such conscious effortful processes. Much of our daily behaviour is controlled by associative rather than deliberative processes which we may be unaware of. In particular, habitual behaviours do not require conscious, motivated, intentional control but may nevertheless be established through repeated performance of initially motivated, intentional behaviours. Consequently, one might expect financial incentives to enable the development of the desired behaviours via conscious, intentional processes. However, for these behaviours to become secure ‘habits,’ extended periods of incentives with diminishing awareness of the incentives would be needed. Otherwise, awareness would draw the habit back into management by conscious, intentional control mechanisms.⁶⁵

Strack and Deutsch⁶⁶ hypothesise that human social behaviour is a product of two interacting systems: a reflective system, based on knowledge, facts and reasoning, and an impulsive system, based on emotions, urges and motivational orientations. This roughly corresponds to the ancient philosophical distinction between “reason” and the “passions,” although the Western philosophical tradition from Aristotle (384-323 BC), through to contemporary Anglo-American analytic philosophy,⁶⁷ has tended to accept that humans are “rational” animals, who by virtue of their cognitive and reasoning faculties are able to recognise what is best for themselves, and act to achieve it. Some philosophers though, such as David Hume (1711-1776),⁶⁸ Arthur Schopenhauer (1788-1860), Friedrich Nietzsche (1844-1900), and philosophers and artists in the German romanticism movement of the late-18th and early 19th centuries, rejected the view that human nature was essentially rational.⁶⁹ Psychology though has been more heavily influenced by developments in the biological sciences than classical philosophy,

⁶⁵ As above.

⁶⁶ F. Strack and R. Deutsch, “Reflective and Impulsive Determinants of Social Behavior,” *Personality and Social Psychology Review*, vol. 8, 2004, pp. 220-247.

⁶⁷ F. Jackson, *From Metaphysics to Ethics: A Defence of Conceptual Analysis*, (Clarendon Press, Oxford, 1998).

⁶⁸ A. T. Nuyen, “David Hume on Reason, Passions and Morals,” *Hume Studies*, volume 10, 1984, pp. 26-45.

⁶⁹ M. Frank, *The Philosophical Foundations of Early German Romanticism*, (SUNY Press, Albany, 2004); W. Barrett, *Irrational Man: A Study in Existential Philosophy*, (Anchor/Doubleday, New York, 1962).

especially by Darwinian evolutionary theory, and advances in neuroscience, and has tended to view humans as primarily social animals, one species amongst others, rather than being ontologically unique.⁷⁰

Although the use of reward-based incentives, especially financial incentives, appeals to the “passions,” or in contemporary terms, motivational orientations, there is still a primary appeal to reason made, and it is implicitly assumed that people offered incentives would rationally evaluate the offers, and make a decision to comply with healthy behaviours, being nudged by the incentive. However, this assumption will not hold for individuals with addictive behaviours, which have a physiological and psychological basis, perhaps from an alteration of neural processes that enhance mesotelencephalic dopamine neurotransmission, making the brain hyper-sensitive to drug-stimuli.⁷¹ Drug cravings will thus persist despite even strong disincentives, let alone small financial incentives and with full knowledge of the physical and psychological harm that such drug consumption can do. People smoke, being fully aware, even from the information on every packet of cigarettes, that smoking contributes to a wide range of diseases, including cancer of many organs and cardiovascular disease. This is an extremely puzzling phenomenon, and however it is ultimately explained, it will certainly not be accounted for within a philosophical framework that puts rationality as the major determinant of all human actions. Consequently, the use of financial and other reward-based incentives will be limited in attempts to change addictive behaviours. Stated in an intuitive fashion, the forces of the addiction, whatever these forces are in their deep

⁷⁰ E. R. Smith and J. DeCoster, “Dual Process Models in Social and Cognitive Psychology: Conceptual Integration and Links to Underlying Memory Systems,” *Personality and Social Psychology Review*, vol. 4, 2000, pp. 108-131.

⁷¹ T. E. Robinson and K. C. Berridge, “The Neural Basis of Drug Craving: An Incentive-Sensitization Theory of Addiction,” *Brain Research Reviews*, vol. 18, 1993, pp. 247-291.

structure, may be simply too strong to be overcome by frail forces such as incentives and rewards.⁷²

In the case of addiction-behaviour, such as smoking, and drug addiction, there has been observed to be a dampened cortical response of drug-addicted individuals to financial incentives and non-drug rewards.⁷³ The prefrontal control systems, which regulate striatal reward-related processes, are of central significance in successful addiction recovery. However, neurological research indicates that addiction recovery is more complex than simply undoing the addiction processes. Recovery is a distinct process involving control over drug urges rather than directly diminishing the urges.⁷⁴

Individuals suffering from depression may also be dysphoric, having “elevated depression scores not meeting diagnostic criteria for major depression.”⁷⁵ In a study using cardiovascular reactivity to indicate effort mobilisation in undergraduates with low depression scores, and those with high depression scores, the participants worked on a cognitive task anticipating either no monetary reward or a small or a significant amount of money to complete tasks successfully. It was found that non-dysphoric subjects had a predictable linear increase as a function of reward, while dysphoric participants had a “blunted” response for all reward levels. Thus, for some people, financial and reward-based incentives may not be sufficient stimuli to achieve behaviour change.⁷⁶

⁷² G. Di Chiara, “Drug Addiction as Dopamine-Dependent Associate Learning Disorder,” *European Journal of Pharmacology*, vol. 375, 1999, pp. 13-30.

⁷³ M. A. Parvaz (et al.), “Sensitivity to Monetary Reward is Most Severely Compromised in Recently Abstaining Cocaine Addicted Individuals: A Cross-Sectional ERP Study,” *Psychiatry Research*, vol. 203, 2012, pp. 75-82.

⁷⁴ H. Garavan and K. Weiestall, “The Neurobiology of Reward and Cognitive Control Systems and Their Role in Incentivizing Health Behavior,” *Preventive Medicine*, vol. 55, 2012, pps17-s23; K. R. Luking and D. M. Barch, “Candy and the Brain: Neural Response to Candy Gains and Losses,” *Cognitive, Affective and Behavioral Neuroscience*, vol. 13, 2013, pp. 437-451; A. Vostroknutov (et al.), “Causes of Social Reward Differences Encoded in Human Brain,” *Journal of Neurophysiology*, vol. 107, 2012, pp. 1403-1412.

⁷⁵ K. Brinkman and J. Franzen, “Not Everyone’s Heart Contracts to Reward: Insensitivity to Varying Levels of Reward in Dysphoria,” *Biological Psychology*, vol. 94, 2013, pp. 263-271.

⁷⁶ As above.

One notable area where incentives, financial or otherwise, have had limited success in changing behaviour to produce patient compliance in taking medication is in schizophrenic patients. Schizophrenia is a mental health disorder, that among other things, impacts upon metacognition and prospective memory, affecting a patient's ability to be able to successfully perform future-orientated tasks, including taking antipsychotic medication.⁷⁷ While antipsychotic medications have been found to be effective in treating the symptoms of schizophrenia, patients have a high non-compliance rate, exhibiting behaviours from an irregular use of the medication, to not taking it at all.⁷⁸

The difficulty for the use of any incentives scheme to aid schizophrenic patients in compliance with the taking of antipsychotic medications, is that such patients have functional deficits in the prefrontal lobes, impacting upon prospective memory and cognitive functioning.⁷⁹ Schizophrenic patients are impaired in all three aspects of prospective memory, including, remembering to do something at a specific time, remembering to complete a specific act when some cue is displayed, and remembering to act upon a future intention after some specific task has been completed.⁸⁰ This neurocognitive impairment has been found to directly impact upon these patients ability to comply with medication directives.⁸¹ Nonadherence, either intentional or unintentional, by schizophrenic patients is an outstanding problem, and the use of incentives has had limited success precisely because the nature of the impairment acts to

⁷⁷ D. Shum (et al.), "Schizophrenia and Prospective Memory: A New Direction for Clinical Practice and Research?" *Hong Kong Journal of Psychiatry*, vol. 11, 2001, pp. 23-26; Y. Wang (et al.), "Meta-analysis of Prospective Memory in Schizophrenia: Nature, Extent, and Correlates," *Schizophrenia Research*, vol. 114, 2009, pp. 64-70.

⁷⁸ R. Gray (et al), "Enhancing Medication Adherence in People with Schizophrenia: An International Programme of Research," *International Journal of Mental Health Nursing*, vol. 19, 2010: doi: 10.1111/j.1447-0349.2009.00649.x.

⁷⁹ Wang (et al), cited note 77.

⁸⁰ As above.

⁸¹ J. Lam (et al.), "Prospective Memory Predicts Medication Management Ability and Correlates with Non-Adherence to Medications in Individuals with Clinically Stable Schizophrenia," *Schizophrenia Research*, vol. 147, 2013, pp. 293-300.

thwart patient compliance.⁸² Incentives may be still used, but primary strategies include long-acting antipsychotic injections, electronic reminders, and service-based interventions.⁸³

It can be concluded that the use of reward-based incentives, especially financial incentives, to enhance healthy behaviors, and produce patient compliance, has limitations, particularly relating to the issue of long-term sustainability. This is not a revolutionary conclusion by any measure, and it had been recognised in the literature, that if financial incentives are used, additional interventions may be necessary to stimulate internal motivation, including traditional strategies such as education campaigns.⁸⁴ Incentives then are only one tool in the “tool box,” so to speak, and only a partially effective one.⁸⁵

Conclusion

This chapter has given an overview of the evidence of financial incentives for promoting health behaviour. In general, there is evidence of short-term behavioural changes, although there are methodological concerns about the statistical strength of

⁸² P. M. Haddad (et al.), “Nonadherence with Antipsychotic Medication in Schizophrenia: Challenges and Management Strategies,” *Patient Related Outcomes Measures*, vol. 5, 2014: doi: 10.2147/PROM.S42735. eCollection 2014.

⁸³ As above.

⁸⁴ J. W. Higgins (et al.), “Redeeming Behaviors: A Push, Not a Shove,” *Healthcare Papers*, vol. 12, 2012, pp. 42-47; A. Oliver and L. B. Brown, “A Consideration of User Financial Incentives to Address Health Inequalities,” *Journal of Health Politics, Policy and Law*, vol. 37, 2012, pp. 201-226; A. Kim (et al.), “Why are Financial Incentives Not Effective at Influencing Some Smokers to Quit? Results of a Process Evaluation of a Worksite Trial Assessing the Efficacy of Financial Incentives for Smoking Cessation,” *Journal of Occupational and Environmental Medicine*, vol. 53, 2011, pp. 62-67; B. K. Mogler (et al.), “Using Insights from Behavioral Economics and Social Psychology to Help Patients Manage Chronic Diseases,” *Journal of General Internal Medicine*, vol. 28, 2013, pp. 711-718.

⁸⁵ E. Mantzari (et al.), “Personal Financial Incentives for Changing Habitual Health-Related Behaviours: A Systematic Review and Meta-Analysis,” *Preventive Medicine*, vol. 75, 2015, pp. 75-85; E. M. Van Epps (et al.), “Financial Incentives for Chronic Disease Management: Results and Limitations of 2 Randomised Clinical Trials with New York Medicaid Patients,” *American Journal of Health Promotion*, 2018: Jan 1:890117117753986. doi:10.1177/0890117117753986.

many studies, given limited samples and their short-term duration. The evidence for long-term effectiveness of incentive programs is weak, and there are a variety of theoretical reasons, especially from a behaviourist perspective, for expecting that behavioural changes will not be sustained after the incentives have been withdrawn. It has been argued in the preface, that this may not matter for many interventions, such as in developing societies, which seek short-term goals, such as influencing parents to undertake vaccination of their children, and the health authorities of such societies, seeing that such programs are successful, may be willing to offer continuous financial support to achieve even limited policy goals.

Given that there is some evidence, at a minimum for the merits of incentive programs for promoting healthy behaviours, and especially patient compliance, it is meaningful to turn to questions of the justification of such programs, both legally and ethically. The next chapter will examine legal issues associated with incentive programs, and attention will then be turned to ethical and philosophical issues.

CHAPTER 2

Law and Incentives

Introduction

This chapter will investigate the jurisprudence of financial incentives for patient compliance, to ascertain whether there are any legal arguments or considerations which render such incentives legally problematic. There is a small literature that deals with the legal and ethical issues associated with employer wellness programs⁸⁶ which has become particularly relevant for American jurisprudence after the signing into law by president Obama on March 23, 2010 of the *Patient Protection and Affordable Care Act* (“Obamacare”), which in the so-called “Safeway Amendment,” expanded the size of financial incentives that may form a part of employer wellness programs.⁸⁷ (At the time of writing, as noted previously, President Donald J. Trump appears to be winding back much of Obamacare.) Concerns have been expressed that such employer wellness programs may be coercive and discriminatory, disadvantaging unhealthy job applicants and existing employees, as well as low income people who may lack information necessary to achieve more healthy lifestyles.⁸⁸

Further, as pointed out in a review by Klautzer (et al.) of US state and federal law, wellness programs could run into a litigation risk through potential violations of insurance, anti-discrimination and privacy laws.⁸⁹ US insurance law

⁸⁶ M. M. Mello and M. B. Rosenthal, “Wellness Programs and Lifestyle Discrimination – The Legal Limits,” *New England Journal of Medicine*, vol. 359, 2008, p. 192-199.

⁸⁷ K. M. Madison (et al.), “The Law, Policy, and Ethics of Employers’ Use of Financial Incentives to Improve Health,” *Journal of Law, Medicine and Ethics*, vol. 39, no. 3, 2011, pp. 450-468.

⁸⁸ As above, p. 456.

⁸⁹ L. Klautzer (et al.), “Can We Legally Pay People for Being Good? A Review of Current Federal and State Law on Wellness Program Incentives,” *Inquiry*, vol. 49, 2012, pp. 268-277.

typically only limits incentives for health related goals, but not for participating in wellness programs at all.⁹⁰ US state and federal anti-discrimination law only prevents employers from using protected properties such as race, age, disability and gender in such schemes.⁹¹ Privacy law acts to restrict the employers' access to sensitive information, such as information about off-duty activities such as smoking and perhaps recreational drug use.⁹² Klautzer (et al.), from their survey did not find evidence of explicit legal prohibition of wellness programs in the United States. They concluded thus: "We were unable to identify comprehensive legal scholarly work or clarifying decisions in state appeals courts. Similarly, our search for tribunal court cases in the four most populous states (California, Texas, New York, and Florida) found no relevant jury verdicts, judgments, settlements, or arbitration awards pertaining to disputes over wellness program incentives."⁹³ Within the limitations of that search it is reasonable to conclude that for employer wellness programs, there is a low litigation risk.

There is little material on the litigation risk of doctor-patient incentive and wellness programs. Nevertheless, there are still relevant legal questions that arise in the doctor-patient relationship which do not arise in the case of the employer-employee relationship, which will now be considered. In particular, if doctors are bound by strict fiduciary obligations, how might this impact, in specific circumstances with prescribing financial incentives for patient compliance? To answer this question, it is first necessary to investigate the jurisprudential question of whether doctors are fiduciaries.

⁹⁰ As above, p. 270.

⁹¹ As above.

⁹² As above.

⁹³ As above, p. 274.

Are Doctors Fiduciaries?

M. A. Rodwin has observed that “[t]he idea that physicians are or should be fiduciaries for their patients ... is a dominant metaphor in medical ethics and law today and is presumed by much of the legal and ethical analysis of physicians’ conflicts of interest.”⁹⁴ Medical ethics codes of conduct throughout the Western world assume that doctors are fiduciaries, stressing aspects of dependence, reliance, loyalty, and trust, and that physicians should hold patients’ interests above all other interests. In short, doctors are often viewed outside of the institute of law as “an agent and trustee for the patient.”⁹⁵ However, the matter is considerably more complex when the appropriate case law is examined.

Historically fiduciary relationships arose from the relations of agency and trusts; trustees owing property legally, which by equity was own by a beneficiary. Agents acted on behalf of such parties, and for such relationships to exist the trustee and agent was not to promote his/her own interests, or that of third parties over that of the principal/beneficiary. Legally high standards of honesty, transparency, loyalty, trust and the strict avoidance of conflicts of interests was required. Over the centuries, court came to define the general fiduciary relationships by means of accepting prima facie paradigm cases, such as director/company, solicitor/client, agent/principal and partner/partner, among others. The doctor/patient relationship was not usually included because the law tended to regard this relationship as

⁹⁴ M. A. Rodwin, “Strains in the Fiduciary Metaphor: Divided Physician Loyalties and Obligations in a Changing Health Care System,” *American Journal of Law and Medicine*, vol. 21, 1995, pp. 241-256, cited p. 242; C. Scott, “Why Law Pervades Medicine: An Essay on Ethics in Health Care,” *Notre Dame Journal of Law, Ethics and Public Policy*, vol. 14, 2000, pp. 245-303; J. Pettila, “Ethics, Money, and the Problem of Coercion in Managed Behavioral Health Care,” *Saint Louis University Law Journal*, vol. 40, 1996, pp. 359-405, cited p. 359: “Health care providers have a fiduciary responsibility to act in the best interests of their patients.”

⁹⁵ A. S. Relman, “Dealing with Conflicts of Interest,” *New England Journal of Medicine*, vol. 313, 1985, pp. 749-751, cited p. 750; C. Ferguson, “Payment of Financial Incentives to GPs May Invalidate Informed Consent Process,” *British Medical Journal*, vol. 316, 1998, pp. 75-76.

contractual, and with harms capable of being dealt with by actions in contract and tort, rather than equitable remedies.⁹⁶

Brennan CJ, and Dawson and Toohey JJ in *Breen v Williams*,⁹⁷ the leading Australian case on the question of whether doctors are fiduciaries, agreed that “the law has not, as yet, been able to formulate any precise or comprehensive definition of the circumstances in which a person is constituted a fiduciary in his or her relations with another.”⁹⁸ Even so, fiduciary relationships typically arise when a party places trust and confidence in another party in conventionally recognised fiduciary settings, and one party undertakes to act on behalf of the other, where there is a potential of abuse of the interests of the acted for party.⁹⁹ A fiduciary relationship exists if in the circumstances the principal can reasonably believe (objective test) that the alleged fiduciary is acting to protect the principal’s interests, with the elements of trust, vulnerability and dependence, going towards evidence.¹⁰⁰ Courts may find, as La Forest J put it in *Lac Minerals* that “a fiduciary obligation can arise as a matter of fact out of the specific circumstances of a relationship.”¹⁰¹ Courts thus have the right to prescribe fiduciary relationships if the circumstances of the case require that fiduciary duties be imposed.¹⁰²

In *Breen v Williams* Gummow J and Brennan CJ both held that the relationship between a medical practitioner and patient is in general fiduciary, but neither held that such fiduciary duties included any duty to give access to medical

⁹⁶ P. H. Pettit, *Equity and the Law of Trusts*, (Oxford University Press, Oxford, 2012).

⁹⁷ *Breen v Williams* (1996) 186 CLR 71.

⁹⁸ As above, at p. 92.

⁹⁹ *Canson Enterprises Ltd v Boughton & Co* [1991] 3 SCR 534, at pp. 543-544; *Hospital Products v United States Surgical Corporation* (1984) 156 CLR 41, Mason J at pp. 96-97.

¹⁰⁰ *Australian Securities and Investment Commission v Citigroup (No. 5)* (2007) 160 FCR 35.

¹⁰¹ *Lac Minerals Ltd v International Corona Resources Ltd* [1989] 2 SCR 574, La Forest J, at p. 648. See also Dawson J, *Hospital Products*, cited note 99, p. 142.

¹⁰² *Johnson v Buttress* (1936) 56 CLR 113, Dixon J at p. 135.

records.¹⁰³ Four judges in that case did not address the issue, so *Breen v Williams* strictly speaking did not decide the matter of whether doctors are fiduciaries for Australian law. However, there is agreement that under Australian law fiduciary relations are proscriptive (i.e. restrictive prohibitions), not prescriptive (imposing positive obligations), that is negative, requiring not to make a profit from the principal's trust, for example. There is no positive duty to act solely in the best interests of the principal, which is not the case, generally for North American jurisprudence.¹⁰⁴ However, to complicate matters further, the *Breen* and *Pilmer* decisions have been judicially argued not to apply to all fiduciary relationships, such as the duty of a company director to act *bona fide* in the company's interests, so that there may be a prescriptive aspect to some fiduciary relationships in special circumstances in Australian law.¹⁰⁵

By contrast North American law has accepted in a number of cases that doctors are fiduciaries and that fiduciary relationships exist between doctors and patients with respect to a number of areas such as informed consent and the confidentiality of patient information.¹⁰⁶ Relevant to this present work is the case of *Moore v. Regents of the University of California*, where it was held that taking tissue samples from a patient, for research purposes, without informing the patient was a breach of a fiduciary duty to disclose material facts, and a lack of informed consent to conduct medical procedures.¹⁰⁷

¹⁰³ *Breen v Williams*, cited note 97, Brennan CJ at pp. 82-83 and Gummow J, at p. 134. The rule in *Breen v Williams* was reversed by statute by the *Privacy Amendment (Private Sector) Act 2000* (Cth).

¹⁰⁴ *Pilmer v Duke Group Ltd (in liq.)* (2001) 207 CLR 165, McHugh, Gummow, Hayne and Callinan JJ at p. 197.

¹⁰⁵ *Bell Group Limited (in liq.) v Westpac Banking Corporation (No. 9)* (2009) 70 ACSR 1, Owen J.

¹⁰⁶ For a sample see *Lockett v Goodill*, 430 P.2d 589, 591 (Wash. 1967); *Cobbs v. Grant*, 502 P.2d 1, 7-8 (Cal. 1972); *Canterbury v. Spence*, 409 U. S. 1064 (1972); *Miller v. Kennedy*, 522 P.2d 852, 860 (Wash. Ct. app., 1974), *aff'd*, 530, P.2d 334 (1975); *Carroll v. Alberts*, 474 U.S. 1013 (1985).

¹⁰⁷ *Moore v. Regents of the University of California*, 499 U. S. 936 (1991).

The Canadian case of *Norberg v. Wynrib* is often cited as ruling on the alleged doctor/patient fiduciary relationship.¹⁰⁸ This case involved a sexual assault action taken against a physician. The issue of a relationship between the patient and physician as fiduciary was discussed, although punitive damages were awarded on a basis other than breach of fiduciary duty. McLachlin J, while concurring on the general verdict, dissented on the question of the doctor/patient relationship being fiduciary in nature.¹⁰⁹ McLachlin J cited the judgment of La Forest J in *McInerney v. MacDonald*,¹¹⁰ a case concerning a patient's right of access to her medical records. It was stated that in general the doctor/patient relationship was fiduciary, because of the trust and confidence placed in the doctor by the patient, but the "relationship may be viewed as fiduciary for some purposes but not others."¹¹¹ Even given a general fiduciary relationship, courts may find that not all aspects of the relationship will be of a fiduciary nature.¹¹²

Dawson and Toohey JJ said in *Breen v Williams*: "it is conceivable that a doctor may place himself (sic) in a position with potential for a conflict of interest – if, for example, the doctor has a financial interest in a hospital or a pathology laboratory."¹¹³ This is likely to be true of most common law jurisdictions.¹¹⁴ In this context an issue of concern regarding the physician use of financial incentives for patient compliance for taking medications are the financial relationships between

¹⁰⁸ *Norberg v. Wynrib* [1992] 2 SCR 226.

¹⁰⁹ As above, McLachlin J, at pp. 270-271.

¹¹⁰ *McInerney v. MacDonald* [1992] 2 SCR 138, La Forest J at pp. 148-149.

¹¹¹ As above, p. 149.

¹¹² See also *Securities and Exchange Commission v. Chenery Corporation*, 318 U.S. 80 (1943); *National Mutual Property Services (Australia) Pty Ltd & Ors v Citibank Savings Ltd* [1998] 564 FCA (May 28, 1998).

¹¹³ *Breen v Williams*, cited note 97, Dawson and Toohey JJ, at p. 274.

¹¹⁴ R. Tjong, "Are Physicians Fiduciaries?" *Australian Law Journal*, vol. 67, 1993, pp. 436-439; T. A. Faunce and S. N. Bolsin, "Fiduciary Disclosure of Medical Mistake: The Duty to Promptly Notify Patients of Adverse Health Care Events," *Journal of Law and Medicine*, vol. 12, 2005, pp. 478-482.

doctors and pharmaceutical companies, a somewhat sensitive issue,¹¹⁵ given that in the United State over three quarters of an estimated 800,000 to 900,000 active doctors had a financial relationship with a medical device or drug company.¹¹⁶ Personal gifts – to be distinguished from institutional gifts to education and research organisations, include conferences, accommodation, entertainment, lavish dinners and even cash.¹¹⁷

Chren (et al.) say that acceptance of such gifts, even if they are said to be “without obligation “still creates an “implicit relationship” between the doctor and the drug company, with an implicit obligation to respond to the gift which could impact upon decisions about patient care. While there are ethical problems arising from many aspects of doctors accepting gifts from drug companies, the most relevant consideration for the purposes of this work are, as Chren (et al.) put it, “obligations that result from gifts may threaten the *physician-patient relationship* in which the physician’s role is that of the patient’s agent or trustee whose first consideration is the patient’s interests in all clinical decisions, including choice of medicines.”¹¹⁸ Chren (et al.), accept that the physician’s role “is that of a fiduciary who holds the faith, trust, and confidence of the patient and who is empowered to act in the patient’s best interests.”¹¹⁹ At worst, gifts could be viewed as a “free bribe”¹²⁰ as it is known that even small gifts can influence physician prescription

¹¹⁵ M. A. Rodwin, *Medicine, Money and Morals: Physicians’ Conflicts of Interest*, (Oxford University Press, New York, 1993).

¹¹⁶ C. Ornstein (et al.), “How Much are Drug Companies Paying Your Doctor?” *Scientific American*, September 30, 2014, at <http://www.scientificamerican.com/article/how-much-are-drug-companies-paying-your-doctor/>.

¹¹⁷ M-M. Chren (et al.), “Doctors, Drug Companies and Gifts,” *JAMA*, vol. 262, 1989, pp. 3448-345; P. A. Komesaroff and I. H. Kerridge, “Ethical Issues Concerning the Relationship Between Medical Practitioners and the Pharmaceutical Industry,” *Medical Journal of Australia*, vol. 176, 2002, pp. 118-121.

¹¹⁸ Chren et al., as above, p. 3450.

¹¹⁹ As above, p. 3450.

¹²⁰ D. R. Waud, “Pharmaceutical Promotion – A Free Bribe?” *New England Journal of Medicine*, vol. 227, 1992, pp. 351-353.

activities.¹²¹ If the gift from the drug company does influence a physician's prescription, so that a less than optimal drug is prescribed or one more expensive than an equally effective less expensive alternative, then the physician has failed to act as a fiduciary for the patient.

The relevance to the issue of financial incentives is quite clear for if a doctor has received gifts or is financially connected with a drug company promoting a specific drug which is the subject of the incentive scheme, then the issue of a conflict of duties will occur. It is likely that a court will see the doctor's role in this context as a fiduciary as conflicts of interest with respect to financial relationships is an area which attracts fiduciary obligations, especially since actions and remedies in tort and contract may not be available here.¹²²

It could be argued that full disclosure to a patient and informed consent would deal with any such conflicts of interest.¹²³ The better view, given the great ethical concern about the entire issue of personal gifts, is for doctors not to accept them in the first place so that any potential conflict of interest does not arise in the first place.

Conclusion

This chapter has considered the question of whether there are any general legal arguments which could *a priori* make schemes involving incentives for patient compliance legally problematic or create a litigation threat for physicians and health professionals. There is little written on this topic by academic researchers, and no case law as far as the present researcher has been able to ascertain. Nevertheless, the question of doctors as fiduciaries offered an in-road to

¹²¹ J. Avorn (et al.), "Scientific Versus Commercial Sources of Influence on the Prescribing Behavior of Physicians," *American Journal of Medicine*, vol. 73, 1982, pp. 4-8.

¹²² See Faunce and Bolsin et al. cited note 114.

¹²³ *New Zealand Netherlands Society 'Orange' Inc. v Kuys* [1973] 2 All ER 1222, Lord Wilberforce, at p. 1225; *Maguire v Makaronis* (1997) 188 CLR 449.

constructing one possible legal threat. Having reviewed the law of fiduciaries with respect to physicians in a number of jurisdictions, including Australia where it is more restrictive than in Canada, it was concluded that even if in general physicians are not fiduciaries in the same sense that, for example, solicitors are to their clients, in various circumstances physicians could be constructively viewed as fiduciaries by courts in particular actions where plaintiffs do not have ready recourse to actions in tort or for breach of contract or for some other remedy outside of equity. In cases where a physician has received gifts from a drug company, and then goes on to engage in an incentives scheme involving the prescription of those drugs to patients, and as well offers incentives for patient compliance in the taking of these medications, the reasonable person viewing the situation detached from the outside, may conclude that the physician has a conflict of interest and is not putting the patient's interest first.

Given an extensive literature criticising doctors receiving personal gifts from drug companies, the prudent action, beyond full disclosure and seeking patient consent, is not to get into such a situation involving perceived conflicts of interest in the first place. This is simple easy advice that could serve physicians engaging in nudging and incentive schemes for patient compliance, well in litigation proofing.

CHAPTER 3

Biomedical Ethics, Epistemology and the Foundations of Morality

Introduction

Before discussing the ethical arguments about financial incentives for patient compliance, matters relating to moral methodology and the foundations of ethics will be addressed in this chapter. It would be inadequate for a philosophical work, even one in an applied field such as the present one, to ignore the contemporary challenges to the rational cogency of the field of discussion. As David DeGrazia has noted: “These are troubled times for ethical theory. Many philosophers, and perhaps more non-philosophers working in bioethics, have lost their hope of discovering an adequate ethical theory in the traditional sense – which would serve as the ultimate court of appeal in the justification of particular moral judgments.”¹²⁴

The aim of this chapter is to detail the meta-epistemological problems facing ethics and bioethics, part of a more general sceptical canon of postmodern arguments addressed to the coherence of human knowledge itself,¹²⁵ and which challenge in particular the idea that medical knowledge can be given a

¹²⁴ D. DeGrazia, “Moving Forward in Bioethical Theory: Theories, Cases, and Specified Principlism,” *Journal of Medicine and Philosophy*, vol. 17, 1992, pp. 511-539, cited p. 511.

¹²⁵ P. Boghossian, *Fear of Knowledge: Against Relativism and Constructivism*, (Oxford University Press, Oxford, 2006); K. Wildes, *Moral Acquaintances*, (University of Notre Dame Press, Notre Dame, 2000).

philosophical foundation or basis.¹²⁶ These sceptical considerations are pursued in more technical detail in the appendix to this work. There will thus be some degree of repetition, with the appendix developing arguments made in the text in more detail. As these arguments relate to fields seemingly distant from the material typically considered in these public policy debates, being “high philosophical logic,” it is appropriate to make the arguments in brief, then develop them in more detail in the appendix to keep the “flow of the work,” without undue technicalities causing the core argument to become buried.

The next section will examine fundamental justificatory problems in ethics and bioethics and the following section will discuss even deeper problems arising from debates in meta-epistemology and the philosophy of logic and mathematics, which impact upon ethics by impacting upon the acceptability of various modes of reasoning. The final section of the chapter does not seek to solve this seething crisis of difficulties, but more modestly, investigates how the present project can study its target question in the light of the general epistemological crisis, which questions, among other things, the status of ethics as a cognitive enterprise.

Justifying Ethics and Bioethics

The two great traditions in modern ethics are consequentialism and deontology. Consequentialism is the position that ethical properties depend upon consequences: “whether an act is morally right depends upon the consequences of that act or something related to that act, such as the motive behind the act or a general rule requiring acts of the same kind.”¹²⁷ Act consequentialism is concerned with acts as the only relevant moral factor, but rule consequentialism attempts to justify ethical rules and principles by considering their consequences, rather than

¹²⁶ M. Little, “Ex Nihilo Nihil Fit? Medicine Rests on Solid Foundations,” *Journal of Evaluation in Clinical Practice*, vol. 19, 2013, pp. 467-470.

¹²⁷ W. Sinnott-Armstrong, “Consequentialism,” *Stanford Encyclopedia of Philosophy*, at <http://stanford.library.usyd.edu.au/entries/consequentialism/>.

relying upon some other factor such as intuition.¹²⁸ Utilitarianism is the best known consequentialist position and it holds that the key moral principle is the maximisation of the “good,” with the “good” being defined in various ways, such as pleasure (hedonism), utility, or even human flourishing.¹²⁹ Utilitarianism (and consequentialism generally), can be further subdivided into other more fine-grained positions such as total utilitarianism (the good is the total net good of consequences/utility) and average utilitarianism (the good is the average net good per person).¹³⁰

There are major difficulties facing utilitarianism in deciding which sub-doctrine, such as total or average utilitarianism, is “correct” in the light of various paradoxes arising in areas such as population ethics and procreation ethics.¹³¹ There are outstanding problems, which are arguably unsolvable dealing with showing how the calculus of utility might work.¹³² There are also objections from deontologists that ultimately utilitarianism violates all of our ethical principles, such as not treating people as mere means to ends, because one can always construct “trolley problems,” where for example the consequences of murdering an innocent person (e.g. pushing someone under a vehicle to save the lives of many) will be justified in consequentialist terms.¹³³

Deontology is a normative position which is often, but not always associated with theistic belief, which prescribes the morally obligatory choices or

¹²⁸ As above.

¹²⁹ M. Bayles (ed.), *Contemporary Consequentialism*, (Doubleday, Garden City, New York, 1968); R. G. Frey (ed.), *Utility and Rights*, (Basil Blackwell, Oxford, 1984); S. Darwell (ed.), *Consequentialism*, (Blackwell, Oxford, 2003).

¹³⁰ As above.

¹³¹ D. Parfit, *Reasons and Persons*, (Clarendon Press, Oxford, 1984).

¹³² J. W. Smith (et al.), *The Bankruptcy of Economics*, (Macmillan, London, 1999).

¹³³ J. J. Thomson, “The Trolley Problem,” *Yale Law Journal*, vol. 94, 1985, pp. 1395-1415.

those actions which are morally forbidden,¹³⁴ by contrast to virtue theories which deal with morally good or excellent characteristics.¹³⁵ For deontology right acts are in accordance with a justified moral norm, such as “do not harm people.” In general, these moral principles are justified by methods other than a consideration of consequences because then there could be negotiation about which moral principles are acceptable on utilitarian grounds. The principles are seen as intuitively obvious, or in some way rationally justifiable by reflection. Whatever method of justification is employed, the deontologist objects vehemently to the consequentialists willingness to engage in moral trade-offs often involving “catastrophes” such as killing the innocent in trolley-style problems. This is well illustrated by Kant’s maxim the “better the whole people should perish” than injustice occur.¹³⁶ To this, consequentialists reply with counterintuitive examples involving nuclear terrorism where a whole people may indeed perish unless some deontological principle is violated.¹³⁷ It seems that both consequentialism and deontology both have counterintuitive implications. It could be that there is a need for an alternative approach, or perhaps, as will be examined in the next section, our common sense morality is incoherent.¹³⁸

There are many attempts to escape this problem. In bioethics one of the most substantial contributions is by Beauchamp and Childress, in their *Principles of Biomedical Ethics*.¹³⁹ Beauchamp and Childress have taken a principlist

¹³⁴ L. Alexander, “Deontological Ethics,” *Stanford Encyclopedia of Philosophy*, at <http://stanford.library.usyd.edu.au/entries/ethics-deontological/>.

¹³⁵ E. D. Pellegrino and D. G. Thomasma, *The Virtues in Medical Practice*, (Oxford University Press, Oxford, 1993).

¹³⁶ I. Kant, *The Metaphysical Elements of Justice: Part I of the Metaphysics of Morals*, translated by J. Ladd, (Hackett, Indianapolis, 1965), p. 100.

¹³⁷ R. Brook, “Deontology, Paradox, and Moral Evil,” *Social Theory and Practice*, vol. 33, 2007, pp. 431-440.

¹³⁸ L. Alexander, “Deontology at the Threshold,” *San Diego Law Review*, vol. 37, 2000, pp. 893-912.

¹³⁹ T. L. Beauchamp and J. F. Childress, *Principles of Biomedical Ethics*, 7th Edition, (Oxford University Press, New York, 2013).

position, based upon four bioethical principles – autonomy (respect for the decision-making quality of autonomous persons), non-maleficence (avoidance of causing harm to others), beneficence (promoting benefits against risks and costs) and justice (fairly distributing benefits and costs) – and have sought to ground this position within the conceptual framework of what they call the “common morality.”¹⁴⁰ The common morality “is applicable to all persons in all places, and we rightly judge all human conduct by its standards.”¹⁴¹ This is the set of moral norms that all people committed to the project of morality would accept, so as to promote human flourishing and attempt to eliminate conditions harming the interests of people.¹⁴² Examples of the common morality include “rescuing persons in danger,” “preventing evil of harm from occurring.” There are also standards in the common morality and virtues such as kindness and gratitude. These somewhat abstract principles require specification to be able to offer guidance in cases to reduce their indeterminacy and generate norms applicable for practical action.¹⁴³

Weighting and balancing of moral principles must also occur in Beauchamp and Childress’ scheme. Balancing involves an assessment of the weights and strengths of various moral principles, with arguments and deliberation and the giving of good reasons. Moral disagreements are always possible even if the same moral principles are agreed upon because different weights may be assigned. Even so, nothing precludes deliberation about the relative merits of assigned weights. However, it is only possible to assess one position as preferable

¹⁴⁰ T. L. Beauchamp, “Principles and Other Emerging Paradigms in Bioethics,” *Indiana Law Journal*, vol. 69, 1993-1994, pp. 955-971; T. L. Beauchamp, “Methods and Principles in Biomedical Ethics,” *Journal of Medical Ethics*, vol. 29, 2003, pp. 269-274; T. L. Beauchamp, “Principlism and Its Alleged Competitors,” *Kennedy Institute of Ethics Journal*, vol. 5, no. 3, 1995, pp. 181-198.

¹⁴¹ Beauchamp and Childress, cited note 139, p. 3.

¹⁴² T. L. Beauchamp, “A Defense of the Common Morality,” *Kennedy Institute of Ethics Journal*, vol. 13, no. 3, 2003, pp. 259-274, cited p. 260.

¹⁴³ Beauchamp and Childress, cited note 139, p. 17.

to another if “we can show that the position rests on a more coherent set of specifications of the common morality.”¹⁴⁴

The moral methodology of Beauchamp and Childress follows the coherence approach of John Rawls, that of “reflective equilibrium.”¹⁴⁵ The approach originated before Rawls’ use in Nelson Goodman’s *Fact, Fiction and Forecast*,¹⁴⁶ in a discussion of the justification of deductive inference. Justifying a deductive inference involves showing that the rule of inference is in conformity with actual deductive practice in the culture of reasoners. If the rule yields unacceptable consequences, it is dropped or modified and tested yet again so that a process of “mutual adjustments between rules and accepted inference” occurs. As Goodman put it: “Justification of general rules thus derives from judgments rejecting or accepting particular deductive inferences.”¹⁴⁷ Thus, applied generally the method of reflective equilibrium seeks to produce a coherent system of beliefs (be it moral or epistemic), beginning with “considered judgments,” moral beliefs held with a high degree of initial confidence, and through a process of critical analysis and testing, strives to produce an optimal equilibrium in the system of beliefs. Beliefs or principles found to be defective are corrected and added back into the system until optimal equilibrium is produced and there is no need for further revision.¹⁴⁸

¹⁴⁴ As above, p. 25. See further M. J. H. Lee, “The Problem of ‘Thick in Status, Thin in Content’ in Beauchamp and Childress’ Principlism,” *Journal of Medical Ethics*, vol. 36, 2010, pp. 525-528.

¹⁴⁵ J Rawls, *A Theory of Justice*, Revised edition, (Belknap Press, Harvard University press, Cambridge MA. 1999).

¹⁴⁶ N. Goodman, *Fact, Fiction and Forecast*, (Harvard University Press, Cambridge MA, 1955), p. 67.

¹⁴⁷ As above.

¹⁴⁸ On reflective equilibrium see D. Little, “Reflective Equilibrium and Justification,” *Southern Journal of Philosophy*, vol. 22, 1984, pp. 373-387; S. Stich, “Reflective Equilibrium, Analytic Epistemology and the Problem of Cognitive Diversity,” *Synthese*, vol. 74, 1988, pp. 391-413; N. Daniels, *Justice and Justification: Reflective Equilibrium in Theory and Practice*, (Cambridge University Press, Cambridge, 1996); F. Schroeter, “Reflective Equilibrium and Anti-Theory,” *Noûs*, vol. 38, 2004, pp. 110-134.

Mere coherence produced by the process of reflective equilibrium is not enough for moral truth because such a coherent system could well be a fairy tale, or a coherent nightmare. Beauchamp and Childress mention the example of the 1640 ‘Pirates’ Creed of Ethics or Custom of the Brothers of the Coast’ as an example.¹⁴⁹ This creed is consistent and coherent but is quite contrary to the common morality involving the acceptance of piracy and slavery. A contemporary example is the Islamic State which has an internally coherent jihadist philosophy, also embracing slavery, but which embraces a theology and a value system in direct conflict with the common morality.¹⁵⁰ This would seem to involve Beauchamp and Childress in a problem which will be discussed in the next section, that of avoiding begging the question, circularity or a vicious infinite regress of justification. Their response to this problem is to propose that some moral judgments are justified without epistemic dependence upon other judgments.¹⁵¹ Presumably some norms, such as non-maleficence, are so basic that they would constitute any system that we would classify as moral in the first place.¹⁵²

Although Beauchamp and Childress’ four principle approach is of benefit in dealing with many problems in biomedical ethics, the system is not “philosopher proof” in the sense of escaping academic philosophical objections.¹⁵³ For example, a principle such as “rescue people in times of disaster” could be challenged on empirical grounds. The Japanese government’s policy of *tsunami-tendenko* adopted after the 2011 tsunami, is for children in the event of a tsunami and dictates

¹⁴⁹ Beauchamp and Childress, cited note 139, p. 407.

¹⁵⁰ W. Phares, *The War of Ideas: Jihadism against Democracy*, (St Martin’s Press, New York, 2007).

¹⁵¹ As above, p. 408.

¹⁵² P. Herissone-Kelly, “Determining the Common Morality’ Norms in the Sixth Edition of *Principles of Biomedical Ethics*,” *Journal of Medical Ethics*, vol. 37, 2011, pp. 584-587, cited p. 585.

¹⁵³ K. D. Clouster and B. Gert, “A Critique of Principlism,” *Journal of Medical Philosophy*, vol. 15, 1990, pp. 219-236; J. Harris, “In Praise of Unprincipled Ethics,” *Journal of Medical Ethics*, vol. 29, 2003, pp. 303-306.

that children should immediately evacuate, being concerned with saving only themselves and not loved ones, so that they are not an added burden to rescue crews. This was found to be a more effective survival strategy than them waiting and trying to help save others.¹⁵⁴ It can be argued in reply that all that is required here is some modification to the principle of common morality, or at worst simply dropping it.

However, there are other more challenging arguments. The common morality has its own implicit metaphysics¹⁵⁵ and assumes that life is of value and is worth living. This assumption has been rejected by philosophical pessimists throughout the ages¹⁵⁶ and recently within contemporary analytic philosophy David Benatar in *Better Never to Have Been: The Harm of Coming into Existence*¹⁵⁷ gives arguments for two views which conflict as much as it is possible with the common morality. The first view is that by bringing someone into existence one harms that person by causing all of the bad aspects of that life and does not benefit them by causing the good aspects of that life. The second view is along the lines of the pessimistic tradition and holds that in balancing the good and bad aspects of any life, most lives are overall bad and not worth living. These theses cannot be explored here, but Benatar has responded to his critics¹⁵⁸ and it seems particularly difficult to refute such a stark position which morally grant opponents so little. But that is the point: that common morality is open to such foundational challenges and we will explore this issue in more detail in the next section.

¹⁵⁴ R. Roach, "Making Consequentialism More Appealing," *Journal of Medical Ethics*, vol. 41, 2015, pp. 359-360.

¹⁵⁵ J. Savulescu, "Why Philosophy is Important to Medical Ethics," *Journal of Medical Ethics*, vol. 40, 2014, pp. 649-650.

¹⁵⁶ J. Sully, *Pessimism: A History and a Criticism*, (Henry S. King, London, 1877).

¹⁵⁷ D. Benatar, *Better Never to Have Been: The Harm of Coming into Existence*, (Clarendon Press, Oxford, 2006).

¹⁵⁸ D. Benatar, "Still Better Never to have Been: A Reply to (More of) My Critics," *Journal of Ethics*, vol. 17, 2013, pp. 121-151.

Ethics and the Epistemological Crisis

There are many more challenging problems facing ethics, and indeed human knowledge that previously discussed. We will now focus on some of these issues. Thus, to begin: assuming that traditional morality is at least cognately coherent, there is a long-term unsolved problem of why an individual should be moral at all, especially given liberalism's assumption of radical individualism.¹⁵⁹ This question grants that there may be "right" and "wrong," but asks: why do "right" and not "wrong," why move beyond self-interest? Kai Nielsen, who has investigated this question in depth, has concluded: "there can be no rational considerations showing us that we must, on pain of simply being irrational, be moral."¹⁶⁰

If that is not challenging enough the moralist then has the problem of refuting *moral scepticism* (moral statements are not knowable because they are either not true (or have no truth value) and/or are not rationally justifiable) and *moral nihilism* (moral statements making substantive positive claims are not statements of object fact, and are either not true or have no truth value). Arguments for moral nihilism include the claim that morality exhibits ontological "queerness" or the strangeness of postulated moral facts, so that by Occam's razor (do not multiply entries in one's ontology beyond necessity), there are no moral facts.¹⁶¹

¹⁵⁹ Kai Nielsen, *Why Be Moral?* (Prometheus Press, Amherst, 1981).

¹⁶⁰ Kai Nielsen, "Why Should I Be Moral? Revisited," *American Philosophical Quarterly*, vol.21, 1984, pp. 89-91.

¹⁶¹ John Mackie, *Ethics: Inventing Right and Wrong*, (Penguin, London, 1977); Richard Joyce and Simon Kirchin (eds), *A World without Values: Essays on John Mackie's Moral Error Theory*, (Springer, New York, 2010); Richard Garner, "Abolishing Morality," at <http://beyondmorality.com/abolishing-morality-...>; Richard Garner, "On the Genuine Queerness of Moral Properties and Facts," *Australasian Journal of Philosophy*, vol. 68, 1990, pp.137-146; Richard Joyce, *The Myth of Morality*, (Cambridge University Press, Cambridge, 2001); Richard Joyce, *The Evolution of Morality*, (Bradford Book/MIT Press, Cambridge MA, 2006); Richard Garner, *Beyond Morality*, (Temple University Press, Philadelphia, 1994).

It should be noted, although it seldom has been, that John Mackie's problem of the ontological queerness of moral qualities has an analogue problem in the philosophy of mathematics. Briefly: mathematical Platonism supposes that mathematical entities exist not as physical spatio-temporal entities but as abstract entities having some sort of *sui generis* sphere of existence. Humans have some rational faculty to grasp, understand and reason with *a priori* knowledge and necessary truths.¹⁶² But, if mathematical objects are mind-independent, having no causal or spatio-temporal relations to the human mind, then there is a problem of explaining exactly how mathematical truths are grasped (the Benacerraf problem).¹⁶³ Rather than postulate a rational mathematical faculty, some philosophers (*intuitionists*) have regarded mathematical objects as mental constructions, and others (*formalists*) have proposed that mathematics is a game played in accordance with formal rules for manipulating meaningless marks.¹⁶⁴ The problem here is that such positions fail to explain the applicability of mathematics in explaining and modelling the world, especially in theoretical

A related scepticism is that of legal scepticism, which as Richard A. Posner puts it holds that: "Many – though certainly not most, and perhaps only a tiny fraction – of the legal questions of our system, and I suspect in most others as well, are not merely difficult, but impossible, to answer by the methods of legal reasoning." Richard A. Posner, "The Jurisprudence of Scepticism," *Michigan Law Review*, vol. 86, 1988, pp.827-891, cited p.828.

Moral nihilism, the position that moral judgments are false faces a "Doppelganger problem": if X is a moral judgment then by the thesis of moral nihilism, X is false, but by classical logic's semantics, not-X is true, hence it can't be that all moral judgments are false: Charles R. Pigden, "Nihilism, Nietzsche, and the Doppelganger Problem," in Joyce and Kirchin (eds), as above, pp. 17-34, at p. 27. Pigden's solution is to propose that all non-negative atomic moral judgments are false. (p. 28) Alternative strategies are to deny that not-X is a moral statement through an internal/external negation distraction (i.e. not-X is not equivalent to "X is not morally wrong") or to reject classical logical semantics and hold that X and not-X can both be false, or simply to hold that moral nihilism states that X, a moral statement, is neither true nor false.

¹⁶² J. J. Katz, *Realistic Rationalism*, (MIT Press, Cambridge, Massachusetts, 1998); D. Lewis, *On the Plurality of Worlds*, (Basil Blackwell, Oxford, 1986).

¹⁶³ P. Benacerraf, "Mathematical Truth," in P. Benacerraf and H. Putnam (eds), *Philosophy of Mathematics: Selected Readings*, 2nd edition, (Cambridge University Press, Cambridge, 1985), pp. 403-420.

¹⁶⁴ H. G. Dales and G. Oliveri (eds), *Truth in Mathematics*, (Clarendon Press, Oxford, 1998); L.E. Szabó, "Formal Systems as Physical Objects: A Physicalist account of Mathematical Truth," *International Studies in the Philosophy of Science*, vol. 17, 2003, pp. 117-123.

physics (Wigner’s puzzle).¹⁶⁵ It has been argued that there is no existing satisfactory ontology of mathematics (or even an adequate philosophy of mathematics).¹⁶⁶ While this does not rebut the ontological difficulties raised by Mackie about the queerness of moral qualities, it does show that this problem is not restricted to morality alone and spills over into seemingly more “secure” areas of knowledge. If the problems that Mackie has raised for morality are genuine, and supposedly lead to moral nihilism, then it would seem that analogous metaphysical difficulties in the philosophy of mathematics should by parity of reason lead to mathematical nihilism.

Even if one makes metaphysical sense of moral reference, there is the further problem of rationally justifying moral claims. Non-cognitivist positions such as *expressivism* (moral statements are not true or false statements but express emotions and feelings on moral issues),¹⁶⁷ may be of little help to the moralist when confronted by the intractable nature of moral disagreements, which Mackie rightly saw “reflect adherence to and participation in different ways of life.”¹⁶⁸

At the end of this dark rainbow is the super-ultimate problem of justification: that a moral standard M requires for its rational justification either a (vicious) infinite regression of other moral standards or meta-moral standards or

¹⁶⁵ S. Bangu, “Wigner’s Puzzle for Mathematical Naturalism,” *International Studies in the Philosophy of Science*, vol. 23, 2009, pp. 245-263; M. Colyvan, “The Miracle of Applied Mathematics,” *Synthese*, vol. 127, 2001, pp. 265-277; E. P. Wigner, “The Unreasonable Effectiveness of Mathematics in the Natural Sciences,” in his *Symmetries and Reflections: Scientific Essays*, (Indiana University Press, Bloomington, 1967), pp. 222-237.

¹⁶⁶ M. Balaguer, *Platonism and Anti-Platonism in Mathematics*, (Oxford University Press, Oxford, 1998). Philosophical issues associated with this problem are discussed in the technical appendix.

¹⁶⁷ R.S Landau, *The Foundations of Ethics*, (Oxford University Press, Oxford, 2010), p. 292.

¹⁶⁸ J.L. Mackie, cited note 161, p. 36; I. Hinckfuss, *The Moral Society: Its Structure and Effects*, (Australian National University, Canberra, 1987); John P. Burgess, “Against Ethics,” *Ethical Theory and Moral Practice*, vol. 10, 2007, pp.427-439. Alex Rosenberg, *The Atheist’s Guide to Reality: Enjoying Life without Illusions*, (W. W. Norton, New York, 2011), argues that moral nihilism follows from materialist reductionism; human life lacks cosmic purpose, hence nihilism is true. (pp.18-19) Moral judgments are “all wrong” based on “false, groundless presuppositions” and “the whole idea of “morally permissible” is untenable nonsense.” (p. 97)

rational principles, M_1 , M_2 , M_3 , ... an arbitrary stopping point (dogmatism) or the question-begging assertion of the rightness of the standard (the problem of the criterion).¹⁶⁹ The problem of the criterion featured in the sceptical armoury of ancient scepticism.¹⁷⁰ The argument has various forms in which it can be stated but for our purposes the argument is based upon an issue of epistemic priority, how to do epistemology without making arbitrary assumptions which would violate the philosophical maxim that it is wrong, everywhere, always, and for anyone to believe anything based upon insufficient evidence, or that which is not adequately justified.¹⁷¹ The problem of the criterion embraces the meta-epistemological problem of ascertaining when we have knowledge as well as determining, that which is true.¹⁷² The question of (1) “what do we know?” the sceptic contends, requires an answer to the question (2) “how do we know,” but the answer to this question requires a prior answer to the first question, so that the process of the justification of knowledge never gets off the ground.

¹⁶⁹ On the problem of the criterion see R. Chisholm, *The Problem of the Criterion*, (Marquette University Press, Milwaukee, 1973); N. Rescher, *The Coherence Theory of Truth*, (Clarendon Press, Oxford, 1973); N. Rescher, *Scepticism*, (Rowman and Littlefield, Totowa, 1980); R. Amico, *The Problem of the Criterion*, (Rowman and Littlefield, Lanham, 1993); M. DePaul, “Sosa, Certainty and the Problem of the Criterion,” *Philosophical Papers*, vol. 40, 2011, pp. 287-304; A. Flaster, “The Problem of the Criterion and Sosa’s Virtue Epistemology,” *Res Cogitans*, vol. 4, 2013, pp. 88-97; K. McCain and W. Rowley, “Pick Your Poison: Beg the Question or Embrace Circularity,” *International Journal for the Study of Skepticism*, vol. 4, 2014, pp. 125-140; D. M. Johnson, “Skepticism and Circular Arguments,” *International Journal for the Study of Skepticism*, vol. 3, 2013, pp. 253-270; W. Schwab, “Skepticism, Belief, and the Criterion of Truth,” *Apeiron*, vol. 46, no. 3, 2013, pp. 327-344; J. W. Wieland, “The Sceptic’s Tools: Circularity and Infinite Regress,” *Philosophical Papers*, vol. 40, 2011, pp. 359-369; H. Sankey, “Witchcraft, Relativism and the Problem of the Criterion,” *Erkenntnis*, vol. 72, 2010, pp. 1-16; H. Sankey, “Epistemic Relativism and the Problem of the Criterion,” *Studies in the History and Philosophy of Science*, vol. 42, 2011, pp. 562-570; H. Sankey, “Scepticism, Relativism and the Argument from the Criterion,” *Studies in the History and Philosophy of Science*, vol. 43, 2012, pp. 182-190.

¹⁷⁰ Sextus Empiricus, *Outlines of Pyrrhonism*, translated by R. G. Bury, (William Heinemann, London, 1933).

¹⁷¹ W. K. Clifford, “The Ethics of Belief,” *Contemporary Review*, vol. 29, December 1876-May 1877, pp. 289-309; K. McCain, “The Problem of the Criterion,” *Internet Encyclopedia of Philosophy*, at <http://www.iep.utm.edu/criterion/>.

¹⁷² R. Fumerton, “The Problem of the Criterion,” in J. Greco (ed.), *The Oxford Handbook of Skepticism*, (Oxford University Press, Oxford, 2008), pp. 34-52.

Alternatively, the problem of the criterion could be framed in terms of a method or criterion for deciding a dispute between the opposing philosophical positions, such as two competing moral theories.¹⁷³ To decide the dispute between say, deontology and consequentialism, will require having some meta-ethical criterion to judge the dispute, but in order to have such a criterion, this meta-ethical criterion must itself be judged to be acceptable, otherwise, the question of the debate may be begged between the parties. The justification of this meta-ethical criterion if done by reference to itself, results in circularity or begging the question of its own validity. Otherwise, if some more comprehensive principle of justification is sought, in a meta²-ethical principle, then a vicious infinite regress is generated. The infinite regress argument, as part of the criterion problem, is a component of a yet more general meta-epistemological problem of the “paradox of reason,” constituting a case for rationality scepticism.¹⁷⁴ In general, there is a problem about justifying a standard of rationality, a justification which philosophy requires given that no proposition can be accepted on “faith” or by custom or tradition. If the standard is not justified, then dogmatism occurs, an arbitrary acceptance of a position, and dogmatism is something which analytic philosophy has defined itself against. If the standard is alleged to be in some way self-justifying, it arguably is circular because it is the question of the justification of the standard in total that needs to be addressed. However, if some more comprehensive standard is appealed to then an infinite regress of justification is generated.¹⁷⁵ The infinite regress is problematic because the social practice of justification is a finite

¹⁷³ J. Brennan, “Scepticism about Philosophy,” *Ratio*, vol. 23, 2010, pp. 1-16.

¹⁷⁴ A. D. Cling, “Reasons, Regresses, and Tragedy: The Epistemic Regress Problem and the Problem of the Criterion,” *American Philosophical Quarterly*, vol. 46, 2009, pp. 333-346; A. D. Cling, “The Epistemic Regress Problem, the Problem of the Criterion and the Value of Reasons,” *Metaphilosophy*, vol. 45, 2014, pp. 161-171; P. D. Klein, “Human Knowledge and the Infinite Regress of Reasons,” *Philosophical Perspectives: Epistemology*, vol. 13, 1999, pp. 297-325; J. W. Wieland, *Infinite Regress Arguments*, (Springer, New York, 2014).

¹⁷⁵ L. Floridi, “The Problem of the Justification of a Theory of Knowledge: Part I: Some Historical Metamorphoses,” *Journal for the General Philosophy of Science*, vol. 24, 1993, pp. 205-233.

time-bound process and any such infinite regress cannot be completed in a finite time, even if other “super-tasks” can be completed.¹⁷⁶

The problem of the criterion thus directly applies to moral epistemology and to morality as well. In an informative discussion of Chisholm’s account of the problem of the criterion applied to morality, DePaul¹⁷⁷ constructs the following analogues of Chisholm’s epistemological questions: (A) which of our actions are morally right? (B) What are the criteria of right action? “Methodists,” those believing that priority should be given to moral rules and principles, contend that an answer should be given to (B) first, while particularists believe that (A) should be answered first. However, DePaul points out that neither methodism nor particularism exhaust the field, at least in moral theory.¹⁷⁸ A position of moral coherentism, for example, holds that one begins inquiry with both particular and general moral propositions, and by a process of reflective equilibrium attempts to answer both (A) and (B). Problems with reflective equilibrium as a moral methodology have already been mentioned; here we can see that moral coherentism only addresses one aspect of the sceptical challenge presented by the criterion argument. It is still open to the moral sceptic to challenge each particular sample of moral knowledge and request a justification of each general moral principle used in the process of reflective equilibrium, as well as contesting the entire coherentist network. Perhaps it is little more than a coherent moral fairy-tale?

The paradox of reason is seen in modern foundational debates in logic, which will impact upon all aspects of knowledge, including ethics, insofar as methods of reasoning are employed. The starting point is the logico-semantic

¹⁷⁶ R. C. Koons and T. H. Pickavance, *Metaphysics: The Fundamentals*, (John Wiley, West Sussex, 2015). A super-task is (roughly) the performance of an infinite series of tasks in a finite time.

¹⁷⁷ M. DePaul, “The Problem of the Criterion and Coherence Methods in Ethics,” *Canadian Journal of Philosophy*, vol. 18, 1988, pp. 67-86.

¹⁷⁸ As above, p. 72.

paradoxes, such as the Liar paradox¹⁷⁹ and Russell's paradox¹⁸⁰ that allows the derivation of a contradiction from what seemed to be acceptable premises. Although there have been innovative attempts to escape the paradoxes, there have also been "revenge" or strengthened paradoxes constructed which escape standard solutions.¹⁸¹ It has also been shown that there are paradoxes of validity that threaten the standard version of deductive validity for arguments.¹⁸² Associated with such logical paradoxes are paradoxes which involve deducing as their conclusion, not merely a contradiction of the form $p \& \sim p$, but an arbitrary proposition q , enabling anything to be proved, as in the truth-theoretic, set-theoretic and property-theoretic versions of Curry's paradox,¹⁸³ Löb's paradox¹⁸⁴ and

¹⁷⁹ Consider the sentence "We are lying now." If we are lying then we are telling the truth, but if we are telling the truth we are lying. See J. F. A. K. van Benthem, "Four Paradoxes," *Journal of Philosophical Logic*, vol. 7, 1978, pp. 49-72.

¹⁸⁰ Russell's paradox arises from the set of all sets which are not members of themselves, which are members of themselves if they are not, and are not, if they are. See A. Weir, "Naïve Set Theory is Innocent!" *Mind*, vol. 107, 1998, pp. 763-798.

¹⁸¹ For example, the "open pair": (1) (2) is false, and (2) (1) is false, escapes many conventional strategies for dealing with the paradoxes via blocking direct self-reference. See B. Armour-Garb, "No Consistent Way with Paradox", *Analysis*, vol. 72, 2012, pp. 66-75; J. A. Woodbridge and B. Armour-Garb, "Semantic Pathology and the Open Pair," *Philosophy and Phenomenological Research*, vol. 71, 2005, pp. 695-703; B. Armour-Garb and J. A. Woodbridge, "Truthmakers, Paradox and Plausibility," *Analysis*, vol. 70, 2010, pp. 11-23; B. Armour-Garb and J. A. Woodbridge, "Dialetheism, Semantic Pathology, and the Open Pair," *Australasian Journal of Philosophy*, vol. 84, 2006, pp. 395-416. This matter is discussed further in the technical appendix.

¹⁸² The standard account of validity holds that an argument is valid if and only if it is not possible for the premises of the argument to be true, whilst the conclusion is false. Validity paradoxes arise from arguments such as: (B) This argument is valid. Therefore, this argument (B) is invalid. If argument (B) is valid, then it has a true premise and a false conclusion, and hence is invalid. Therefore (B) is invalid. But deducing the invalidity of (B) is what (B) describes, so it is valid, and hence, valid and not valid. See S. Read, "Self-Reference and Validity," *Synthese*, vol. 42, 1979, pp. 265-274; S. Read, "Self-reference and Validity Revisited," in M. Yrjönsuuri (ed.), *Medieval Formal Logic: Obligations, Insolubles and Consequences*, (Kluwer, Dordrecht, 2001), pp. 183-196; D. Jacquette, "The Validity Paradox in Model S_5 ," *Synthese*, vol. 109, 1996, pp. 47-62; J. A. Woodbridge and B. Armour-Garb, "The Pathology of Validity," *Synthese*, vol. 160, 2008, pp. 63-74.

¹⁸³ J. C. Beall, "Curry's Paradox," Stanford Encyclopedia of Philosophy, at <http://plato.stanford.edu/entries/curry-paradox/>.

¹⁸⁴ J. F. A. K. van Benthem, "Four Paradoxes," *Journal of Philosophical Logic*, vol. 7, 1978, pp. 49-72, cited pp. 50-51.

others.¹⁸⁵ These paradoxes cannot be solved by simply accepting that their conclusion is a “true contradiction” because that would lead to triviality, although as discussed below, some philosophical logicians in the “madhouse” of modern logic are prepared to embrace even that.¹⁸⁶ The issues here are highly technical and are discussed further in the technical appendix to this work. As detailed in the technical appendix, there are good reasons given by contemporary developments in symbolic logic, taken to be the foundation of reasoning in science and common life, to believe that fundamental principles of reason are inconsistent, including mathematics, as puzzling as this may seem to outsiders of the field of logic.¹⁸⁷

The epistemological implications of this are profound and not appreciated by most philosophers and logicians. If the most fundamental principles of human reasoning are, strictly speaking false, or at least, not universally true, then surely this means that “weaker” fields such as ethics and moral philosophy face even graver problems, for what ethical principle could be taken to be more intuitively true than say, the logical principle of non-contradiction, which today seems to have had an open hunting season declared upon it?

Graham Priest and others have proposed that the logico-semantic paradoxes indicate that there are true contradictions or dialetheias such that $A \& \sim A$ is true.¹⁸⁸

¹⁸⁵ P. Y. Windt, “The Liar in the Prediction Paradox,” *American Philosophical Quarterly*, vol. 10, 1973, pp. 65-68.

¹⁸⁶ The “madhouse” phrase was used by my logic teachers the late Dean Barnett of Flinders University, and also late Professor Brian Medlin, to describe the situation depicted in this brief cooks’ tour of the paradoxes.

¹⁸⁷ See G. Priest, *In Contradiction: A Study of the Transconsistent*, (Clarendon Press, Oxford, 2006), chapter 3. Briefly, Priest considers a formalisation of intuitive mathematics, T. If T is formalised there is a Gödel sentence G^* which is not provable or refutable in T, but which can be established by informal proof, to be true. Therefore, G^* is provable, and hence is inconsistent, showing that proof theory is inconsistent. For a critique see F. S. Tanswell, “Saving Proof from Paradox: Gödel’s Paradox and the Inconsistency of Informal Mathematics,” in H. Andreas and P. Verdeé (eds), *Logical Studies of Paraconsistent Reasoning in Science and Mathematics*, (Trends in Logic, Springer, Cham, 2016), pp. 159-173.

¹⁸⁸ Priest, as above. For an argument that there is no adequate system of paraconsistent logic see G. Littmann, *A Critique of Dialetheism*, PhD thesis, University of North Carolina at Chapel Hill, 2004.

This has led to an increasing number of philosophical problems being “solved” by simply positing that seemingly contradictory states are actually true contradictions, such as states of motion, and the unity of the universe.¹⁸⁹ This in turn has generated a debate about where all this ends, with some philosophers such as Kabay in *On the Plenitude of Truth*¹⁹⁰ defending the thesis of trivialism, that all propositions (and their negations) are true (e.g. financial incentives for patient compliance are morally justified and are *not* morally justified). While this seems absurd, philosophical logicians hold that trivialism is a difficult thesis to refute and cannot be ruled out on logical grounds. If this is so then nothing can be ruled out on logical grounds, that is, anything is indeed possible, and may well be. Applying that “high” logic to the thesis of this work, one could conclude that incentives are both justified and not justified for patient compliance!¹⁹¹

The logico-semantic paradoxes thus seem to debunk the ideal of deductive mathematical logic that holds that inference rules are strictly or universally valid, rather than only generally valid.¹⁹² This is especially so in the light to a body of counterexamples that have been given to even the most secure rules of inference

For example, a sentence such as “this sentence is true and not a dialetheia,” both is and is not a monaletheia, defined as a sentence having only one truth value: G. Littman and K. Simmons, “A Critique of Dialetheism,” in G. Priest (et al., eds), *The Law of Non-Contradiction: New Philosophical Essays*, (Clarendon Press, Oxford, 2004), pp. 314-335. See also B. Burgis, “Can Dialetheists Make Sense of Monoletheias? August 4, 2008, at <http://blogandnot-blog.blogspot.com.au/2008/08/can-dialetheists-make-sense-of.htm/>; G. Young, *Revenge: Dialetheism and Its Expressive Limitations*, (PhD Thesis, University of Glasgow, 2015) (arguing that dialetheism does not escape “revenge” style paradoxes); E. Zardini, “Truth Without Contradiction,” *Review of Symbolic Logic*, vol. 4, 2011, pp. 498-535.

¹⁸⁹ G. Priest, *One*, (Oxford University Press, Oxford, 2014).

¹⁹⁰ P. Kabay, *On the Plenitude of Truth: A Defense of Trivialism*, (Lambert Academic Publishing, 2010).

¹⁹¹ See L. Estrada-González, “Models of Possibilism and Trivialism,” *Logic and Logical Philosophy*, vol. 21, 2012, pp. 175-205; O. Bueno, “Troubles with Trivialism,” *Inquiry*, vol. 50, 2007, pp. 655-667.

¹⁹² T. Hofweber, “Validity, Paradox, and the Ideal of Deductive Logic,” In J. C. Beall (ed.), *Revenge of the Liar*, (Oxford University Press, Oxford, 2007), pp. 145-158.

such as *modus ponens* ($p \rightarrow q$, p , therefore q).¹⁹³ One of the consequences of this is that there is very much a problem of justifying deduction, parallel to the problem of justifying induction.¹⁹⁴ This problem will also flow on to ethics as well where it can be asked: why accept any moral argument at all if no non-circular justification can be given of the argument's validity? Once again, this seems to make ethics and moral theory impossible, and of course, all other knowledge claims.¹⁹⁵

¹⁹³ V. McGee, "A Counterexample to Modus Ponens," *Journal of Philosophy*, vol. 82, 1985, pp. 462-471; V. McGee, *Truth, Vagueness, and Paradox*, (Hackett, Indianapolis, 1991); W. G. Lycan, *Real Conditionals*, (Oxford University Press, Oxford, 2001); L. Carroll, "What the Tortoise Said to Achilles," *Mind*, vol. 4, 1895, pp. 278-280; P. Marton, "Achilles Versus the Tortoise: The Battle Over Modus Ponens (An Aristotelian Argument)," *Philosophia*, vol. 31, 2004, pp. 383-400.

¹⁹⁴ See S. Haack, "The Justification of Deduction," *Mind*, vol. 85, 1976, pp. 112-119; S. Haack, "Dummett's Justification of Deduction," *Mind*, vol. 91, 1982, pp. 216-239; G. Couvalis, "Is Induction Epistemologically Prior to Deduction?" *Ratio*, vol. 17, 2004, pp. 28-44; P. Contu, "The Justification of Logical Laws Revisited," *Synthese*, vol. 148, 2006, pp. 573-588; C. Cellucci, "The Question Hume Didn't Ask: Why Should We Accept Deductive Inferences?" In C. Cellucci and P. Pecere (eds), *Demonstrative and Non-Demonstrative Reasoning*, (Edizioni dell' Universit a, Cassino, 2006), pp. 207-235; W. R. Stirton, "Some Problems for Proof-Theoretic Semantics," *Philosophical Quarterly*, vol. 58, 2008, pp. 278-298.

¹⁹⁵ Indeed, Schwartz has argued that the morality is impossible on logico-semantic grounds: Stephen P. Schwartz, "Why It is Impossible to be Moral," *American Philosophical Quarterly*, vol. 36, 1999, pp. 351-360. Schwartz shows that there is a contradiction between fundamental principles of morality. First, is the principle of equality, a purely formal principle that states: "similar cases must be treated similarly." (p. 351) Thus, "if there is a distinction in the way individuals are treated, this distinction must rest on a morally relevant difference between the individuals." (p. 351) If people are treated differently, then morally relevant reasons must be given. The principle of equality is also called the "generalization principle" and this principle "is presupposed in every attempt to give a reason for a moral judgement": M. Singer, *Generalization in Ethics*, (Knopf, New York, 1961), p. 34. Schwartz notes that the principle of equality/generalization principle is "a key part of the arguments against racial, gender and other sorts of discrimination." (p. 352)

Schwartz sets out to show that the principle of equality, given certain "undisputed empirical facts" is contradictory, so that it is impossible to be moral. One principle leading to this contradiction is the principle of nontransitivity of similarity (NTS): if A is indistinguishable in respect of property R from B, and B is indistinguishable in respect of R from C, then A may be possible to be distinguishable in respect R from C. R can be various observational properties and vague predicates. For example, given series of red paints each slightly darker than the one before it, it may not be possible to discriminate between any red and its immediate successor by the naked eye, but it may still be possible to distinguish between the end point colours. (p. 352)

The other principle required to produce the contradiction is the principle of differential treatment, that it "is morally required or at least allowed to treat sufficiently dissimilar cases differently." (p. 353) Differences of treatment are justified by virtue of differences in the cases.

However, the principles of equality, differential treatment and NTS with respect to morally relevant characteristics generates a contradiction: "Consider the following simple model: It is

These concerns about the cognitive coherence of the discipline of philosophy, including ethics and moral theory, are as old as Western philosophy itself. Thus, Sextus Empiricus (c. 160-210 CE) saw the disagreement of the philosophers about all things as supporting scepticism about knowledge: “According to the mode deriving from dispute, we find that undecidable dissention about the matter proposed has come about both in ordinary life and among the philosophers. Because of this we are not able either to choose or to rule out anything, and we are driven to suspend judgement.”¹⁹⁶ The argument from the disagreement of the philosophers was one of the Ten Modes of Aenesidemus and the Five Modes of Agrippa, forming the basis of ancient scepticism about knowledge and morals.¹⁹⁷

The problem of perennial philosophical disagreement¹⁹⁸ has continued to disturb philosophers, because, whatever philosophy is, it involves “unbridled criticism,”¹⁹⁹ and the questioning of everything, “the premises of their arguments...the very canons of right reasoning and the methodology of argument.”²⁰⁰ As we have seen, the justification of basic principles becomes difficult, and intuitions, in normal times controversial as a methodology, are of

morally required to treat items indistinguishable with respect to morally relevant characteristic R similarly. It is morally required (or at least allowed) to treat items indistinguishable with respect to R differently. Now we have the situation that A is indistinguishable from B in respect R, B is indistinguishable from C, but A is distinguishable from C. Thus it is morally required to treat A and C similarly, because A and B must be treated similarly and B and C must be treated similarly, but it is also morally required (or allowed) to treat A and C differently. This situation will arise wherever A and C are required (or allowed) to be treated differently and NTS applies to respect R, but this is just the situation with all morally relevant characteristics. Thus it is impossible to be moral.” (p. 352)

¹⁹⁶ Sextus Empiricus, *Outlines of Scepticism*, 2nd edition, edited by J. Annas and J. Barnes, (Cambridge University Press, Cambridge, 2000), I, p. 165.

¹⁹⁷ K. Vogt, “Ancient Scepticism,” *Stanford Encyclopedia of Philosophy*, at <http://plato.stanford.edu/entries/skepticism-ancient/>.

¹⁹⁸ J. W. Smith, *The Progress and Rationality of Philosophy as a Cognitive Enterprise*, (Avebury, Aldershot, 1988).

¹⁹⁹ G. Priest, “What is Philosophy,” *Philosophy*, vol. 81, 2006, pp. 189-207, cited p. 207.

²⁰⁰ J. J. C. Smart, “Why Philosophers Disagree,” *Canadian Journal of Philosophy*, Suppl. Vol. 19, 1993, pp. 67-82, cited p. 71.

even less help in areas which involving a subject matter so fundamental that there may not be any clear intuitions about the matter at all, or where the intuitions of epistemic peers (people equally as intelligent and informed in the subject matter²⁰¹), disagree.²⁰² As Cohen puts it, “[w]hat one philosopher takes to be a self-evident principle, another regards as an absurdity.”²⁰³ Luntley gives an account of this issue with respect to the role of intuitions in orthodox moral theory where intuitions seem to be both necessary, and unsatisfactory, at the same time:

On the orthodox conception a theory of morality must offer some critique of our intuitions about value on pain of failing to rise above the level of a complicated description. Theorizing involves an element of normativity as the theory knocks our intuitive grasp of the domain into shape. Without the scope for critique of the intuitive grasp, the theory loses this normative role. But it is because of this that, for example, utilitarianism runs into difficulty when the theory warrants courses of action which affront our intuitive conception of what is just and unjust. It does no good here for the utilitarian to appeal to two different levels of moral thought, for that presupposes that the two levels, intuition and theory, are commensurable. But that is to assume that our intuitive grasp of what is just and unjust is fit for codification into a utilitarian theory. And that is something which only a utilitarian will find compelling. On the orthodox conception of theorizing in morals the important questions can then seem to be concerned with the initial choice of theory type employed in order to justify the critique of values the theory will generate.²⁰⁴

²⁰¹ G. Gutting, *Religious Belief and Religious Skepticism*, (University of Notre Dame Press, Notre Dame, 1982), p. 83. Epistemic peers have “intelligence, perspicacity, honesty, thoroughness and other relevant epistemic virtues.” (p. 83)

²⁰² R. Rorty, *Philosophy and Social Hope*, (Penguin, London, 1999), p. 10. On the limits of intuitions see: J. Hintikka, “The Emperor’s New Intuitions,” *Journal of Philosophy*, vol. 96, 1999, pp. 127-147; J. Weinberg (et al.), “Normativity and Epistemic Intuitions,” *Philosophical Topics*, vol. 29, 2001, pp. 429-459; B. Weatherson, “What Good are Counterexamples?” *Philosophical Studies*, vol. 115, 2003, pp. 1-31; L. Schroeter, “The Limits of Conceptual Analysis,” *Pacific Philosophical Quarterly*, vol. 85, 2004, pp. 425-453; H. Kornblith, “Appeals to Intuitions and the Ambitions of Epistemology,” in S. Hetherington (ed.), *Epistemology Futures*, (Clarendon Press, Oxford, 2006), pp. 10-25; J. Alexander (et al.), “Accentuate the Negative,” *Review on Philosophy and Psychology*, vol. 1, 2010, pp. 297-314. Philosopher William Lycan has said that standard philosophical methodology is “a disgusting mess of squabbling, inconclusion, dogma and counter-dogma, trendy patois, fashionable but actually groundless assumptions, vacillation from one paradigm to another, mere speculation, and sheer abuse.” W. G. Lycan, “Bealer on the Possibility of Philosophical Knowledge,” *Philosophical Studies*, vol. 81, 1996, pp. 143-150, cited p. 149.

²⁰³ A. Cohen, “Certainty, Doubt and Anxiety: Towards a Theory of the Psychology of Metaphysics,” *Metaphilosophy*, vol. 12, 1981, pp. 113-144, cited p. 114.

²⁰⁴ M. Luntley, “On the Critique of Values,” *Inquiry*, vol. 32, 1989, pp. 399-417, cited p. 399.

As an example of the stark conflict that is occurring in contemporary philosophy over the question of philosophy's ultimate methodology and intuitions, consider the debate centred around James Ladyman and Don Ross, *Every Thing Must Go: Metaphysics Naturalized*.²⁰⁵ Their book is concerned with issues in traditional "analytic" metaphysics, but their arguments apply to moral and ethical philosophy as well, because human agents and moral value are part of the furniture of the universe as well, and thus, metaphysics encompasses moral and ethical philosophy.²⁰⁶

Ladyman and Ross are some of the more recent philosophers who believe that the "folk" world of common sense and everyday life should be "rejected" in favour of the "naturalistic metaphysics" of natural science, particularly physics.²⁰⁷ They thus embrace "scientism," the view that the natural sciences determine what exists in the world, as well as providing epistemological standards for knowledge, a position they call, "ontic structural realism." The common sense philosophical intuitions about the world do not constitute an "objective truth," although they briefly state that the project of social phenomenology and the *Lebenswelt* (the study of the "Life-World" and social existence, as revealed to intentional consciousness),²⁰⁸ is not rejected so long as it is not seen as being part of "objective truth," only of "philosophical anthropology."²⁰⁹ In particular, they reject the

²⁰⁵ J. Ladyman and D. Ross, *Every Thing Must Go: Metaphysics Naturalized*, (Oxford University Press, Oxford, 2007).

²⁰⁶ A. Quinton, *The Nature of Things*, (Routledge and Kegan Paul, London, 1973).

²⁰⁷ For an outline of previous physicalist reductionist material, and their refutation see the present author's work: J. W. Smith, *Reductionism and Cultural Being: A Philosophical Critique of Sociobiological Reductionism and Physicalist Scientific Unificationism*, (Martinus Nijhoff, The Hague, 1984).

²⁰⁸ A. Schutz and T. Luckmann, *The Structure of the Life World*, Volume 1, (Northwestern University Press, Evanston, Ill, 1973).

²⁰⁹ Ladyman and Ross, cited note 205, p. 5.

methodology employed by contemporary analytic philosophy²¹⁰ of testing philosophical ideas by reflections based on intuitions, over scientific research, as intuitions depend on our “ontogenetic cognitive makeup and partly on culturally specific learning. Intuitions are the basis for, and are reinforced and modified by, everyday practical heuristics for getting around in the world under various resource (including time) pressures, and navigating social games; they are not cognitive gadgets designed to produce systematically worthwhile guidance in either science or metaphysics.”²¹¹

The question of the validity of the use of intuitions as a methodology in philosophy has been the subject of considerable recent debate.²¹² Empirical studies have indicated the contextual relativity of intuitions, with intuitions depending upon cultural, linguistic and educational background,²¹³ and even being relative to the order in which the thought experiments are given (framing effects).²¹⁴ There

²¹⁰ Works in the traditional analytic framework are illustrated by M. Loux and D. Zimmerman (eds), *The Oxford Handbook of Metaphysics*, (Oxford University Press, Oxford, 2003); E. J. Lowe, *A Survey of Metaphysics*, (Oxford University Press, Oxford, 2002).

²¹¹ As above p. 10. It is interesting to note regarding this point about intuitions, that at least one leading philosopher, Frank Jackson, who once advanced an intuitive argument (“Mary’s room:” F. Jackson, “What Mary Didn’t Know,” *Journal of Philosophy*, vol. 83, 1986, pp. 291-295) against the physicalist account of mind (roughly, that the mind is just the brain, as described by an advance neuroscience, so that qualia like “redness” do not exist in a dualistic sense), later abandoned his old argument in favour of the physicalist position he once rejected: F. Jackson, “Mind and Illusion,” in A. O’Hear (ed.), *Minds and Persons*, (Cambridge University Press, Cambridge, 2004), pp. 251-271. Jackson’s argument was taken up by David Chalmers, *The Conscious Mind: In Search of a Fundamental Theory*, (Oxford University Press, 1996). Radical 180 degree turns like this are always possible in the discipline of philosophy, while one would hope that matters are more stable in other disciplines where people’s lives are at stake, such as medicine.

²¹² For a sample see K. P. Tobia, “Philosophical Method and Intuitions as Assumptions,” *Metaphilosophy*, vol. 46, 2015, pp. 575-594; H. Cappelen, *Philosophy Without Intuitions*, (Oxford University Press, Oxford, 2012); S. Loncar, “Why Listen to Philosophers? A Constructive Critique of Disciplinary Philosophy,” *Metaphilosophy*, vol. 47, 2016, pp. 3-25.

²¹³ J. M. Weinberg (et al.), “Are Philosophers Expert Intuiters?” *Philosophical Psychology*, vol. 23, 2010, pp. 331-355; E. R. Machery (et al.), “Semantics, Cross-Cultural Style,” *Cognition*, vol. 92, 2004, pp. B1-B12; S. Nichols (et al.), “Metaskepticism: Meditations in Ethno-Epistemology,” in S. Luper (ed.), *The Sceptics*, (Ashgate, Aldershot, 2003), pp. 227-248; K. Vaesen (et al.), “The Reliability of Armchair Intuitions,” *Metaphilosophy*, vol. 44, 2013, pp. 559-578.

²¹⁴ S. J. Swain (et al.), “The Instability of Philosophical Intuitions: Running Hot and Cold on Truetemp,” *Philosophy and Phenomenological Research*, vol. 76, 2008, pp. 138-155.

have been numerous attempts to respond to this sceptical approach to orthodox philosophy,²¹⁵ primarily through subjecting experimental philosophy to a methodological critique itself. It has been argued, for example by T. Williamson that the experimental critique goes too far in its rejection of the methodology of intuitions, leading to global scepticism because even basic ordinary judgments depend upon them.²¹⁶ Andersen and Arenhart²¹⁷ argue that radical naturalism, as seen in the example given above of Ladyman and Ross' *Every Thing Must Go*, itself has metaphysical presuppositions, because even the physical sciences are not metaphysically free. To give our own example, while Ladyman and Ross think that quantum mechanics and special and general relativity lead to a radical naturalist view of the world, other philosophers and scientists have a differing view.

For example, Donald Hoffman, professor of cognitive science at the University of California, Irvine, believes that science, particularly evolutionary theory, indicates that consciousness and its contents is all which really exists, and that quantum mechanics shows "Spacetime, matter and fields never were the fundamental denizens of the universe but have always been, from their beginning, among the humbler contents of our consciousness, dependent on it for their very beginning."²¹⁸ He believes that evolutionary game theory shows that our belief in an independently existing reality is an illusion: "Snakes and trains, like the particles

²¹⁵ See for example A. Kauppinen, "The Rise and Fall of Experimental Philosophy," *Philosophical Explorations*, vol. 10, 2007, pp. 95-118; J. Bengson, "Experimental Attacks on Intuitions and Answers," *Philosophy and Phenomenological Research*, vol. 86, 2013, pp. 495-532.

²¹⁶ T. Williamson, "Philosophical Criticisms of Experimental Philosophy," in J. Sytsma and W. Buckwalter (eds), *A Companion to Experimental Philosophy*, (Wiley Blackwell, Chichester, 2016), pp. 22-36.

²¹⁷ F. Andersen and J. R. B. Arenhart, "Metaphysics Within Science: Against Radical Naturalism," *Metaphilosophy*, vol. 47, 2016, pp. 159-180. They say: "If we reject all the above intuitions on the ground that they are instances of *a priori* metaphysics, therefore, we are left with no argumentative restriction. This ultimately means that anything goes." (at p. 163) On this debate see further M. Deutsch, *The Myth of the Intuitive: Experimental Philosophy and Philosophical Method*, (MIT Press, Cambridge MA, 2015).

²¹⁸ D. Hoffman, "2005: What do You Believe is True Even Though You Cannot Prove It?" At <https://www.edge.org/response-detail/10930>.

of physics, have no objective, observer-independent features. The snake I see is a description created by my sensory system to inform me of the fitness consequences of my actions. Evolution shapes acceptable solutions, not optimal ones. A snake is an acceptable solution to the problem of telling me how to act in a situation. My snakes and trains are my mental representations; your snakes and trains are your mental representations.”²¹⁹ Thus, there is a most fundamental disagreement between highly competent thinkers, at a most fundamental level. One team says that reality is physical and another thinker says that it is mental. How could such a debate possibly be solved by resort to intuitions? If not, then how can it be addressed at all? Likewise, how can other fundamental debates, more immediately relevant to this work be addressed and solved? This, sadly, leads us to yet another philosophical conundrum.

There is a lively debate in metaphilosophy, the philosophy of philosophy, about the significance of fundamental disagreements, and whether or not this alone shows that philosophy is not a rational and progressive discipline.²²⁰ If cognitive peers disagree, should one suspend belief in one’s own position? If so, is this rationally self-undermining if everybody does this, for they all are epistemic peers, thus leading to metaphilosophical scepticism, to be neutral, or suspend judgment

²¹⁹ D. McNew, “The Evolutionary Argument Against Reality,” at <https://www.quantamagazine.org/20160421-the-evolutionary-argument-against-reality/>. See also A. Gefer, “The Case Against Reality,” *The Atlantic*, April 25, 2016, at <http://www.theatlantic.com/science/archive/2016/04/the-illusion-of-reality/479559/>.

²²⁰ A. Elga, “Reflection and Disagreement,” *Noûs*, vol. 41, 2007, pp. 478-502; D. Christensen, “Epistemology of Disagreement: The Good News,” *Philosophical Review*, vol. 116, 2007, pp. 187-217; D. Christensen, “Disagreement as Evidence: The Epistemology of Controversy,” *Philosophy Compass*, vol. 4/5, 2009, pp. 756-767; R. Feldman and T. A. Warfield (eds), *Disagreement*, (Oxford University Press, Oxford, 2010); B. Plant, “Philosophical Diversity and Disagreement,” *Metaphilosophy*, vol. 43, 2012, pp. 567-591; D. Christensen and J. Lackey (eds), *The Epistemology of Disagreement: New Essays*, (Oxford University Press, Oxford, 2013); H. Kornblith, “Is Philosophical Knowledge Possible?” In D. E. Machuca (ed.), *Disagreement and Skepticism*, (Routledge, New York, 2013), pp. 260-276. Kornblith concludes: “[t]here is something deeply worrying about the nature of the philosophical enterprise.” (p. 261)

on philosophical issues?²²¹ Philosophical dissensus, along with the unreliability of the methods of philosophy for attaining truth, Jason Brennan argues, would entail that “a person who lacks philosophical beliefs ought to refrain from using philosophical methodology and instead should remain agnostic.”²²² This would mean that there could be no progress made in analysing the central concern of this work, namely whether incentives for patient compliance are morally justified or not. The debate is essentially indeterminate, as all philosophical debates, be they in metaphysics, epistemology, or ethics, would be.

Although this critique has plausibility, if at this point anything at all remains plausible, I have argued in *The Progress and Rationality of Philosophy as a Cognitive Enterprise*,²²³ that the Brennan-type of metaphilosophical scepticism is ultimately undermining, because self-referentially applied, the position that one should be agnostic about all philosophical theses means that one should be agnostic about being agnostic about all philosophical theses, which undermines itself.²²⁴

²²¹ N. Jones, “An Arrovian Impossibility Theorem for the Epistemology of Disagreement,” *Logos & Episteme*, vol. 3, 2012, pp. 97-115; S. Graves, “The Self-Undermining Objection in the Epistemology of Disagreement,” *Faith and Philosophy*, vol. 30, 2013, pp. 93-106; A. Rotondo “Disagreement and Intellectual Scepticism,” *Australasian Journal of Philosophy*, vol. 93, 2015, pp. 251-271.

²²² J. Brennan, “Scepticism about Philosophy,” *Ratio*, vol. 23, 2010, pp. 1-16. See also, P. Seipel, “Philosophy, Famine Relief, and the Skeptical Challenge from Disagreement,” *Ratio*, vol. 29, 2014, pp. 89-105; B. Ribeiro, “Philosophy and Disagreement,” *Critica*, vol. 43, 2011, pp. 3-25. On the intractability of philosophical problems see T. Nagel, *The View from Nowhere*, (Oxford University Press, New York, 1986); C. McGinn, *Problems in Philosophy: The Limits of Inquiry*, (Blackwell, Oxford, 1993). McGinn says: “we are not cognitively equipped to solve philosophical problems.” (p.10) As well, we “make so little progress in philosophy for the same reason we make so little progress in unassisted flying: We lack the requisite equipment.” (p. 13) Eric Dietrich, concludes that philosophers suffer from mental disabilities, such as “illusory superiority,” an overestimation of their intellectual worth, and anosognosia, a mental disability of denying that one has a disability: “[t]heir primary disability is that they work in a field, a discipline, that never progresses, yet most of them get state money in the form of salaries.” See E. Dietrich, “There is No Progress in Philosophy,” *Essays Philos*, vol. 12, 2011, pp. 329-344, cited p. 336.

²²³ J. W. Smith, *The Progress and Rationality of Philosophy as a Cognitive Enterprise: An Essay on Metaphilosophy*, (Avebury, Aldershot, 1988).

²²⁴ On these type of self-referential arguments, undermining global scepticism and relativism, see J. W. Smith, “Against Orientational Pluralism in Metaphilosophy,” *Metaphilosophy*, vol. 16, 1985, pp. 214-220.

Even so, after reviewing all of the problems which philosophy faces, all of which remain unsolved, one as a matter of practice, if not strict logic, should feel considerable doubt about the discipline, even if not all of philosophy's claims can be dismissed. Much of philosophy – and that includes ethics and moral theory – remains unjustified in accordance with its own strong canons of reason. This is a puzzling and unsettling situation that has disturbed the present writer for around 35 years, and no doubt would continue to perturb one even if one lived for another 35, or 350 years. The problems outlined here seem to get more complex and intractable each time one does a journal article run to update and review one's knowledge. There is thus a real problem attempting to deal with an inquiry such as the one undertaken in this book, which ultimately would seem to be undermined by all of the considerations discussed above. After all, logic and reasoning must be employed, and won't those concepts strictly be open to the sorts of attacks reviewed here? What can be done to address the topic of the ethics of incentives for patient compliance in the context of the epistemological crisis?

Conclusion: Is It Possible to Move Forward?

From a strict philosophical point of view, one should presumably be led to a rejection of orthodox morality and the resultant acceptance of moral nihilism. Yet even if this was so at a theoretical level this in itself does not imply that all values and evaluative norms must therefore be rejected. One can still say that it is better than not for humans to maximise their flourishing according to their natures and constitutive powers (e.g. that all other things being equal, it is better to be physically stronger than weaker, and healthy rather than sick) as it would ultimately lead to the elimination of humans beings if they had no interest in satisfying their functioning at all. It could be held that there are valid (if only pragmatically justified) norms of rational judgment and instrumental reasoning, if

we do indeed beg the question of the ultimate value of life.²²⁵ Or one could bite the epistemic bullet and maintain that it is not necessary to philosophically justify our moral systems at all, so long as such systems provide useful guides to living for people and live with the moral relativism that would follow. There can still be useful instrumental and other values even if morality is an incoherent assembly of conceptual bits and pieces as Alasdair MacIntyre argues in *After Virtue*.²²⁶ The ancient Greeks did not have our moral preoccupations, says Bernard Williams in *Ethics and the Limit of Philosophy*.²²⁷ Derek Browne also puts this point well:

Morality adopts the universal point of view: that is what is most striking about this peculiarly modern phenomenon. The most useful way to view this feature of morality is to say that morality is ruled by the metaethical principle that the universal point of view has supreme authority over all other points of view. From the universal point of view, my own interests and those of my friends are impartially and neutrally weighed along with the interests of all significant others. The practical thinking that I undertake from the moral point of view does not disregard my own well-being. But it relegates my own self to the status of one of the others with whom morality is impartially concerned; and my friends retreat to the distance of strangers. From the universal point of view, the local concerns of the self stand in need of moral justification; they are suspect, unless they can be endorsed morally.

One might suppose, with the Greeks, that it is unquestionably healthy for me to have a substantial care and concern for my own wellbeing. One might suppose, with the Greeks, that it is not only healthy but plainly good to have a substantial, special care for my own family and friends. Whatever else was true of human goodness, the Greeks were quite sure that it was a healthy state in which

²²⁵ Daniel Fincke, "Why Moral Nihilism is Self-Contradictory," November 22, 2001, at <http://www.patheos.com/blogs/camelswithhammers/2011/11/why-moral-nihilism-...>; Daniel Fincke. "If You Don't Believe in Objective Values, Then Don't Talk to Me about Objective Scientific Truth Either," November 27, 2011, at <http://www.patheos.com/blogs/camelswithhammers/2011/11/if-you-dont-believe-....>

²²⁶ A. MacIntyre, *After Virtue: A Study in Moral Theory*, 3rd Edition, (University of Notre Dame Press, Notre Dame, 2007); A. MacIntyre, *Ethics in the Conflicts of Modernity*, (Cambridge University Press, Cambridge, 2016). MacIntyre regards contemporary moral discourse as a "catastrophe" and in a state of "crisis," primarily arising from the lack of agreement about rational standards for the resolution of moral disputes.

²²⁷ B. Williams, *Ethics and the Limits of Philosophy*, (Harvard University Press, Cambridge, 1985); S. L. Darwell, "Abolishing Morality," *Synthese*, vol. 72, 1987, pp.71-89; M. Ojakangas, *On the Origins of Greek Biopolitics: A Reinterpretation of the History of Biopower*, (Routledge, London and New York, 2016).

to be. Local loves and commitments are an integral part of such a healthy condition of human life: only those corrupted by morality could ever doubt that. Yet from the universal point of view, local concerns stand in need of moral justification. ... According to utilitarianism – a theory which very clearly expresses the universalist thrust or moral thinking – it could happen that local concerns turn out to be morally indefensible. If that is so, then we ought – morally ought – to give them up.

This conclusion is repugnant because it contradicts the way we are. A morality which lacks any plausible grounding in human psychology surrenders its clam to the allegiance of human beings. Universalist morality threatens constantly to break the connection which ethics has with the goodness of a human life – human goodness, not moral goodness. Yet any plausible account of human goodness will be grounded in the facts of real human motivation. ...

If there is any final point of view in ethics, it is just the point of view in which everything that counts receives its proper consideration. It is not a point of view which neglects the special relationships I have to myself and my friends. Nor does it neglect those practical considerations that we would categorise as merely prudential or merely aesthetic. The self and its local concerns stand at the centre of Greek ethics. The self and its local concerns are banished to the distance of strangers by morality. The suspicion that this is an unhealthy attitude is the major reason for thinking that we might be better off without morality.²²⁸

The problems posed by contemporary philosophical analysis seem to undermine the common sense world as we know it.²²⁹ This is usually not discussed in the literature of ethics and moral theory because a common sense realism is assumed from the beginning of the analysis and seldom are deep metaphysical presupposition critically examined. Thus, what should moral philosophers and bioethicists make of claims coming from the metaphysics of quantum mechanics of quantum atomism and mereological nihilism, that a range of metaphysical considerations relating to both vagueness and composition and part/whole

²²⁸ Derek Browne, "Ethics without Morality," *Australasian Journal of Philosophy*, vol.68, 1990, pp. 395-412, cited pp. 408-409. Browne notes that the problem of the rational justification of morality is an unsolved philosophical problem.

²²⁹ B. Frances, *Scepticism Comes Alive*, (Clarendon Press, Oxford, 2005), says: "many people are attracted to philosophy in large part because of the nature of many philosophical puzzles: it seems that every solution must violate common sense in a radical manner" (p. 106) See further, E. Schwitzgebel, "The Crazyist Metaphysics of Mind," *Australasian Journal of Philosophy*, vol. 92, 2014, pp. 665-682.

relationships,²³⁰ indicates that there are no macroscopic objects at all (such as doctors and patients) but only “partless fundamental particles exist (electrons, quarks etc.), they do not compose any composite objects, and thus, empirical reality does not exist?”²³¹ No room for incentives here!

These conclusions coming from metaphysics would seem to eliminate the field of inquiry of this work in one solid strike. Yet, taking matters one step further and playing along with the metaphysician, we may ask why he/she believes in the existence of even partless fundamental quantum entities? After all the “atoms” of physics are supposed to explain the common world of human physical experience and these microscopic entities are postulated to exist, rather than mythical causes such as demons because of the explanatory and predictive power that they allegedly have. This presupposes that there is a “world” and an “us.” But if quantum mechanics leads to the metaphysical rejection of the “life world” and humans as knowing subjects, the principle of simplicity implies that the hypothesis of the existence of fundamental quantum entities should also be rejected, leading to ontological nihilism, that nothing (physical at least), exists!²³² This could be taken as a *reductio ad absurdum* of this metaphysical position. Bryan Frances commenting on the way that many philosophical claims, especially in metaphysics and epistemology, are contrary to common sense, says that “large portions of metaphysics, the philosophy of language, the philosophy of logic, the philosophy

²³⁰ P. Unger, “I Do Not Exist,” in G. F. MacDonald (ed.), *Perception and Identity*, (Cornell University Press, Ithaca, 1979), pp. 235-251; P. Unger, “There are No Ordinary Things,” *Synthese*, vol. 41, 1979, pp. 117-154; P. Unger, “Why There are No People,” *Midwest Studies in Philosophy*, vol. 4, 1979, pp. 177-222; P. Unger, “Skepticism and Nihilism,” *Noûs*, vol. 14, 1980, pp. 517-545.

²³¹ J. Grupp, “Mereological Nihilism: Quantum Atomism and the Impossibility of Material Constitution,” *Axiomathes*, vol. 16, 2006, pp. 245-386, cited pp. 245-246; J. Grupp, “Western Analytic Metaphysics Reduces to a Philosophy of Brahman,” *Journal of Indian Council of Philosophical Research*, vol. 21, no. 1, January-March, 2004, pp. 1-49.

²³² On the relationship between the principle of simplicity and nothingness see C. Dilworth, *Simplicity: A Meta-Metaphysics*, (Lexington books, Lanham, 2013). If abstract entities are given a physicalist treatment then on this account they do not exist either, so nothing exists!

of physic, and metaethics are bunk and philosophers should give up most of their error theories despite the fact that their supporting arguments are generally as good as or even better than other philosophical arguments.”²³³

I have argued throughout my philosophical, or anti-philosophical “career,” that these sort of ultimate problems, that self-destruct like the iconic cigar blowing up in one’s face, are the product of the hyper-rationalism of philosophy (or at least Western/Greek/Anglo-American philosophy) with its demand for a continuous, relentless justification and the defence of all assumptions.²³⁴ As has now been shown by the cooks’ tour of problems outlined here, of formal or mathematical logic and epistemology, it is highly unlikely that some new unified solution will be forthcoming; issues that have been trashed for over two thousand years, with no solution, but only deepening difficulties and greater confusion and complexity, will not be simply solved, if at all. Thus humans will have to “muddle through”²³⁵ using the fallible and defective conceptual tools that we have, for that is our human condition.²³⁶

²³³ B. Frances, “Philosophical Renegades,” in D. Christensen and J. Lackey (eds), *The Epistemology of Disagreements: New Essays*, (Oxford University Press, Oxford, 2013), pp. 121-166, cited p. 123.

²³⁴ J.W. Smith, *The Progress and Rationality of Philosophy as a Cognitive Enterprise: An Essay on Metaphilosophy*, (Avebury, Aldershot, 1988); J. W. Smith, *Essays on Ultimate Questions: Critical Discussions on the Limits of Contemporary Philosophical Inquiry*, (Avebury, Aldershot, 1988). See also P. F. Strawson, *Skepticism and Naturalism: Some Varieties*, (Columbia University Press, New York, 1985); George Santayana, *Scepticism and Animal Faith*, (R. & R. Clark, Edinburgh, 1933).

²³⁵ C. E. Lindblom, “The Science of ‘Muddling Through,’” *Public Administration Review*, vol. 19, 1959, pp. 79-88; C. E. Lindblom, “Still Muddling, Not Yet Through,” *Public Administration Review*, vol. 39, 1979, pp. 517-526.

²³⁶ J. W. Smith and G. Maddern, *The Surgical Litigation Crisis: Medical Practice and Legal Reform*, (Edwin Mellen Press, Lewiston, 2010); J. W. Smith and G. Maddern, *Medical Malpractice, Mistakes and Mishaps: Essays on Medical Litigation, the Mandatory Reporting of Health Professionals and the Limits of Law*, (Edwin Mellen Press, Lewiston, 2013); J. W. Smith and G. Maddern, *The Influence of Climate Change on the Practice of Surgery: The Scientific and Public Policy Implications*, (Edwin Mellen Press, Lewiston, 2015).

Thus, I believe that the approach to be adopted in dealing with all philosophical questions, (including both metaphilosophy and ethics) is not to reject principlism in total, but to see all principles (including the meta-principle embodied in this statement itself) as having their limits, and if applicable to reality at all, such principles are only applicable within a limited range and domain. I call such a position of epistemic humbleness, “limitationism.”²³⁷

Limitationism is sympathetic to the philosophical orientation of *casuistry*, an approach to bioethics which sees moral rules as useful, but not absolute and seeks to deal with resolving issues involved in specific cases, comparing examined cases to paradigmatic ones.²³⁸ There is less concern with formal logical methods of reasoning, as employed extensively in analytic philosophy and its associated Anglo-American moral theories, and instead, informal logic and “rhetorical reasoning,” is employed, as is done in fields outside the formal mathematics-based sciences, and disciplines, such as in law.²³⁹

The casuistry approach has found little direction from classical ethics philosophy; Jonsen says that the classical ethicist “prefers to contemplate the abstractions of the map rather than plunge into the thickets of actual cases.”²⁴⁰

Casuistry though:

...works in the terrain, taking into account the lay of the land, distance, the vegetation, and the weather. Aristotle likens this sort of reasoning to the way in which doctors and sailors go about their work. In both medicine and navigation there are theories and principles, but the physician treating a sick person is guided by the changing symptoms and the varying response to treatments; the sailor trims his sails as the wind and current shift. So the ethical analyst must know the meaning and relevance of the multifarious circumstances of the case, as well as

²³⁷ J. W. Smith and S. Positano, *The Self-Destructive Affluence of the First World*, (Edwin Mellen Press, Lewiston, 2010).

²³⁸ A. R. Jonsen and S. Toulmin, *The Abuse of Casuistry: A History of Moral Reasoning*, (University of California Press, Berkeley, 1988).

²³⁹ A. R. Jonsen, “Casuistry as a Methodology in Clinical Ethics,” *Theoretical Medicine*, vol. 12, 1991, pp. 295-307, cited p. 297.

²⁴⁰ A. R. Jonsen, “Casuistry,” in J. Sugarman and D. P. Sulmasy (eds), *Methods in Medical Ethics*, (Georgetown University Press, Washington DC, 2009), pp. 104-125, cited p. 106.

the principles and theories. Indeed, the principles and theories by themselves do not get a person anywhere; the moral mind and imagination are moved by circumstances.²⁴¹

Casuistry, although instructive, and an improvement upon standard analytic ethics, is not accepted as a methodological foundation for this work, as the idea of beginning with paradigm cases, where the moral nature has already been decided, seems to lead once more to the problem of the criterion.²⁴² Rather, there are no uncontroversial “paradigm” cases, but sets of possibly revisable facts and “essentially contested”²⁴³ rules and principles, that for the purposes of some debates may be accepted without the demand of unending philosophical scrutiny and justification.

It will be shown in the next chapter that it is still possible to make progress in defending the principal thesis of this work, even given the paradoxes of reason and the “epistemological crisis.” It may well be at the highest level of abstraction, typically found in the philosophy of logic, mathematics, physics and metaphysics, that certain ultimate principles breakdown. Thus, at present quantum mechanics and special and general relativity are logically incompatible, and hence inconsistent,²⁴⁴ and leading physicists hope that string theory may resolve this contradiction, as I discuss in the technical appendix.²⁴⁵ But, work in “lower” less abstract areas of physics continues as usual. If one happens to run aground into these conceptual impasses, then one does. But, until

²⁴¹ As above.

²⁴² K. Wildes, “The Priesthood of Bioethics and the Return of Casuistry,” *Journal of Medicine and Philosophy*, vol. 18, 1991, pp. 33-49; L. Kopelman, “Case Method and Casuistry: The Problem of Bias,” *Theoretical Medicine*, vol. 15, 1994, pp. 21-37.

²⁴³ W. B. Gallie, “Essentially Contested Concepts,” *Aristotelian Society Proceedings*, vol. 56, 1955-1956, pp. 167-198.

²⁴⁴ N. Maxwell, “Are Probabilism and Special Relativity Incompatible?” *Philosophy of Science*, vol. 52, 1985, pp. 23-43.

²⁴⁵ L. Smolin, *The Trouble with Physics: The Rise of String Theory, The Fall of a Science and What Comes Next*, (Houghton Mifflin, Boston, 2006).

then, it is business as usual. The strict logical contradiction, which would excite the philosopher, is simply ignored so that work can continue. Hyper-rationality is thus put in its place by the concerns of practice. This would be a hard lesson for philosophers, concerned with providing a metanarrative for all disciplines, enabling them to critique such discipline's purported knowledge claims, to accept. Yet, under pain of scepticism, accept it we must. Hence, there is no general philosophical-ethical answer to the core question of this work, which could attempt by application of some abstract ethical principle decide that incentives for patient compliance are justified. There can be no easy road apart from analysing each of the main arguments, within the context and values of the existing debate, and drawing a conclusion. That is the task now before us.

CHAPTER 4

Incentives and Ethics

Introduction

This chapter will examine the principal ethical and philosophical objections that have been made in the contemporary literature to incentives for patient compliance, especially financial incentives. There are a variety of objections, most based upon a belief that the use of incentives violates the principle of autonomy in some fundamental way. Almost all of the articles, and books discussing the issue which are critical of the use of incentives to produce patient compliance, and of the wider use of incentives in social policy, also accept that there is no real fundamental epistemological crisis and that the matter is capable of rational resolution.

However, in one of the few papers that recognised the relevance of epistemological issues to the more narrow matter of incentives to aid in patient compliance, Szmukler argued that this issue faced a problem of value incommensurability.²⁴⁶ Certain “higher” goods (e.g. a human life) are valued in a metric which equates with goods in a “lower” domain, such as money, commodifying, in an unjustified way, the “higher” valued good. There is a devaluation of the goods in the “higher” domain, when different spheres of valuation are mechanically equated. It is argued by Szmukler that the competent and considered decisions of patients, cannot be equated with a monetary value, because their value is intrinsic, while the monetary value is purely instrumental. Equating these values, arguably shows a lack of respect to people as agents having

²⁴⁶ G. Szmukler, “Financial Incentives for Patients in the Treatment of Psychosis,” *Journal of Medical Ethics*, vol. 35, 2009, pp. 224-228. See also M. Dunn (et al.), “Threats and Offers in Community Mental Healthcare,” *Journal of Medical Ethics*, vol. 38, 2012, pp. 204-209.

an intrinsic value.²⁴⁷ Financial incentives may also be taken to override the patient's decision of medication, demonstrating a failure of respect for a person's autonomy which may be especially damaging to patients with a mental illness, as Szmukler believes that this promotes "an inferior conception of personhood – of diminished agency and autonomy – of those with a mental illness."²⁴⁸

This example illustrates some of the difficulties that confront the present work. As seen from the previous chapter it is quite likely that the value question of incommensurability, as posed by Szmukler, is philosophically insoluble. The values in question may well be incommensurable. However, even so, as Dunn (et al.) point out, decisions in social life often involve balancing different and competing interests, usually involving instrumental values, which may be in conflict with some "higher" intrinsic values. Decisions will still have to be made, and the epistemological sceptic's luxury of merely suspending judgment and doing nothing will not be a live and realistic option when there may be dire consequences from doing nothing at all, as is the case in many healthcare decision situations.²⁴⁹ Possibly philosophically imperfect decisions would need to be made. Indeed, the sceptical "null hypothesis" may in itself fail to show due respect to persons: "if the effect of a decision to withdraw from treatment means that a patient requires increased levels of support in the future and becomes unable to act upon her interests, giving ethical primacy to a narrow, 'in-the-moment' refusal of treatment rather than the broader scope of the duties of care that shape the provision of treatment [this] could itself be considered to fail to show due respect to the person."²⁵⁰ The strategy here is to show that even given the epistemological problems noted in the previous chapter, it still may be possible to side step objections to the use of incentives to produce patient compliance.

²⁴⁷ I. G. Cohen, "The Price of Everything, the Value of Nothing: Reframing the Commodification Debate," *Harvard Law Review*, vol. 117, 2003, pp. 698-710.

²⁴⁸ Szmukler, as above, cited note 246, p. 225.

²⁴⁹ Dunn (et al.), cited note 246, p. 207.

²⁵⁰ As above.

The response then to the problem of incommensurability, is to accept its logical point, but to note that this problem covers much of modern living. For example, people, who have intrinsic value, and are Kantian ends in themselves, work in factories every day to produce goods consumed by us all, yet are treated as mere mechanisms, with their activities and time even for toilet breaks, monitored.²⁵¹ This is the essential and enduring insight of the Marxist tradition, about the alienation of industrial workers,²⁵² although with the rise of robots and ultra-smart AI, the future focus may be what, if any work survives, alienated or not.²⁵³ The conflict produced by incommensurable values is thus vast in modernity, and extends far beyond the incentives debate. What can be said in reply to Szmukler on this point is that designers of incentive-based healthcare programs need to be aware of such value concepts and seek to minimize conflicts even if such conflicts cannot be practically eliminated. In particular, this will involve full disclosure to patients about the intentions of incentive-based schemes, as well as ensuring that fully-informed patients consent to participation.

Szmukler argues that even if there is a consent by a patient to participate in an incentives-based program, there is a further ethical dilemma. If the patient is assumed to have decision-making capacity, then the patient has already made a decision (i.e. to smoke or use IV drugs, sharing syringes), because she/he has already weighted up the pros and cons of such actions, and by continuing to perform the actions, accepts that they are acting in their best health interests, even though from an objective point of view, their activities may be seen as health-threatening. There is thus a denigration of the patient's decision about what is in

²⁵¹ J. Cersonsky, "6 Ways that Workers are Being Treated Like Machines," August 28, 2013, at <http://www.alternet.org/labor/6-extreme-ways-companies-are-trying-get-workers-behave-machines>.

²⁵² P. D'Amato, *The Meaning of Marxism*, (Haymarket Books, Chicago, 2014); M. Roberts, *The Long Depression: Marxism and the Global Crisis of Capitalism*, (Haymarket Books, Chicago, 2016).

²⁵³ J. Kaplan, *Humans Need Not Apply: A Guide to Wealth and Work in the Age of Artificial Intelligence*, (Yale University Press, New Haven, 2016).

their best interests, and a failure of the respect for personhood, especially for people with mental disorders.²⁵⁴ Lerner has argued as well from an historical construction that the notion of compliance itself is “judgmental,” and that noncomplying patients are therefore “deviants.”²⁵⁵

The situation depicted by Szmukler is somewhat unrealistic. The patient who has decided that smoking is in their health-interests, will simply not show up as a patient, but will just be another smoker. The use of incentives will simply not arise for the people that Szmukler is referring to, and the healthcare system is not based on paternalistically seeking uncooperative people, and attempting to change their behaviour, if they are resistant. If a patient has the decision-making capacity to understand the use of incentive-based rewards for healthy behaviour, but still lacks, or has great difficulty making treatment decisions, then the situation will not involve an incommensurability of values because the issue is one of consent to participate in the program, which we assume *ex hypothesi*, was freely given.

Likewise, although Lerner is right to note that historically noncompliant patients have been harshly judged by the medical profession, the historical argument is of limited relevance to today’s situation, because the problem which is depicted by the issue of patient noncompliance is real whatever terms one can or cannot use. The issue does not go away and unless we propose the idea that modern medicine cannot help patients, there is still a need for patients to see that various prescribed medications and treatments are of objective benefit to them. The patient should comply with the doctor’s directions because these are, presumably in the health interests of the patient, although it is always open to further investigation whether a specific doctor or treatment is “right.” Hence, the claim of judgmentalism should also be rejected.

²⁵⁴ Szmukler, cited note 246, p. 225.

²⁵⁵ B. H. Lerner, “From Careless Consumptives to Recalcitrant Patients: The Historical Construction of Noncompliance,” *Social Science and Medicine*, vol. 45, 1997, pp. 1423-1431.

However, there will still be a problem of whether or not such programs undermine patient autonomy, as Szmukler notes, an issue which will now be addressed.

The Problem of Autonomy

The major objections to the use of incentives, especially financial incentives to enhance patient compliance, generally relate to possible threats to patient autonomy. One of the leading critics is Ruth W. Grant who discusses this matter in her book, *Strings Attached*.²⁵⁶ Incentives purport to be benefits to people, but by definition they seek to change people's behaviour, so there is the intrinsic possibility of manipulation, especially as incentives, as in the case of the doctor-patient relationship, are usually between the powerful and the less powerful.²⁵⁷ The problem of autonomy arises with incentive schemes, Grant argues, because incentives "circumvent the need for persuasion by giving people extrinsic reasons to make the choices that the person or institution offering the incentive wishes them to make."²⁵⁸ Incentives allegedly often fail the autonomy test, that is, of respecting the free and rational character of human beings, to "the extent that incentives are one of the ways in which experts seek to manipulate behavior and to the extent that incentive systems substitute for persuasion and foreclose deliberation and debate, a democratic people ought to be deeply suspicious of them."²⁵⁹

Grant illustrates the core importance that the value of autonomy has for critics of incentives, and as will be discussed in the next chapter, soft and hard (coercive) forms of paternalism. Even so, she believes that incentives can still be

²⁵⁶ R. W. Grant, *Strings Attached: Untangling the Ethics of Incentives*, (Russell Sage Foundation, Princeton University Press, New York and Princeton, 2012).

²⁵⁷ As above, p. 39.

²⁵⁸ As above, p. 7.

²⁵⁹ As above, p. 12.

used in an acceptable way, so long as the use of incentives does not undermine autonomy and serves a legitimate purpose, giving genuine choices to recipients and not having an ill effect on character. There are various necessary minimal threshold standards. The first threshold questions are:

- (1) Is a legitimate purpose served by the incentive?
- (2) Is a voluntary response permitted by the incentive?
- (3) Does the incentive have a positive or neutral effect on the character of recipients, or are impacts largely negative?²⁶⁰

If the incentive meets this threshold, then there are a second set of questions to be examined:

- Which of several purposes is most important here?
- Is the incentive seductive or exploitative?
- What is the most important in this case: purpose, voluntariness, or character?
- Does it mask accountability?
- What will be its long-term impact on institutional culture?
- Is it fair?
- Is this incentive a legitimate use of power and not a case of “undue influence?”²⁶¹

The philosophical difficulty posed by such a shopping list of attributes, although having intuitive plausibility, is that in crucial respects the list will either beg the question on many contentious issues involving the use of incentives, or not

²⁶⁰ As above, p. 73.

²⁶¹ As above, p. 74.

aid in deciding matters at all. For example, it is intuitively plausible that a justified use of incentives be one that is “fair,” but what is “fair”? Surely, the term as applied in this debate is an “essentially contested concept,”²⁶² and thus both supporters and critics of the use of incentives, will be advancing mutually incompatible arguments for their side of the case. The same point can be made with other concepts mentioned in the list such as “accountability,” “exploitative,” “legitimate” and “seductive.” More will be said specifically about the issue of exploitation in the discussion below. At this point, it is concluded that Grant’s work has not established that incentives are as problematic as she supposes without begging the question at issue in this debate with supporters of incentives.

Even if terms such as “legitimate” are taken at their ordinary common sense meanings, the debate between the supporters of incentives and the critics of incentives is not resolved by use of most of Grant’s other criteria. Supporters of incentives can argue that incentive schemes for the enhancement of patient compliance, do in fact have a legitimate purpose and that is to aid patients complying with schemes that objectively aid their health, and thus wellbeing. The schemes operate, because in the cases in question, people have failed purely by strength of will and autonomous rationality to comply with medical recommendations designed to help them. Hence, autonomy is failing, and needs some support, and incentives are designed precisely to supply that support. Rather than being a *prima facie* threat to autonomy as Grant believes (“they tend to inhibit autonomous action, deliberation over purposes, ethical judgment, or self-direction”),²⁶³ incentives could be viewed as the opposite of this. Incentives have been seen as helping to promote autonomy by reducing barriers to behavioural health change, especially among low-income people, who already have their

²⁶² W. B. Gallie, “Essentially Contested Concepts,” *Proceedings of the Aristotelian Society*, vol. 56, 1956, pp. 167-198.

²⁶³ Grant, cited note 256.

autonomy challenged by other forces.²⁶⁴ Incentives such as cash payments for quitting smoking, ending substance abuse or losing weight, can be used not to induce recipients to do something that they do not want to do, but rather to help them overcome addictions, weakness of will and other “motivational deficiencies,” and thus to enhance, rather than diminish autonomy.²⁶⁵ While one can cite individual cases where lack of a careful and prudent use of incentives have undermined, in whole or in part, personal responsibility,²⁶⁶ this is by no means intrinsic to such incentive schemes.²⁶⁷

The argument to this point has accepted the principle of autonomy as being an unquestioned moral principle, but of course, the full-blooded autonomy principle, like every other principle is contested and under challenge by

²⁶⁴ K. Lunze and M. K. Paasche-Orlow, “Financial Incentives for Healthy Behavior: Ethical Safeguards for Behavioral Economics,” *American Journal of Preventive Medicine*, vol. 44, no. 6, 2013, pp. 659-665, cited p. 660; J. S. Slater (et al.), “Effect of Direct Mail as a Population Based Strategy to Increase Mammography Use Among Low-Income Underinsured Women ages 40 to 64 Years,” *Cancer Epidemiology, Biomarkers & Prevention*, vol. 14, 2005, pp. 2346-2352; S. D. Halpern (et al.), “Patients as Mercenaries? The Ethics of Using Financial Incentives in the War on Unhealthy Behaviors,” *Circulation: Cardiovascular Quality and Outcomes*, vol. 2, 2009, pp. 514-516, “incentives merely counter our self-defeating tendencies toward immediate gratification without constraining our opinions.” (p. 515); S. D. Halpern (et al.), “Harnessing the Power of Default Options to Improve Health Care,” *New England Journal of Medicine*, vol. 357, 2007, pp. 1340-1344.

²⁶⁵ T. Marteau (et al.), “Using Financial Incentives to Achieve Healthy Behaviour,” *British Medical Journal*, vol. 338, 2009, pp. 983-985; A. J. London (et al.), “Improving Ethical Research for Research Involving Incentives for Health Promotion,” *PLOS Medicine*, vol. 9, 2012, e1001193; A. J. London, “Justice and the Human Development Approach to International Research,” *Hastings Center Report*, vol. 35, 2005, pp. 24-37.

²⁶⁶ A. Oliver, “Can Financial Incentives Improve Health Equity?” *British Medical Journal*, vol. 339, 2009: b3847; H. Schmidt, “Personal Responsibility in the NHS Constitution and the Social Determinants of Health Approach: Competitive or Complementary?” *Health Economics Policy and Law*, vol. 4, 2009, pp. 129-138; H. Schmidt, “Bonuses as Incentives and Rewards for Health Responsibility: A Good Thing?” *Journal of Medicine and Philosophy*, vol. 33, 2008, pp. 198-220.

²⁶⁷ G. Loewenstein (et al.), “Asymmetric Paternalism to Improve Health Behaviors,” *JAMA*, vol. 298, 2007, pp. 2415-2417.

paternalist,²⁶⁸ feminist²⁶⁹ and communitarian critiques.²⁷⁰ John Gray has argued that liberalism faces a “problem of indeterminacy,” since it does not offer a normative basis for deciding what the scopes and limits of liberty and autonomy are, and how in principle there can be an adjudication of conflicts between different claims of liberty.²⁷¹ For example, is liberty being reduced or increased when, the state through increased taxation makes a transfer of wealth from the “rich” to the “poor”?²⁷²

Although, as expected, there is a lively dispute about the nature of autonomy²⁷³ at a minimum, “personal autonomy encompasses self-rule that is free from controlling interference by others and limitations that prevent meaningful choice, such as inadequate understanding.”²⁷⁴ Personal autonomy is thus free action on the basis of a plan chosen by the individual acting on the basis of their own desires and thus encompasses the two conditions of (1) *liberty* (freedom from controlling influences) and (2) *agency* (the capability of engaging in intentional action), including understanding the action, even if this is not a complete

²⁶⁸ G. Dworkin, “Paternalism,” *Monist*, vol. 56, 1972, pp. 64-84. “By paternalism I shall understand roughly the interference with a person’s liberty of action justified by reasons referring exclusively to the welfare, good, happiness, needs, interests or values of the person being coerced.” (p. 65) see generally J. Feinberg, *Harm to Self*, (Oxford University Press, Oxford, 1986); D. van de Veer, *Paternalistic Intervention: The Moral Bounds of Benevolence*, (Princeton University Press, Princeton, 1986). Paternalism is discussed in the next chapter.

²⁶⁹ W. Brown, *States of Injury: Power and Freedom in Late Modernity*, (Princeton University Press, Princeton, 1995); S. Hoagland, *Lesbian Ethics: Toward New Value*, (Institute of Lesbian Studies, Palo Alto, 1988).

²⁷⁰ D. Callahan, “Autonomy: A Moral Good, Not a Moral Obsession,” *Hastings Center Report*, vol. 14, 1984, pp. 40-42.

²⁷¹ J. Gray, “Liberalism and the Choice of Liberties,” in T. Attig (ed et al.), *Restraint of Liberty*, (Bowling Green State University, Bowling Green, 1985), pp. 1-25.

²⁷² D. B. Rasmussen, “Liberalism and Natural End Ethics,” *American Philosophical Quarterly*, vol. 27, 1990, pp. 153-161.

²⁷³ G. Dworkin, *The Theory and Practice of Autonomy*, (Cambridge University Press, New York, 1988).

²⁷⁴ T. L. Beauchamp and J. F. Childress, *Principles of Biomedical Ethics*, 7th edition, (Oxford University Press, New York, 2013), p. 101.

understanding.²⁷⁵ Some ethicists have a much more complex account of autonomy, and Gerald Dworkin defines the autonomy in terms of a “second-order capacity of persons to reflect critically upon their first-order preferences, desires, wishes, and so forth and the capacity to accept or attempt to change these in the light of higher-order preferences and values.”²⁷⁶ Thus, someone may be obese due to lack of exercise and/or overeating, or a poor diet based around eating the wrong sorts of food, but still may have a second-order desire to change their diet and exercise, but has difficulty in doing so. Nevertheless, as Beauchamp and Childress have commented, if “second-order desires (decisions, volitions etc.) are generated by prior desires or commitments, then the process of identifying with one desire rather than another does not distinguish autonomy from nonautonomy.”²⁷⁷ Along with this, the more complex account of autonomy by Dworkin conflicts with common sense intuitions of situations generally regarded as autonomous action, but would fail to be so by his account, such as selecting junk food when grocery shopping by impulse buying, when one has not reflected on one’s desire for junk food.²⁷⁸ Thus, while it would certainly be the case than on accounts of autonomy such as Dworkin’s there would be difficulties created for many programs of incentives to enhance patient compliance, his account should be rejected, or at least treated as one special conception of personal autonomy, and a restrictive one at that. The conception would make few human decisions, which are often sub-optimal in rational reflection, autonomous at all.²⁷⁹

Autonomous action then can be understood as intentional action, based on a modest degree of understanding, free from controlling constraints such as severe

²⁷⁵ As above, p. 102. See also J. S. Taylor (ed.), *Personal Autonomy: New Essays on Personal Autonomy and its Role in Contemporary Moral Philosophy*, (Cambridge University Press, Cambridge, 2005).

²⁷⁶ Dworkin, cited note 273, p. 20.

²⁷⁷ Beauchamp and Childress, cited note 274, p. 103.

²⁷⁸ As above, p. 103.

²⁷⁹ As above.

illness, irrationality, immaturity and external controls that would strip away the self-directedness of the person. In an insightful entry for the respected *Stanford Encyclopedia of Philosophy*, John Christman notes that the importance given to the ideal of personal autonomy is a product of Western modernity:

In the western tradition, the view that individual autonomy is a basic moral and political value is very much a modern development. Putting moral weight on an individual's ability to govern herself, independent of her place in a metaphysical order or her role in social structures and political institutions is very much the product of the modernist humanism of which much contemporary moral and political philosophy is an offshoot.... As such, it bears the weight of the controversies that this legacy has attracted. The idea that moral principles and obligations, as well as the legitimacy of political authority, should be grounded in the self-governing individual, considered apart from various contingencies of place, culture, and social relations, invites skeptics from several quarters. Autonomy, then, is very much at the vortex of the complex (re) consideration of modernity.²⁸⁰

Thus, Alasdair MacIntyre has argued that autonomy gains its sense and intelligibility from its place in tradition, and to “cut myself off from the past, in the individualist mode, is to deform my present relationships.”²⁸¹ Callahan says that the ideal of autonomy would not sustain a community, as it “effectively excludes the mediating and civilizing role of community,” and that there is no common good “under a reign of autonomy; there is only the aggregate of individual goods.”²⁸²

There can be no community without a powerful sense that my neighbor is my obligation, quite apart from whether I chose that obligation or not. There can be no community if the drive for a just society cannot, in principle, encompass an effort to define the nature of a good society. In its absence, there will be only the transitory alliances of those who find it convenient to serve their autonomy by banding together to spread it to others. And it will not escape the perceptive eye

²⁸⁰ J. Christman, “Autonomy in Moral and Political Philosophy,” *Stanford Encyclopedia of Philosophy*, at <http://stanford.library.usyd.edu.au/entries/autonomy-moral/>; J. B. Schneewind, *The Invention of Autonomy*, (Cambridge University Press, Cambridge, 1998).

²⁸¹ A. MacIntyre, *After Virtue: A Study in Moral Theory*, 2nd edition, (University of Notre Dame Press, Notre Dame, 1984), p. 205.

²⁸² D. Callahan, “Autonomy: A Moral Good, Not a Moral Obsession,” *Hastings Center Report*, vol. 14, no. 5, 1984, pp. 40-42, cited p. 42.

that the best way to reduce an anachronistic sense of mutual obligation mutually uninvited is to spread the good news of liberating autonomy.

One should not be surprised that biomedical ethics is fashioned from the more general ethical ingredients available on the open market of contemporary morality. The antipaternalism that is at least one of the natural children of autonomy is hardly unique to the medical sphere; it is one with the skepticism toward authority, especially moral authority, that has marked the past two decades. But is a society based upon an individualistic search for autonomy, and a cherishing of moral independence, a good community? There is little to suggest that it is. By flying in the face of those goods that have constituted valid communities, we have left nothing with which to build bonds between and among people. Community requires constraints, limits, and taboos, just as it requires shared ideals, common dreams, and a vision of the self that is part of a wider collectivity. By bringing into the medical relationship the most sterile and straitened notions of an autonomous self, ethics has borrowed not from the richest portion of our tradition but from the thinnest.²⁸³

In the discussion to follow, especially in the next chapter concerned with soft and hard paternalism, it is not proposed that the ideal of autonomy be abandoned, only that autonomy be seen as one important moral value among others. Thus, the prima facie conflict between the use of incentives and the autonomy of recipients is not in itself a knockdown objection to an incentives scheme. It will need to be shown on some independent basis that the prima facie conflict is in fact real, and objectionable.²⁸⁴

Coercion, Exploitation and Manipulation

The principal autonomy-based critiques of the use of incentives to enhance patient compliance are based upon issues of coercion, exploitation and manipulation, although these objections are usually run together as an argument

²⁸³ As above.

²⁸⁴ T. S. Huddle, "The Limits of Social Justice as an Aspect of Medical Professionalism," *Journal of Medicine and Philosophy*, vol. 38, 2013, pp. 369-387; A Wertheimer, "Voluntary Consent: Why a Value-Neutral Concept Won't Work," *Journal of Medicine and Philosophy*, vol. 37, 2012, pp. 226-254.

based on coercion.²⁸⁵ We can dispose of the issues of manipulation and exploitation more easily, so these will be discussed first.

Manipulation and exploitation would require influencing a person so that the person acting stands to make some personal gain from the said acts. Thus, to use an example from Szmukler,²⁸⁶ one may find (in North America or Europe) that one's car has been snowed in and to get to an important meeting in time, it is necessary to promptly dig the tires free, but you do not have a shovel. Then, along comes "Seller" with a shovel, which has a sale price three times the normal price of a shovel, indicating that she/he is capitalising on your difficulty. If you do not accept, you will be no worse off than if she/he did not arrive on the scene, but you may feel that an unfair advantage has been taken of your plight. Exploitation thus involves an unfair advantage taken over a person, typically for gain.²⁸⁷

Manipulation though involves acts using various strategies and tactics so that some agent's behaviour can be changed.²⁸⁸ Incentives, along with much of human social interaction has elements of manipulation, but whether this is ethically problematic or not would need to be decided on an independent basis. The manipulation in most of the incentive schemes considered in chapter 1 of this work,

²⁸⁵ See generally, M. Wilkinson and A. Moore, "Inducements in Research," *American Journal of Bioethics*, vol. 11, 1997, pp. 373-389; C. Pies and S. Samuels, *Using Incentives in Reproductive Health Programs: An Ethical Framework*, (School of Public Health, University of California at Berkeley, Berkeley, 1999); J. Popay, "Should Disadvantaged People be Paid to Take Care of their Health? No," *British Medical Journal*, vol. 337, 2008: a594; T. M. Marteau (et al.), "Using Financial Incentives to Achieve Healthy Behaviour," *British Medical Journal*, vol. 338, 2009; b1415; R. E. Ashcroft, "Personal Financial Incentives in Health Promotion: Where Do They Fit in an Ethic of Autonomy?" *Health Expectations*, vol. 14, 2011, pp. 191-200; A. J. London (et al.), "Improving Ethical Review of Research Involving Incentives for Health Promotion," *PLOS Medicine*, vol. 9, 2012; e1001193; K. G. Volpp and R. Galvin, "Reward-Based Incentives for Smoking Cessation: How a Carrot Became a Stick," *JAMA*, vol. 311, 2014, pp. 909-910.

²⁸⁶ G. Szmukler, "Financial Incentives for Patients in the Treatment of Psychosis," *Journal of Medical Ethics*, vol. 35, 2009, pp. 224-228, cited p. 226.

²⁸⁷ A Wertheimer, *Exploitation*, (Princeton University Press, Princeton, 1996), p. 207.

²⁸⁸ M. D. White, *The Manipulation of Choice: Ethics and Libertarian Paternalism*, (Palgrave Macmillan, New York, 2013); T. Nys and B. Engelen, "Judging Nudging: Answering the Manipulation Objection" *Political Studies*, 2016; doi:10.1177/0032321716629487; C. Coons and M. Weber (eds), *Manipulation: Theory and Practice*, (Oxford University Press, 2014).

are indeed strategies to change human behaviour, but from that alone it does not follow that such programs are therefore problematic or morally unjustified, even in some common sense respect. A parent may subtly “manipulate” their child’s choices so that they make the “right” one, one which is in their long term interests, as they characterise it, and as they feel their child may later characterise it, such as not dropping out of school so that they can ultimately obtain a higher education, and hopefully a better job than would be obtained other than by, say, collecting bottles from rubbish bins for sale. Incentives do not necessarily embody any unjustified manipulation, unless one wished to see most of human social life and influence, as ethically unjustified. But, such an extreme libertarianism would, as we have seen above, be incompatible with the flourishing of social life and community.

Likewise, incentives for patient compliance need not be exploitative. The scheme could very well be undertaken for altruistic and community benefit reasons, to help people, not to benefit doctors personally. Incentive schemes could in principle degenerate into modes of exploitation if doctors stood to benefit financially from implementing them, but this is universally accepted ethically and legally as involving a clear conflict of interest, so such schemes would indeed be ethically flawed, and should not be undertaken.²⁸⁹

The concern about the ethics of coercion features prominently in debates about incentives for patient compliance and in other areas where incentives are used. Claassen, for example, in a study of financial incentives for antipsychotic depot medication, submitted questionnaires to team managers of 150 assertive outreach (AO) teams on the issue of financial incentives to increase drug adherence behaviour.²⁹⁰ Of the 150 questionnaires, there were 70 replies and 53 (76%)

²⁸⁹ D. F. Thompson, “Understanding Financial Conflicts of Interest,” *New England Journal of Medicine*, vol. 329, 1993, pp. 574-576.

²⁹⁰ D. Claassen, “Financial Incentives for Antipsychotic Depot Medication: Ethical Issues,” *Journal of Medical Ethics*, vol. 33, 2007, pp. 189-193. See also R. C. Christensen, “Ethical Issues in Community Mental Health: Cases and Conflicts,” *Community Mental Health Journal*, vol. 33, 1997, pp. 5-11.

mentioned ethical objections to psychiatric paternalism, with 31 responses, the largest, expressing concerns about issues of coercion.

What then is coercion? Some influential accounts of the concept of coercion are based upon jurisprudential notions of coercion, typically requiring that force, or the threat of force, is used to compel a person to do something, obviously against their will, otherwise force would not be needed and the act would merely be one of free agency.²⁹¹ But this account is almost certainly too narrow, as it would not capture cases where authorities made a threat that, for example, a psychiatric patient would not be able to see her/his children unless complying with a medication regime. The Belmont Report saw incentives as never being coercive as coercion occurs when “an overt threat or harm is intentional presented by one person to another in order to gain compliance.”²⁹² Undue influence was defined by the Belmont Report as “an offer of an excessive, unwarranted, inappropriate, or improper reward or other overture in order to obtain compliance.”²⁹³ Undue influence could occur in vulnerable populations such as prisoners, the economically disadvantaged, the very sick and the institutionalised, where the individuals may find it difficult to refuse consent, even if they strongly wished to.²⁹⁴ This ethical conception is consistent with the position in jurisprudence, where in contract theory, for example, undue influence exists if there is an inequality of power between the parties which results in the weaker party contracting with the

²⁹¹ R. Faden and T. L. Beauchamp (with N. King), *A History and Theory of Informed Consent*, (Oxford University Press, New York, 1986); R. M. Veatch, “Why Liberals Should Accept Financial Incentives for Organ Procurement,” *Kennedy Institute of Ethics Journal*, vol. 13, 2003, pp. 19-36; A. Wertheimer, *Coercion*, (Princeton University Press, Princeton, 1987); A. Wertheimer, “Remarks on Coercion and Exploitation,” *Denver University Law Review*, vol. 74, 1997, pp. 889-906.

²⁹² *Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research*, (U.S. Government Printing Office, Washington D.C., 1979), cited from E. Singer and R. M. Bossarte, “Incentives for Survey Participation: When are They “Coercive”?” *American Journal of Preventive Medicine*, vol. 35, 2006, pp. 411-418, cited p. 413.

²⁹³ Singer and Bossarte, as above, p. 414.

²⁹⁴ E. A. Largent (et al.), “Money, Coercion, and Undue Influence: Attitudes about Payments to Research Participants,” *IRB: Ethics and Human Research*, vol. 34, 2012, pp. 1-8; C. Levine (et al.), “The Limitations of “Vulnerability” as a Protection for Human Research Participants,” *American Journal of Bioethics*, vol. 4, 2004, pp. 44-49.

stronger, either expressly (where the stronger party deprives the weaker of free will), or presumed, where the influence is exerted on the basis of a position of trust and confidence which the weaker party has, and which may be betrayed. As Dixon J said in *Johnson v Buttress* (1936), undue influence was the “unconscientious use of any special capacity or opportunity that may exist or arise ... affecting the alienor’s will or freedom of judgment in reference to such a matter.”²⁹⁵ A related legal concept is that of *duress*, where in a contract one party exerts illegitimate pressure (coercion) on a weaker party to induce the weaker party to contract, typically involving threats of harm and physical force.²⁹⁶

Probably those advancing the coercion objection against the use of incentives for patient compliance are operating with a concept of coercion based on undue influence. Joanne Shaw, for example says that paying patients for adherence “is coercion by carrot rather than stick, but coercion none the less. Can we imagine paying people to have lobotomies? Paying people to take drugs occupies the same ethical territory and is no more acceptable just because we do not use the same explicit written consent processes for drugs as we do for some other medical interventions.”²⁹⁷ On the same lines it has been said that payments and incentives for the good of patients could have been used to defend sterilisation policies, such as the past sterilisation of thousands of women in Sweden.²⁹⁸

The problem with the Swedish sterilisation example as a counter-example to incentive schemes is that the women in question were sterilised without consent at all.²⁹⁹ Further, supporters of the ethnicity of incentives for patient compliance

²⁹⁵ *Johnson v Buttress* (1936) 56 CLR 113, Dixon J, at p. 134; *Earl of Aylesford v Morris* (1873) L. R. 8 Ch 484, Lord Selborne L.C., p. 491.

²⁹⁶ *Barton v Armstrong* [1976] AC 104.

²⁹⁷ J. Shaw, “Is It Acceptable for People to be Paid to Adhere to Medication? No,” *British Medical Journal*, vol. 335, 2007, p. 233.

²⁹⁸ A. E. Raffle and K. Morgan, “Financial Inducements Are Equivalent to Coercion,” *British Medical Journal*, vol. 316, 1998, p. 394.

²⁹⁹ A. Armstrong, “Thousands of Women Sterilised in Sweden Without Consent,” *British Medical Journal*, vol. 315, 1997, p. 563.

require that the object of compliance be in the patient's interests, and accepted as being morally good by the society in question, which today would also defeat the sterilisation example. One can indeed argue that incentives programs for say, the sterilisation of drug addicted women, are unethical, not because incentives are being offered, but because the project of sterilising women, and highly vulnerable ones, clearly violates fundamental human rights.³⁰⁰ As well, if the object of compliance involves medical procedures or medicine, then this should be scientifically sound by today's standards, which it is not.³⁰¹

Emanuel argues that there are four elements of undue influence which are:

1. There is an offered good (or service) made to induce a person to do something.
2. The offer is excessive and is thus irresistible or undermining of the will.
3. The individual subject of the influence exercises poor judgment and decision-making.
4. This poor judgment leads with a high probability to harm of the individual.³⁰²

In the case of incentives for patient compliance, these conditions are infrequently met. The schemes are devised on the basis of not being irresistible, offering levels of financial benefit that a person would just do what is being asked merely to secure the benefit. As was seen from the review of the literature in

³⁰⁰ J. C. Lucke and W. D. Hall, "Under What Conditions is it Ethical to Offer Incentives to Encourage Drug-Using Women to Use Long-Acting Forms of Contraception?" *Addiction*, vol. 107, 2012, pp. 1036-1041; M. Morgan, "The Payment of Drug Addicts to Increase their Sterilisation Rate is Morally Unjustified and Not Simply 'A Fine Balance,'" *Journal of Obstetrics and Gynaecology*, vol. 24, 2004, pp. 119-123.

³⁰¹ R. Whitaker, *Mad in America: Bad Science, Bad Medicine, and the Enduring Mistreatment of the Mentally Ill*, (Basic Books, New York, 2010).

³⁰² E. J. Emanuel, "Undue Influence: Nonsense on Stilts?" *American Journal of Bioethics*, vol. 5, 2005, pp. 9-13.

chapter 1, the incentives are small, but meaningful; they are *incentives*, not windfall gains.³⁰³

Further, reward-based incentives should not have any threat of negative consequences, or harm of the individual, defeating condition 4 above. If such a program does have such features, as for example offering substantial cash incentives to drug-addicted women for long-term contraception, where there is a real possibility that the capacity to make a free and informed decision is undermined, then such a scheme should not be undertaken.³⁰⁴ Indeed, the very point of incentives schemes is to benefit, not harm participants.³⁰⁵ As Tom Burns has remarked:

It is hard to see how a relatively small financial inducement to take medicine to remain well, balanced against a high likelihood of relapse (and possible compulsory admission) would conflict with society's view of fairness or justice. Its transparency is surely one of its ethical strengths. It is absolutely clear what is being offered and why; I tell you what I want you to do and offer you payment to do it. You can refuse for any reason you wish and that's that.

Far from being unethical and unacceptable, money for medication is a refreshingly honest acknowledgement of the different perspectives of the two parties involved. Rather than a way to manipulate patients to do what we want them to do it provides a model of respectful and equal exchange.³⁰⁶

Burns' remarks also answer an objection that incentives, even if they are not coercive as such, still involve *bribery*, influencing people to do what they

³⁰³ E. Emanuel, "Ending Concerns about Undue Inducement," *Journal of Law, Medicine and Ethics*, vol. 32, 2004, pp. 100-105.

³⁰⁴ C. L. Frey (et al.), "The Ethics of Paying Drug Users Who Participate in Research: A Review and Practical Recommendations," *Journal of Empirical Research on Human Research Ethics*, vol. 1, 2006, pp. 21-36; B. Lambert (et al.), "Ethical Issues and Addiction," *Journal of Addictive Diseases*, vol. 29, 2010, pp. 164-174.

³⁰⁵ K. Lunze and M. K. Paasche-Orlow, "Financial Incentives for Healthy Behavior: Ethical Safeguards for Behavioral Economics," *American Journal of Preventive Medicine*, vol. 44, 2013, pp. 659-665.

³⁰⁶ T. Burns, "Is it Acceptable for People to be Paid to Adhere to Medication? Yes," *British Medical Journal*, vol. 335, 2007, p. 232.

would not have been doing.³⁰⁷ That, however, is merely a re-description of the problem, and it surely begs the question at issue to depict incentives as bribes. Bribes are generally *unlawful* or *unethical* inducements, and this debate is about whether or not incentives are unethical – defining them as such does not prove that they are unethical.³⁰⁸

Ashcroft gives the hypothetical case of Holly, a 16-year old, who has been offered chlamydia screening and has failed to attend her scheduled appointment, or even declined the offer of testing.³⁰⁹ However, she is then offered a mobile phone credit as part of an incentives scheme. Has an unethical bribe been offered here to do something which she should have done for non-monetary reasons, namely to do her part in promoting public health and wellbeing?³¹⁰

If the incentive in Holly's case is unethical then a case could be made that most incentives offered by parents to children to motivate their behaviour – from cleaning their rooms, to making the sacrifices need to succeed in their studies and say get into a university course rather than temporarily enjoy life, not work, and become unemployed – would also be unethical. Parents would then have extreme difficulty in trying to guide their children, who may in their adolescence, not be the easiest people to reason with, in tasks which are in their long-term self-interest, but which may involve shorter-term sacrifices.

In the parallel case of Holly's chlamydia test, the consequences of untreated chlamydia can be pelvic inflammatory disease, resulting in a possible future ectopic pregnancy, infertility or trachoma, some of which could prove to be life-

³⁰⁷ For a discussion of the bribery objection see, R. E. Ashcroft, "Personal Incentives in Health Promotion: Where do They Fit in an Ethic of Autonomy?" *Health Expectations*, vol. 14, 2011, pp. 191-200, at pp. 195-196.

³⁰⁸ As above.

³⁰⁹ As above.

³¹⁰ B. S. Frey and F. Oberholzer-Gee, "The Cost of Price Incentives: An Empirical Analysis of Motivation Crowding-Out," *American Economic Review*, vol. 87, 1997, pp. 746-755.

threatening.³¹¹ The idea that offering Holly a mobile phone credit is unethical, needs to be confronted with the hypothetical of not offering her that incentive, where she happens to have been recently infected by chlamydia. Suppose the years pass, and Holly's infection, unknown to her, is left untreated and she develops trachoma that leads to blindness. If it was then put to her that she was not offered an incentive of a mobile phone credit to be nudged into undertaking a chlamydia test when she was 16 years-old, is she likely to agree that the incentive was an immoral bribe, or a coercive measure? Or would she be like the rebellious child who after leaving school and loafing for some time, finds that opportunities are now few and far between, and has to undertake study as an adult, just to have a chance to get employment? Surely, in both cases it would be felt that the incentive was not a bribe, but a valuable nudge that ultimately helped the individual achieve goals that they came to desire, even though in their youth, due to their immaturity, they were unclear about what they desired. Rather than constituting bribery, incentives may help people choose what is best in their long-term interests, especially when these interests may be unclear to them.³¹²

Informed Consent, and the Integrity of Decision-Making

There are numerous objections in the literature critical of the use of incentives for patient compliance based around a constellation of concepts, such as incentives posing a threat to the social institutions of informed consent and the integrity of decision-making. The argument here is a variant of the one that has been considered in detail above, namely that incentives undermine autonomy, and in doing so undermine the patient's capacity to make informed consent. Further,

³¹¹ W. M. Geisler, "Duration of Untreated, Uncomplicated *Chlamydia Trachomatis* Genital Infection and Factors Associated with Chlamydia Resolution: A Review of Human Studies," *Journal of Infectious Diseases*, vol. 201, 2010, pp. s104-s113.

³¹² T. M. Marteau (et al.), "Using Financial Incentives to Achieve Healthy Behaviour," *British Medical Journal*, vol. 338, 2009; b1415; M. C. Lynagh (et al.), "What's Good for the Goose is Good for the Gander. Guiding Principles for the Use of Financial Incentives in Health Behaviour Change," *International Journal of Behavioral Medicine*, vol. 20, 2013, pp. 114-120.

as Shaw has argued, it is not possible to screen people who would have adhered anyway, so voluntary adherence would be undermined, further threatening the autonomy of patients, and the integrity of decision-making.³¹³ This argument presupposes that incentives are coercive and undermining of the will, rather than an aid to achieve ends which a patient actually wants.³¹⁴

Empirical evidence, as London (et al.) and others point out,³¹⁵ does not support the view that incentives undermine the integrity of patient decision-making. Indeed, this is expected because ethically justified incentive schemes, attempt to be based upon patient consent, being only given to competent patients who have adequate information about the proposal, in full transparency of information, so that a take-it-or-leave-it choice can be made.³¹⁶ Thus, rather than undermining the integrity of patient decision-making, incentive schemes, if soundly constructed, aid in promoting patient wellbeing and autonomy.

Social Justice Considerations

Many critics feel that even if incentives for patient compliance do not violate the principle of autonomy that there are other ethical problems that vitiate its use. First, there are privacy concerns expressed about employer-base health

³¹³ Shaw, cited note 297.

³¹⁴ R. Machlin, "The Paradoxical Case of Payment as Benefit to Research Subjects," *IRB*, vol. 11, 1989, pp. 1-3; R. Abadie, *The Professional Guinea Pig*, (Duke University Press, Durham, 2010); B. Moulton and J. S. King, "Aligning Ethics with Medical Decision-Making: The Quest for Informed Patient Choice," *Journal of Law, Medicine and Ethics*, Spring 2010, pp. 85-97.

³¹⁵ A. J. London (et al.), "Improving Ethical Review of Research Involving Incentives for Health Promotion," *PLOS Medicine*, vol. 9, 2012; e101193; E. Singer and M. P. Cooper, "Do Incentives Exert Undue Influence on Survey Participation: Experimental Evidence," *Journal of Empirical Research on Human Research Ethics*, vol. 3, 2008, pp. 49-56; S. D. Halpern (et al.), "Empirical Assessment of Whether Moderate Payments are Undue or Unjust Inducements for Participation in Clinical Trials," *Archives of Internal Medicine*, vol. 164, 2004, pp. 801-803.

³¹⁶ S. Cohen, "The Gettier Problem in Informed Consent," *Journal of Medical Ethics*, vol. 37, 2011, pp. 642-645; O. O'Neill, "Some Limits of Informed Consent," *Journal of Medical Ethics*, vol. 29, 2003, pp. 4-7; S. Kristinsson, "Autonomy and Informed Consent: A Mistaken Association?" *Medicine, Health Care and Philosophy*, vol. 10, 2007, pp. 253-264.

monitoring,³¹⁷ and more generally about the surveillance of individuals in incentives programs, which inevitably results in an accumulation of personal information, and such information may require special protection.³¹⁸ As the right to privacy is arguably grounded on the value of human dignity³¹⁹ it is important that the protection of patient's private information is undertaken. To do so is a legal requirement in most Western legal systems,³²⁰ and thus privacy concerns alone do not vitiate incentive programs any more than any other program where information about people is stored.

Do incentive schemes weaken the common good through undermining trust? Trust is a concept that has received attention in the literature of ethics, law and public policy, and is one of the glues of society.³²¹ Do incentive schemes weaken the institution of trust? This question is difficult to empirically investigate because of its vagueness and the obvious methodological problems of operationalising the concepts involved. Parco (et al.) published a paper with the title: "Effects of Financial Incentives on the Breakdown of Mutual Trust," but close reading of the paper indicates that it was concerned with interactive decision-

³¹⁷ S. D. Halpern (et al.), "Patients as Mercenaries? The Ethics of Using Financial Incentives in the War on Unhealthy Behaviors," *Circulation: Cardiovascular Quality and Outcome*, vol. 2, 2009, pp. 514-516.

³¹⁸ E. P. Klein, "Patient Health Incentives: Ethical Challenges and Frameworks," *International Journal of Behavioral Medicine*, vol. 21, 2014, pp. 995-1004.

³¹⁹ D. J. Solove, *Understanding Privacy*, (Harvard University Press, Cambridge, 2008); J. Q. Whitman, "The Two Western Cultures of Privacy: Dignity Versus Liberty," *Yale Law Journal*, vol. 113, 2004, pp. 1153-1221; E. J. Bloustein, "Privacy as an Aspect of Human Dignity: An Answer to Dean Prosser," *New York University Law Review*, vol. 39, 1964, pp. 962-1007.

³²⁰ A. Levine, "Biomedical Research: Privacy Rules," *Nature*, vol. 532, 2016, pp. 273-274.

³²¹ M. A. Hall, "Law, Medicine and Trust," *Stanford Law Review*, vol. 55, 2002, pp. 463-527; M. A. Hall, "The Importance of Trust for Ethics, Law, and Public Policy," *Cambridge Quarterly of Healthcare Ethics*, vol. 14, 2005, pp. 156-167; D. E. Rogers, "On Trust: A Basic Building Block for Healing Doctor-Patient Interactions," *Journal of the Royal Society of Medicine*, vol. 87, 1994, pp. 2-5; O. O'Neill, *Autonomy and Trust in Bioethics*, (Cambridge University Press, Cambridge, 2002); C. C. Clark, "Trust in Medicine," *Journal of Medicine and Philosophy*, vol. 27, 2002, pp. 11-29; S. D. Goold, "Trust and the Ethics of Health Care Institutions," *Hastings Center Report*, vol. 36, no. 6, 2001, pp. 26-33; H. Schmidt, "Bonuses as Incentives and Rewards for Health Responsibility: A Good Thing?" *Journal of Medicine and Philosophy*, vol. 33, 2008, pp. 198-220.

making situations, “centipede games,” where concern was about the magnitude of financial incentives, and the question of the “dissolution of mutual trust” was left for further research.³²² A case could be put though, that if the use of incentive programs did succeed in helping people, such schemes would be likely to be viewed in a positive light by people and seen as socially beneficial. As such, the schemes would then contribute to social capital and trust, not erode it.

Incentives for enhancing patient compliance have also been regarded as stigmatising those people undertaking the schemes.³²³ It separates poor and disadvantaged people from the rest of society, and may label these participants as “irresponsible,”³²⁴ and hence is “unfair.”³²⁵ Another approach on this issue is that incentive schemes involve paying, or offering some other valuable consideration to people to do what others are doing unpaid, and this is unfair and inequitable as well.³²⁶

It is inequitable to pay a person to do something, which another person does for free – stated as such. But in the situations where incentives are used, there is a

³²² J. E. Parco (et al.), “Effects of Financial Incentives on the Breakdown of Mutual Trust,” *Psychological Science*, vol. 13, 2002, pp. 292-297.

³²³ J. Popay, “Should Disadvantaged People Be Paid to Take Care of Their Health? No,” *British Medical Journal*, vol. 337, 2008, p. 141; R. Cookson, “Should Disadvantaged People Be Paid to Take Care of Their Health? Yes,” *British Medical Journal*, vol. 337, 2008, p. 140.

³²⁴ Popay, as above.

³²⁵ A. Oliver, “Can Financial Incentives Improve Health Equity?” *British Medical Journal*, vol. 339, 2009; b3847; M. M. Mello and M. B. Rosenthal, “Wellness Programs and Lifestyle Discrimination – The Legal Limits,” *New England Journal of Medicine*, vol. 359, 2008, pp. 192-199; H. Schmidt (et al.), “Carrots, Sticks, and Health Care Reform – Problems with Wellness Incentives,” *New England Journal of Medicine*, vol. 362, 2010; e3.

³²⁶ G. Szmukler, “Financial Incentives for Patients in the Treatment of Psychosis,” *Journal of Medical Ethics*, vol. 35, 2009, pp. 224-228; M. C. Lynagh (et al.), “What’s Good for the Goose is Good for the Gander: Guiding Principles for the Use of Financial Incentives in Health Behaviour change,” *International Journal of Behavioral Medicine*, vol. 20, 2013, pp. 114-120; M. S. Hagger (et al.), “The Goose is (Half) Cooked: A Consideration of the Mechanisms and Interpersonal Context is Needed to Elucidate the Effects of Personal Financial Incentives on Health Behaviour,” *International Journal of Behavioral Medicine*, vol. 21, 2014, pp. 197-201; T. M. Marteau (et al.), “Changing Behaviour through State Intervention. When Does an Acceptable Nudge Become an Unacceptable Shove?” *British Medical Journal*, vol. 338, 2009, pp. 121-122; M. C. Lynagh, “Keeping the ‘Goose’ on the Menu: Response to Commentaries on Financial Incentives in Health Behaviour Change,” *International Journal of Behavioral Medicine*, vol. 21, 2014, pp. 206-209.

good reason for doing so: strategies such as education have failed, and there is a cost imposed upon society by not acting at all purely because actions may be seen as violating abstract ideals of strict mathematical equality. In the case of patients with severe mental illnesses, it is important that they continue to take their prescribed medications, not only for their own wellbeing, but for the safety of society. The consequences of non-adherence of such people to medication can have catastrophic consequences. In England non-adherence of medication and treatments cause around one quarter of all suicides and homicides committed by people with a severe mental illness.³²⁷ What should be noted is that the behaviours that initially create the need for an incentives program in the first place may be stigmatising in themselves and by using incentives it may be possible to change behaviours and eliminate the behaviour causing the conjectured stigma. Any abstract mathematical inequality needs to be compared to the social costs of such behaviours and the harm to self often resulting if nothing is done to help such people.³²⁸ As well, cash transfer programs are effective in improving the health of disadvantaged people,³²⁹ and thus would be justified on utilitarian grounds even if there was a strict abstract inequality produced.³³⁰

³²⁷ S. Priebe (et al.), "Acceptability of Offering Financial Incentives to Achieve Medication Adherence in Patients with Severe Mental Illness: A Focus Group Study," *Journal of Medical Ethics*, vol. 36, 2010, pp. 463-468; L. Appleby, "Safer Services: Conclusions from the Report of the National Confidential Inquiry," *Advances in Psychiatric Treatment*, vol. 6, 2000, pp. 5-15.

³²⁸ R. Cookson, "Should Disadvantaged People Be Paid to Take Care of Their Health? Yes," *British Medical Journal*, vol. 337, 2008; a589.

³²⁹ M. Lagarde (et al.), "Conditional Cash Transfers for Improving Uptake of Health Interventions in Low and Middle Income Countries: A Systematic Review," *JAMA*, vol. 298, 2007, pp. 1900-1910; J. P. Lussier (et al.), "A Meta-Analysis of Voucher-Based Reinforcement Therapy for Substance Use Disorders," *Addiction*, vol. 101, 2006, pp. 192-203.

³³⁰ E. Blacksher, "Carrots and Sticks to Promote Healthy Behaviors: A Policy Update," *Hastings Center Report*, vol. 38, 2008, pp. 13-16; S. Marchand (et al.), "Class, Health, and Justice," *Milbank Quarterly*, vol. 76, 1998, pp. 449-467; K. L. Frohlich and L. Potvin, "The Inequality Paradox: The Population Approach and Vulnerable Populations," *American Journal of Public Health*, vol. 98, 2008, pp. 1-6.

But Won't They Just Spend it on "Grog" and/or Drugs Anyway?

In programs using financial incentives to attempt to intervene in alcohol and drug abuse behaviours, it has been objected that patients may use any money from incentives to buy more alcohol and/or drugs, so that at least for those programs, incentives may be undermining. This is a serious objection, which if sound would indeed show that such schemes are untenable. What does the empirical evidence suggest?

Festinger and Dugosh³³¹ conducted a study in a misdemeanour court in Wilmington. Clients received US \$40 to complete their baseline assessment. The clients were questioned in about one month about how their money was spent. The largest proportion (29%) spent the money paying bills, 21% saved it, 19% used it on transport related expenses, 16% on household purchases, and only less than 1% reported using the payments on drugs and alcohol, and none reported using it for gambling and prostitution. It was concluded that the money was used in a responsible manner. Even so, this is based on clients self-reporting and it could be objected that "that's just what they wanted the authorities to hear." There are a number of other studies which come to the same conclusion, that people do use financial incentives in a responsible manner,³³² but some of these studies are based on subject self-reports, and the cynic, or critic of incentive schemes, could discount the honesty of the replies, unless rigorous and consistent drug testing occurred. That, however, does not show that money was spent on drugs and alcohol, simply that at the present state of the evidence, we cannot conclusively evaluate this

³³¹ D. S. Festinger and K. L. Dugosh, "Paying Substance Abusers in Research Studies: Where Does the Money Go?" *American Journal of Drug and Alcohol Abuse*, vol. 38, 2012, pp. 43-48.

³³² D. B. Marlowe (et al.), "Matching Judicial Supervision to Client's Risk Status in Drug Court," *Crime and Delinquency*, vol. 52, 2006, pp. 52-76; D. B. Marlowe (et al.), "An Effectiveness Trial of Contingency Management in a Felony Pre-Adjudication Drug Court," *Journal of Applied Behavior Analysis*, vol. 41, 2008, pp. 565-577; D. S. Festinger (et al.), "Higher Magnitude Cash Payments Improve Research Follow-Up Rates without Increasing Drug Use or Perceived Coercion," *Drug and Alcohol Dependence*, vol. 96, 2008, pp. 128-135; D. S. Festinger (et al.), "Do Research Payments Precipitate Drug Use or Coerce Participation?" *Drug and Alcohol Dependence*, vol. 78, 2005, pp. 275-281.

objection. Future evidence could well indicate that it is a substantial objection to many incentive schemes, at least involving money rather than goods. Or, the evidence may show that such schemes are justified and that the cited research is correct.

The Problem of Crowding Out

It has been argued that there is good evidence that financial incentives may “crowd out” or dilute recipients’ intrinsic motivation and thus undermine “moral sentiments.”³³³ An aversion to cash payments in blood donation was first hypothesised by Titmuss³³⁴ and then other researchers examined various extrinsic incentives for altruistic activities performed for intrinsic motivation such as charity work.³³⁵ The phenomenon appears to exist when a non-monetary relationship is transferred into a monetary one, which is counter-intuitive from the perspective of neo-classical economics, because raising monetary incentives is thought to generally increase supply. On the contrary, crowding out scenarios mean that increasing monetary incentives decreases supply.³³⁶

A meta-analysis of 128 studies of the effects of extrinsic rewards on intrinsic motivation, found a significant undermining of intrinsic motivation,

³³³ R. M. Titmuss, *The Gift Relationship*, (Allen and Unwin, London, 1971); E. L. Deci (et al.), “A Meta-Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation,” *Psychological Bulletin*, vol. 125, 1999, pp. 627-668; B. S. Frey and F. Oberholzer-Gee, “The Cost of Price Incentives: An Empirical Analysis of Motivation Crowding-Out,” *American Economic Association*, vol. 87, 1997, pp. 746-755; B. S. Frey and R. Jegen, “Motivation Crowding Theory,” *Journal of Economic Surveys*, vol. 15, 2001, pp. 589-611; S. Bowles, “Policies Designed for Self-Interested Citizens May Undermine “the Moral Sentiments:” Evidence from Economic Experiments,” *Science*, vol. 320, 2008, pp. 1605-1609.

³³⁴ Titmuss, as above; N. Lacetera and M. Macis, “Do All Material Incentives for Pro-Social Activities Backfire? The Response to Cash and Non-Cash Incentives for Blood Donations,” *Journal of Economic Psychology*, vol. 31, 2010, pp. 738-748.

³³⁵ E. L. Deci, *Intrinsic Motivation*, (Plenum Press, New York, 1975); R. Bénabou and J. Tirole, “Intrinsic and Extrinsic Motivation,” *Review of Economic Studies*, vol. 70, 2003, pp. 489-520.

³³⁶ See Frey and Jegen, cited note 333.

frustrating people's responsibility of self-regulation, especially in the long-term.³³⁷ Moller (et al.) concluded that financial motivation undermines intrinsic enjoyment in interventions relating to diet and physical activity.³³⁸ However, other meta-analyses are in conflict with this conclusion, seeing no detrimental effects of extrinsic rewards on intrinsic motivation.³³⁹ There are also studies that find a positive correlation between intrinsic motivation and extrinsic reward.³⁴⁰

Moller (et al.) point out that on the basis of "self-determination theory" that intrinsic motivation is undermined when material incentives are perceived as "controlling."³⁴¹ The idea is that where extrinsic rewards are contingent upon successful performance there will be an increase in controlled motivation and a decrease in autonomous motivation, also after the time the reward is removed.³⁴²

³³⁷ E. L. Deci (et al.), "A Meta-Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation," *Psychological Bulletin*, vol. 125, 1999, pp. 627-668; E. L. Deci and R. M. Ryan, *Intrinsic Motivation and Self-Determination in Human Behavior*, (Plenum Press, New York, 1985); D. U. Himmelstein (et al.), "Pay-for-Performance: Toxic to Quality? Insights from Behavioral Economics," *International Journal of Health Services*, vol. 44, 2014, pp. 203-214. Experiments discussed in U. Gneezy and A. Rustichini, "Pay Enough or Don't Pay at All," *Quarterly Journal of Economics*, vol. 115, 2000, pp. 791-810, indicate that financial incentives on performance are not monotonic; larger amounts result in higher performance, but sometimes, with small incentives, an incentives group did worse than people offered no incentive.

³³⁸ A. C. Moller (et al.), "Financial Motivation Undermines Potential Enjoyment in an Intensive Diet and Activity Intervention," *Journal of Behavioral Medicine*, vol. 37, 2014, pp. 819-827.

³³⁹ J. Cameron and W. D. Pierce, "Reinforcement, Reward, and Intrinsic Motivation: A Meta-Analysis," *Review of Educational Research*, vol. 64, 1994, pp. 363-423. For a commentary on the inconsistencies between the various meta-analyses in this field, see M. R. Lepper (et al.), "Understanding the Effect of Extrinsic Rewards on Intrinsic Motivation – Uses and Abuses of Meta-Analysis: Comment on Deci, Koestner, and Ryan (1999)," *Psychological Bulletin*, vol. 125, 1999, pp. 669-676.

³⁴⁰ M. Fang and B. Gerhart, "Does Pay for Performance Diminish Intrinsic Interest?" *International Journal of Human Resource Management*, vol. 23, 2012, pp. 1176-1196; G. Ledford (et al.), "Negative Effects of Extrinsic Rewards on Intrinsic Motivation: More Smoke Than Fire," *WorldatWork*, 2013, at <http://www.formapex.com/telechargementpublic/ledford2013a.pdf>. For further criticisms see, W. E. Scott, "The Effects of Extrinsic Rewards on "Intrinsic Motivation": A Critique," *Organizational Behavior and Human Performance*, vol. 15, 1976, pp. 117-129; U. J. Wiersma (et al.), "The Effects of Extrinsic Rewards in Intrinsic Motivation: A Meta-Analysis," *Journal of Occupational and Organizational Psychology*, vol. 65, 1992, pp. 101-114.

³⁴¹ A. C. Moller (et al.), "Financial Motivation Undermines Potential Enjoyment in an Intensive Diet and Activity Intervention," *Journal of Behavioral Medicine*, vol. 37, 2014, pp. 819-827.

³⁴² E. L. Deci and R. M. Ryan, *Intrinsic Motivation and Self-Determination in Human Behavior*, (Plenum Press, New York, 1985); E. L. Deci and R. M. Ryan, "The "What" and "Why" of Goal

Moller (et al.) note that incentives may have short-run success in changing patient's behaviour, but after the incentive period ends and incentives are removed, there may be no improvement in issues such as weight loss.³⁴³ As we have seen from the review of the literature in chapter 1, this is a fair summary not only of the literature on the use of incentives for weight loss, but for most other incentives as well, where there may be an ongoing problem of sustaining short term gains over longer periods.

Nevertheless, there are studies which did not observe crowding out when incentives were used in weight loss programs,³⁴⁴ and incentives to attend screening for STDs.³⁴⁵ A review of evidence of 19 studies of randomised controlled trials of the impact of financial incentives on smoking cessation found higher quit rates during incentives use and no difference between the incentive group and the control group after the incentives were removed,³⁴⁶ although other studies found a higher quit rate in the incentives group.³⁴⁷

Pursuits: Human Needs and the Self-Determination of Behavior," *Psychological Inquiry*, vol. 11, 2000, pp. 227-268; Q. Ma (et al.), "The Dark Side of Monetary Incentive: How does Extrinsic Reward Crowd Out Intrinsic Motivation?" *Neuroreport*, vol. 25, 2014, pp. 194-198.

³⁴³ R. J. Burns (et al.), "A Theoretically Grounded Systematic Review of Material Incentives for Weight Loss: Implications for Intervention," *Annals of Behavioral Medicine*, vol. 44, 2012, pp. 375-388. The systematic review concluded that "[d]efinitive conclusions about the usefulness of material incentives for weight loss could not be drawn." (p. 375) By contrast: J. Q. Purnell (et al.), "A Systematic Review of Financial Incentives for Dietary Behavior Change," *Journal of the Academy of Nutrition and Dietetics*, vol. 114, 2014, pp. 1023-1035.

³⁴⁴ V. Paul-Ebhohimhen and A. Avenell, "Systematic Review of Use of Financial Incentives in Treatments for Obesity and Overweight," *Obesity Reviews*, vol. 9, 2008, pp. 355-367; K. G. Volpp (et al.), "Financial Incentive-Based Approaches for Weight Loss: A Randomised Trial," *JAMA*, vol. 300, 2008, pp. 2631-2637.

³⁴⁵ N. Low (et al.), "Epidemiological, Social, Diagnostic and Economic Evaluation of Population Screening for Genital Chlamydial Infection," *Health Technology Assessment*, vol. 11, 2007, pp. 1-165; C. K. Malotte (et al.), "Incentives vs. Outreach Workers for Latent Tuberculosis Treatment in Drug Users," *American Journal of Preventive Medicine*, vol. 20, 2001, pp. 103-107.

³⁴⁶ K. Cahill and R. Perera, "Competitions and Incentives for Smoking Cessation," *Cochrane Database of Systematic Reviews* (2011); doi: 10.1002/14651858, CD004307.pub4.

³⁴⁷ K. G. Volpp (et al.), "A Randomized Controlled Trial of Financial Incentives for Smoking Cessation," *New England Journal of Medicine*, vol. 360, 2009, pp. 699-709.

In a literature review by Promberger and Marteau,³⁴⁸ who undertook a comprehensive examination of both the psychological and economic literature on the matter of when financial incentives reduced intrinsic motivation, it was concluded that there was evidence from the psychological literature of such a reduction for simple tasks with high initial motivation, and evidence from the economic literature dealing with contexts of conflicts of interest between parties. However, relevant to the central argument of this work, for health-related behaviours, there was no evidence of crowding out: “[t]he existing evidence does not warrant a priori predictions that an undermining effect could be found for health-related behaviors.”³⁴⁹ They pointed out that health-related behaviours are not usually engaged in for any intrinsic motivation, but are essentially utilitarian, motivated to achieve outcomes such as weight-reduction. The very point of using reward-based incentives, is to attempt to motivate individuals who are low in motivation to begin with, which differs from the generally high initial behaviour levels seen in the management and organisational psychology literature.³⁵⁰

Mantzari (et al.), found no evidence of crowding out in a study of the use of financial incentives on patients taking medicine with potential side-effects, in risk-information processing; that is, the level of perceived risk in taking the medication and knowledge of its side-effects.³⁵¹

In fact, in the health literature there is some evidence, although it is limited, of “crowding in,” rather than crowding out. For example, in one study of incentives for college students to attend gym, it was found that students who received

³⁴⁸ M. Promberger and T. M. Marteau, “When do Financial Incentives Reduce Intrinsic Motivation? Comparing Behaviors Studied in Psychological and Economic Literatures,” *Health Psychology*, vol. 32, 2013, p. 950-957.

³⁴⁹ As above, p. 950.

³⁵⁰ As above, p. 954.

³⁵¹ E. Mantzari (et al.), “Does Incentivising Pill-Taking ‘Crowd Out’ Risk-Information Processing? Evidence from a Web-Based Experiment,” *Social Science and Medicine*, vol. 106, 2014, pp. 75-82.

incentives to attend gym, continued to attend gym more frequently than the students in a control group, even when incentives were removed.³⁵²

In a study by Cooke (et al.), being a randomised control trial with children, the incentive was intangible praise as well as stickers for consuming and saying, presumably honestly, that they liked eating vegetables. The “liking” of the vegetables continued in a follow-up observation three months after the incentives ceased.³⁵³

In a program of incentives used in dealing with substance use it was found that the group receiving the incentives did not differ in motivation from the control group up to three months after the incentives ceased.³⁵⁴

In their review of the literature on crowding out and incentives in the health sphere Promberger and Marteau conclude that there is little evidence of undermining effects from incentives for health-related matters, as “undermining effects of incentives depend on a high baseline level for simple tasks, and on an interpersonal conflict of interest in more complex behaviors, neither of which are dominant for health-related behaviors that are targets for incentives schemes.”³⁵⁵

As one would expect, incentives typically would be offered to patients, not as a first resort, but as a last, when there is no realistic danger of undermining intrinsic motivation because the patient in question is struggling with motivation from the start. Thus, rather than see crowding out as a knock-down objection to incentive schemes, the phenomenon can be viewed as an important restriction and

³⁵² G. Charness and U. Gneezy, “Incentives to Exercise,” *Econometrica*, vol. 77, 2009, pp. 909-931. See also L. Pope and J. Harvey-Berino, “Burn and Earn: A Randomized Controlled Trial Incentivizing Exercise During Fall Semester for College First-Year Students,” *Preventive Medicine*, vol. 56, 2013, pp. 197-201, where monetary incentives for US first-year college students for 12 weeks of US \$10-38.75, to meet fitness-centre use goals, led to 63% of the incentives group meeting their goals, compared to 13% of the control group.

³⁵³ L. J. Cooke (et al.), “Eating for Pleasure or Profit: The Effect of Incentives on Children’s Enjoyment of Vegetables,” *Psychological Science*, vol. 22, 2011, pp. 190-196.

³⁵⁴ D. M. Ledgerwood and N. M. Petry, “Does Contingency Management Affect Motivation to Change Substance Use?” *Drug and Alcohol Dependence*, vol. 83, 2006, pp. 65-72, cited from Promberger and Marteau, cited note 348.

³⁵⁵ Promberger and Marteau, cited note, 348, p. 954.

problem to be aware of in implementing any incentive scheme. If there is a likelihood of crowding out occurring, then the incentive scheme is probably problematic from the start.

Conclusion

This chapter has examined and criticised the principal objections that have been made to the use of financial incentives to enhance patient compliance in the literature. The objections generally are based around the principle of autonomy, that incentives undermine the free action of patients. A stronger criticism is that incentives involve coercion, exploitation and manipulation. Associated with the argument from autonomy is a claim that incentive use is inconsistent with informed consent and works to frustrate the integrity of patient decision-making. It is granted that some less careful incentives schemes could do this, but there is no evidence that all, or even most, schemes fall to these criticisms.

Social justice concerns including privacy violations, the weakening of the common good, inequalities and the stigmatising of those patients involved in incentive projects, are also issues of concern, but again do not constitute a generally applicable argument against all incentive schemes. Many schemes can advance patients' interests and autonomy, and rather than stigmatising them may be valuable aids in helping people overcome existing difficulties. Privacy protection is always a matter of concern, but measures should be taken to ensure that patient privacy is protected, not to abandon incentive schemes because of the possibility of privacy violation issues.

A weaker objection to incentive schemes involving financial incentives to people seeking to deal with drug and alcohol problems, is that participants may end up spending the money on more drugs and alcohol, so that the programs are ultimately self-defeating. The empirical evidence indicates that this is not the case, but it is far from strong and more research is needed on this matter.

Finally, the most serious criticism discussed is that incentives result in crowding out, diluting recipients' intrinsic motivation. There is a vast literature

discussing this, and evidence that a number of incentive programs may have this impact. Nevertheless, there is evidence that crowding out is not a major problem for health-related incentive programs.

Incentive programs can thus be ethically defended, but these programs are not the sole way of enhancing patient compliance, and it is worthwhile now to broaden the discussion by considering paternalist approaches, which at least in their strong form offer a challenge to the principle of autonomy.

Chapter 5

From Nudges to Coercive Paternalism

Introduction

In this chapter an examination will be made of positions that see the principle of autonomy as one ethical value among others,³⁵⁶ and hence only an aspect of moral life, albeit an important one.³⁵⁷ These debates need to be understood within the tradition of epistemological crisis discussed in chapter 3, with the principle of autonomy, the foundation of classical liberalism,³⁵⁸ being subjected to a multi-pronged attack from multiculturalism, feminism and communitarianism.³⁵⁹ Further, this chapter will develop the criticisms of the principle of autonomy that were introduced in chapter 4.

The “autonomous,” “self-regulating” and “self-legislating”³⁶⁰ social atoms of classical liberalism, as S. I. Benn once put it, “must have reasons for acting, and

³⁵⁶ C. Foster, *Choosing Life, Choosing Death: The Tyranny of Autonomy in Medical Ethics and Law*, (Hart, London, 2009).

³⁵⁷ O. O’Neill, “Autonomy: The Emperor’s New Clothes,” *Aristotelian Society Supplement*, vol. 77, 2003, pp. 1-21.

³⁵⁸ J. S. Mill, *On Liberty*, (Penguin Books, London, 1985); G. Dworkin, *The Theory and Practice of Autonomy*, (Cambridge University Press, Cambridge, 1988).

³⁵⁹ J. Li and J. Wang, “Individuals are Inadequate: Recognizing the Family-Centeredness of Chinese Bioethics and Chinese Health System,” *Journal of Medicine and Philosophy*, vol. 37, 2012, pp. 568-582; M-K. Lim, “Values and Health Care: The Confucian Dimension in Health Care Reform,” *Journal of Medicine and Philosophy*, vol. 37, 2012, pp. 545-555; R. Fan, *Contemporary Confucian Bioethics*, (Peking University Press, Beijing, 2011); A. MacIntyre, *After Virtue*, 3rd edition, (University of Notre Dame Press, Notre Dame, 2007); A. Jagger, *Feminist Politics and Human Nature*, (Rowman and Allanheld, Totowa, 1985); L. Code, *What Can She Know?* (Cornell University Press, Ithaca, 1991); K. Abrams, “From Autonomy to Agency: Feminist Perspectives on Self-Direction,” *William & Mary Law Review*, vol. 40, 1999, pp. 805-846; C. MacKenzie and N. Stoljar (eds), *Relational Autonomy: Feminist Perspectives on Autonomy, Agency and the Social Self*, (Oxford University Press, 2000).

³⁶⁰ A. Kuflik, “The Inalienability of Autonomy,” *Philosophy and Public Affairs*, vol. 13, 1984, pp. 271-298, cited p. 272.

be capable of second thoughts in the light of new reasons.”³⁶¹ The autonomous person can “justify, on morally rational grounds, the direction he [she] has taken.”³⁶² While the autonomous person is not a bloodless utilitarian calculating machine engaging in ceaseless reasoning, and may find good reasons limiting argumentation and may defer to expert opinion on various matters, “to function autonomously is to live in accordance with one’s own critically reflective moral judgment, and ... to alienate autonomy is to bind oneself to obey someone else, regardless of one’s own critically reflective moral judgment.”³⁶³ The autonomous individual is thus, as John Stuart Mill put it, “sovereign,” over “himself[herself], over his [her] own body and mind.”³⁶⁴ Individuals, according to this philosophical position are best at ascertaining their own conception of the good, because this is part of what it means to be a free individual. I. Berlin put this thought as follows:

The ‘positive’ sense of the word ‘liberty’ derives from the wish on the part of the individual to be his [her] own master. ... I wish my life and decisions to depend on myself, not on external forces of whatever kind...I wish to be somebody, not nobody; a doer – deciding, not being decided for, self-directed and not acted upon by external nature or by other men [women] as if I were a thing, or an animal, or a slave incapable of playing a human role, that is, of conceiving goals and policies of my own and realizing them. This is at least a part of what I mean when I say that I am rational, and that is my reason that distinguishes me as a human being from the rest of the world. I wish, above all, to be conscious of myself as a thinking, willing, active being, bearing responsibility for my own choices and able to explain them by references to my own ideas and purposes.³⁶⁵

Along similar lines, Harry Frankfurt has advanced an account of the autonomous person that sees people as having both first and second order desires.

³⁶¹ S. I. Benn, “Freedom, Autonomy and the Concept of a Person,” *Proceedings of the Aristotelian Society*, vol. 76, 1975-76, pp. 109-130, at p. 126.

³⁶² As above, p. 273.

³⁶³ As above, p. 274.

³⁶⁴ J. S. Mill, *On Liberty*, (Penguin Books, London, 1985), cited from N. Levy, “Forced to be Free? Increasing Patient Autonomy by Constraining It,” *Journal of Medical Ethics*, vol. 40, 2014, pp. 293-300, cited p. 294.

³⁶⁵ I. Berlin, “Two Concepts of Liberty,” in *Four Essays on Liberty*, (Oxford University Press, Oxford, 1969), p. 131.

A first-order desire is a desire to do or not do a particular action, while a second order desire is a desire to have or not have a particular first-order desire. Agents are morally responsible for their actions if they are capable of rationally forming second-order desires and beliefs that determine those first-order desires and beliefs that determine actions.

This rationalistic conception of the liberal individual is to be found not only in the ethics and law of informed consent,³⁶⁶ but even features in contemporary arguments in defence of slavery, where it has been argued that the notion of autonomy even allows people to enter into voluntary slavery contracts, which after the initial choice would result in the loss of autonomy.³⁶⁷ It is expected that there would be something of an intellectual backlash among theorists who see the ideal of autonomy, as at best over-used, at worst, conceptually problematic, especially within medical contexts.³⁶⁸ As A. L. Caplan has said:

Autonomy often does not work in healthcare. Our brains are not designed to let us act upon it. In addition, our cultures do not all value it; quizzing and challenging our choices may make us even less autonomous; we bring too much affect and magical thinking along with us as subject and patient; and our basic memory and perceptual skills fail us when the topic is who is going to stick a needle in our arm or give us a brand new pill in our life-and-death fight against cancer.³⁶⁹

³⁶⁶ A. J. Weisbard, "Informed Consent: The Law's Uneasy Compromise with Ethical Theory," *Nebraska Law Review*, vol. 65, 1986, pp. 749-767; M. Quante, "In Defence of Personal Autonomy," *Journal of Medical Ethics*, vol. 37, 2011, pp. 597-600.

³⁶⁷ S. Kershnar, "A Liberal Argument for Slavery," *Journal of Social Philosophy*, vol. 34, 2003, pp. 510-536.

³⁶⁸ W. Gaylin, "Worshipping Autonomy," *Hastings Center Report*, vol. 26, no. 6, 1996, pp. 43-45; W. Gaylin and B. Jennings, *The Perversion of Autonomy: The Proper Uses of Coercion and Constraints in a Liberal Society*, (The Free Press, New York, 1996); C. Foster, *Choosing Life, Choosing Death: The Tyranny of Autonomy in Medical Ethics and Law*, (Hart Publishing, Oxford, 2009).

³⁶⁹ A. L. Caplan, "Why Autonomy Needs Help," *Journal of Medical Ethics*, vol. 40, 2014, pp. 301-302, cited p. 301; N. Levy, "Forced to be Free? Increasing Patient Autonomy by Constraining It," *Journal of Medical Ethics*, vol. 40, 2014, pp. 293-300; N. Levy, "Autonomy and Addiction," *Canadian Journal of Philosophy*, vol. 36, 2006, pp. 427-448.

This line of thought has led to contemporary defences of paternalism, in both a medical and a non-medical context, with “paternalism” being defined, roughly, as “altruistic beneficence,” a “refusal to accept or to acquiesce in another person’s wishes, choices, and actions for that person’s own benefit.”³⁷⁰ Thus, the government forbids the sale of various drugs because there is evidence that such drugs are harmful. Paternalism may be *soft*, or *hard*, and the following discussion will consider the major works addressing this issue with respect to patient compliance.

The soft paternalist holds, to use a famous example from John Stuart Mill, that it is justified to restrain someone from crossing a dangerous bridge, only if the person does not know about the condition of the bridge, but if she/he does know and wants to commit suicide, she/he should be able to do so. In general, as we will see from the discussion below, the soft or libertarian paternalist respects freedom of choice and autonomy, but still believes that it is justified to permit public and private institutions and agents to influence human behaviour for the good and wellbeing of the subjects. The hard paternalist disagrees and believes that it may be justified to prevent even the person wanting to commit suicide from doing so for a number of public policy reasons.³⁷¹

Nudges: Soft or Libertarian Paternalism?

Richard Thaler and Cass Sunstein in *Nudge: Improving Decisions about Health, Wealth and Happiness*³⁷² introduce the idea of the “nudge” with some

³⁷⁰ J. F. Childress, *Who Should Decide? Paternalism in Health Care*, (Oxford University Press, New York, 1982), p. 13.

³⁷¹ J. S. Mill, *On Liberty*, (John W. Parker & Son, London, 1859); “Paternalism,” *Stanford Encyclopedia of Philosophy*, at <http://stanford.library.usyd.edu.au/entries/paternalism/>.

³⁷² R. H. Thaler and C. R. Sunstein, *Nudge: Improving Decisions about Health, Wealth and Happiness*, (Penguin Books, Camberwell, Victoria, 2009). For further developments in the theory of the nudge see: Y. Saghai, “Salvaging the Concept of Nudge,” *Journal of Medical Ethics*, vol. 39, 2013, pp. 487-493. These refinements are not considered here because it will be argued that the

memorable examples. Men’s toilets at Schiphol Airport in Amsterdam had a black housefly painted on the urinal surface. It was found that this simple environmental act increased the accuracy of men’s aim and reduced spillage by 80%, as men tended to aim at the fly.³⁷³ Another example is the cafeteria fruit scenario, where it is possible in, say, a school or workplace cafeteria, to increase the consumption of healthy food and decrease the consumption of unhealthy food, by simple measures such as putting the healthy food at eye level, and the unhealthy food on a lower shelf, rather than outrightly banning it as a hard paternalist would do.

The fruit in the cafeteria example is a good illustration of an administrator manipulating the “choice architecture,” and being a “choice architect,” which involves “organizing the context in which people make decisions.”³⁷⁴ Free choice is still retained, but people are given a “nudge” in a direction that is of benefit to their wellbeing and health. On nudging they say: “A nudge ... is any aspect of the choice architecture that alters people’s behavior in a predictable way without forbidding any options or significantly changing the economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid.”³⁷⁵ This position is one of the leading accounts of libertarian paternalism, which aims to coherently integrate two seemingly contradictory elements; *liberty*, that people should be free to choose, even things which are objectively bad for them, and *paternalism*, that choice architects can morally influence people’s behaviour to benefit these people, with choices being influenced or nudged, to make people better off, as judged by themselves.³⁷⁶

Why would choice architects want to nudge people’s choices at all? The master argument which runs through contemporary soft and hard paternalist

standard objections to Thaler and Sunstein’s account fail, even though, nudges, like incentives, have their limits.

³⁷³ As above, p. 4.

³⁷⁴ As above, p. 3.

³⁷⁵ As above, p. 6.

³⁷⁶ As above, p. 5.

literature is based on social science evidence, primarily from behavioural economics, that people systematically make bad decisions, contrary to their own interests because of cognitive blindspots, so people are not *Homo economicus*, from neo-classical economics, perfectly rational decision makers.³⁷⁷ As Thaler and Sunstein say, “[t]he false assumption is that almost all people, almost all of the time, make choices that are in their best interest or at the very least are better than the choices that would be made by someone else.”³⁷⁸ Relevant to the thesis of this work, Thaler and Sunstein distinguish between nudges and incentives, on the basis of this epistemology, as incentives are seen as rational factors that *Homo economicus* would respond to, such as they will buy less junk food if a tax is placed on it. Nudges are much wider interventions, and include psychological factors such as the order in which options are placed.³⁷⁹ Their position is that choices need to be constantly made in society which impact upon the wellbeing of individuals so it is best for all that choices made serve fundamental values such as the promotion of human health, over mere profit maximisation. In their by now iconic cafeteria example, they point out that both the healthy food and the junk food have to be put somewhere and even a random assignment can still have unintended consequences.³⁸⁰ They argue that there is no coercion involved in their paradigm

³⁷⁷ As above, p. 7. See also J. Persky, “Retrospectives: The Ethology of Homo Economicus,” *Journal of Economic Perspectives*, vol. 9, no. 2, 1995, pp. 221-231, and for an introduction to behavioural economics, P. Diamond and H. Vartiainen, *Behavioral Economics*, (Princeton University Press, Princeton, 2012); R. H. Thaler, “Toward a Positive Theory of Consumer Choice,” *Journal of Economic Behavior and Organization*, vol. 1, 1980, pp. 39-60; S. D. Levitt and J. A. List, “Homo Economicus Evolves,” *Science*, vol. 319, 2008, pp. 909-910. Behavioural economics work embracing soft paternalism includes: C. F. Camerer (et al.), “Regulation for Conservatives: Behavioral Economics and the Case for ‘Asymmetrical Paternalism,’” *University of Pennsylvania Law Review*, vol. 151, 2003, pp. 1211-1254; G. Loewenstein and P. A. Ubel, “Hedonic Adaptation and the Role of Decision and Experience Utility in Public Policy,” *Journal of Public Economics*, vol. 92, 2008, pp. 1795-1810; D. Bernheim and A. Rangel, “Toward Choice-Theoretical Foundations for Behavioral Welfare Economics,” *American Economic Review: Papers and Proceedings*, vol. 97, 2007, pp. 464-470.

³⁷⁸ Thaler and Sunstein, as above, p. 10.

³⁷⁹ As above, p. 9. See also the discussion on pp. 106-109.

³⁸⁰ As above, p. 11.

example of a nudge because the choice order of food on the cafeteria shelves does not force any food choice on people. Hence, because choice architecture and its effects cannot be avoided, it is justified to offer nudges that are most likely to help people and least likely to harm them.³⁸¹

Thaler and Sunstein devote a considerable amount of discussion to the nature of cognitive illusions and blindspots which people face, including perhaps the most important blindspot for the debate discussed in this work: that people often choose not to choose, when choices really need to be made; a type of head-in-the-sand ostrich factor. As has been said, as this is the core argument adopted by both soft and hard forms of paternalism, this work will need to look at this specific argument closely and assess its validity and soundness. The key epistemological issue is not whether humans are perfectly rational utilitarian agents – because even a nodding awareness of the psychological literature would refute this – but whether the level of errors are so severe as to challenge human individual rational decision making, and if this was so, does this tendency for error flow on to infect even so called more objective decision makers that paternalists seem to think escape error infection, such as government organisations? Thaler and Sunstein bluntly, almost cruelly, say that, “people tend to be somewhat mindless, passive decision makers.”³⁸² If this was literally so then they would not only have established their case, but would have given good reasons to accept hard or coercive paternalism as Sarah Conly does in her book, *Against Autonomy*, which supports coercive policies to promote people’s interests.³⁸³ Conly’s challenging work is discussed below.

Critics may contend that once one moves away from libertarian freedom one is on a slippery slope to a totalitarian loss of freedom. Thaler and Sunstein

³⁸¹ As above.

³⁸² As above, p. 40.

³⁸³ S. Conly, *Against Autonomy: Justifying Coercive Paternalism*, (Cambridge University Press, Cambridge, 2013).

respond to this objection by advancing three counterarguments, all of which seem sound. First, even if this was true the objection does not in itself show that the position is incorrect. There would need to be some independently made objection other than begging the question at issue about freedom and autonomy. Second, they believe that the risks associated with nudges are moderate, as the very point of a nudge is to retain freedom at all points. Therefore, if any policy did have the effect of undermining freedom and autonomy, it could be cogently argued that the policy is not a nudge at all and is thus, at least *prima facie*, objectionable. Finally, nudges cannot be avoided anyway in our modern highly interconnected society, so we will simply have to deal with the potential of any slippery slope occurring and take prompt action to deal with it.³⁸⁴ As with any social policy, there will always be the potential danger of over-reach and of lobbyists and axe-grinders attempting to hijack the program. Consequently, freedom of choice, in the context of nudges, should be safeguarded to reduce potential abuses and fraud by systems of checks and balances and constant democratic scrutiny.³⁸⁵ In particular, although people suffer from a multitude of cognitive blindspots and illusions, people are still capable of learning from their mistakes and opt-out rights from any program involving nudges offer further protections of liberty.

Sarah Conly argues that Thaler and Sunstein's nudge approach essentially collapses into the harder position of coercive paternalism because nudges are manipulative and do not involve a free and open discussion to change behaviour because cognitive biases and blindspots are used to produce good effects.³⁸⁶ Conly herself does not see this sort of manipulation as problematic, being a hard paternalist, but she does think that this is a problem for the libertarian paternalism

³⁸⁴ As above, pp. 235-237.

³⁸⁵ As above, p. 239.

³⁸⁶ Conly, cited note 383, p. 30. See also T. C. Leonard, "Book Review: Richard H. Thaler, Cass R. Sunstein, *Nudge: Improving Decisions about Health, Wealth, and Happiness*," *Constitutional Political Economy*, vol. 19, 2008, pp. 356-360, at p. 358; J. S. Blumenthal-Barby and H. Burroughs, "Seeking Better Health Care Outcomes: The Ethics of Using the Nudge," *American Journal of Bioethics*, vol. 12, 2012, pp. 1-10.

of Thaler and Sunstein, which aims to retain the rational core of liberalism. The issue here is whether or not this aspect of manipulation – and the term “nudge” is no doubt a nice way of saying “manipulation” – is inconsistent with autonomy and freedom. Here I think it is evident that if human autonomy exists at all, it exists within a maelstrom of social influences, from advertising, to peer group opinion, to education. Much of social life, as Conly recognizes does involve socialisation and manipulation aspects. Nevertheless, this alone does not undermine the proposition that an individual still has autonomy, the capacity to choose otherwise. I may see an advertisement a thousand times for fast food, and feel mildly ill and annoyed every time I see the advertisement, and choose not to purchase the advertised product.

Conly also objects that even if the freedom to choose still exists, the nudge can simply be bypassed. Thus, people who need help, such as those suffering from obesity and/or heart disease, can still purchase the fatty food in the cafeteria, rather than the healthy food: “What libertarian paternalism does is not simply preserve the option of better choices for those who, for some reason, are different from the norm. It preserves options for those who have stronger motivations than others do, or for those who have stronger and crazier convictions than the norm. It preserves the options for error.”³⁸⁷ Nudges will therefore fail for strongly imbedded behaviours, but Thaler and Sunstein have never said in their work that nudges are a universal solution to all problems humans face, only one fruitful policy option. Both incentives and nudges are likely to be inadequate for many people, for many behavioural problems.

Nevertheless, nudges can avoid being problematically manipulative, where human autonomy is undermined, as would occur using subliminal advertising.³⁸⁸ Thaler and Sunstein’s approach is to use John Rawls’ publicity principle which,

³⁸⁷ As above, pp. 31-32.

³⁸⁸ Thaler and Sunstein, cited note 372, p. 244; D. M. Hausman and B. Welch, “Debate: To Nudge or Not to Nudge,” *Journal of Political Philosophy*, vol. 18, 2010, pp. 123-136, at p. 131.

“bans government from selective policy that it would not be able or willing to defend publicly to its own citizens.”³⁸⁹ This principle constrains nudges and the transparency of government respects freedom and liberty. Thus, transparent policies, fully open to scrutiny by all, would not be coercive as there would be no deception concerning the choice set. Nor, by definition of the nudge policy, is there a restriction of the choice set, so there is no unjustified coercion in this sense.

Robert Sugden disagrees and argues that administrators doing nudging may allow their own conceptions of wellbeing to override those of the nudgees (those being nudged).³⁹⁰ He says:

As I pointed out earlier, Thaler and Sunstein repeatedly claim that their criterion is the well-being of the person being nudged, as judged by him. Given their account (quoted above) of the ‘pretty bad decisions’ that individuals are liable to make, it seems clear that they want the choice architect to try to work out what the individual would have chosen, had his decision-making not been subject to limitations of attention, information, cognitive ability or self-control, and then nudge him in that direction. But working that out is not just a matter of discovering given facts about the individual. The concepts of full attention, perfect information, unimpaired cognitive ability and complete self-control do not have objective definitions; they are inescapably normative. Just about any intervention that a paternalist sincerely judges to be in the individual’s best interests can be justified in this way if the paternalist is allowed to define what counts as attention, information, cognitive ability and self-control. The claim that the paternalist is merely implementing what the individual would have chosen for himself under ideal conditions is a common theme in paternalistic arguments, but should always be treated with suspicion. Even if Thaler and Sunstein’s concept of perfect rationality (that is, no limitations of attention, information, cognitive ability or self-control) could be defined objectively, there might still be no determinate answer to the question of what an individual would have chosen, had he been fully rational. Thaler and Sunstein seem to be assuming that inside every Human there is an Econ – that, deep down, each of us has coherent preferences, of the kind that economic theory has traditionally assumed, and that these can be found by stripping away specific failures of rationality. But if one takes the behavioural approach seriously, one must ask whether this hypothesis is an implication of received psychological theory, and how far it is supported by experimental

³⁸⁹ As above. See also J. Rawls, *A Theory of Justice*, (Clarendon Press, Oxford, 1971).

³⁹⁰ R. Sugden, “On Nudging: A Review of *Nudge: Improving Decisions about Health, Wealth and Happiness* by Richard H. Thaler and Cass R. Sunstein,” *International Journal of the Economics of Business*, vol. 16, 2009, pp. 365-373.

evidence. The answers to these questions, I suggest, are ‘No’ and ‘Only partially.’³⁹¹

This objection requires a consideration of the issue of how challenging cognitive illusions and blindspots are to individual rationality, which will be undertaken below. Sugden’s objection is that on Thaler and Sunstein’s account of behavioural economics, people’s often incoherent preferences, that is, preferences inconsistent with decision theory and neo-classical economics, means that their preferences are *indeterminate*, even to themselves. This means that these people have no formulated preferences in a certain area at all. Sugden himself, accepts the basic insight of behaviour economics, that people are not fully rational decision makers and often have incoherent preferences, but he argues that markets operate according to the non-paternalistic principle of mutual advantage, which does not require coherent preferences.³⁹² While that is true, there is still a requirement for the identification of an advantage, that preferences, even if incoherent, at least be identifiable and non-indeterminate. It is one thing to find out that one’s beliefs are inconsistent: many logicians believe that our most basic sciences are ultimately inconsistent. However, it does not follow from that proposition that our belief systems are therefore indeterminate. Even if one does have inconsistent or incoherent preferences, it would be the role of the nudgers to attempt to aid people in clarifying their preference sets, by in the first place, at least becoming aware of the incoherence. From that, people may be capable of making more coherent decisions. If after receiving full information people do not know then what their needs, values and ends are, then it is doubtful whether they know anything at all,

³⁹¹ As above, p. 370.

³⁹² R. Sugden, “Why Incoherent Preferences Do Not Justify Paternalism,” *Constitutional Political Economy*, vol. 19, 2008, pp. 226-248; R. Sugden, “Market Simulation and the Provision of Public Goods: A Non-Paternalist Response to Anomalies in Environmental Evaluation,” *Journal of Environmental Economics and Management*, vol. 57, 2009, pp. 87-103; R. Sugden, “The Opportunity Criterion: Consumer Sovereignty Without the Assumption of Coherent Preferences,” *American Economic Review*, vol. 94, 2004, pp. 1014-1033.

which seems extremely implausible. Hence, Sugden has not established that Thaler and Sunstein's account is so problematic that it should be rejected.

It has also been argued that “the power to nudge – fed by the presumption of consumer inadequacy – is not necessarily a power for good,” according to W. Robert Reed.³⁹³ Reed gives the example of New Zealand's KiwiSaver program, which he notes Thaler and Sunstein take as a “banner example of a nudge policy.”³⁹⁴ New Zealand's Labour government introduced this program in 2007, believing that New Zealanders were undersaving. Automatic enrolment of all workers beginning new jobs was made, with financial incentives for people currently employed to opt-in. It was found that the automatic enrolment aspect of the program dominated, because as one of the insights from behavioural economics has observed, people automatically enrolled in a program tend to do nothing and do not exercise opt-out options. Reed cites evidence indicating that “(i) New Zealanders were not generally undersaving when KiwiSaver was introduced ... (ii) the program redistributes income to relatively wealthy households ... (iii) the meagre amount of new savings generated through the program may well be dominated by dead-weight losses and transaction costs associated with implementing and administering the program.”³⁹⁵

It is beyond the scope of this work to investigate whether or not KiwiSaver is a flawed program, but for the sake of argument, assume that Reed is right. Then Thaler and Sunstein are simply wrong in taking this program as being a banner example of a nudge program. Instead, it is a flawed, and possibly failed nudge program. However, that in itself is not a decisive objection to the theory of nudges. Nudge programs can be mistaken and undertaken on a mistaken factual basis, which may have been the case with KiwiSaver, if it is correct that New Zealanders

³⁹³ W. R. Reed, “Book Review: *Nudge*,” *Journal of Economic Psychology*, vol. 34, 2013, pp. 302-303, cited p. 303.

³⁹⁴ As above.

³⁹⁵ As above.

were not undersaving when the program was introduced. Nudges, to be successful must be based on the best available evidence, and there certainly needs to be evidence that the phenomena under investigation for possible nudging really exists. If this was not so, it is not entirely the fault of the nudge, that it ultimately failed.

Further, all human policies will have failures, as we saw earlier in this work in the case of incentives. To demand infallibility would therefore be to place an unreasonable demand upon any policy. Hence, it is concluded that examples of failures of nudges is not a strong objection to the policy of nudging. Of course, if it turned out as a matter of fact that nudges had a statistically significant failure rate, then the policy of the nudge would have to be viewed of limited relevance in public life. This though does not appear to be so, as Thaler and Sunstein argue in their book because human social life, with its complex array of interactions between people, inevitably will involve multitudes of nudges occurring. We seem to be committed to nudging one and other merely as a product of the complexities of modern social life.

Thus, many of the standard objections to Thaler and Sunstein's position on nudges, fail. However, there is an important issue noted by them, namely: where does one stop with nudges? They in fact say that there "are no hard-and-fast stopping points."³⁹⁶ Their text concludes with a recognition that their position could place one on slippery slope as some critics, such as Glenn Whitman have also argued, leading to a harder paternalism:³⁹⁷

Many of these arguments have substantial appeal, yet we usually resist going further down the paternalistic path. What are the grounds for our resistance? After all, we have already granted that the costs imposed by libertarian paternalism may not be zero, so it would be disingenuous for us to say that we always and strongly object to regulations that raise the costs imposed from tiny to small. Nor do we personally oppose all mandates. But deciding where to stop, and when to call a nudge a shove (much less a prison), is tricky. Where mandates are involved and

³⁹⁶ Thaler and Sunstein, cited note 372, p. 249.

³⁹⁷ G. Whitman, "The Rise of the New Paternalism," *Cato Unbound*, April 5, 2010, at <http://www.cato-unbound.org/2010/04/05/glen-whitman/rise-new-paternalism>.

opt-outs are unavailable, the slippery-slope argument can begin to have some merit, especially if regulators are heavy-handed. We agree that flat bans are justified in some contexts, but they raise distinctive concerns, and, in general, we prefer interventions that are more libertarian and less intrusive.³⁹⁸

This paragraph leaves open the possibility that other supporters of the nudge could, as a matter of preference opt for harder paternalistic policies in some situations. To examine whether or not this is justified, we turn now to a consideration of the leading contemporary defence of hard or coercive paternalism, Sarah Conly's *Against Autonomy*.³⁹⁹

Coercive Paternalism: Against Autonomy

Conly supports hard or coercive paternalism, which forces people to act or refrain from acting, typically by use of law and regulations, rather than engaging in a well-meaning manipulation of choices and actions that people may not choose may be imposed upon them, even if they had perfect information. Coercive paternalism is “intended to advance your ends, but interfere with your ability to choose your means.”⁴⁰⁰ Individuals are saved by governments by use of the law to ban cigarettes, rather than offer incentives or nudges, to eliminate or reduce their use, and banning trans-fats in foods, to cite but two health-based examples. Outside of the health area, there are many areas where coercive paternalism can potentially operate, and Conly, as discussed below, sees no *a priori* limit in principle to the area of application. This is so because of an implication of her core argument that “autonomy is not all that valuable; not valuable enough to offset what we lose by leaving people to their own autonomous choices.”⁴⁰¹ Although the contemporary debate has been framed in the context of the limitations of the principle of

³⁹⁸ Thaler and Sunstein, cited note 372, at pp. 251-252.

³⁹⁹ Conly, cited note 383.

⁴⁰⁰ As above, p. 45. She says “we may, and indeed are sometimes morally obligated to, force people to refrain from certain actions and to engage in others.” (p. 18)

⁴⁰¹ As above, p. 1.

autonomy, the debate could have taken an alternative path, that of the use of law to achieve healthier lifestyles.⁴⁰² However, most of the questions of interest, such as food prohibitions (e.g. a trans-fat ban) can still be examined and debated within a framework of ethics, rather than law.

The rejection of the importance of the value of autonomy in life and ethics is highly counter-intuitive, but is justified by Conly by exactly the same argument used by Thaler and Sunstein, namely that psychological evidence and the work of behavioural economics refutes the Enlightenment idea of humans being primarily rational beings. Human irrationality is much greater than the Enlightenment tradition contemplated. People act in ways that are contrary to their wellbeing, so it is justified to protect them from things that are bad for them, done by democratic governments. She rightly notes that the use of incentives is limited, especially with regard to addictions from addictive substances such as cigarettes, as addictions overcome the rational will.

There is another argument running through *Against Autonomy*, not based upon the argument from cognitive blindspots and biases, and that is that autonomous action in many cases can cause harm and be detrimental to survival. This seems to be a utilitarian argument against holding the principle of autonomy as some sort of moral absolute or fundamental moral truth. She develops this argument in her sound critique of John Stuart Mill's classic *On Liberty*.⁴⁰³ Mill's harm principle holds that the only grounds for restricting individual liberty is self-protection, interfering with the liberty of others, and that paternalistic actions taken to promote the good of the individual, even if correct, are unjustified. The individual, in concerns over her/himself is "sovereign" and this is "absolute."⁴⁰⁴ Mill is not a deontologist, relying upon principles of right grounded in human or

⁴⁰² L. O. Gostin, "Law as a Tool to Facilitate Healthier Lifestyles and Prevent Obesity," *JAMA*, vol. 297, 2007, pp. 87-90.

⁴⁰³ J. S. Mill, *On Liberty* (1859), in *Utilitarianism and On Liberty*, edited by M. Warnock, Meridian British Philosopher's Series, (World Publishing, New York, 1971).

⁴⁰⁴ As above, p. 135.

divine nature, but a consequentialist, and a utilitarian in particular, holding that happiness/wellbeing/utility is the ground of value, and that the moral right of actions is accessed by examining the consequences of actions. If liberty is therefore not intrinsically valuable, there may well be utilitarian reasons for restricting liberty if paternalistic restrictions generate greater happiness than not restricting liberty.⁴⁰⁵ Conly believes that the best way of promoting people's overall liberty would be to constrain it in areas where cognitive blindspots and biases operate, because these factors undermine liberty.⁴⁰⁶

Conly argues that there is a general problem facing liberalism of finding a justified dividing line between cases where coercive paternalism is widely accepted (e.g. compulsory education), and where it is rejected by liberals. There are various attempts to provide such a justification, such as distinguishing between voluntary and involuntary action, mental competency/incompetency, and the distinction between being informed and not being informed. She shows that there is no sharp dividing line between purely rational decision makers and irrational ones and between acting voluntarily and acting involuntarily, and that there are only differences of degree between being informed and being ignorant, so that there is no natural demarcation between permissible and impermissible paternalism.

As we have seen, liberals from John Stuart Mill onward have objected to coercive paternalist positions, typically on the grounds that such positions undermine individuality and crush differences between human beings, producing stale conformity and uniformity. However, Conly holds that psychological evidence counts against Mill's liberal individualism, as human beings are more prone to social conformity than Mill recognized. Mill was thus mistaken about the individual's capacity to pursue happiness, underestimating the poor instrumental reasoning of people and their inertial. On the other hand, governments are in a more "objective" position: "Since we do better at estimating efficacy when we are in a

⁴⁰⁵ Conly, cited note 383, p. 49.

⁴⁰⁶ As above, p. 50.

relatively objective position, governments, insofar as those in it are not the ones who are present tempted by the rewards of the poor decision, can intervene in ways that help us reach our own, individual goals better than we would do if left to our own devices. It can help to free us of the conformity of social opinion.”⁴⁰⁷ Conly, who also holds that there is no area of policy in principle off limits to paternalistic intervention, nevertheless says that this position does not lead to totalitarianism because of a cost-benefit analysis of interfering with people’s behaviour (presumably the costs of totalitarianism are too high) and also because the policy is to be acted in a democratic and transparent framework. We will return to the question of government control below. However, note that she says that “people who make regulations ... are themselves as subject to cognitive bias as the rest of the population,”⁴⁰⁸ but “... while those who do the choosing are indeed subject to bias, we know that we are better in some situations more than in others at avoiding error, and we have reason to believe that those making regulations for other people can avoid many of the errors we make when faced with a choice that affects us personally.”⁴⁰⁹

Conly admits that one major problem for coercive paternalism, even this form of paternalism which aims to benefit the individual, is that after Nazi Germany and the Soviet Union, there is a legitimate fear that a government could eventually get out of hand and slowly become corrupted and ultimately metamorphose into a totalitarian regime, once it has substantial power, or become so rather quickly right from the beginning.⁴¹⁰ Governments can also make bad decisions, as it is said, the road to hell is paved with good intentions. This seems to be a danger that she thinks we need to be aware of, and be sensitive and observant of, because alternative social policies such as liberalism and libertarian

⁴⁰⁷ As above, p. 10.

⁴⁰⁸ As above, p. 12.

⁴⁰⁹ As above.

⁴¹⁰ As above, p. 24.

paternalism have clear weaknesses and limitations. This though, I will argue below, is a weakness in Conly's position.

Coercive paternalism is, as we have seen, dependent upon the expertise of administrators and experts. Yet, as Conly herself admits, knowing more and obtaining greater expertise, surprisingly enough, does not improve people's abilities to make better judgment calls, because experts themselves suffer from cognitive defects, blindspots and biases. She says:

[E]xperts tend to exaggerate their own expertise and often make worse judgments than people who have no pretence of expertise. Nonexperts may rely on the statistically best bet, while experts often trust their own specialized knowledge to allow them to deviate from the guidelines emerging from past studies – they think they can recognize an exception when they see it, whereas in fact they apparently can't. The result is that more knowledge leads to worse judgments, and experts do worse than nonexperts.⁴¹¹

I will argue in the next section that self-referentially applying the argument from cognitive blindspots and biases to governments, undermines the full generality of the position of coercive paternalism, although it is granted, as will be examined shortly, there still may be carefully argued evidence-based cases where coercive paternalist policies are correct. For the moment, it is noted that Conly runs into difficulties in this respect in attempting to refute the argument of Edward Glaeser, made in his paper "Paternalism and Psychology."⁴¹² Glaeser argued that governments would be more prone to bias than individuals who seek to maximise their own welfare, so governments in general will make worse decisions. Individuals have a greater incentive to act in accordance with their own welfare, and to make specific decisions promoting their interests, however fallible, more so

⁴¹¹ As above, p. 28. See further M. Hibert, "Toward a Synthesis of Cognitive Biases: How Noisy Information Processing Can Bias Human Decision Making," *Psychological Bulletin*, vol. 138, 2012, pp. 211-237; C. J Lee (et al.), "Bias in Peer Review," *Journal of the American Society for Information Science and Technology*, vol. 64, 2013, pp. 2-17; M. L. Commons (et al.), "Expert Witness Perceptions of Bias in Experts," *Journal of the American Academy of Psychiatry and Law*, vol. 32, 2004, pp. 70-75.

⁴¹² E. L. Glaeser, "Paternalism and Psychology," *University of Chicago Law Review*, vol. 73, 2006, pp. 133-156.

than governments legislating paternalistic laws to do this. As well, powerful lobby groups may influence governments more easily than individuals, and legislators may be influenced by electoral funding promises. Some have argued that this is one force, among many working to undermine modern Western democracy.⁴¹³

Conly accepts that there is some merit in the claims made by Glaeser, but argues that individuals are still more irrational than governments, such as in buying goods on impulse, leading to cognitive biases. Thus, legislators “like anyone who considers a decision from the perspective of a third party, not subject to its seductive qualities – are in a better position to see what is and what is not, a good bet.”⁴¹⁴ Further, rather than take these factors as intrinsically limiting legislative power, one could take this as a good reason for improving the democratic process:

All government is dangerous. To have a government at all is to have given others power over us. There is no need to think, though, that paternalistic measures make a government any more dangerous than one that is not paternalistic. Legislation is always subject to misuse and abuse. We always need democracy; transparency, free and fair elections; the minimizing of the power of wealth. ... However, even when we consider the reality of our political system, rather than the ideal, we consider the benefits of law to be greater than the costs. There is no reason this should not be true of paternalistic laws, which, after all, are intended to benefit all.⁴¹⁵

This argument begs the question against Glaeser, who was not arguing that there should be no laws, or an extreme limit to the law-making process, but rather that individuals, despite cognitive blindspots and biases, still overall will make better decisions about their welfare than governments. The issue cannot be resolved at this point without further consideration of the impact of the argument of cognitive blindspots and biases upon governments, which will be undertaken below.

⁴¹³ J. Allen, *Democracy in Decline: Steps in the Wrong Direction*, (McGill-Queens University Press, Montreal, 2014).

⁴¹⁴ Conly, cited note 383, p. 118.

⁴¹⁵ As above, p. 148.

Conly devotes, rightly enough, considerable space in her text to defending the position of coercive paternalism against some less challenging objections, which I believe she successfully does, and of which a brief summary will be made here. Almost all of these objections could be made to the use of incentives for patient compliance, so the replies are relevant to the defence offered in this work.

Paternalism may be said to give people less respect than they should have and as autonomous beings they should, despite errors, be able to make their own choices.⁴¹⁶ “Respect” is difficult to define, but in this context would at least involve recognising a person’s value and acting in such a way to give effect to such recognition. The value of a person could be taken to be intrinsic or lying in any number of qualities, such as rationality, personhood or having interests and the capacity to flourish; there is no consensus on this matter, beyond points that in the modern era, *non-voluntary* slavery is contrary to respect.⁴¹⁷ Conly points out that there are uncontroversial cases where governments can intervene to stop people doing things which they may want to do, where it is too harmful to be permitted, such as consenting to allow people to beat one up.⁴¹⁸ Also, the law may require others to act positively for you in ways to benefit you, but not, perhaps themselves, such as special benefits of welfare and medical benefits. Conly rightly asks why there should be any material difference requiring a person to do acts, or refrain from acting, when it is something that is in their interests? After all, in some cases governments may act to stop people doing things to one when it may cause a substantial harm or violate some right contrary to public policy.⁴¹⁹ The objection from respect thus presupposes the unrestrained applicability of the principle of autonomy, and thus begs the question against coercive paternalism.

⁴¹⁶ See S. Darwell, “The Value of Autonomy and Autonomy of the Will,” *Ethics*, vol. 116, 2006, pp. 263-284.

⁴¹⁷ J. Philmore, “The Libertarian Case for Slavery,” *Philosophical Forum*, vol. 14, 1982, pp. 43-58.

⁴¹⁸ Conly, cited note 383, p. 34.

⁴¹⁹ As above, p. 35.

Likewise, the related claim that paternalism demeans and degrades people is met by Conly by arguing that coercive paternalism is based on cold hard realism, and finding people lacking is not degrading but an accurate assessment of them: “Claiming to have a stature you don’t is more disrespectful of self, and of one’s real attributes, than is admitting to a lesser stature.”⁴²⁰

Does coercive paternalism treat people unequally, so that those administering the paternalistic policy have a “superior” judgment than those subject to that paternalistic policy? Here Conly says that there are no superior classes of people, only doers and planners. The planners make decisions in situations free from specifically relevant cognitive biases and blindspots, and supposedly are not prey to particular temptations. Thus, coercive paternalism is based on fallibility rather than superiority. Conly points out that experts and intelligent people are also subject to cognitive biases, so sheer IQ is no protection: “experts in their own fields who deviate from generally suggested guidelines because they think they can trust their own expert judgment are mistaken.”⁴²¹ While this is an effective reply to the argument from inequality, embedded in this reply is another counter-argument that can be made to the full generality of the coercive paternalism position, which will be discussed in the next section.

The Limits of Paternalism

How far should coercive paternalistic policies go? Conly states that in principle coercive paternalist policies can apply to any aspect of life, but in practice these policies would only impact on a few areas: “Legislation should intervene when people are likely to make decisions that seriously and irrevocably interfere with their ability to reach goals, and where legislation can reliably prevent them

⁴²⁰ As above, p. 41. See also E. Anderson, “What is Equality For?” *Ethics*, vol. 109, 1999, pp. 287-337.

⁴²¹ Conly, as above.

from making those bad decisions, and where legislation is the least costly thing that can reliably prevent them from making these bad decisions.”⁴²²

To this end, she gives some criteria for the applicability of coercive paternalist policies.⁴²³ First, the activity to be controlled “really is one that is opposed to our long-term ends”⁴²⁴ and is not based on moral or perfectionist grounds. Perfectionism may take at least two forms, moral perfectionism, the ideal of living lives of objective value, as defined by the culture rather than the lives that individuals want to live, and welfare perfectionism, that lives should meet some objective welfare standard. A number of philosophers, pursuing the broad Aristotelian idea of flourishing have supported forms of perfectionism.⁴²⁵ The problem with theories of flourishing consisting of one unique quality, such as in Aristotle, the capacity to reason, is that it can be soundly objected that one can still imagine a good life where that capability is absent or at least diminished.⁴²⁶ If it is proposed instead that there are a number of distinctive human qualities, the objection can be made that a person can be stunted in all of them, but still have a worthwhile life.⁴²⁷

The second criterion for the justified imposition of coercive paternalist policies is that these policies must actually be effective. She cites the case of Prohibition being a failure, although the empirical evidence, examined by Blocker,⁴²⁸ indicates that this controversial policy did lower alcohol consumption,

⁴²² As above, p. 72

⁴²³ As above, pp. 150-152.

⁴²⁴ As above, p. 150.

⁴²⁵ M. Nussbaum, *Women and Human Development: The Capabilities Approach*, (Cambridge University Press, Cambridge, 2000); P. Foot, *Natural Goodness*, (Oxford University Press, Oxford, 2001); R. Kraut, *What is Good and Why: The Ethics of Well-Being*, (Harvard University Press, Cambridge, 2007).

⁴²⁶ Conly, cited note 383, p. 108.

⁴²⁷ As above.

⁴²⁸ J. S. Blocker, “Did Prohibition Really Work? Alcohol Prohibition as a Public Health Innovation,” *American Journal of Public Health*, vol. 96, 2006, pp. 233-243.

with alcohol consumption declining by 30-50%. Organised crime flourished because a substantial minority of people did not support the *Volstead Act*. This suggests that part of the effectiveness of any coercive paternalist policy should be that the policy is widely supported in society, with only minor pockets of opposition.

Further, the benefits of a coercive paternalist policy should be greater than the costs. Arguably “failed” coercive paternalist policies, such as the US Prohibition, had a greater cost than benefit, even with a reduction in alcohol consumption, because of the creation of large-scale organised crime networks, that were able to make the transition to other areas of crime after the repeal of the *Volstead Act*, helping to lay the foundations for the global organised crime networks of today.⁴²⁹ However, this cost needs to be evaluated against the ill health that alcohol consumption produces. While globally, almost six million people die from tobacco use each year, 2.5 million people die from the harmful use of alcohol, about 3.8% of all deaths in the world.⁴³⁰ By comparison, 2.8 million people die each year in the world because of obesity and being overweight, accepted by health authorities as a major health problem. Therefore, alcohol abuse is also a substantial health problem.⁴³¹ Although many of us will not like to hear it, there is no safe level of alcohol consumption, with, for example, the cancer death rate increased by only one drink a day.⁴³² This illustrates some of the difficulties that coercive paternalist policies will face, where there will be complex issues involving possibly

⁴²⁹ L. Paoli (ed), *The Oxford Handbook of Organized Crime*, (Oxford University Press, Oxford, 2014); J. A. Miron and J. Zwiebel, “Alcohol Consumption During the Prohibition,” *American Economic Review*, vol. 81, 1991, pp. 242-247.

⁴³⁰ World Health Organization, *Global Status Report on Noncommunicable Diseases 2010*, (World Health Organization, Geneva, 2011), p. 2.

⁴³¹ As above.

⁴³² D. E. Nelson (et al.), “Alcohol-Attributable Cancer Deaths and Years of Potential Life Lost in the United States,” *American Journal of Public Health*, vol. 103, 2013, pp. 641-648. See also: A. Topiwala (et al.), “Moderate Alcohol Consumption as a Risk Factor for Adverse Brain Outcomes and Cognitive Decline: Longitudinal Cohort Study,” *British Medical Journal*, vol. 357, 2017: j2353.

incommensurable social values which may clash, such as in this discussion, security and social order versus public health.

The final criterion is that the ban must be the most effective way of preventing the activity, and better than the alternatives.⁴³³ Conly does not discuss this, but it is at least logically possible that all alternatives may be equally bad, so the coercive paternalist policy should be better than society collectively grinning its teeth and bearing the problem. Alcohol consumption in the US in the 1920s may have been one such problem where all the options looked flawed. Perhaps the drug problem today is another intractable problem with no satisfactory solution, but one where we “muddle through.”⁴³⁴

Conly supports her position with a number of examples of successful coercive paternalist policies, and some failures, relevant to health policy. One such example is the New York City trans-fat ban. In 2008 the municipality of New York City Department of Health and Mental Hygiene, banned the use of trans-fats in New York City restaurants and cafeterias, because of the link between trans-fats and coronary heart disease. The ban has been followed in Boston, Philadelphia and California. Denmark had banned trans-fats before New York City, in 2003, a ban that has been followed by Austria and Switzerland.⁴³⁵

The ban can be justified along the same lines as bans on known carcinogens, such as the fungicide captafol, which was banned in the United States in 1999.⁴³⁶ The ban clearly meets the criteria of advancing the long-term good of public health promotion, since it, as we will see, has lowered the consumption of trans-fats in New York City from restaurants and cafeterias. The ban has been working as the use of trans-fats in New York City restaurants and cafeterias has

⁴³³ Conly, cited note 383, p. 151.

⁴³⁴ C. E. Lindblom, “The Science of “Muddling Through,”” *Public Administration Review*, vol. 19, 1959, pp. 79-88.

⁴³⁵ Conly, cited note 383, p. 153.

⁴³⁶ “Captafol,” Report on Carcinogens, 13th edition, National Toxicology Program, U.S. Department of Health and Human Services, at <http://ntp.niehs.nih.gov/ntp/roc/content/profiles/captafol.pdf>.

been reduced from 50% to less than two%.⁴³⁷ Restaurants and bakeries have moved from use of saturated fats (containing trans-fats) to more healthy fats. It is too soon to judge if the ban has had an impact on heart health in New York City, but Conly believes that it will, based on evidence from Denmark, which indicates that since the time of their ban there has been a 70 percent fall in cardiovascular disease deaths. Even here, one cannot infer causality because other factors are at work as well, such as better diet, exercise, better education and greater public awareness of the health risks of smoking.⁴³⁸

The virtue of the ban is that previous attempts to eliminate trans-fat use in restaurants and cafeterias had failed, not because people had some desire for trans-fats, but because change was too inconvenient for businesses. Ultimately, as has occurred for decades now with environment protection issues, legislation and the law was required to get action. Cooks soon found ways of preserving tastes in food; there were complaints that some goods such as Danish pastries could not be traditionally made without the use of trans-fats, but enterprising cooks soon found ways of doing this.⁴³⁹ Hence, there does not appear to be any harm arising from the trans-fat ban as people can still purchase their favourite pastries.

The ban appears to be the most effective available way of cutting down the use of trans-fats, as New York City did try to get a voluntary reduction in the use of trans-fats, which was unsuccessful.⁴⁴⁰ This is then an example of a successful coercive paternalist policy, a support for Conly's thesis.

The New York City food stamp soda ban is a good illustration of how coercive paternalist policies which are not carefully constructed and thought

⁴³⁷ Conly, cited note 383, p. 153.

⁴³⁸ "Denmark Sees 70% Fall in Cardiovascular Disease," May 7, 2014, at www.euractiv.com/section/health-consumers/news/denmark-sees-70-fall-in-cardiovascular-disease-deaths/.

⁴³⁹ D. F. Maron, "Some Danish Advice on the Trans-Fat Ban," November 14, 2013, at www.scientificamerican.com/article/some-danish-advice-on-the/.

⁴⁴⁰ Conly, cited note 383, p. 154.

through can fail dramatically. In 2010, the City of New York banned the use of food stamps to buy sodas and other sweetened drinks because of a link between soda consumption and obesity, due to the high sugar content of sodas.⁴⁴¹ Conly notes that with this example the problems with the ban related to the issues of effectiveness and net benefits. Food stamp users were still able to buy soda, just not with food stamps, and soda is relatively cheap and easily obtained. As well, alternative diet sodas have their own health issues, with a possible link to strokes and heart attacks. Further, artificial sweeteners often result in a fall in the level of the appetite-regulating hormone leptin, which inhibits hunger, so that the diet drinks could actually make one hungrier.⁴⁴²

The attempt by New York City to try and deal with the soda health problem was ultimately to place limits on the size of sugary drinks. This proposal was enormously controversial and met with a legal challenge, the proposal being struck down by Justice Milton A. Tingling of the State Supreme Court in Manhattan, who found the drink size limits were “arbitrary and capricious.”⁴⁴³ Tingling J said that the rules did not apply to dairy-based drinks such as milkshakes and while the rules were enforced in restaurants and delis, they were not in convenience stores, making the rules arbitrary. The decision was appealed by New York City, but the New York Court of Appeals affirmed the lower court’s invalidation of the soda limit rule, holding that the City’s Board of Health had usurped legislative authority.⁴⁴⁴

This example shows some of the legal obstacles that could face coercive paternalist policies. There would need to be considerable attention devoted to

⁴⁴¹ As above, p. 156.

⁴⁴² L. R. Vartanian (et al.), “Effects of Soft Drink Consumption on Nutrition and Health: A Systematic Review and Meta-Analysis,” *American Journal of Public Health*, vol. 97, 2007, pp. 667-675.

⁴⁴³ M. M. Grynbaum, “Judge Blocks New York City’s Limits on Big Sugary Drinks,” *New York Times*, March 11, 2013, at http://www.nytimes.com/2013/03/12/nyregion/judge-invalidates-bloombergs-soda-ban.html?_r=0.

⁴⁴⁴ *New York Statewide Coalition of Hispanic Chambers of Commerce v. The New York City Department of Health and Mental Hygiene*, 970 N. Y. S. 2d 200 (N. Y. App. Div. 2013); aff’d (N. Y. July 2014), following the rule in *Boreali v Axelrod*, 517 N. E. 2d 1350 (1987).

ensuring that the proposals are not arbitrary, leading to the legislation being struck down. Controversial proposals, certainly in the United States, which impact upon corporate interests, and most issues do, are highly likely to be met with a litigation challenge. The literature on coercive paternalism, being largely concerned with the ethical ramifications of the position, does not adequately consider the legal impact of the position, a clear practical limitation.⁴⁴⁵

Conly considers the idea of making cigarettes illegal given the evidence of the multitudes of health dangers from smoking. One objection to this, apart from the ferocious legal response that cigarette companies would make in something of a “last stand” battle, is that a situation may arise like the 1920s Prohibition ban on alcohol, leading to crime and black markets, as exists today with drugs such as marijuana. Conly argues that at the time of the Prohibition the public did not appreciate that alcohol was harmful. Today there is widespread acceptance that smoking is harmful. The benefits of cigarette smoking are the sense of enjoyment to smokers, which comes after one is addicted – initial smoking episodes are usually unpleasant. The pleasure is primarily negative, through controlling an addiction.⁴⁴⁶ If the addiction can be independently dealt with, which it can, any suffering people get from being deprived of smoking cigarettes can be replaced by gains in health, as well as additional money saved from not having to buy rather expensive cigarettes. Incentives to control smoking have had some impact, with such measures reducing the smoking rate, but it is still around 20% in the United States.⁴⁴⁷ Thus, education and incentives have significantly reduced the rate of smoking, but it is still a major health problem. This does suggest that two of the criteria for justified coercive paternalist policies are met, namely that the activity is harmful and that there are no other existing ways of dealing with the health issue.

⁴⁴⁵ M. M. Grynbaum, “Will Soda Restrictions Help New York Win the War on Obesity?” *British Medical Journal*, vol. 345, 2012: e6768; A Sivin, “Striking the Soda Ban: The Judicial Paralysis of the Department of Health,” *Journal of Law and Health*, vol. 28, 2015, pp. 247-263.

⁴⁴⁶ Conly, cited note 383, p. 171.

⁴⁴⁷ As above, p. 172.

The central issues in banning smoking will relate to the overall effectiveness of the measure, including public acceptance and whether the benefits are greater than the costs. Exploring this would involve more research than Conly has presented in her thought provoking discussion. The cost of last stand litigation by cigarette companies should not be underestimated. Their resources are considerable and cases would certainly proceed to the highest courts, such as the US Supreme Court. However, the benefits from such a ban are considerable as Proctor summarises: “Apart from reducing human suffering, abolishing the sale of cigarettes would result in savings in the realm of healthcare costs, increased labour productivity, lessened harms from fires, reduced consumption of scarce physical resources, and a smaller global carbon footprint. Abolition would also put a halt to one of the principal sources of corruption in modern civilisation, and would effectively eliminate one of the historical forces behind global warming denial and environmental obfuscation. The primary reason for abolition, however, is that smokers themselves dislike the fact they smoke. Smoking is not a recreational drug, and abolishing cigarettes would therefore enlarge rather than restrict human liberties. Abolition would also help cigarette makers fulfil their repeated promises to ‘cease production’ if cigarettes were ever found to be causing harm.”⁴⁴⁸ Fifteen US states had banned the sale of cigarettes from 1890 to 1927; Bhutan outlawed the cultivation, harvesting, production and sale of tobacco in 2004; Turkmenistan in January 2016; the Pitcairn Islands had a total ban on tobacco sales, but now allows sales from government stores and New Zealand and Finland hope to achieve a tobacco free society within the next few decades.⁴⁴⁹ This suggests that there is considerable merit in a wide social debate about implementing a coercive paternalist policy to ban cigarettes.

⁴⁴⁸ R. N. Proctor, “Why Ban the Sale of Cigarettes? The Case for Abolition,” *Tobacco Control*, vol. 22, 2013, pp. 127-130, cited p. 127.

⁴⁴⁹ As above.

Although there are some interesting applications of coercive paternalism, the concern for those from a liberal tradition is that the policy “simply takes certain options away” and “does not respect people’s ability to choose well for themselves.”⁴⁵⁰ Further; “[o]nce we have established that personal decisions don’t always have to be respected, it may be hard to say when they should be respected.”⁴⁵¹ Would the application of coercive paternalism lead to the establishment of arranged marriages, or more radically the abolition of marriage itself, given the high divorce rate and the associated socio-economic and legal costs of this?⁴⁵² Conly considers this as a possible *reductio ad absurdum* of her position and replies that government intervention in this area would be a failure because there is not enough known to be able to claim that arranged marriages would be more successful than the present arrangement and the lack of information about long-term compatibility. She also says that the pursuit of love has value in itself and can only be explored by the potential of relationship failure: “We really enjoy the process, even if the outcome is a failure.”⁴⁵³ Those who have suffered the pains of divorce, both women and men, may disagree.⁴⁵⁴

There are, however, good reasons to see a limitation upon coercive paternalism even if we accept the argument from cognitive biases and blindspots. As has been said, and recognised by supporters of coercive paternalism such as Conly, the experts and administrators who are to administer the paternalist proposals also suffer from the same biases that non-experts suffer from.⁴⁵⁵ The

⁴⁵⁰ Conly, cited note 383, p. 8.

⁴⁵¹ As above, p. 100.

⁴⁵² L. Wilson and L. Cornish, “Divorce is Costing the Australian Economy \$14 Billion a Year,” July 5, 2014, at <http://www.news.com.au/lifestyle/relationships/marriage/divorce-is-costing-the-australian-economy-14-billion-a-year/news-story/e5a101ea76351d4ba145279011b934ac>.

⁴⁵³ As above, p. 184.

⁴⁵⁴ K. Kolves (et al.), “Suicidal Ideation and Behavior in the Aftermath of Marital Separation: Gender Differences.” *Journal of Affective Disorders*, vol. 120, 2010, pp. 48-53.

⁴⁵⁵ The literature on the cognitive illusions of experts is vast, but see: A. Tversky and D. Kahneman, “Judgment Under Uncertainty: Heuristics and Biases,” *Science*, vol. 185, 1974, p. 1124-1131; P. Slovic, “Perceptions of Risk,” *Science*, vol. 236, 1987, pp. 280-285; D. Kahneman, “Judgment and

typical reply by the paternalist to this objection, as we have seen from our earlier discussion of Conly is that the blindspots are not in the exact areas where individual cognitive biases occur, so by a happy pre-established harmony, government intervention can fill the gaps left by the failure of individual autonomy and rationality.

This, however, is most unlikely, and exactly the opposite may be true. F. A. Hayek in his critique of the limits of central planning, argued that private market mechanisms are often based on “local knowledge,” experience of “local conditions and special circumstances.”⁴⁵⁶ This knowledge, Hayek described as the “knowledge of the particular circumstances of time and place,”⁴⁵⁷ which Padilla says “cannot be collected, centralized, and redistributed to the members of the society by the government or one of its apparatus because such knowledge can only be acquired through experience.”⁴⁵⁸ The intrinsic lack of knowledge of governments is dramatically illustrated in the aftermath of Hurricane Katrina, which soft paternalist such as Thaler and Sunstein regard as a good supporting case for their position: “government is often required to act, for it is the only means by which the necessary resources can be mustered, organized, and deployed.”⁴⁵⁹ The evidence, in the case of Hurricane Katrina, Padilla points out, is contrary to this, as it was the private firm Wal-Mart and other big retailers such as Lowe’s and Home

Decision Making : A Personal View,” *Psychological Science*, vol. 2, 1991, pp.142-145; J. Shanteau, “Competence in Experts: The Role of Task Characteristics,” *Organizational Behavior and Human Decision Processes*, vol. 53, 1992, pp. 252-266; A. J. Wistrich (et al.), “Can Judges Ignore Inadmissible Information? The Difficulty of Deliberately Disregarding,” *University of Pennsylvania Law Review*, vol. 153, 2005, pp. 1251-1345; J. J. Rachlinski, “Cognitive Errors, Individual Differences, and Paternalism,” *University of Chicago Law Review*, vol. 73, 2006, pp. 207-229; C. Guthrie (et al.), “Blinking on the Bench: How Judges Decide Cases,” *Cornell Law Review*, vol. 93, 2007, pp. 1-43.

⁴⁵⁶ F. A. Hayek, “The Use of Knowledge in Society,” *American Economic Review*, vol. 35, 1945, p. 519-530, cited p. 522.

⁴⁵⁷ As above.

⁴⁵⁸ A. Padilla, “Review of Richard H. Thaler and Cass R. Sunstein, *Nudge: Improving Decisions about Health, Wealth, and Happiness*,” *Review of Austrian Economics*, vol. 22, 2009, pp. 425-429, cited p. 426.

⁴⁵⁹ Thaler and Sunstein, cited note 372, p. 13.

Depot, who mobilised to supply free food, water and prescription drugs to the devastated victims. The government was slow to mobilise and took days to provide relief.⁴⁶⁰ Just as markets may fail, so may governments, in a most fundamental way.⁴⁶¹

The most fundamental of these problems with governments was noted by Lord Acton (1834-1902), who famously said: “Power tends to corrupt and absolute power corrupts absolutely,”⁴⁶² and also by Friedrich Nietzsche (1844-1900) who said that “[t]he state is the coldest of all cold monsters.”⁴⁶³ Commenting on Nietzsche, Richard Falk said: “the United States, claiming the mantle of leader of ‘the free world,’ remains ready to incinerate tens of millions of innocent civilians for the sake of regime survival for itself and allied governments. What could be colder? What could be more anti-human?”⁴⁶⁴

The same position is argued for by *Scientific American* blogger and science sceptic John Horgan, who has argued that the military empire of the US threatens world peace,⁴⁶⁵ and he too, is outraged that since 9/11 U.S.-led forces have directly, not indirectly, killed over a thousand children in Syria and other war zones, often the result of drone assassinations, which are contrary to international prohibitions against assassinations.⁴⁶⁶ Between 2003 and 2011, U.S. and coalition forces killed over 1,201 children in just Iraq and U.S. drone strikes in Pakistan over the last 10

⁴⁶⁰ S. Horwitz, “Wal-Mart to the Rescue: Private Enterprise’s Response to Hurricane Katrina,” *Independent Review*, vol. 13, no. 4, 2009, pp. 511-528.

⁴⁶¹ C. J. Wolf, *Markets or Governments: Choosing Between Imperfect Alternatives*, (MIT Press, Cambridge, 2003).

⁴⁶² Acton Institute, Lord Acton Quote Archive, at <http://www.acton.org/research/lord-acton-quote-archive>.

⁴⁶³ F. Nietzsche, *Thus Spake Zarathustra*, quoted from R. Falk, “Is the State a Monster? Pro and Contra Nietzsche,” at <http://richardfalk.wordpress.com/2011/06/16/is-the-state-a-monster-pro-contra-nietzsche/>.

⁴⁶⁴ Falk, as above.

⁴⁶⁵ J. Horgan, “How the U.S. Can Help Humanity Achieve World Peace (Yes, World Peace),” *Scientific American*, January 17, 2012, at <http://blogs.scientificamerican.com/cross-check/how-the-us-can-help-humanity-achieve-world-peace-yes-world-peace/>.

⁴⁶⁶ As above.

years killed between 172 and 207 children.⁴⁶⁷ Some of these children, sadly, may have been child soldiers, but they would be the minority; most are simply collateral damage.⁴⁶⁸ The US used radioactive weapons during the first three weeks of the 2003 Iraq War, these being missiles loaded with depleted uranium. About 2,000 tons of radioactive material was scattered over Iraq, resulting in cancers for both Iraqis and US soldiers.⁴⁶⁹ The US also used depleted uranium in Syria in raids on the Islamic state in late 2015.⁴⁷⁰ If the use of chemical weapons is regarded as a war crime (and rightly so), then the use of depleted uranium, which contaminates the environment for much longer (uranium-238 has a half-life of 4.468 billion years), is arguable as well.⁴⁷¹

There is a considerable literature detailing US military violence, the overthrowing of democracies that had policies contrary to US interests, and the dispossession of millions of people.⁴⁷² There has been as well, exposures from UN officials and former Washington D.C. insiders, about the politics behind the “intelligence” which at the time claimed that there were weapons of mass

⁴⁶⁷ J. Horton, “Where is Outcry Over Children Killed by U.S.-Led Forces?” *Scientific American*, September 10, 2015, at <http://blogs.scientificamerican.com/cross-check/where-is-outcry-over-children-killed-by-u-s-led-forces/>.

⁴⁶⁸ As above; J. Horgan, “U.S. Bombs, which Helped Spawn ISIS, Can’t Crush It,” *Scientific American*, September 1, 2014, at <http://blogs.scientificamerican.com/cross-check/u-s-bombs-which-helped-spawn-isis-can-8217-t-crush-it/>.

⁴⁶⁹ R. B. Stuart, ““Depleted Uranium from Sea to Shining Sea”: Cancer Kills US Soldiers and Iraqi Civilians,” March 29, 2010, at https://www.huffingtonpost.com/r-b-stuart/depleted-uranium-from-sea_b_437346.html.

⁴⁷⁰ S. Oakford, “The United States Used Depleted Uranium in Syria,” February 14, 2017, at <http://foreignpolicy.com/2017/02/14/the-united-states-used-depleted-uranium-in-syria/>.

⁴⁷¹ C. Considine, “U.S. Depleted Uranium as Malicious as Syrian Chemical Weapons,” n.d, at https://www.huffingtonpost.com/craig-considine/us-depleted-uranium-as-ma_b_3812888.html

⁴⁷² J. Pilger, “A World War has Begun: Break the Silence,” March 20, 2016, at <http://johnpilger.com/articles/a-world-war-has-begun-break-the-silence>; W. Blum, *America’s Deadliest Export: Democracy: The Truth about US Foreign Policy and Everything Else*, (Fernwood, Halifax, 2013); N. Chomsky and D. Barsamian, *Imperial Ambitions: Conversations on the Post-9/11 World*, (Metropolitan Books, New York, 2005); I. Gland, *The Empire has No Clothes: U. S. Foreign Policy Exposed*, (Independent Institute, Oakland, 2004); R. H. Immerman, *Empire for Liberty: A History of American Imperialism from Benjamin Franklin to Paul Wolfowitz*, (Princeton University Press, Princeton, 2010).

destruction in Iraq, when there was not, and the manipulations of that intelligence to promote the Iraq war, disclosures all published with reputable mainstream presses, not one person shadowy internet sites.⁴⁷³ It is not the intent of this discussion to analyse first hand whether or not this material is factually correct, because such a task would be far beyond the resources and research capacity of one person, certainly the present writer. However, given the weighty amount of literature dealing with areas of government failure, if not outright criminality and corruption, we should be extremely cautious about adding to government control and power unless it is absolutely necessary. One need not embrace completely the philosophical anarchist critique of government, to recognise that just as individuals have epistemic and moral failings, so do governments, only on a much larger scale.⁴⁷⁴ This is not to say that the United States is the only example of such behaviour, or even the worst – the problem is a general one arising from the extensive power that modern governments have. Where there is power, there is always the likelihood of abuse. There is simply no reason to suppose that this corruption of power is limited merely to military operations, and even our daily press reveals political corruption on most pages.⁴⁷⁵

This is especially so with coercive paternalist policies that will involve giving governments increasing power over individuals. We have seen that coercive paternalists such as Conly defend their position by claiming that democratic controls will prevent ill-effects arising from this transfer of power, but as the above

⁴⁷³ R. A. Clarke, *Against all Enemies: Inside America's War on Terror*, (Free Press, New York, 2004); J. W. Dean, *Worse than Watergate: The Secret Presidency of George W. Bush*, (Little, Brown, New York, 2004); H. Blix, *Disarming Iraq*, (Pantheon, New York, 2004); S. Ritter and S. Hersh, *Iraq Confidential: The Untold Story of the Intelligence Conspiracy to Undermine the UN and Overthrow Saddam Hussein*, (Tauris, New York, 2005).

⁴⁷⁴ M. S. Shatz (ed.), *The Essential Works of Anarchism*, (Quadrangle Books, New York, 1972); R. P. Wolff, *In Defense of Anarchism*, (Harper and Row, New York, 1970); G. Graham, *The Case Against the Democratic State*, (Imprint Academic, Thorverton, 2002).

⁴⁷⁵ S. Attkisson, *The Smear: How Shady Political Operatives and Fake News Control What You See, What You Think, and How You Vote*, (Harper, New York, 2017); P. Schweizer, *Secret Empires: How the American Political Class Hides Corruption and Enriches Family and Friends*, (Harper, New York, 2018).

discussion illustrates, democracy has not prevented the harms discussed above. Certainly at a minimum, coercive paternalism will involve a massive expansion of law making. However, there is a case against even this as I detailed in my book (with Guy Maddern), *Medical Malpractice, Mistakes and Mishaps*,⁴⁷⁶ which detailed the considerable economic and social costs which arise from a further expansion of the laws of society. There is a need to reduce, not increase, the amount of law in society, and as such, this too will place limitations upon coercive paternalist policies.⁴⁷⁷

It is also relevant to this critique of expert knowledge to note that there is now a considerable literature on the limitations of expert knowledge in a wide range of sciences. We have already seen, previously in this work, the lack of consensus that exists in philosophy and ethics, which is one sceptical argument that has been advanced against the discipline as a cognitive enterprise. However, there are equally as alarming claims made about “expert” scientific knowledge.

John Ioannidis published a now widely cited paper, “Why Most Published Research Findings are False,”⁴⁷⁸ where he pointed out that there is a high rate of non-replication, and failure of confirmation, in many sciences, due to a number of factors. One reason is basing research on a single study assessed by the methodology of statistical significance, with a *p*-value less than 0.05. There is considerable debate about the correct interpretation, and epistemological merits of significance testing, with many methodologists maintaining that the approach is

⁴⁷⁶ J. W. Smith and G. Maddern, *Medical Malpractice, Mistakes and Mishaps: Essays on Medical Litigation, The Mandatory Reporting of Health Professionals and the Limits of Law*, (Edwin Mellen Press, Lewiston, 2013).

⁴⁷⁷ C. Crier, *The Case Against Lawyers*, (Broadway, New York, 2002); S. Daicoff, “Law as a Healing Profession: The ‘Comprehensive Law Movement,’” *Pepperdine Dispute Resolution Law Journal*, vol. 6, 2006, pp. 1-61.

⁴⁷⁸ J. P. A. Ioannidis, “Why Most Published Research Findings are False,” *PLOS Medicine*, vol. 2, no. 8, 2005, pp. 0696-0701; J. P. A. Ioannidis, “Contradictions in Highly cited Research – Reply,” *JAMA*, vol. 294, 2005, pp. 2695-2696.

not scientific.⁴⁷⁹ Some methodologists advocating that significance tests should be replaced by alternative methods, “the new statistics” of estimation confidence

⁴⁷⁹ On the significance test controversy see generally, H.C. Selvin, “A Critique of Tests of Significance in Survey Research,” *American Sociological Review*, vol. 22, 1957, pp. 519-527; J. Nunnally, “The Place of Statistics in Psychology,” *Educational and Psychological Measurement*, vol. 20, 1960, pp. 641-650; W.W. Rozeboom, “The Fallacy of the Null-Hypothesis Significance Test,” *Psychological Bulletin*, vol. 57, 1960, pp. 416-428; D.T. Lykken, “Statistical Significance in Psychological Research,” *Psychological Bulletin*, vol. 70, 1968, pp. 151-159; D. Bakan, “The Test of Significance in Psychological Research,” *Psychological Bulletin*, vol. 66, 1966, pp. 423-437; D.E. Morrison and R.E. Henkel (eds.), *The Significance Test Controversy*, (Aldine, Chicago, 1970); R.P. Carver, “The Case Against Statistical Significance Testing,” *Harvard Educational Review*, vol. 48, 1978, pp. 378-399; G. V. Glass (et.al.), *Meta-Analysis in Social Research*, (Sage Publications, Beverly Hills, 1981); L. Guttman, “The Illogic of Statistical Inference for Cumulative Science,” *Applied Stochastic Models and Data Analysis*, vol. 1, 1985, pp. 3-10. R. Rosenthal and D.B. Rubin, “Statistical Analysis: Summarizing Evidence Versus Establishing Facts,” *Psychological Bulletin*, vol. 97, 1985, pp. 527-529; D. McCloskey, “Why Economic Historians Should Stop Relying on Statistical Tests of Significance and Lead Economists and Historians into the Promised Land,” *Newsletter of the Cliometrics Society*, no. 2, December, 1986, pp. 5-7; J. W. Pratt, “Testing a Point Null Hypothesis: The Irreconcilability of P Values and Evidence: Comment,” *Journal of the American Statistical Association*, vol. 82, 1987, pp. 123-125; S. L. Chow, “Significance Test or Effect Size?” *Psychological Bulletin*, vol. 103, 1988, pp. 105-110; G.R. Loftus, “On the Tyranny of Hypothesis Testing in the Social Sciences,” *Contemporary Psychology*, vol. 36, 1991, pp. 102-105; S.N. Goodman, “P Values Hypothesis Tests, and Likelihood: Implications for Epidemiology of a Neglected Historical Debate,” *American Journal of Epidemiology*, vol. 137, 1993, pp. 485-496; S. L. Chow, *Statistical Significance: Rationale, Validity and Utility*, (Sage, London, 1996); R.W. Frick, “The Appropriate Use of Null Hypothesis Testing,” *Psychological Methods*, vol. 1, 1996, pp. 379-390; R. F. Kirk, “Practical Significance: A Concept Whose Time Has Come,” *Educational and Psychological Measurement*, vol. 56, 1996, pp. 746-759; F.L. Schmidt, “Statistical Significance Testing and Cumulative Knowledge in Psychology: Implications for Training of Researchers,” *Psychological Methods*, vol. 1, 1991, pp. 115-129; R. P. Abelson, “On the Surprising Longevity of Flogged Horses: Why There is a Case for the Significance Test,” *Psychological Science*, vol. 8, 1997, pp. 12-15; J. Berger (et al.), “Unified Frequentist and Bayesian Testing of a Precise Hypothesis,” *Statistical Science*, vol. 12, 1997, pp. 133-160; L.L. Harlow (et al. eds), *What If There Were No Significance Tests?* (Lawrence Erlbaum Associates, Mahwah, New Jersey, 1997); R. L. Hagan, “In Praise of the Null Hypothesis Statistical Test,” *American Psychologist*, vol. 52, 1997, pp. 15-24; R. J. Harris, “Significance Tests Have Their Place,” *Psychological Science*, vol. 8, 1997, pp. 8-11; J. E. Hunter, “Needed: A Ban on the Significance Test,” *Psychological Science*, (Special Section), vol. 8, 1997, pp. 3-7; P. Shrout, “Should Significance Tests Be Banned?” *Psychological Science*, vol. 8, 1997, pp. 1-2; S. L. Chow, “Precis of *Statistical Significance: Rationale, Validity and Utility*,” *Behavioral and Brain Sciences*, vol. 21, 1998, pp. 169-239; D. H. Johnson, “The Insignificance of Statistical Significance Testing,” *Journal of Wildlife Management*, vol. 63, 1999, pp. 763-772; A. Gelman and H. Stern, “The Difference Between ‘Significant’ and ‘Not Significant’ Is Not Itself ‘Statistically Significant,’” *American Statistician*, vol. 60, 2001, pp. 328-331; M. Albert, “Resolving Neyman’s Paradox,” *British Journal for the Philosophy of Science*, vol. 53, 2002, pp. 69-76; J. Gliner (et.al.), “Problems with Null Hypothesis Significance Testing (NHST): What do the Textbooks Say?” *Journal of Experimental Education*, vol. 71, 2002, pp. 83-92; R. Hubbard and M. J. Bayarri, “Confusion Over Measures of Evidence (P’s) versus Errors (α ’s) in Classical Statistical Testing (With Comments),” *American Statistician*, vol. 57, 2003, pp. 171-182; P. L. Morgan, “Null Hypothesis Significance Testing: Philosophical and Practical Considerations of a Statistical Controversy,” *Exceptionality*,

intervals, and meta-analysis.⁴⁸⁰ The largest competing school of thought though is Bayesianism, which assesses the inductive support for hypotheses on the basis of both objective and subjective factors. This subjective factor is the prior probability of a hypothesis before the evidence in question is considered, and it is subjective as people will differ in their prior probabilities $\Pr(h)$, for a hypothesis h . The objective factor consists of direct inference probabilities that a hypothesis h is supported by evidence e . Bayes' theorem relates these direct inference probabilities with a subject's prior probabilities to produce the subject's *posterior probability*, the subject's probability judgment after the evidence has been considered. Bayes' theorem relates the *posterior* (or later coming) probability of a

vol. 11, 2003, pp. 209-221; F. Fidler (et.al.), "Editors Can Lead Researchers to Confidence Intervals, But They Can't Make Them Think: Statistical Reform Lessons from Medicine," *Psychological Science*, vol. 15, 2004, pp. 119-126; A. D. Banasiewicz, "Marketing Pitfalls of Statistical Significance Testing," *Marketing Intelligence and Planning*, vol. 23, 2005, pp. 515-528; D. Bakan, "The Test of Significance in Psychological Research," *Psychological Bulletin*, vol. 66, 1966, pp. 423-437; R. Carver, "The Case Against Statistical Significance Testing," *Harvard Educational Review*, vol. 48, 1978, pp. 378-399; G. Gigerenzer, "We Need Statistical Thinking, Not Statistical Rituals," *Behavioral and Brain Sciences*, vol. 21, 1998, pp. 199-200; J. A. C. Sterne and G. D. Smith, "Sifting the Evidence – What's Wrong with Significance Tests?" *British Medical Journal*, vol. 322, 2001, pp. 226-231; F. L. Schmidt and J. E. Hunter, "Are There Benefits from NHST?" *American Psychologist*, vol. 57, 2002, pp. 65-66; D. R. Anderson (et.al.), "Null Hypothesis Testing: Problems, Prevalence and an Alternative," *Journal of Wildlife Management*, vol. 64, 2000, pp. 912-923; J. S. Armstrong, "Significance Tests Harm Progress in Forecasting," *International Journal of Forecasting*, vol. 23, 2007, pp. 321-327. Well over 300 critical articles in the NHST literature are cited at <http://www.cnr.colostate.edu/~anderson/thompson1.html> and <http://www.cnr.colostate.edu/~anderson/nester.htm/>.

⁴⁸⁰ G. Cumming, *Understanding the New Statistics: Effect Sizes, Confidence Intervals, and Meta-Analysis*, (Routledge, New York and London, 2012); G. Cumming, "The Errors of Statistical Significance Testing," at <http://www.psychology.org.au/inpsych/2012/june/cumming/>; G. Cumming, "The New Statistics: Why and How," *Psychological Science*, vol. 25, 2014, pp. 7-29. For criticisms see A. Gelman, "The Fallacy of Placing Confidence in Confidence Intervals," at <http://andrewgelman.com/2014/12/11/fallacy-placing-confidence-confidence-intervals/>; R. D. Morey (et al.), "Why Hypothesis Tests are Essential for Psychological Science: A Comment on Cumming," *Psychological Science*, vol. 25, 2014, pp. 1289-1290; R. D. Morey (et al.), "The Fallacy of Placing Confidence in Confidence Intervals," *Psychological Bulletin and Review*, vol. 23, 2016, pp. 103-123. In general, they argue from a Bayesian perspective, that the frequentist approach using confident intervals, leads to inconsistent inferences, and that confidence intervals do not solve the existing problems with null hypothesis significance testing: Z. Dienes, "Bayesian Versus Orthodox Statistics; Which Side Are You On?" *Perspectives on Psychological Science*, vol. 6, 2011, pp. 274-290.

hypothesis $\Pr(h/e)$ to $\Pr(h)$, $\Pr(e/h)$ and $\Pr(e)$ so that knowing the values of the last three terms will enable the calculation of $\Pr(h/e)$ as:

$$\text{Bayes' theorem: } \Pr(h/e) = \frac{\Pr(e/h) \cdot \Pr(h)}{\Pr(e)}$$

for $\Pr(h), \Pr(e) > 0$.

Thus, scientific inference as involves moving from the prior probability $\Pr(h)$ of a hypothesis to its posterior probability $\Pr(h/e)$ on the basis of the evidence collected, such that if $\Pr(h/e) > \Pr(h)$ then e confirms or supports h . If $\Pr(h/e) < \Pr(h)$ then e disconfirms or refutes h .⁴⁸¹

Just as the conventional significance testing approach has been subject to extensive criticism, so too has the Bayesian approach. It is beyond the scope of this work to go into anything beyond a simple gloss on this debate, but it is fair to say that the critics of the Bayesian approach believe that it has severe limitations and cannot provide a complete statistical methodology for the sciences, with critics raising problems about the limits of rationality and the cognitive capacities of Bayesian subjects, questioning the claim that degrees of justification are Bayesian probabilities, and demonstrating the mathematical and computational intractability of Bayesian methods for even simple problems.⁴⁸² What is interesting about this

⁴⁸¹ For a summary see J. W. Smith and G. Maddern, *Medical Malpractice, Mistakes and Mishaps: Essays on Medical Litigation, the Mandatory Reporting of Health Professionals and the Limits of Law*, (Edwin Mellen Press, Lewiston, 2013), chapter 9.

⁴⁸² K. R. Popper and D. W. Miller, "A Proof of the Impossibility of Inductive Probability," *Nature*, vol. 302, 1983, pp. 687-688; K. R. Popper and D. W. Miller, "Why Probabilistic Support is Not Inductive," *Philosophical Transactions of the Royal Society*, London A, vol. 321, 1987, pp. 569-591; M. Redhead, "On the Impossibility of Inductive Probability", *British Journal for the Philosophy of Science*, vol. 36, 1985, pp. 185-191; C. Howson, "Some Further Reflections on the Popper-Miller 'Disproof' of Probabilistic Induction," *Australasian Journal of Philosophy*, vol. 68, 1990, pp. 221-228; H. Kyburg, "Subjective Probability: Criticisms, Reflections and Problems", *Journal of Philosophical Logic*, vol. 7, 1978, pp. 157-180; H. Kyburg, "The Scope of Bayesian Reasoning," in D. Hull (et al. eds), *Philosophy of Science Association 1992*, (Philosophy of Science Association, East Lansing, Michigan, 1993), pp. 139-152; A. Hyland and R. Zeckhauser, "The Impossibility of Bayesian Group Decision Making with Separate Aggregation of Beliefs and

debate, if one has a neutral standpoint, is that the experts seem to make telling criticisms of opposing statistical methodologies without begging the question and assuming that their own position is correct, such as the argument from the computational intractability of the Bayesian approach holding even if significance tests face independent criticisms, such that p values are misunderstood as posterior probabilities of the null hypothesis, or the common fallacious deduction of “no difference” from “no significant difference,” and “non-significant” with “no

Values,” *Econometrica*, vol. 47, 1979, pp. 1321-1336; L. Sowden, “The Inadequacy of Bayesian Decision Theory,” *Philosophical Studies*, vol. 45, 1984, pp. 293-313; J. Humburg, “The Bayes Rule is Not Sufficient to Justify or Describe Inductive Reasoning,” *Erkenntnis*, vol. 26, 1987, pp. 379-390; L. Zynda, “Old Evidence and New Theories,” *Philosophical Studies*, vol. 77, 1995, pp. 67-95; E.C. Barnes, “The Quantitative Problem of Old Evidence,” *British Journal for the Philosophy of Science*, vol. 50, 1999, pp. 249-264; E. Eells, *Bayesian Problems of Old Evidence in Scientific Theories* (University of Minnesota Press, Minneapolis, 1990); J. Earman, “Old Evidence, New Theories: Two Unresolved Problems in Bayesian Confirmation Theory,” *Pacific Philosophical Quarterly*, vol. 70, 1989, pp. 323-340; C. Howson, “The Old Evidence Problem,” *British Journal for the Philosophy of Science*, vol. 42, 1991, pp. 547-555; C.G. Wagner, “Old Evidence and New Explanation,” *Philosophy of Science*, vol. 64, 1997, pp. 677- 691; B. C. Van Fraassen, “The Problem of Old Evidence,” in D.F. Austin (ed.), *Philosophical Analysis* (Kluwer, Norwell, 1988), pp. 153-165; D Garber, “Old Evidence and Logical Omniscience in Bayesian Confirmation Theory,” in: J. Earman (ed.), *Testing Scientific Theories* (University of Minnesota Press, Minneapolis, 1983), pp. 99-132. It has also been shown that even “overwhelming evidence” may fail to convince: L. J. Gunn (et al.), “Too Good to be True: When Overwhelming Evidence Fails to Convince,” *Proceedings of the Royal Society A*, vol. 472, March 23, 2016, doi:10.1098/rspa.2015.0748.

The experiments of Kahneman and Tversky indicate that human subject responses systematically differ from the predictions of ideal mathematical theories such as Bayesian decision theory: L. Brilmayer, “Discrepancies between Human Behavior and Formal Theories of Rationality: The Incompleteness of Bayesian Probability Logic,” *Behavioral and Brain Science*, vol. 6, 1983, pp. 488-489; A. Tversky and D. Kahneman, “Belief in the Law of Small Numbers,” *Psychological Bulletin*, vol. 76, 1971, pp. 105-110; A. Tversky and D. Kahneman, “Extensional Versus Intuitive Reasoning: The Conjunction Fallacy in Probability Judgment,” *Psychological Review*, vol. 90, 1983, pp. 293-315; D. Kahneman, “Maps of Bounded Rationality: Psychology for Behavioral Economics,” *American Economic Association*, vol. 93, 2003, pp. 1449-1475; D. Kahneman and A. Tversky, “On the Reality of Cognitive Illusions,” *Psychological Review*, vol. 103, 1996, pp. 582-591.

effect.”⁴⁸³ This raises the threat of epistemological scepticism, discussed in chapter 3, only this time for the sciences. It certainly raises a very severe challenge to expert knowledge, and there are many astonishing claims made in the technical literature.

Since the publication of Ioannidis’ paper there have been other papers published also proposing that “most published research findings are false.”⁴⁸⁴ There has been deep concern in the literature about a “reproducibility crisis” in psychology and other sciences.⁴⁸⁵ For example, in an attempt to replicate results in 98 original papers in three psychology journals, one research team found only 39 of 100 replication attempts successful (with two replication attempts duplicated by separate research teams).⁴⁸⁶ While 97 percent of the original studies reported significant results, only 36 percent of the replications found significance.

Matters were worse in cancer biology research, where only six of 53 high-profile peer-reviewed papers could be replicated, the problem arising from the basic cell line animal models themselves being inadequate.⁴⁸⁷ Further, similar

⁴⁸³ A. B. Hill, “The Environment and Disease: Association or Causation?” *Proceedings of the Royal Society of Medicine*, vol. 58, 1965, pp. 295-300, cited pp. 299-300; S. Greenland, “Null Misinterpretation in Statistical Testing and Its Impact on Health Risk Assessment,” *Preventive Medicine*, vol. 53, 2011, pp. 225-228.

⁴⁸⁴ A. Tabarrok, “Why Most Published Research Findings are False,” September 2, 2005, at http://marginalrevolution.com/marginalrevolution/2005/09/why_most_publications.html; R. Moonesinghe (et al.), “Most Published Research findings are False – But a Little Replication goes a Long Way,” *PLoS Medicine*, vol. 4, no. 2, 2007, pp. 0218-0221; A. Diekmann, “Are Most Published Research Findings False?” *Journal of Economics and Statistics*, vol. 231, 2011, pp. 628-635; D. H. Freedman, *Wrong*, (Little Brown and Company, New York, 2010). Similar concerns were raised before Ioannidis by J. B. de Long and K. Lang, “Are All Economic Hypotheses False?” *Journal of Political Economy*, vol. 100, 1992, pp. 1257-1272.

⁴⁸⁵ E. Yong, “How Reliable Are Psychology Studies?” *The Atlantic*, August 27, 2015, at <http://www.theatlantic.com/science/archive/2015/08/psychology-studies-reliability-reproducibility-nosek/4024661/>; J. P. Simmons, “False Positive Psychology: Undisclosed Flexibility in Data Collection and Analysis Allows Presenting Anything as Significant,” *Psychological Science*, vol. 22, 2011, pp. 1359-1366.

⁴⁸⁶ Open Science Collaboration, “Estimating the Reproducibility of Psychological Science,” *Science*, vol. 349, 2015, pp. aac4716-1 – aac4716-8. A critique arguing that the same data in this paper support exactly the opposite conclusion, of the high reproducibility of psychological science is given by: D. T. Gilbert (et al.), “Comment on “Estimating the Reproducibility of Psychological Science”” *Science*, vol. 351, 2016, p. 1037a. The debate continues.

⁴⁸⁷ C. G. Begley and L. M. Ellis, “Drug Development: Raise Standards for Preclinical Cancer Research,” *Nature*, vol. 483, 2012, pp. 531-533.

problems have been found in neuroscience and genetics research. Button (et al.), have concluded: “the average statistical power of studies in the neuroscience is very low. The consequences of this include overestimates of effect size and low reproducibility of result.”⁴⁸⁸ The same is true of genetic research.⁴⁸⁹ In general, “the cumulative (total) prevalence of irreproducible preclinical research exceeds 50 %,” with the estimated range being from 51 to 89%.⁴⁹⁰

There is no doubt, as Button (et al.) note, that small sample sizes in research is one factor undermining the reliability of such research, but as Higginson and Munafò have argued, the institutional incentive structure of academia, the “publish or perish” mentality, especially the desire for publications in journals with a high Impact Factor (IF), leads researchers to pursue small samples, to quickly get publishable results, and maintain the continuity of careers.⁴⁹¹ They show, using an ecological model, that scientists would seek to maintain their “fitness” (academic survivability) and thus would conduct research producing novel results with small studies (to quickly publish and reduce research costs), but with only 10-40% statistical power. Hence, half of published studies across the sciences will have erroneous conclusions.

⁴⁸⁸ K. S. Button (et al.), “Power Failure: Why Small Sample Size Undermines the Reliability of Neuroscience,” *Nature Reviews/Neuroscience*, vol. 14, 2013, pp. 365-376, cited p. 365.

⁴⁸⁹ J. P. A. Ioannidis and T. A. Trikalinos, “Early Extreme Contradictory Estimates May Appear in Published Research: The Proteus Phenomenon in Molecular Genetics Research and Randomized Trials,” *Journal of Clinical Epidemiology*, vol. 58, 2005, pp. 543-549.

⁴⁹⁰ L. P. Freedman (et al.), “The Economics of Reproducibility in Preclinical Research,” *PLOS Biology*, vol. 13, 2015; e1002165; doi:10.1371/journal.pbio/1002165. See also J. Hartshorne (et al.), “Tracking Replicability as a Method of Post-Publication Open Evaluation,” *Frontiers in Computational Neuroscience*, vol. 6, 2012, pp. 1-13; J. P. A. Ioannidis, “Why Most Discovered True Associations are Inflated,” *Epidemiology*, vol. 19, 2008, pp. 640-648; J. A. C. Everett and B. D. Earp, “A Tragedy of the (Academic) Commons: Interpreting the Replication Crisis in Psychology as a Social Dilemma for Early-Career Researchers,” *Frontiers in Psychology* (2015): 6:1152; doi:10.3389/fpsyg.2015.01152.

⁴⁹¹ A. D. Higginson and M. R. Munafò, “Current Incentives for Scientists Lead to Underpowered Studies with Erroneous Conclusions,” *PLOS Biology*, vol. 14, 2016; e200995; doi:10.1371/journal.pbio.2000995; J. P. Simmons (et al.), “False-Positive Psychology: Undisclosed Flexibility in Data Collection and Analysis Allows Presenting Anything as Significant,” *Psychological Science*, vol. 22, 2011, pp. 1359-1366.

Richard Horton, writing in *The Lancet*, lamented the precarious state of scientific research:

The case against science is straightforward; much of the scientific literature, perhaps half, may be simply untrue. Afflicted by studies with small sample sizes, tiny effects, invalid exploratory analyses, and flagrant conflicts of interest, together with an obsession for pursuing fashionable trends of dubious importance, science has taken a turn towards darkness.⁴⁹²

Horton observes that scientists no longer have an incentive to be “right” in the disinterested pursuit of truth, as academic incentives only reward those who are innovative and productive, however wrong. Ironically, as shown by the “Matthew effect,”⁴⁹³ the academic establishment may be, perhaps, implicitly aware of this problem, as in one experiment, papers that had previously been published were resubmitted to journals, the papers having different titles. The majority were rejected, not because prior publication was detected, but because of the poor quality of the papers. Yet, the errors were not originally detected.⁴⁹⁴

Worse still, reviewers were found in one study, to have failed to detect all errors deliberately inserted into a paper for review – and the reviewers were peer-review experts in that field.⁴⁹⁵ R. Smith, commenting in the *Journal of the Royal Society of Medicine*, concluded that scientific peer review – a review by experts – is a process merely based on “belief” (faith), not strict rationality:

So peer review is a flawed process, full of easily identified defects with little evidence that it works. Nevertheless, it is likely to remain central to science and journals because there is no obvious alternative, and scientists and editors have a

⁴⁹² R. Horton, “Offline: What is Medicine’s 5 Sigma?” *The Lancet*, vol. 385, 2015, p. 1380.

⁴⁹³ R. K. Merton, “The Matthew Effect in Science,” *Science*, vol. 159, 1968, pp. 56-63.

⁴⁹⁴ D. Peters and S. Ceci, “Peer-Review Practices of Psychological Journals: The Fate of Submitted Articles, Submitted Again,” *Behavioral and Brain Sciences*, vol. 5, 1982, pp. 187-255.

⁴⁹⁵ F. Godlee (et al.), “Effect on the Quality of Peer Review of Blinding Reviewers and Asking Them to Sign Their Reports: A Randomized Control Trial,” *JAMA*, vol. 280, 1998, pp. 237-240; T. Jefferson (et al.), “Effects of Editorial Peer Review: A Systematic Review,” *JAMA*, vol. 287, 2002, pp. 2784-2786.

continuing belief in peer review. How odd that science should be rooted in belief.⁴⁹⁶

Along with this, scientific experts are biased in many ways, including selectively reporting data,⁴⁹⁷ and even outright fraud and the use of “false” data is more frequent than is often thought by mainstream scientists.⁴⁹⁸ Therefore, expert opinion is highly fallible and often erroneous.

Refuting the Argument from Cognitive Blindspots and Biases

We turn now to a consideration of the argument from cognitive blindspots and biases, to examine whether or not, this argument does in fact establish the radical conclusions often claimed for it by supporters of paternalism. The literature here is vast, but for the purposes of the present discussion Conly gives a relevant summary:

We are ... unduly influenced by the particular description used in the presentation of our options (more likely to choose a medical procedure with a 20 percent chance of success that one described as having an 80 percent chance of failure); unduly prone to think that we ourselves are less likely than others to suffer misfortunes, even of something entirely random, like lightening; prone to miscalculate the value of a thing depending upon whether we do or don't yet own it; prone to assuming things that have one superficial characteristic in common also have similarities throughout (commonly known as stereotyping). Smoking, not surprisingly, seems to involve a number of errors in judgment: people use time discounting to undervalue how much the future matters; anchor the use of an irrelevant starting point to make comparisons, so that they judge that since the first ten cigarettes haven't hurt them then the next ten years' worth won't either; or

⁴⁹⁶ R. Smith, “Peer Review: A Flawed Process at the Heart of Science and Journals,” *Journal of the Royal Society of Medicine*, vol. 99, 2006, pp. 178-182, cited p. 182.

⁴⁹⁷ J. P. A. Ioannidis (et al.), “Publication and Other Reporting Biases in Cognitive Sciences: Detection, Prevalence, and Prevention,” *Trends in Cognitive Sciences*, vol. 18, no. 5, 2014, pp. 235-241.

⁴⁹⁸ G. Vogel, “Scientific Misconduct: Psychologist Accused of Fraud on ‘Astonishing Scale,’” *Science*, vol. 334, 2011, p. 579; B. Martin, “Scientific Fraud and the Power Structure of Science,” *Prometheus*, vol. 10, 1992, pp. 83-98.

employ wishful thinking, the tendency to reinterpret judgments to make what we are doing look ok, and to conclude that since they smoke, smoking can't really be harmful.⁴⁹⁹

People tend to conform, and follow others in many behaviours, as indicated by the Asch social conformity experiments.⁵⁰⁰ They often prefer not to make decisions, procrastinate and frequently delegate decision-making authority to others⁵⁰¹ and if they do tasks, underestimate the time it will take to complete them.⁵⁰² Even the most intelligent and best informed of people exaggerate their abilities and believe that they are more competent than they actually are.⁵⁰³ There are also base-rate neglect errors (errors in estimating the relative frequency of an event in a population);⁵⁰⁴ framing errors (the presentation of choices affects

⁴⁹⁹ Conly, cited note 383, pp. 21-22; J. A. Blumenthal, "A Psychological Defense of Paternalism," at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.388.2304&rep=rep1&type=pdf>; D. Ariely, *Predictably Irrational: The Hidden Forces that Shape Our Decisions*, (HarperCollins, New York, 2008); J. D. Trout, "Paternalism and Cognitive Bias," *Law and Philosophy*, vol. 24, 2005, pp. 393-434; J. D. Trout, *Why Empathy Matters: The Science and Psychology of Better Judgment*, (Penguin, New York, 2009), pp. 86-122; D. Kahneman, *Thinking Fast and Slow*, (Farrar, Straus and Giroux, New York, 2013); J.-P. Caverni (ed.), *Cognitive Biases*, (Elsevier, Oxford, 1990); E. Shafir (ed.), *Preference, Belief, and Similarity: Selected Writings of Amos Tversky*, (Bradford Book, MIT Press, Cambridge, 2004).

⁵⁰⁰ S. Asch, "Opinions and Social Pressure," *Scientific American*, vol. 193, 1955, p. 35; M. Sherif, "An Experimental Approach to the Study of Attitudes," *Sociometry*, vol. 1, 1937, pp. 90-98; R. S. Crutchfield, "Conformity and Character," *American Psychologist*, vol. 10, 1955, pp. 191-198; R. Bond and P. B. Smith, "Culture and Conformity: A Meta-Analysis of Studies Using Asch's (1952b, 1956) Line Judgment Task," *Psychological Bulletin*, vol. 119, 1996, pp. 111-137.

⁵⁰¹ J. Beattie (et al.), "Determinants of Decision Attitude," *Journal of Behavioral Decision Making*, vol. 7, 1994, pp. 129-144; C. R. Sunstein and E. Ullmann-Margalit, "Second-Order Decisions," *Ethics*, vol. 110, 1999, pp. 5-31; J. A. Blumenthal, "Emotional Paternalism," *Florida State University Law Review*, vol. 35, 2007, pp. 1-72; D. Ariely and K. Wertenbroch, "Procrastination, Deadlines, and Performance: Self-control by Precommitment," *Psychological Science*, vol. 13, 2002, pp. 219-224.

⁵⁰² D. Kahneman and A. Tversky, "Intuitive Prediction Biases and Corrective Procedures," *TIMS Studies in Management Science*, vol. 12, 1979, pp. 313-327.

⁵⁰³ T. Gilovich, *How We Know What Isn't So*, (Free Press, New York, 1991), p. 114.

⁵⁰⁴ M. Henrion and B. Fischhoff, "Assessing Uncertainty in Physical Constants," *American Journal of Physics*, vol. 54, 1986, pp. 791-798.

people's reactions),⁵⁰⁵ preference reversals and the prominence effect,⁵⁰⁶ omission biases,⁵⁰⁷ the status quo bias (favouring an existing course of action over alternatives),⁵⁰⁸ availability bias,⁵⁰⁹ hindsight bias (finding past events more predictable than they are),⁵¹⁰ ordering effects,⁵¹¹ anchoring and adjustment (estimations made by people, even experts such as judges, can be influenced by seemingly irrelevant factors).⁵¹² In general, cognitive biases and blindspots are the result of noisy information processing and cognitive limits affecting even the sophisticated.⁵¹³ In particular, human beings appear to have poor probability reasoning ability, and there are a number of probability puzzles where even mathematicians, may at first make errors, such as the Monty Hall problem.⁵¹⁴ It has been argued by Cohen that some of these results may be due to the limitations of Bayesian decision theory, and that subjects' responses make more sense viewed

⁵⁰⁵ A. J. Rothman and P. Salovey, "Shaping Perceptions to Motivate Healthy Behavior: The Role of Message Framing," *Psychological Bulletin*, vol. 121, 1997, pp. 3-19.

⁵⁰⁶ Gilovich, cited note 503, p. 97.

⁵⁰⁷ As above, p. 98.

⁵⁰⁸ I. Ritov and J. Barron, "Status-Quo and Omission Bias," *Journal of Risk and Uncertainty*, vol. 5, 1992, pp. 49-61.

⁵⁰⁹ A. Tversky and D. Kahneman, "Judgment Under Uncertainty: Heuristics and Biases," *Science*, vol. 185, 1974, pp. 1124-1131.

⁵¹⁰ B. Fischhoff and R. Beyth, "'I Knew It Would Happen:' Remembered Probabilities of Once-Future Things," *Organizational Behavior and Human Decision Processes*, vol. 31, 1975, pp. 1-16.

⁵¹¹ E. Schwitzgebel and F. Cushman, "Expertise in Moral Reasoning? Order Effects on Moral Judgment in Professional Philosophers and Non-Philosophers," *Mind and Language*, vol. 27, 2012, pp. 135-153.

⁵¹² A. J. Wistrich (et al.), "Can Judges Ignore Inadmissible Information? The Difficulty of Deliberately Disregarding," *University of Pennsylvania Law Review*, vol. 153, 2005, pp. 1251-1345.

⁵¹³ M. Hilbert, "Toward a Synthesis of Cognitive Biases: How Noisy Information Processing Can Bias Human Decision Making," *Psychological Bulletin*, vol. 138, 2012, pp. 211-237; R. F. West (et al.), "Cognitive Sophistication Does Not Attenuate the Bias Blind Spot," *Journal of Personality and Social Psychology*, vol. 103, 2012, pp. 506-519.

⁵¹⁴ M. Bar-Hillel and R. Falk, "Some Teasers Concerning Conditional Probabilities," *Cognition*, vol. 11, 1982, pp. 109-122; M. Bishop and J. D. Trout, *Epistemology and the Psychology of Human Judgment*, (Oxford University Press, New York, 2005); J. Rosenhouse, *The Monty Hall Problem*, (Oxford University press, oxford, 2009).

in the light of his own non-Pascalian probability theory, so human irrationality cannot be experimentally demonstrated.⁵¹⁵ That is an interesting question, well deserving a book in its own right, but human fallibility of reasoning is not restricted to probability, but extends to deductive reasoning as well, as I have indicated by use of the term “cognitive blindspots.”⁵¹⁶

The argument from cognitive biases and blindspots though, does not in itself establish human irrationality, or even a level of fallibility sufficient to justify paternalistic interventions. It would have to be shown that at least a *majority* of people suffer from a *majority* of these errors, but what has been established is only that representative samples of various populations, commit these errors and are subject to these biases. To draw a general epistemological conclusion from this, it seems to be merely a reworking of the epistemological sceptic’s argument from error, which asserts that because some subjects are mistaken or biased some of the time, on any occasion we could also be mistaken, so in general, the human race is subject to that error or bias. The argument is of the form, to use the case of knowledge, that if a person knows proposition P, then it is not the case that there is the possibility of error about P. But, if there is a possibility of error about P, then it is not the case that the subject knows that P. The problem with this reasoning, as Griffin and Harton have observed, is that a modal fallacy has been committed, as the sceptic, or in our case, the paternalist/behavioural psychologist, “has used the

⁵¹⁵ L. J. Cohen, “Can Human Irrationality Be Experimentally Demonstrated?” *Behavioral and Brain Sciences*, vol. 6, 1983, pp. 487-533. Cohen argued against the Kahneman/Tversky position of the alleged systematic violation of theories of rationality, maintaining that the position is self-refuting as “ordinary human reasoning ... cannot be held to be faultily programmed: it sets its own standards,” and these standards form part of a normative theory which is “itself acceptable ... only so far as it accords, at crucial points, with the evidence of untutored intuition.” (p. 317) Thus, if all of the logical and probabilistic inferences of most people were based on false intuitions, this would undermine the intuitions used to justify any theory at all. This argument though, as Cherniak has pointed out, is more directed against showing *complete* human irrationality, which is not Kahneman and Tversky’s position: C. Cherniak, “Minimal Rationality,” *Mind*, vol. 90, 1981, pp. 161-183; C. Cherniak, “The Epistemological Status of Lay Intuition,” *Behavioral and Brain Sciences*, vol. 6, 1983, pp. 489-490; H. Mercier and D. Sperber, “Why Do Humans Reason? Arguments for an Argumentative Theory,” *Behavioral and Brain Sciences*, vol. 34, 2011, pp. 57-111.

⁵¹⁶ R. Sorensen, *Blindspots*, (Clarendon Press, Oxford, 1988).

premise that it is *possible* that we are mistaken about any proposition which we claim to know, in an argument which requires as premise the claim that we *actually* are mistaken about any proposition which we claim to know.”⁵¹⁷

Moreover, while the list of cognitive biases should prove to be disturbing to traditional analytic philosophers who may still hold to the ideal that humans are essentially *rational* beings, it does not follow that humans are essentially *irrational* beings either, or that they are primarily irrational and thus in need of paternalistic control. The problem with that argument is that it faces the inverse problem which the rationalist faces from cognitive biases and blindspots, namely that there is strong evidence that humans often do reason correctly inductively and deductively, and not *all* of the people *all* of the time, are deceived by various cognitive blindspots, nor do they all, or even a majority, fall victims to *all* cognitive biases. The problem with the general paternalist argument is that it lumps together in one mix a whole bundle of cognitive biases and then concludes that there are strict limitations to the rationality of human decision-making in general. But this is a fallacious form of some-to-all reasoning in itself, and demonstrates that the core argument for coercive paternalism fails. Ironically, the coercive paternalist argument from cognitive biases, is itself subject to a cognitive bias.

An evolutionary defence has also been given for the general reliability of human reasoning for beliefs where it counts in matters of survival in the physical world, because a successful interaction is necessary for humans to pass on genes. As Quine put it: “Creatures inveterately wrong in their inductions have a pathetic but praiseworthy tendency to die before reproducing their kind.”⁵¹⁸ Various false

⁵¹⁷ N. Griffin and M. Harton, “Sceptical Arguments, *Philosophical Quarterly*, vol. 31, 1981, pp. 17-30.

⁵¹⁸ W. V. O. Quine, *Ontological Relativity and Other Essays*, (Columbia University Press, New York, 1969), p. 129. See also J. A. Fodor, *Representations: Philosophical Essays on the Foundations of Cognitive Science*, (MIT Press, Cambridge, MA, 1981); S. Stewart-Williams, “Innate ideas as a Naturalistic Source of Metaphysical Knowledge,” *Biology and Philosophy*, vol. 20, 2005, pp. 791-814; S. J. Boulter, *The Rediscovery of Common Sense Philosophy*, (Palgrave Macmillan, Basingstoke, 2007).

beliefs, such as Creationism, do not directly impact upon fitness because they do not necessary impact upon survival in the world, so there is a limitation to evolutionary justifications of human rationality.⁵¹⁹ Nevertheless, with respect to much ordinary knowledge claims about the world, humans arguably have true, or approximately true beliefs, or they would be harmed by literally bumping into the hazards of reality. Therefore, just as the existence of wide-ranging systematic cognitive biases shows that the idea of humans as rational animals, held by philosophers from Aristotle to modern Anglo-American analytic philosophy, is false, the other extreme, which sees humans as irrational animals, is also an exaggeration, and false. Hence, the argument from cognitive biases fails.

Conclusion

This chapter has examined Thaler and Sunstein's soft paternalist notion of the nudge, and Conly's strong or coercive paternalist position. Nudges are needed where incentives, financial and other, fail to change human behaviour. Nudges aim to preserve autonomy, acting to influence the choice architecture, but still allowing people to make unhealthy choices if they still wish to. It is a nudge to put the trans-fat containing food on a lower shelf, relying upon other human biases to permit healthy food, placed at eye-level, to be chosen. The position of coercive paternalism goes further, seeing nudges as limited, failing to change human behaviour in many important areas. The coercive paternalist simply wishes to ban the problematic items that are the object of the problematic behaviour, so that trans-fats in foods, and cigarettes are simply made illegal.

⁵¹⁹ J. de Smedt, "The Role of Intuitive Ontologies in Scientific Understanding – The Case of Human Evolution," *Biology and Philosophy*, vol. 22, 2007, pp. 351-368; C. L. Stephens, "When it is Selectively Advantageous to have True Beliefs? Sandwiching the Better Safe than Sorry Argument," *Philosophical Studies*, vol. 105, 2001, pp. 161-189; J. Clarke-Doane, "Morality and Mathematics: The Evolutionary Challenge," *Ethics*, vol. 122, 2012, pp. 313-340.

Both positions are highly controversial and have been criticised mainly on liberal grounds, that the positions do not respect human autonomy, and thus degrade us. Against this, it has been argued that these objections fail for the basic reasons outlined in chapter 3; that is, that the fundamental assumption that autonomy is a foundational value that trumps all others, cannot hold. This is not to say that autonomy should be rejected, or regarded as unimportant, but autonomy concerns are but one concern among many.

Both the nudge position and coercive paternalism are supported by the argument from cognitive biases and blindspots. There is a large body of psychological research that indicates that humans, even the most intelligent of us, are subject to many biases, and suffer from numerous blindspots in reasoning. Much of the concern has been with blindspots with probabilistic reasoning, where various probability puzzles have led to even mathematicians making elementary errors. But, human limitations in reasoning also extends to deductive reasoning, and chapter 3 has illustrated some of the controversies in deductive logic which may be at the base of this problem and more will be said about this in the technical appendix to this work. The extent of human rationality and irrationality, and what actually constitutes both of these notions is, as detailed in chapter 3, an outstanding philosophical question.

It should be noted that the position taken here, is that humans are subject to cognitive blindspots, but even given these limitation are still capable of sufficient rationality not to be subjected to strong forms of paternalism. This position of limitationism, is not inconsistent with the epistemological position taken in this work, especially in the technical appendix, which sees the problematic nature of most human knowledge. Those defects arise not because people are thinking irrationally, but rather because they are being too rational, or hyper-rational, pushing reason to limits beyond which it cannot go. The problem is not just with the workmen/women, but with their tools. More will be said about this epistemological dilemma in the technical appendix.

Nevertheless, it has been argued that the paternalist literature is wrong to infer that forms of paternalism necessarily follow from the mere existence of cognitive biases and blindspots. The argument in question seems to follow the pattern of reasoning involved in one of the fallacious arguments for epistemological scepticism, the argument from error, where the existence and possibility of error is inferred to preclude the possibility of knowledge. The argument commits a fallacious some-to-all inference, as well as a modal fallacy, arguing from possibility to actuality. Ironically, the argument from cognitive blindspots and biases, is itself based on a cognitive blindspot.

Further, governments are not free from cognitive blindspots and biases, and often may make worse decisions than individuals. These considerations mean that there will be clear limits upon both nudges and coercive paternalist policies, because such policies may have unintended consequences which make matters worse for people.

Experts, including scientists, also face the problem of cognitive blindspots, and these are the socio-technicians who will presumably engineer coercive paternalist programs. Knowledge, even in the exact sciences of mathematics, logic and physics, is highly fallible, and faces foundational problems, as detailed in the technical appendix. The Social Sciences face even more severe foundational problems, and there are arguments in the literature indicating that these sciences have less knowledge than generally purported, and may have more falsehoods than truths. Consequently, ordinary citizens need to have a healthy scepticism about expert knowledge, not rejecting it for even more problematic superstitions, but instead, maintaining an open mind, seeing all knowledge claims as contingent, and in principle revisable.

It is concluded that incentives should be supported by both nudges and, if all else fails *suitable* coercive paternalist policies. There is no general principle for deciding prior to empirical inquiry and extensive public debate, which of these policies will prove to be socially acceptable. Common sense suggests that in situations where incentives fail, or are limited, perhaps not yielding long-term

changes in behaviour, nudges should be carefully examined, and tried on an experimental basis. If there are positive results, without overriding negative problems, then more comprehensive programs can be put in place.

If nudges fail, and the social cost of the behaviour is high, such as the health costs of smoking, following successful coercive paternalist policies such as trans-fat bans, the problematic item may be banned, and thus made illegal. Conly's four criteria will need to be met, and a fifth one, that the policy has wide social acceptance. There should not be a repeat of the case of Prohibition in the US in the 1920s. Community support is always needed to make laws work. This, as well, will place a limitation upon coercive paternalist policies and help address the fear that such policies may get out of control. The public must want the ban, and hopefully widely and actively support it. This is especially important in an age of widespread public distrust of the political process, as unfortunately is occurring today.⁵²⁰

⁵²⁰ J. Allen, *Democracy in Decline: Steps in the Wrong Direction*, (McGill-Queen's University Press, Montreal, 2014).

Conclusion

This work has undertaken a defence of the use of incentives, particularly financial incentives in health promotion programs, especially as an aid to patient compliance. Chapter 1 gave an overview of the evidence of the effectiveness of incentives in such schemes, and even though there are methodological limitations to many studies, the balance of evidence is that incentives are effective in short-term interventions. Evidence of long-term interventions are lacking, and it may well be for a variety of theoretical reasons, reviewed below, that there are clear limitations to incentives use in this respect.

The remainder of the work reviewed both legal and ethical aspects of incentives use. A review of the legal arguments revealed no major issues in using incentives, either at common law, or statutory.

The ethics of financial incentives is controversial with numerous papers expressing essentially the same arguments, that incentives may undermine intrinsic motivation, are inconsistent with autonomy and are coercive and exploitative. These arguments have been reviewed and refuted. Although certain incentive programs may fall prey to such objections, in general, carefully implemented schemes can be ethical and enhance patient autonomy.

Finally, an examination was made of coercive paternalistic approaches, which openly advocate implementing health measures, even if in conflict with the principle of autonomy. There are a limited number of areas where such measures can be justified, but it has been argued that overall, coercive paternalism is an undesirable path for health policy to take, and the principle of autonomy should be upheld unless the utilitarian reasons for not doing so are overwhelmingly great. The arguments given in support of coercive paternalism, based on cognitive errors and limitations of human reason, were criticised from the broad epistemological considerations given in chapter 3.

It is concluded that in general, subject to the limitations noted in this work, incentives for promoting healthy behaviour and patient compliance, are justified, and one measure, among others, to be used in aiding health promotion in the community.

Appendix

The Limits of Logic and Reason

One of the main epistemological problems weaving through this work is the problem of ultimate justification of not only philosophical principles, but scientific ones as well. In chapter 3 this problem was discussed with examples from philosophy, ethics and logic. Here I will outline in more detail some of the epistemological difficulties arising in the exact sciences, to illustrate the thesis of the epistemological crisis of knowledge. This problem raises extreme doubts about “expert” knowledge, and our alleged ability to manipulate social entities in some alleged scientifically rigorous fashion. Instead, as argued earlier in this work, we are left only with muddling through strategies in most of human affairs, including relatively mundane epistemic matters such as incentives for patient compliance.

The problem of the limits of science and reason has been recognised by a number of philosophers and scientists. Philosopher William H. Davis has said:

...How would we feel if science came up against experimental and intellectual brick walls, so that after centuries of trying, man finally concluded that the world was constructed – if upon intelligible principles at all – upon principles so bizarre as to be perfectly undiscoverable or unfathomable by the human mind? What if men became totally convinced that the world simply could not be understood, that the world is and always must remain an intellectual surd? Science might then continue at it pertains to technology, but not as it pertains to theory. What if all hope of theoretical understanding were permanently lost⁵²¹

The philosopher/scientist Charles Sanders Pierce (1839-1914) also said:

⁵²¹ W. H. Davies, “The Meaning of Life,” *Metaphilosophy*, vol. 18, 1987, pp. 288-305, cited p. 293.

The very theory or reasoning, were we resolutely to attack it without any dread of mathematics, would furnish us conclusive reasons for limiting the applicability of reasoning to unimportant matter.⁵²²

What David Hume (1711-1776) said about philosophy, arguably also applies to the foundations of many of our sciences:

Principles taken upon trust, consequences lamely deduced from them, want of coherence in the parts, and of evidence in the whole, these are everywhere to be met with in the systems of the most eminent philosophers, and seems to have drawn disgrace upon philosophy itself... [E]ven the rabble without doors may judge from the noise and clamour, which they hear, that all goes not well within. There is nothing which is not the subject of debate, and in which men of learning are not of contrary opinions. The most trivial question escapes not our controversy, and in the most momentous we are not able to give any certain decisions.⁵²³

I have argued elsewhere that Hume's remarks are true of contemporary philosophy⁵²⁴ and also, arguably, of many social sciences such as sociology and psychology, which lack a single unifying theoretical paradigm.⁵²⁵ The same issues though also arise for the exact sciences. The arguments to follow develop many of the points only briefly outlined in chapter 3, showing the epistemological limits of knowledge and rational decision-making.

⁵²² C. Hartshorne and P. Weiss (eds.), *Collected Papers of Charles Sanders Pierce*, (Belknap Press of Harvard University Press, Cambridge, MA, 1960), p. 1. 6.

⁵²³ D. Hume, *A Treatise of Human Nature*, edited by L.A. Selby-Bigg, (Clarendon Press, Oxford, 1960), cited pp. xvii-xviii.

⁵²⁴ See J. W. Smith, *The Progress and Rationality of Philosophy as a Cognitive Enterprise: An Essay on Metaphilosophy*, (Avebury, Aldershot, 1988).

⁵²⁵ See J. W. Smith, *Reductionism and Cultural Being: A Philosophical Critique of Sociobiological Reductionism and Physicalist Scientific Unification*, (Martinus Nijhoff, The Hague, 1984); J. W. Smith (et.al.), *The Bankruptcy of Economics: Ecology, Economics and the Sustainability of the Earth*, (Macmillan, London, 1999).

Intractable Problems in the Exact Sciences

It is not too difficult to cite examples of seemingly intractable foundational problems.⁵²⁶ These occur right across the entire spectrum of science.⁵²⁷ In this chapter I will discuss mathematics, logic and physics so here are some introductory examples. There is an unsolved problem in the philosophy of mathematics about the appropriate philosophy of mathematics and the nature of mathematical entities⁵²⁸ with a recent survey concluding that the field has reached a philosophical impasse:⁵²⁹ none of the various schools of thought adequately deal with problems such as the relationship between the abstract entities of mathematics, and the success of mathematics in modeling reality.⁵³⁰ There are long standing problems about how one should understand the relationship between mathematical truth and

⁵²⁶ There are many examples of difficult-to-solve empirical problems in science that have been unsolved for thousands of years. Consider the moon illusion: the moon looks bigger when it is near the horizon than when it is high in the sky. This is a psychological phenomenon: it is known that the moon illusion is not an astronomical phenomena or due to a physical effect such as atmospheric refraction. There is no agreement among psychologists as to the cause of this illusion: R. N. Haber and C. A. Levin, "The Lunacy of Moon Watching: Some Preconditions on Explanations of the Moon Illusion," in M. Hershenson (ed.), *The Moon Illusion*, (Lawrence Erlbaum, Hillsdale NJ, 1989), pp. 229-318, F. Egan, "The Moon Illusion," *Philosophy and Science*, vol. 65, 1998, pp. 604-623.

⁵²⁷ See generally, M-W. Ho, *The Rainbow and the Worm: The Physics of Organisms*, 2nd edition, (World Scientific, New Jersey, 2003); A. Flew (with R. A. Varghese), *There is a God*, (HarperOne, New York, 2007); D. Berlinski, *The Devil's Delusion: Atheism and Its Scientific Pretensions*, (Crown Forum, New York, 2008).

⁵²⁸ See for example P. Maddy, *Naturalism and Mathematics*, (Oxford University Press, New York, 1997); S. Shapiro, *Philosophy of Mathematics: Structure and Ontology*, (Oxford University Press, New York, 1997); J. Tappenden, "Recent Work in Philosophy of Mathematics," *Journal of Philosophy*, vol. 98, 2001, pp.488-497; J. Burgess, "Mathematics and Bleak House," *Philosophia Mathematica*, vol. 12, no.1, 2004, pp. 18-36.

⁵²⁹ M. Tiles, "Philosophy of Mathematics," in N. Bunnin and E. P. Tsui-James (eds.), *The Blackwell Companion to Philosophy*, (Blackwell, Oxford, 2003), pp. 345-374, cited p. 345. J. R. Lucas, *The Conceptual Roots of Mathematics*, (Routledge, London and New York, 2000) observes: "Philosophers may be unable to understand how we can know mathematical truths, but they have a bad track record at being able to understand anything" (cited p. 19).

⁵³⁰ D. A. Gasking, "Mathematics and the World," *Australasian Journal of Philosophy*, vol. 18, 1940, pp. 97-116; H. N. Castaneda, "Arithmetic and Reality," *Australian Journal of Philosophy*, vol. 37, 1959, pp. 91-107; H. Hin-Chung, "Mathematics and Reality," *Australasian Journal of Philosophy*, vol. 51, 1973, pp. 144-152; J. Franklin, "Mathematical Necessity and Reality," *Australasian Journal of Philosophy*, vol. 67, 1989, pp. 286-294.

proof and whether entities such as infinite sets “exist” and what this actually “means.”⁵³¹ Questions about the infinite become particularly perplexing when considering the nature of space, time and motion and Zeno of Elea (born c. 490-30 BCE) presented a series of paradoxes which seemed to show that motion (and plurality) was impossible.⁵³² Versions of these paradoxes, stated in sophisticated forms informed by modern mathematics, logic and physics, are still actively discussed in the technical literature.⁵³³

⁵³¹Some working mathematicians take a particularly sceptical view about the state of modern mathematics. An interesting example is my fellow Australian N. J. Wildberger of the School of Mathematics, The University of New South Wales, Sydney. In his paper “Set Theory: Should you Believe?” at <http://web.maths.unsw.edu.au/~norman>, he says, provocatively: “Modern mathematics *doesn't make complete sense*. ...Using flawed and ambiguous concepts, hiding confusions and circular reasoning, pulling theorems out of thin air to be justified ‘later’ (i.e. never) and relying on appeals to authority.” Wildberger sees one major problem being the “uncritical embrace” of set theory, especially the idea that there exists “infinite sets”, for it is by no means clear in his opinion that infinite sets exist. (p. 5) He says: “ If you have an elaborate theory of ‘hierarchies upon hierarchies of infinite sets’, in which you cannot even in principle decide whether there is anything between the first and second ‘infinity’ on your list, *then it's* time to admit that you are no longer doing mathematics.” (p. 9). Modern mathematics has become, he believes a “religion,” with its creed, set theory, and its priesthood, the logicians. Wildberger is attempting to reconstruct the foundations of mathematics, without set theory: N. J. Wildberger, “Numbers, Infinities and Infinitesimals,” at <http://web.maths.unsw.edu.au/~norman/>; *Divine Proportions: Rational Trigonometry to Universal Geometry*, (Wild Egg, Sydney, 2005). See also J. Fang, *The Illusory Infinite: A Theology of Mathematics*, (Paideia, Memphis, 1976).

⁵³² For an outline of Zeno’s paradoxes, see: J. Benardete, *Infinity*, (Clarendon Press, Oxford, 1964); W. C. Salmon (ed.), *Zeno’s Paradoxes*, (Bobbs-Merrill, New York, 1970).

⁵³³A small sample of the technical literature debating and refining Zeno’s paradoxes (and related issues) includes: B. Misra and E. C. G. Sudarshan, “The Zeno’s Paradox in Quantum Theory,” *Journal of Mathematical Physics*, vol. 18, no. 4, 1977, pp. 756-763; C. Butler, “Motion and Objective Contradictions,” *American Philosophical Quarterly*, vol. 18, 1981, pp. 131-139; J. P. van Bendegem, “Zeno’s Paradoxes and the Tile Argument,” *Philosophy of Science*, vol. 54, 1987, pp. 295-302; P. O. Johnson, “Wholes, Parts and Infinite Collections,” *Philosophy*, vol. 67, 1992, pp. 367-379; J. P. van Bendegem, “How Infinities Cause Problems in Classical Physics Theories,” *Philosophia*, vol. 50, 1992, pp. 33-54; V. Allis and T. Koetsier, “On Some Paradoxes of the Infinite,” *British Journal for the Philosophy of Science*, vol. 42, 1991, pp. 187-194; W. I. McLaughlin and S.L. Miller, “An Epistemological Use of Nonstandard Analysis to Answer Zeno’s Objections Against Motion,” *Synthese*, vol. 92, pp. 371-384; R. Godfrey, “Paradoxes and Infinite Numbers,” *Philosophy*, vol. 68, 1993; pp. 541-545; J. P. van Bendegem, “Strict Finitism as a Viable Alternative in the Foundations of Mathematics,” *Logique et Analyse*, vol. 37, 1994, pp. 23-40; P. O. Johnson, “More About Infinite Numbers,” *Philosophy*, vol. 69, 1994; pp. 369-370; M. Zangari, “Zeno, Zero and Indeterminate Forms: Instants in the Logic of Motion,” *Australasian Journal of Philosophy*, vol. 72, 1994, pp. 187-204; J.P. van Bendegem, “Ross’ Paradox is an Impossible Super-Task,” *British Journal for the Philosophy of Science*, vol. 45, 1994, pp. 743-748; P. Forrest, “Is Space-Time Discrete or Continuous? An Empirical Question,” *Synthese*, vol. 103, 1995, pp. 327-354; V. Allis and T. Koetsier, “On Some Paradoxes of the Infinite II,” *British Journal for the Philosophy of Science*, vol. 46, 1995, pp. 235-247; A. Papa-Grimaldi, “Why

There are of course many other unsolved, controversial problems in the philosophy of mathematics and science that we can cite in passing such as the problem of presenting a “universal concept of probability” that can be justified.⁵³⁴ A survey of the literature would indicate to a reviewer with no axe to grind, that this issue, like many others, has the professional communities perplexed.

There are numerous unsolved foundational problems in the philosophy of physics that could in principle justify an epistemological sceptic maintaining that humanity’s star physical science faces conceptual incoherence in its core foundations, notwithstanding fundamental problems of the explication of central concepts, such as “time,” and “space.”⁵³⁵ These problems are complex and will be discussed after the following discussion of logic and mathematics.

Mathematical Solutions of Zeno’s Paradoxes Miss the Point: Zeno’s One and Many Relation and Parmenides’ Prohibition,” *Review of Metaphysics*, vol. 50, 1996, pp. 299-314; J. S. Alper and M. Bridger, “Mathematics, Models and Zeno’s Paradoxes,” *Synthese*, vol. 110, 1997, pp. 143-166; J. P. van Bendegem, “Why the Largest Number Imaginable is Still a Finite Number,” *Logique et Analyse*, vol. 42, 1999, pp. 107-126; G. Priest, “On a Version of One of Zeno’s Paradoxes,” *Analysis*, vol. 59, 1999, pp. 1-2; S. Yablo, “A Reply to New Zeno,” *Analysis*, vol. 60, 2000, pp. 148-151; J. P. Laraudogoitia, “Priest on the Paradox of the Gods,” *Analysis*, vol. 60, 2000, pp. 152-155; L. Angel, “A Physical Model of Zeno’s Dichotomy,” *British Journal for the Philosophy of Science*, vol. 52, 2001, pp. 347-358; T. Glazebrook, “Zeno Against Mathematical Physics,” *Journal of the History of Ideas*, vol. 62, 2001, pp. 193- 210; L. Angel, “Zeno’s Arrow, Newton’s Mechanics, and Bell’s Inequalities,” *British Journal for the Philosophy of Science*, vol. 53, 2002, pp. 161-182; K. S. Friedman, “A Small Infinite Puzzle,” *Analysis*, vol. 64, 2002, pp. 344-345; R. Black, “Solution of a Small Infinite Puzzle,” *Analysis*, vol. 64, 2002, pp. 345-346; M. C. Cooke, “Infinite Sequences: Finitist Consequences,” *British Journal for the Philosophy of Science*, vol. 54, 2003, pp. 591-599; N. Shackel, “The Form of the Benardete Dichotomy,” *British Journal for the Philosophy of Science*, vol. 56, 2005, pp. 397-417; C. Mortensen, “Zeno’s Paradoxes,” in E. Close (et.al. eds.), *Greek Research in Australia*, (Flinders University Department of Languages, Modern Greek, Adelaide, 2007), pp. 11-18; D. Atkinson, “A Relativistic Zeno Effect,” *Synthese*, vol. 160, 2008, pp. 5-12.

⁵³⁴ As above.

⁵³⁵ There is, for example in the field of the metaphysics of physics (that is, the field of research examining questions concerning the nature of existence of the entities and phenomena that occur in physics), numerous open-ended questions. For example, what is a force in itself? One cannot discover a force before discovering its effects, so that no “topic neutral” analysis of forces seems available. See K. Pearson, *The Grammar of Science*, (J.M. Dent and Sons Ltd., London, 1951); B. Ellis, “The Existence of Forces,” *Studies in the History of Philosophy and Science*, vol.7, 1976, pp. 171-185; I. E. Hunt and W. A. Suchting, “Force and Natural Motion,” *British Journal for the Philosophy of Science*, vol. 36, 1969, pp. 223-251. The nature of energy and its relationship to mass remains as well a matter of philosophical debate. See M. Lange, “The Most Famous Equation,” *Journal of Philosophy*, vol. 98, 2001, pp. 219-238; F. Flores, “Interpretations of Einstein’s Equation $E=mc^2$,” *International Studies in the Philosophy of Science*, vol. 19, no. 3, 2005, pp. 245-260; W. Krajewski, “On the Interpretation of the Equation $E=mc^2$: Reply to Flores,” *International Studies in the Philosophy of Science*, vol. 20, no. 2,

However, before moving to a discussion of the foundations of logic (to be followed in another section by a discussion of the foundations of physics), let us mention one long-standing philosophical problem, which seemingly challenges the rationality of science: the problem of induction. The problem in one form was found in the weaponry of sceptics of the ancient world, such as Sextus Empiricus (2nd Century AD), but was given a more modern challenging expression by David Hume, whom I mentioned previously.⁵³⁶ As one would expect, there is lively philosophical debate about how the principle or principles of induction should be understood. Sometimes the principle of induction is defined as the inference of a general principle or law from observations or particular instances (enumerative induction). However, there are also inductive inferences from a general premise to a particular conclusion, such as:

All observe emeralds have been green.

Therefore,

The next observed emerald will be green.

Induction also is involved in the presupposition that some future sequence of events will occur as it previously has: that the laws of nature will not undergo some radical transformation.⁵³⁷ Common to all formulations of induction is the idea of reasoning from the observed to the unobserved, or from the known to the unknown. The premises of the induction may also move from the statement that all

2006, pp. 215-216; F. Flores, "On the Interpretation of the Equation $E=mc^2$: Response to Krajewski," *International Studies in the Philosophy of Science*, vol. 20, no. 2, 2006, pp. 217-218. Whether motion is absolute or relative, and whether motion is merely a change of location or something more, are questions still subject to lively debate. See. D. M. Armstrong, "Absolute and Relative Motions," *Mind*, vol. 72, 1963, pp. 209-223; P. Forrest, "Is Motion Change of Location," *Analysis*, vol. 44, 1984, pp. 177-178; M. Tooley, "In Defense of the Existence of States of Motion," *Philosophical Topics*, vol. 16, 1988, pp. 225-253.

⁵³⁶ R. Weintaub, "What Was Hume's Contribution to the Problem of Induction?" *Philosophical Quarterly*, vol. 45, 1955, pp. 460-470.

⁵³⁷ B. Russell, *The Problems of Philosophy*, (Oxford University Press, London, 1971).

observed Xs have been Y to the conclusion that *all* Xs are Y or will be Y. Thus, all observed emeralds have been green, therefore all emeralds are green. But, all Xs have not been observed. It was once thought that all swans are white, until black Australian swans were observed. To take a more general example: we believe that the sun will rise tomorrow. Pressed about how we know this, we refer to facts about the solar system and the laws of physics. However, *how* do we know that the laws of physics will hold tomorrow? If we appeal to some sort of principle that nature is uniform and do not permit radical changes in natural law to occur, we are presupposing what we have to prove (the principle of induction) and therefore begging the question at issue.⁵³⁸ Philosopher David Papineau sums up: “The problem of induction calls the authority of all these laws [i.e. laws of nature] into question. For if our evidence is simply that these laws have worked so far, then how can we be sure that they will not be disproved by future occurrences?”⁵³⁹

As one would predict, an enormous amount of work by philosophers, logicians, mathematicians and scientists has been devoted to attempting to solve the problem of induction and avoiding Hume’s sceptical conclusion that the principle of induction is invalid. There have been inductive vindications of induction, probability arguments, pragmatic justifications, metaphysical justifications⁵⁴⁰ and the view of Sir Karl Popper that Hume’s inductive scepticism is correct, but the proper methodology of science is that of conjectures and refutations.⁵⁴¹ As a leading Popperian philosopher David Miller has put it: “[S]cientific knowledge is everything that a classical epistemologist says it ought

⁵³⁸ R. Harre, *The Principles of Scientific Thinking*, (Macmillan, London, 1970); R. Harre and E. Madden, *Causal Powers*, (Basil Blackwell, Oxford, 1975).

⁵³⁹ D. Papineau, “Philosophy of Science,” in N. Bunnin and E. P. Tsui-James (eds.), *The Blackwell Companion to Philosophy*, 2nd edition, (Blackwell, Oxford, 2003), pp. 286-316, cited p. 287.

⁵⁴⁰ For a sample see D. Murdoch, “Induction, Hume, and Probability,” *Journal of Philosophy*, vol. 99, 2002, pp. 185-199; C. Howson, *Hume’s Problem: Induction and the Justification of Belief*, (Clarendon Press, Oxford, 2000); D. Stalker (ed.), *Grue! The New Riddle of Induction*, (Open Court, Chicago, 1994).

⁵⁴¹ K. R. Popper, *Conjectures and Refutations*, (Routledge and Kegan Paul, London, 1963) and *Objective Knowledge*, (Oxford University Press, Oxford, 1972).

not be: it is unjustified, untrue, unbelief.”⁵⁴² The standard counter to this has been given by David Papineau: “In insisting that scientific theories are just conjectures and that therefore we have no rational basis for *believing* their predictions, Popper is simply denying that we can make rational judgments about the future.”⁵⁴³ Be that as it may, it is still the case that there is something of a general consensus among philosophers that the problem of induction is unsolved and that there are defects in the standard solutions, the solutions usually presupposing what needs to be shown.

Matters though get worse. Some philosophers who have attempted to solve the problem of induction have argued that induction is justified because of its success and that this proposal is not question-begging because deduction itself can only be justified by deduction. Stated very roughly, deductively valid arguments are those arguments where it is logically contradictory to assert the premises and deny the conclusion, that is, it is logically impossible for the conclusion to be false and the premises true. (Below we will see that there are problems even with this, the so-called classical account of validity). Susan Haack argued in a paper “The Justification of Deduction”⁵⁴⁴ that deduction faces a parallel dilemma to that which Hume raised for induction: inductive justifications of deduction will be too weak, but deductive justifications will be circular. To attempt to show the validity of the rules of inference of a logical system in general, would be circular in the sense of using principles of inference of where the conclusion asserts the validity of the argument.⁵⁴⁵

⁵⁴² D. Miller, “Can Science Do Without Induction?” In L. J. Cohen and M. B. Hesse (eds.), *Applications of Inductive Logic*, (Clarendon Press, Oxford, 1980), pp. 109-129, cited p. 129.

⁵⁴³ D. Papineau, cited note 539, p. 289.

⁵⁴⁴ S. Haack, “The Justification of Deduction,” *Mind*, vol. 85, 1976, pp. 112-119.

⁵⁴⁵ On the problem of deduction and the alleged “circularity of logic,” see M. Dummett, “The Justification of Deduction,” *Proceedings of the British Academy*, vol. 59, 1973, pp. 201-232; G. B. Keene, “On the Logic of the Circularity of Logic,” *Mind*, vol. 84, 1975, pp. 100-101; J. J. Strom, “On Squaring Some Circles of Logic,” *Analysis*, vol. 37, 1977, pp. 127-129; J. E. Bickenbach, “Justifying Deduction,” *Dialogue* vol. 18, 1979, pp. 500-516; G. B. Keene, “Self-Referent Inference and the Liar Paradox,” *Mind*, vol. 92, 1983, pp. 430-433. Also of relevance: J. Fox, “Deductivism Surpassed,” *Australasian Journal*

Flinders University philosopher George Couvalis has also argued that we cannot know logical and mathematical truths unless we use experience and induction, which makes induction epistemologically prior to deduction.⁵⁴⁶ Couvalis says, modernising an argument found in the work of David Hume:

To get to know a logical truth we must use an appropriately functioning entity such as a computer or a brain. Past philosophers talked about transparently infallible immediate apprehensions by the soul. But such views rely on dubious ontological assumptions and do not fit well with the fact that we sometimes make mistakes, even in simple cases. To the best of our knowledge, our minds can know logical or mathematical truths only if they at least supervene on a structured material entity, such as a brain or a computer. If it is to be reliable, this entity must function in an appropriate way. Because it is a structured material entity, it is liable to malfunction. Its malfunctions damage the power of the mental processes which it instantiates or which supervene on it. To be fairly sure it is reliable, we need ways of telling that it is functioning in an appropriate way. All such ways use inductive reasoning to reason to the conclusion that someone's brain or computer is likely to function well from knowledge that that brain or computer seems to have functioned well in the past. This implies that our knowledge that we know that reasoning is logically valid or invalid, or that axioms are true, is dependent on the cogency of inductive reasoning. That is, *if no inductive reasoning is cogent, we natural beings [nomologically] cannot know that we know any particular mathematical or logical statement to be true.*⁵⁴⁷

Couvalis goes on to argue that while many logicians and philosophers believe that axioms (statements for which no proof or argument is given) and rules of inference are self-evident, there are problems with this view that were recognized by two of the founding fathers of modern mathematical logic, Bertrand Russell (1872-1970) and Alfred North Whitehead (1861-1947). Russell and Whitehead said that:

[S]elf-evidence is never more than a part of a reason for accepting an axiom, and is never indispensable. The reason for accepting an axiom, as for accepting any other proposition, is always largely inductive, namely that many propositions which are nearly indubitable can be deduced from it, and that no equally plausible

of Philosophy, vol. 77, 1999, pp. 447-464; T. Oakley, "An Argument for Scepticism about Justified Beliefs," *American Philosophical Quarterly*, vol. 13, 1976, pp. 221-228; A. Gallois, "Is Global Scepticism Self-Refuting?" *Australasian Journal of Philosophy*, vol. 71, 1993, pp. 36-46.

⁵⁴⁶ G. Couvalis, "Is Induction Epistemologically Prior to Deduction?" *Ratio*, vol. 17, 2004, pp. 28-44.

⁵⁴⁷ As above, p. 34.

way is known by which these propositions could be true and the axiom were false, and nothing which is probably false can be deduced from it. ... In formal logic, the element of doubt is less than in most sciences, but it is not absent, as appears from the fact that the paradoxes followed from premises which were not previously known to require limitation.⁵⁴⁸

If Couvalis is right, and his arguments strike the present author as being correct, then there is a dilemma. Either some inductive reasoning must be accepted as valid or we should be sceptical about the justification of our knowledge of logical and mathematical knowledge. Couvalis does not deal with the resolution of this dilemma in the paper under discussion. Indications are that he is not a skeptic about logical and mathematical knowledge. But that will require a solution to the problem of induction, which most philosophers grant is unsolved.

We turn now to examine what we take to be the major skeptical challenge facing modern logic. This challenge highlights the difficulties already mentioned about the justification of deduction. Before doing so however, we briefly outline what formal deductive or mathematical logic actually is. In a recent survey Dale Jacquette said: "Logic is formal, and by itself has no content. It applies at most only indirectly to the world, as the formal theory of thoughts about and descriptions of the world."⁵⁴⁹ Bertrand Russell wrote in his *Introduction to Mathematical Philosophy* that "logic (or mathematics) is concerned with *forms*, and is concerned with them only in the way of stating that they are always or sometimes true, with all the permutations of "always" and "sometimes" that may occur."⁵⁵⁰

Formal deductive logic is concerned with arguments in formal languages, or logistic systems. Such languages have syntax or grammar and a *semantics* or

⁵⁴⁸ B. Russell and A. N. Whitehead, *Principia Mathematica I*, 2nd edition, (Cambridge University Press, Cambridge, 1927), p. 59.

⁵⁴⁹ D. Jacquette, "Introduction: Logic, Philosophy, and Philosophical Logic," in D. Jacquette (ed.), *A Companion to Philosophical Logic*, (Blackwell, Oxford, 2002), pp. 1-8, cited p. 3.

⁵⁵⁰ B. Russell, *Introduction to Mathematical Philosophy*, (George Allen and Unwin, London, 1919), pp. 199-200. On logical forms, see further: N. Chomsky, "Questions of Form and Interpretation," *Linguistic Analysis*, vol. 1, 1975, pp. 75-109; R. May, *Logical Form: Its Structure and Derivation*, (MIT Press, Cambridge MA, 1985); T. Moody, "The Indeterminacy of Logical Forms," *Australasian Journal of Philosophy*, vol. 64, 1986, pp. 190-205.

interpretation. The syntax outlines the formal relationship between signs in a language and consists of the vocabulary, rules of formation and axioms and rules of the system. Well-formed formulas are specified by giving a set of symbols and rules of formation, which say what sequences of symbols constitute well-formed formulas. The semantics of language describes the relationships between expressions in the syntax and non-linguistic objects, which gives an *interpretation* of the language. Formal languages are interpreted by assigning objects (such as numbers, physical entities and so on) to the symbols and/or well-formed formulas. A formula has a *model* in a language if and only if there is an interpretation in the language which makes the formulae true. If A and B are well formed formula of a language, then B is a *logical consequence* of A in the language, if and only if B is true in all models of the language in which A is true. A is valid in the language if and only if A is true in all models of the language. While the concept of logical consequence is a semantic concept, the concept of proof is syntactical. A *proof* in the language is a set of well-formed formulas such that each formula is either an axiom of the language or derivable by means of the rules of inference of the system.⁵⁵¹ A logistic system is *consistent* (proof-theoretically or syntactically) if and only if there is no well-formed formula X such that both X and not X (written “ $\sim X$ ”) are provable in the system. Even at this point there are major philosophical problems, such as with the concept of logical consequence and the definition of validity, but we will pass over this.⁵⁵²

⁵⁵¹ See G. Hunter, *Metalogic: An Introduction to the Metatheory of Standard First Order Logic*, (Macmillan, London, 1971); S. C. Kleene, *Mathematical Logic*, (John Wiley and Sons, New York, 1967); A. B. Manaster, *Completeness, Compactness, and Undecidability: An Introduction to Mathematical Logic*, (Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1975).

⁵⁵² J. Etchemendy, *The Concept of Logical Consequence*, (Harvard University Press, Harvard, MA, 1990); V. McGee, “Review of Etchemendy (1990),” *Journal of Symbolic Logic*, vol. 57, 1990, pp. 254-255; V. McGee, “Two Problems with Tarski’s Theory of Consequence,” *Proceedings of the Aristotelian Society*, vol.92, 1992, pp. 273-292; G. Priest, “Etchemendy and Logical Consequence,” *Canadian Journal of Philosophy*, vol.25, 1995, pp. 283-292; M. Gómez-Torrente, “Logical Truth and Tarskian Logical Truth,” *Synthese*, vol. 117, 1999, pp. 375-408.

Languages or logistic systems are said to be *complete* if every valid argument has a proof in the formal system. The language or logistic system is *sound* if no invalid arguments are provable: only proofs of valid arguments can be constructed. Some logistic systems are incomplete, but this is not a fatal defect in the system. Unsoundness is because formal deductive logic requires that if the logical form of an argument is valid, then given that its premises are true, then its conclusions must by “logical necessity” be true as well. It is a contradiction in a valid deductive argument to assert the premises and deny the conclusion.

Most, but far from all, logicians and mathematicians accept “classical logic,” which can be vaguely defined as the logic of Russell and Whitehead’s *Principia Mathematica* with related developments. The logic is not many-valued (having three or more values to be well formed formula, such as “true”, “false” and “indeterminate”), but has two values “true” and “false” (all propositions are either true or false). Quantification (quantifiers are operators which indicate whether a statement is universal or particular (existential)) occurs only over existent objects, not “objects” such as “the round square” or the “present King of the USA.” Most importantly in classical logic it is necessary and a sufficient condition for an argument to be valid, that if the premises of the argument are true, then the conclusion must be true.⁵⁵³

The classical account of validity means that arguments with a necessarily true conclusion, and all those with a necessary false or (according to classical logic) inconsistent premises, are valid. On this account, a contradiction implies anything. Let “&” mean “and”, and “~” mean “not”, then $p \ \& \ \sim p, \ \text{therefore} \ q$, is classically valid and can be proved to be so.⁵⁵⁴ Relevant or relevance logics reject these inferences because the logicians championing these positions believe that there should be some sort of logical connection between these premises and the

⁵⁵³ A. Pap, “The Laws of Logic”, in *An Introduction to the Philosophy of Science*, (Free Press, New York, 1962), pp. 94-106.

⁵⁵⁴ S. Read, *Relevant Logic: A Philosophical Examination of Inference*, (Basil Blackwell, Oxford, 1988), cited p. 31.

conclusion of a deductively valid argument $X \rightarrow Y$ (where “ \rightarrow ” means “implies”), where the “logical content” of the conclusion is contained in the premises.⁵⁵⁵ A movement in modern logic associated with relevant or relevance logics are paraconsistent logic (and mathematics) which holds that there are propositions for which X and $\sim X$ are both true, true contradictions. If there were true contradictions then $p \ \& \ \sim p \rightarrow q$ would be counter-modelled, for the premises could be true and the conclusion, an arbitrary proposition q , could be false. We will look at the significance of the so-called logico-semantical paradoxes and paraconsistency shortly in this context. It is time now to begin to roll out the problems that modern formal logic and mathematics faces.⁵⁵⁶

Problems with Logical Validity

The classical account of validity holds that an argument is valid if its conclusion follows from its premises and invalid if it is possible for its premises to be true and its conclusion false. It is a necessary condition of validity that the premises of an argument cannot be true while the conclusion is false because valid arguments are supposed to go from truth to truth, not truth to falsity.⁵⁵⁷ The logician Stephen Read developed an argument traditionally known as the “Pseudo-Scotus” which prima facie shows the inconsistency of the concept of validity. Woodbridge and Armour-Garb have said that this paradox shows “not just a problem with the “classical account” of validity ... [but] what it shows is that our very *concept* of

⁵⁵⁵ See A. R. Anderson and N. D. Belnap, *Entailment*, vol. 1 (Princeton University Press, Princeton, New Jersey, 1975); R. Routley (et.al.), *Relevant Logics and their Rivals I*, (Ridgeview Publishing Company, Atascadero, 1982); G. I. Iseminger, “Is Relevance Necessary for Validity?” *Mind*, vol. 89, 1980, pp. 196-213.

⁵⁵⁶ For a more comprehensive survey, see J. W. Smith (et.al), *The Bankruptcy of Economics*, (Macmillan, London, 1999), pp. 55-88.

⁵⁵⁷ S. Read, “Self-Reference and Validity,” *Synthese*, vol. 42, 1979, pp. 265-274.

validity (and, thus the language we use to express it is inconsistent - at least *prima facie*.”⁵⁵⁸

Consider the argument:

A: $1=1$

Therefore, argument A is invalid.

Suppose that argument A is valid. Then A has a true premise and a false conclusion, which by the classical account of validity means that A is invalid. Therefore if A is valid, then A is invalid. Therefore (by *reductio ad absurdum*) A is invalid. However the premise $1=1$ is a necessary truth. It is a principle of modal logic (the logic of notions such as necessity and possibility) that any proposition deduced from a necessarily true position is itself necessarily true. Therefore it is necessarily true that A is invalid, which means that A has a necessarily true conclusion. However on the classical account of validity (that is, the necessary truth of the conclusion of an argument is sufficient for the validity of an argument), A is valid. Therefore A is invalid and valid: a contradiction.⁵⁵⁹ Another paradox can be generated with “B: This argument is valid, therefore, this argument is invalid”.⁵⁶⁰ Along similar lines it can also be shown that from these two propositions:

(I) P and

(II) There is no sound deduction of (I)

from (I) and (II)

⁵⁵⁸ J. A. Woodbridge and B. Armour-Garb, “The Pathology of Validity,” *Synthese*, vol. 160, 2008, pp. 63-74, cited p. 64. See also D. Jacquette, “The Validity Paradox in Model S,5” *Synthese*, vol. 109, 1996, pp. 47-62; S. Read, “Self Reference and Validity Revisited,” in M. Yrjönsuuri (ed.), *Medieval Formal Logic: Obligations, Insolubles, and Consequences*, (Kluwer, Dordrecht, 2001), pp. 183-196; J. A. Woodbridge and B. Armour-Garb, “Semantic Pathology and the Open Pair,” *Philosophy and Phenomenological Research*, vol. 71, 2005, pp. 695-703.

⁵⁵⁹ Read, cited note 557.

⁵⁶⁰ As above, p, 267.

that there is a proof that P is not true, that is, a refutation of any proposition at all!⁵⁶¹

The Logical-Semantical Paradoxes

Logical-semantical paradoxes are almost as old as Western philosophy.⁵⁶² The liar paradox of Epimenides the Cretan arose from the statement “I am lying”, which is true if it is false and false if it is true. A modern variant to consider is:

(L) This sentence is false

and “strengthened paradoxes,” such as a sentence that says of itself that it is not true and variants of this, such as a sentence that says of itself that it is not definitely true.⁵⁶³

The 20th century also saw the presentation of a number of other surprising paradoxes. Löb’s paradox involves considering a sentence A which is true if and only if it implies B:

⁵⁶¹ P. Y. Windt, “The Liar in the Prediction Paradox,” *American Philosophical Quarterly*, vol. 10, 1973, pp. 65-68.

⁵⁶² R. L. Martin (ed.), *The Paradox of the Liar*, (Yale University Press, New Haven, 1970).

⁵⁶³ J. L. Mackie, *Truth, Probability and Paradox: Studies in Philosophical Logic*, (Clarendon Press, Oxford, 1973); L. Goldstein and L. Goddard, “Strengthened Paradoxes,” *Australasian Journal of Philosophy*, vol. 58, 1980, pp. 211-221; T. Parsons, “Assertion, Denial and the Liar Paradox,” *Journal of Philosophic Logic*, vol. 13, 1984, pp. 137-152; V. McGee, *Truth, Vagueness and Paradox*, (Hackett, Indianapolis, 1991); R. Heck, “A Note on the Logic of Higher Order Vagueness,” *Analysis*, vol. 53, 1993, pp. 201-208; L. Goldstein, “A Yabloesque Paradox in Set Theory,” *Analysis*, vol. 54, 1994, pp. 223-227; A. Mills, “Unsettled Problems with Vague Truth,” *Canadian Journal of Philosophy*, vol. 25, 1995, pp. 103-117; R. A. Sorensen, “Yablo’s Paradox and Kindred Infinite Liars,” *Mind*, vol. 107, 1998, pp. 137-155; S. Soames, *Understanding Truth*, (Oxford University Press, Oxford and New York, 1999); G. Priest, “Truth and Contradiction,” *Philosophical Quarterly*, vol. 50, 2000, pp. 305-319; P. Greenough, “Free Assumptions and the Liar Paradox,” *American Philosophical Quarterly*, vol. 38, 2001, pp. 115-135; O. Bueno and M. Colyvan, “Yablo’s Paradox and Referring to Infinite Objects,” *Australasian Journal of Philosophy*, vol. 81, 2003, pp. 402-412.

(1) $A \leftrightarrow (A \rightarrow B)$.

Assume then

(2) A, then

(3) $A \rightarrow B$, and

(4) B. Withdraw A, so

(5) $A \rightarrow B$, i.e.

(6) A, Therefore,

(7) B.⁵⁶⁴

Closely related to this paradox is Curry's paradox which also proves an arbitrary proposition by generally accepted (that is, until the paradox was uncovered), logical principles.⁵⁶⁵

Better known than these paradoxes are the paradoxes of set theory such as Russell's paradox. Consider the set of all sets which are not members of themselves. Is this set a member of itself? If it is, then it is not. If it is not, then it is.⁵⁶⁶ There are a number of other set theoretical paradoxes such as the Burali-Forti paradox and Cantor's paradox, which need not be discussed here.⁵⁶⁷ Typically the set theoretical paradoxes have been dealt with by modifying our naïve conception of a set through various formal set theories. Ingenious as these theories have been it would appear from a survey of the critical literature that a final resolution of

⁵⁶⁴J. F. A. K. van Benthem, "Four Paradoxes," *Journal of Philosophic Logic*, vol. 7, 1978, pp. 49-72, cited p. 50; M. H. Löb, "Solution of a Problem of Leon Henkin," *Journal of Symbolic Logic*, vol.20, 1955, pp. 115-119.

⁵⁶⁵H. B. Curry, "The Inconsistency of Certain Formal Logics," *Journal of Symbolic Logic*, vol. 7, 1942, pp. 115-117; A. D. Irvine, "Gaps, Gluts, and Paradox," *Canadian Journal of Philosophy*, Supplementary vol. 18, 1992, pp. 273-299.

⁵⁶⁶F. Moorecroft, "Why Russell's Paradox Won't Go Away," *Philosophy*, vol. 68, 1993, pp. 99-103.

⁵⁶⁷A. Weir, "Naïve Set Theory is Innocent!" *Mind*, vol. 107, 1998, pp. 763-798.

these difficulties has not been accomplished.⁵⁶⁸ Logician Benson Mates concluded that “although each possible point of contact is identified by someone as the source of the difficulty, each is also exonerated by the great majority; and consequently no purported solution ever comes close to general acceptance”.⁵⁶⁹ Mates believes that our fundamental concepts such as set, truth etc. may be *radically defective* “in the sense, that, the clearer we get about them, the clearer it becomes that they lead to contradiction and must be repaired, if possible, or, failing that, replaced”.⁵⁷⁰

A subject beloved by popular science writers in this field is that of Gödel’s incompleteness theorem.⁵⁷¹ The proof of this theorem was published by the logician Kurt Gödel (1906-1978) in 1931. The proof showed the existence of formally undecidable propositions in certain formal systems of arithmetic. One such system of arithmetic is Peano arithmetic which has as its axioms: (1) 0 is a number; (2) the successor of any number is a number; (3) no two numbers have the same successor; (4) 0 is not the successor of any number and (5) if a predicate P is true of 0 (i.e. P(0) is true), and if it is true that $P(n) \rightarrow P(n+1)$, then P is true of all numbers. The formal theory of Peano arithmetic PA is open to Gödel’s first incompleteness theorem. This states that in the formal theory PA there is a sentence G of PA such that if PA is consistent, neither G nor $\sim G$ can be proved in the formal theory. There are various ways that this theorem can be proved, with associated logical and philosophical issues.⁵⁷² One method involves use of a “diagonal”

⁵⁶⁸ G. Priest, *In Contradiction: A Study of the Transconsistent*, (Expanded edition), (Clarendon Press, Oxford, 2006).

⁵⁶⁹ B. Mates, *Skeptical Essays*, (University of Chicago Press, Chicago and London, 1981), cited p.5.

⁵⁷⁰ As above, p. 57.

⁵⁷¹ T. Franzén, *Gödel’s Theorem: An Incomplete Guide to its Use and Abuse*, (A.K. Peters, Wellesley, MA, 2005).

⁵⁷² Of relevance see B. J. Copeland and R. Sylvan, “Beyond the Universal Turing Machine,” *Australasian Journal of Philosophy*, vol. 77, 1999, pp. 46-47; B. J. Copeland, “Hypercomputation,” *Minds and Machines*, vol. 12, 2002, pp. 461-502; P. Cotogna, “Hypercomputation and the Physical Church-Turing Thesis,” *British Journal of the Philosophy of Science*, vol. 54, 2003, pp. 181-223; B. J. Copeland, *Artificial Intelligence: A Philosophic Introduction*, (Blackwell, Cambridge, 1993); T. Ord and T. D. Kieu, “The Diagonal Method and Hypercomputation,” *British Journal of the Philosophy of Science*, vol. 50, 2005, pp. 147-156.

argument arguably similar to the liar paradox.⁵⁷³ Let the Gödel sentence be the sentence:

- (G) This sentence is not provable from the axioms of Peano arithmetic.

Then G is true, but not provable in PA. Suppose that G is not true. Then given the statement of G's contents, then G must be provable in PA. Assume that the axioms of PA are true and that the system is logically sound. Then statements provable in PA must be true. G is provable in PA. Therefore G is true. However the statement that G is true contradicts our initial assumption that G is not true. Therefore G is true. If G is true, then by the Tarski principle, True (P) \rightarrow P, what G says, holds, G is not provable.⁵⁷⁴

There are a number of interesting papers (and chapters in books), most appropriately peer-reviewed, reporting some challenging ramifications of Gödel's

⁵⁷³ On the relationship between Gödel's theorem and the Liar Paradox see J. Humphries, "Gödel's Proof and the Liar Paradox," *Notre Dame Journal of Formal Logic*, vol. 20, 1979, pp. 535-544; A. A. Johnstone, "Self-Reference, the Double Life and Gödel," *Logique et Analyse*, vol. 24, 1981, pp. 35-47. In R. L. Martin, "On a Puzzling Classical Validity," *Philosophical Review*, vol. 86, 1977, pp. 454-473, Martin shows that a diagonal statement: (TS) "Nothing in the discourse D bears a relation R to exactly the things in the discourse D that don't bear R to themselves," underlies a number of syntactical and semantical paradoxes, as well as some important results in metalogic such as Gödel's theorem, Cantor's power-set theorem, Tarski's theorem and every instance of the diagonal argument. (p. 455) The intriguing philosophical question is how to distinguish between "good" (i.e. non-paradoxical) and "bad" (i.e. paradoxical) uses of (TS).

⁵⁷⁴ This proof which parallels some of the proofs of the other logical paradoxes discussed earlier appears in the excellent logic textbook by J. Barwise and J. Etchemendy, *Language, Proof and Logic*, (CSLI Publications, Stanford, California, 2007), pp. 554-555. However for a philosophical counter see R. Butrick, "The Gödel Formula: Some Reservations," *Mind*, vol. 74, 1965, pp. 411-414; F. Romero and A. Mehta, "Critique of Kurt Gödel's 1931 Paper Entitled "On Formally Undecidable Propositions of *Principia Mathematica* and Related Systems", (March 25, 2001) at http://homepage.mac.com/ardeshir/Critique_Of_Goedel.pdf; A. Mehta, "A Simple Refutation of Gödel's Theorem," at <http://homepage.mac.com/ardeshi/Godel-Simple/Refutation.html>; D. Iaá, "Gödel's theorem is Invalid," (2000), at <http://arXiv.org/pdf/math/0510469>; A.S. Yessenin-Volpin and C. Hennix, "Beware of the Gödel-Wette Paradox Part I," eprint at <http://Xiv:math/0110094>; S. Fennell, "Antinomies of Mathematical Reason: The Inconsistency of PM Arithmetic and Related Systems," at <http://arXiv.org/ftp/math/papers/007/007096.pdf>.

incompleteness theorem. Ketland⁵⁷⁵ has given a proof that there is a sentence K (which “says of itself that it is not a true sentence”)⁵⁷⁶ such that K is provable in the system PA(S). PA is standard first-order Peano arithmetic in a formal language L, the first-order language of arithmetic. PA(S) is a semantical extension of PA resulting from adding a primitive satisfaction predicate $Sat_L(x, y)$. By way of explanation: an object or sequence of objects satisfies a predicate if the predicate “holds” (is “true”) of the object or sequence of objects. For example, the object “electron” satisfies “does not simultaneously have definite position and momentum values,” because according to mainstream quantum theory the electron does not simultaneously have definite position and momentum values. In formal semantics, the satisfaction concept is used to define a formal concept of systems-relative truth.⁵⁷⁷ Therefore adding a primitive satisfaction predicate to PA is unobjectionable. However, Ketland shows that K, the strengthened liar formula that says of itself that it is not true, is provable in PA(S).

Graham Priest has also produced an argument demonstrating a surprising consequence of Gödel’s theorem.⁵⁷⁸ He states Gödel’s theorem as follows: let T be a theory which can represent all recursive functions and where the proof relation of T is recursive. To explain: recursive functions, roughly, are functions definable from successor, constant and projection functions by composition of functions and recursive definitions. A recursive definition applies to the first term of a series and then for a successor term, through the predecessor of that term. To require that the

⁵⁷⁵ J. Ketland, “A Proof of the (Strengthened) Liar Formula in a Semantical Extension of Peano Arithmetic,” *Analysis*, vol. 60, 2000, pp. 1-4.

⁵⁷⁶ As above, p. 1.

⁵⁷⁷ R. Kaye, *Models of Peano Arithmetic*, (Clarendon Press, Oxford, 1991); J. Ketland, “Deflationism and Tarski’s Paradise,” *Mind*, vol. 108, 1999, pp. 69-94.

⁵⁷⁸ G. Priest, *In Contradiction: A Study of the Transconsistent*, (Expanded edition), (Clarendon Press, Oxford, 2006). See also F. Berto, “The Gödel Paradox and Wittgenstein’s Reasons,” *Philosophia Mathematica*, vol. 17, 2009, pp. 208-209.

proof theory of T be recursive is to require a proof be effectively recognizable, a reasonable requirement. Priest rightly observes that it is part of the very notion of a proof that a proof should be effectively recognizable, for the very point of a proof is to give us a way of determining whether something is true or not. Given all this, Priest states Gödel's (first) incompleteness theorem as follows: if T is consistent then there is a formula ϕ , Gödel's, such that (1) ϕ is not provable in T and (2) if the axioms and rules of inference of T are intuitively correct, then ϕ can be shown to be true by an intuitively correct argument. An "intuitively correct argument" refers to the type of unformalised arguments used by mathematicians in their daily work. These methods of informal proof are generally accepted to be capable of formalisation. Thus, the naïve notion of proof satisfies the conditions of Gödel's theorem.

Priest shows that the assumption of the consistency of the naïve notion of proof leads to contradiction. Let T be the formalisation of the naïve theory of proof. T satisfies the conditions of Gödel's theorem. Thus if T is consistent then there is a sentence ϕ which is not provable in T, but which can be shown to be true in T by a naïve proof. But the naïve notion of proof is just T, so ϕ is provable in T after all!⁵⁷⁹ Priest then swiftly concludes that the "only way out of the problem, other than to accept the contradiction, and thus dialetheism [the idea that there are true contradictions] anyway, is to accept the inconsistency of naïve proof."⁵⁸⁰

Priest's argument was first published in a peer-reviewed journal⁵⁸¹ and has been criticised, but defended by him.⁵⁸² As Priest notes, the Gödel sentence is a paradoxical sentence. Informally it is "This sentence is not provably true." Assume that the sentence is false. Then the sentence is provably true. Therefore it is true. By *reductio ad absurdum* it is therefore true. This though is a proof (informally).

⁵⁷⁹ As above, p. 39.

⁵⁸⁰ As above, p. 41.

⁵⁸¹ G. Priest, "The Logic of Paradox", *Journal of Philosophic Logic*, vol. 8, 1979, pp. 219-241 and "Logic of Paradox Revisited," *Journal of Philosophic Logic*, vol. 13, 1984, pp. 153-179.

⁵⁸² See Priest, as above.

Thus, the Gödel sentence is provably true. But if the Gödel sentence is provably true, then it is not provably true, which is contradictory! Priest speculates at this point that naïve proof procedures may therefore be essentially inconsistent because the theory is capable of giving its own semantics (semantic closure) so that the semantical paradoxes will be provable in the theory. Priest concludes that this vindicates the Kant/Hegel thesis that Reason is inherently inconsistent.⁵⁸³

Priest could be correct about Reason being inherently inconsistent. He himself does not draw a sceptical conclusion from this because he believes that paraconsistent logic can control the contradictions. The problematic contradictions are not provable falsehoods or necessarily false propositions, but *true* contradictions. So, Reason, after all is saved. But is it? Consider Priest's argument from Gödel's theorem to start with. Gödel's theorem shows that T, the formalized theory of naïve proof (intuitive mathematical proof) is inconsistent. But note that the proof of Gödel's theorem given earlier, and quoted from Priest's own presentation, presupposed that T is consistent. But by Priest's theorem, T is inconsistent, that is, it is not the case that T is consistent. Therefore it is not the case that Gödel's theorem is correct. If Gödel's theorem is incorrect then Priest's theorem fails because it presupposes the correctness of Gödel's theorem, so that the theorem seems to be self-undermining. This does not rehabilitate classical logic because it was classical consistency assumptions which generated this logical spiral in the first place. There is thus something intrinsically problematic with the Gödel sentence.⁵⁸⁴ At this point we need to look more closely at the paraconsistent approach to the logico-semantical paradoxes.

⁵⁸³ See further: J. Kallestrup, "If Omniscient Beings are Dialetheists, then So are Anti-Realists," *Analysis*, vol. 67, 2007, pp. 252-254, says that in an unpublished paper by P. Greenough, "Truthmaker Gaps and the No-No Paradox," Greenough shows that "given reasonable assumptions, versions of the Gödel sentence generate paradox." (p. 252).

⁵⁸⁴ As above.

Paraconsistency

The paraconsistent criticism of classical logic has led to some interesting developments in metaphysics⁵⁸⁵ and formally useful work in paraconsistent logic and mathematics,⁵⁸⁶ especially for automated reasoning and information processing with computer systems, where a data base contains inconsistent data.⁵⁸⁷ Needless to say, many of these useful formal developments would still be possible without accepting that there are true contradictions: all that is needed at a minimum for automated reasoning with inconsistent data is to prevent triviality occurring. So why then believe that there are true contradictions? Priest and others generally believe that the logico-semantical paradoxes present the best case for dialetheism (that there are true contradictions). The classical solutions to the paradoxes all face difficulties and something of a logician's task of Hercules: "For every single argument they must locate a premise that is untrue, or a step that is invalid. Of course, choosing a point at which to break each argument is not difficult: we can just choose one at random. The problem is to justify the choice. It is my contention

⁵⁸⁵ G. Priest, "Perceiving Contradictions," *Australasian Journal of Philosophy*, vol. 77, 1999, pp. 439-446; G. Priest, "Could Everything be True?" *Australasian Journal of Philosophy*, vol. 78, 2000, pp. 189-195; G. Priest, *Doubt Truth to be a Liar*, (Clarendon Press, Oxford, 2006); J. C. Beall, "Is the Observable World Consistent?" *Australasian Journal of Philosophy*, vol. 78, 2000, pp. 113-118; J. C. Beall and M. Colyvan, "Looking for Contradictions," *Australasian Journal of Philosophy*, vol. 79, 2001, pp. 564-569; P. Kabay, "When Seeing is Not Believing: A Critique of Priest's Argument from Perception," *Australasian Journal of Philosophy*, vol. 84, 2006, pp. 443-460. For general surveys of paraconsistent logic see D. Batens (et al. eds), *Frontiers of Paraconsistent Logic*, (Research Studies Press, Ltd, Baldock, Hertfordshire, 2000); W. A. Carnielli (et.al. eds.), *Paraconsistency: The Logical Way to the Inconsistent*, (Marcel Dekker Inc., New York, 2002).

⁵⁸⁶ For a survey see G. Priest, "Inconsistent Models of Arithmetic Part I: Finite Models," *Journal of Philosophical Logic*, vol. 26, 1997, pp. 223-235; C. Mortensen, "Inconsistent Nonstandard Arithmetic," *Journal of Symbolic Logic*, vol. 52, 1987, pp. 512-518; C. Mortensen, *Inconsistent Mathematics*, (Kluwer, Dordrecht, 1995).

⁵⁸⁷ P. Besnard and A. Hunter (eds.), *Handbook of Defeasible Reasoning and Uncertainty Management Systems*, vol. 2, *Reasoning with Actual and Potential Contradictions*, (Kluwer, Dordrecht, 1998).

that no choice has been satisfactorily justified, and moreover, that no choice can be.”⁵⁸⁸

Presumably these remarks are made about the logico-semantical paradoxes and not all “logical/metaphysical” paradoxes dear to the hearts of philosophical logicians. Consider for example the ancient Sorites paradox or paradox of the heap associated with Eubulides of Miletus (fourth century BCE). This paradox can be stated as follows: “One thousand stones, suitably arranged, might form a heap. If we remove a single stone from a heap of stones we still have a heap; at no point will the removal of just one stone make sufficient difference to transform a heap into something which is not a heap. But, if this is so, we still have a heap, even when we have removed the last stone composing our original structure.”⁵⁸⁹ The argument need not use the concept of a “heap” but can still be restated with any number of vague predicates. Thus, 0 is a small number. If n is a small number, then $n+1$ is a small number. Therefore, by the principle of mathematical induction, all numbers are small.⁵⁹⁰ Florentin Smarandache of the Department of Mathematics, University of Mexico has produced a number of quantum mechanics Sorites paradoxes.⁵⁹¹ For example, there is not a clear dichotomy between matter which on the large-scale behaves deterministically, and matter which is subject to Heisenberg’s indeterminacy principle (variables specifying the position and momentum of subatomic particles cannot simultaneously both take definitive

⁵⁸⁸ G. Priest, *In Contradiction: A Study of the Tranconsistent*, (Martinus Nijhoff, Dordrecht, 1987), p. 11.

⁵⁸⁹ J. A. Burgess, “The Sorites Paradox and Higher-Order-Vagueness,” *Synthese*, vol. 85, 1990, pp. 417-474, cited p. 417.

⁵⁹⁰ G. Priest, “A Note on the Sorites Paradox,” *Australasian Journal of Philosophy*, vol. 57, 1979, pp. 74-75, says “Mathematical induction is shown to be an invalid form of argument when fuzzy properties are involved.” (p. 75). The Sorites paradox can be generated by finitely many applications of *modus ponens* ($p \rightarrow q$, p , therefore q) or by use of the substitutivity of identicals. See. M. Dummett, “Wang’s Paradox,” *Synthese*, vol. 30, 1975, pp. 301-324; G. Lakoff, “Hedges: A Study in Meaning Criteria and the Logic of Fuzzy Concepts,” *Journal of Philosophic Logic*, vol. 2, 1973; pp. 458-508; O. Hanfling, “What is Wrong with Sorites Arguments?” *Analysis*, vol. 61, 2001, pp. 29-35; R. Keefe and P. Smith (eds), *Vagueness: A Reader*, (MIT Press, Cambridge, MA, 1999).

⁵⁹¹ F. Smarandache, “Quantum Quasi-Paradoxes and Quantum Sorites Paradoxes,” *Progress in Physics*, vol. 1, 2005, pp. 7-8.

values). In general, philosophers have paid insufficient attention to the Smarandache paradoxes. No matter: vagueness has already “become a philosopher’s nightmare.”⁵⁹² In a survey of solutions to the Sorites paradox Richard De Witt says that “all the proposals offered to date as ways of blocking the paradox are seriously deficient.”⁵⁹³ Graham Priest is also of the opinion that “no extant solution to the Sorites paradox works”⁵⁹⁴ – and that presumably includes a paraconsistent response. If one is to postulate that situations of vagueness involve true contradictions, then much of the observable world would be contradictory, a position which Priest does not embrace.⁵⁹⁵

The proposal that taking the paradoxes as being sound arguments delivering a true conclusion (a true contradiction) constitutes a unified and non-ad hoc solution to the logico-semantical paradoxes is also contestable.⁵⁹⁶ Curry’s paradox and Löb’s paradox, for example, do not have a “true contradiction” as a conclusion, but rather an arbitrary proposition. Some have argued that paraconsistent logics still face the Curry/Löb paradoxes.⁵⁹⁷ The general response has been to reject the principle of absorption:

$$(AB) (A \rightarrow (A \rightarrow B)) \rightarrow (A \rightarrow B),$$

⁵⁹² E. Napoli, “Is Vagueness a Logical Enigma?” *Erkenntnis*, vol. 23, 1985, pp. 115-121, cited p. 115; B. Russell, “Vagueness,” *Australasian Journal of Philosophy*, vol. 1, 1923, pp. 84-92; S. P. Schwartz and W. Throop, “Intuitionism and Vagueness,” *Erkenntnis*, vol. 34, 1991, pp. 347-356.

⁵⁹³ R. DeWitt, “Remarks on the Current Status of the Sorites Paradox,” *Journal of Philosophical Research*, vol. 17, 1992, pp. 93-118, cited pp. 93-94.

⁵⁹⁴ G. Priest, “Sorites and Identity,” *Logique et Analyse*, vol. 34, 1991, pp. 293-296, cited p. 296.

⁵⁹⁵ See Priest, note 588.

⁵⁹⁶ E. D. Mares, “Even Dialetheists Should Hate Contradictions,” *Australasian Journal of Philosophy*, vol. 78, 2000, pp. 503-516; J. C. Beall, “Dialetheism and the Probability of Contradictions,” *Australasian Journal of Philosophy*, vol. 79, 2001, pp. 114-118; A. Everett, “Absorbing Dialetheia,” *Mind*, vol. 103, 1994, pp. 413-419; A. Everett, “A Note on Priest’s “Hypercontradictions,”” *Logique et Analyse*, no. 141-142, 1993, pp. 39-43; J. Broman, “Why Paraconsistent Logic Can Only Tell Half the Truth,” *Mind*, vol. 111, 2002, pp. 741-749.

⁵⁹⁷ A. Everett, “A Dilemma for Priest’s Dialetheism?” *Australasian Journal of Philosophy*, vol. 74, 1996, pp. 657-668.

read as “If A implies A implies B, then A implies B. This has involved the alleged construction of a countermodel to (AB). Even so, Geach has shown how a sentence A such that $A \rightarrow (A \rightarrow B)$, where B is an arbitrary statement can be constructed.⁵⁹⁸ More recently Armour-Garb and Woodbridge⁵⁹⁹ have constructed pathological sentences that defy classical and paraconsistent responses. An example is:

- (C1) (C2) is true \rightarrow ‘Everything is true’
 (C2) (C1) is true \rightarrow ‘Everything is true’

The “open pair (in the above case “Curried open pair”) has a simpler form:

- (1) (2) is false
 (2) (1) is false,

which generates a pathological oscillation. Armour-Garb and Woodbridge argue, convincingly in my opinion that both consistent solutions and paraconsistent solutions to the “open pair” paradox fail. Debate continues on this issue.

It is to be expected that the ultimate result of this logical research would be ruin. To begin, the dialetheist position, that some contradictions are true, represented as “D is true” where D is a dialetheia (a true contradiction) comes out on Priest’s account of paraconsistent to be a dialetheia itself, that is, true *and* false. Thus, the very statement of the position of *strong* paraconsistency (dialetheism) is contradictory. Priest accepts this result.⁶⁰⁰ One could argue as Manuel Bremer does in his excellent on-line “Lectures on Paraconsistent Logic” that it is a minimum

⁵⁹⁸ P. J. Geach, “On *Insolubilia*,” *Analysis*, vol. 15, 1955, pp. 71-72.

⁵⁹⁹ B. Armour-Garb and J. A. Woodbridge, “Dialetheism, Semantic Pathology, and the Open Pair,” *Australasian Journal of Philosophy*, vol. 84, 2006, pp. 395-416.

⁶⁰⁰ G. Priest, “The Logic of Paradox,” cited note 581, pp. 238-240.

condition for the assertability of a thesis that it should be *true only*⁶⁰¹; no doubt dialetheists would counter this by arguing that it begs the question against them because after all they have asserted their thesis, it is open to criticism (e.g. the production of “hypercontradictions” or triviality) and so on. However, arguably, if dialetheism is true *and* false, then this position is to be rejected in favor of a position which offers a non-ad hoc unified solution to the logico-semantical paradoxes and is arguably true only. Classical logic is not such position because of the arguments outlined by its paraconsistent critics. Their critique of classical logic holds, even if, which we believe is the case, paraconsistent logic has its own internally destructive problems.

The Refutation of Formal Logic

Modern developments in logic have resulted in an almost unbound power to construct exotic counter-examples and counter-models to refute once cherished logical principles. Paraconsistent logician Chris Mortensen of the University of Adelaide has said on this point:

One of the directions of recent logical research has been into semantical conditions under which various propositions hold and fail. One of the upshots has been a growing body of information about how to construct models to refute more and more propositions. It is, for example, no news that countermodels can be constructed to large numbers of theorems of the very natural modal logic S5, on which David Lewis’ modal realism is based. It is also a straightforward matter to construct countermodels to the laws of excluded middle and noncontradiction. Recent work by Errol Martin has even shown how to construct countermodels to every instance of $A \rightarrow A$. In light of these kinds of results, it seems to me that it

⁶⁰¹ M. Bremer, “Lectures on Paraconsistent Logic,” at <http://www.mbp-homepage.t-online.de/Logic/ParaLec.htm>. Bremer accepts that hypercontradictions are a problem for the strong paraconsistency/dialetheism position, especially given Bromand’s proof (see note 596). He engages in some radical acts of logical revision to avoid this result, such as relative identity theory and inconsistent mathematics. He accepts that sceptical viewers may see such moves as ad hoc. I do.

would be a bold claim that there is *any* proposition that cannot be made to come out *false* in some structure.⁶⁰²

Countermodels to every instance of $A \rightarrow A$? Routley and Meyer have constructed relevant logic semantics where any formula of the form $x \rightarrow y$ may fail.⁶⁰³ Graham Priest agrees that the countermodels can be constructed to any arbitrary formula.⁶⁰⁴ According to Priest:

[The] prime notion of logic is inference; and valid (deductive) inferences are expressed by statements of entailment, $\alpha \rightarrow \beta$, (that α entails that β). Hence in a logically impossible world we should expect statements of this form to take values other than the correct ones. Is there a limit to the value that such a conditional might take? I do not see why. Just as we can imagine a world where the laws of physics are arbitrarily different, indeed, an anomalous world where there are no such laws; so we imagine worlds where the laws of logic are arbitrarily different, indeed an anomalous world where there are no such laws.⁶⁰⁵

The late Richard Routley/Sylvan developed a theory of items based upon the ideas of logician Alexius von Meinong (1853-1928).⁶⁰⁶ Items are everything

⁶⁰² C. Mortensen, "A Plea for Model Theory," *Philosophical Quarterly*, vol. 31, 1981, pp. 152-157; C. Mortensen, "Anything is Possible," *Erkenntnis*, vol. 30, 1989, pp. 319-337. Mortensen goes on to argue that given Martin's countermodelling of $A \rightarrow A$ (in a weak propositional calculus) one can in principle doubt the seeming logical necessity of statements such as "If Smith is a bachelor then Smith is an unmarried man." That statement presupposes that "If Smith is a bachelor then Smith is a bachelor" is also necessary, which is of course a substitution instance of $A \rightarrow A$. (p. 329) On this basis, Mortensen says, we can conceive how our mathematics could be false: "[It] seems to me that the intuitive solidity of mathematics rests on the same foundation. Short, quite obvious inferences in mathematics often derive, like the previous bachelor case, from some definitional decision to use terms interchangeably applied to $A \rightarrow A$, (or to $(A \& B) \rightarrow A$ or $A \rightarrow (A \vee B)$). Mathematical connections established by longer chains of reasonings appealing to more complex deductive principles are to that extent less evidently necessary. I am not suggesting here that it is *easy* to understand how standard mathematics might have been false. But then we should beware of projecting the limitations of our imaginations onto the world." (p. 329). See further E. P. Martin, *The P-W Problem*, (PhD dissertation, Australian National University, 1978); E. P. Martin and R. K. Meyer, "Solution to the P-W Problem," *Journal of Symbolic Logic*, vol. 47, 1982, pp. 869-887.

⁶⁰³ R. Routley (et.al.), *Relevant Logics and their Rivals I*, (Ridgeview Publishing Company, Atascadero, CA, 1982).

⁶⁰⁴ G. Priest, "What is a Non-Normal World?" *Logique et Analyse*, vol. 35, 1992, pp. 291-302, cited p. 291.

⁶⁰⁵ As above, pp. 292-293.

⁶⁰⁶ R. Routley, *Exploring Meinong's Jungle and Beyond*, (Department of Philosophy, Research School of Social Sciences, Australian National University, 1980).

that can be the object of thought, and things which cannot: if I is defined as I= that object which is not an item, then it is an item. One can thus speculate about a prime number p between 11 and 13 or even an infinite number of prime numbers between 11 and 13, even though standard Peano arithmetic has no such p.⁶⁰⁷ This position as stated has some logical difficulties including a problem with absolute inconsistency (i.e. it allows the derivation that 1=0) which Graham Priest has addressed and which we need not discuss here.⁶⁰⁸ Given all this logical freedom it is seemingly inevitable that counter-examples to one's most prized principles and counter-arguments to beloved arguments would multiply "in a way that makes the breeding habits of rabbits look like family planning."⁶⁰⁹

The conclusion reached here is the same one the present author reached over 20 years ago: formal logic is bankrupt – there are no "laws of form." The only other philosopher I am aware of reaching the same conclusion is the late Australian philosopher David Stove. Stove said in his book *The Rationality of Induction*:

There are no logical forms, above a low level of generality ... There are few or no logical forms, above a low level of generality, of which every instance is valid: nearly every such supposed form has invalid cases or paradoxical cases. The natural conclusion to draw is that formal logic is a myth and that over validity, as well over invalidity, forms do *not* rule: cases do.⁶¹⁰

⁶⁰⁷ R. Sylvan, "Item Theory Further Liberalized," (Unpublished manuscript, not dated).

⁶⁰⁸ G. Priest, *Towards Non-Being: The Logic and Metaphysics of Intentionality*, (Oxford University Press, New York, 2005).

⁶⁰⁹ G. Priest, "Unstable Solutions to the Liar Paradox," in S. J. Bartlett, and P. Suber (eds.), *Self-Reference: Reflections on Reflexivity*, (Martinus Nijhoff, Dordrecht, 1987), pp. 145-175, cited pp. 145-146. The quoted remarks by Priest were directed towards the solutions of the logical semantical paradoxes proposed by other theorists; I believe that the remarks apply to the entire field of research.

⁶¹⁰ D. C. Stove, *The Rationality of Induction*, (Clarendon Press, Oxford, 1986), chapter 9, "The Myth of Formal Logic," pp. 115-144, cited p. 127. Stove said (p. 127) that he knew of no one else who has expounded such a philosophy of logic. J. W. Smith expressed an even deeper scepticism about the faith of formal logic in 1984, two years before Stove's book was even published. See: J. W. Smith, "Formal Logic: A Degenerating Research Programme in Crisis," *Cogito*, vol. 2, no. 3, 1984, pp. 1-18; J. W. Smith, *Reason, Science and Paradox: Against Received Opinion in Science and Philosophy*, (Croom Helm, London, 1986); J. W. Smith, "The Illogic of Logic; The Paradoxes and the Crisis of Modern Logic," in *Essays on Ultimate Questions: Critical Discussions of the Limits of Contemporary Philosophical Inquiry*, (Avebury, Aldershot, 1988), pp. 124-176; J. W. Smith, "Fingernails on the Mind's Blackboard: Universal Reason, Postmodernity and the Limits of Science," in J.W. Smith (et.al.), *The Bankruptcy of*

The idea that formal logic has its limitations has been expressed before of course,⁶¹¹ but the full sceptical ramifications have seldom been embraced. Clearly if the most precise area of human knowledge has numerous “black holes” of reason, we can expect paradoxes a plenty in every other field, and that is exactly what we find. The same issues can be illustrated with the example of contemporary physics, to show that this epistemological problem is not localised in logic and mathematics.

The Problems with the Foundations of Physics

We have looked so far at the foundations of logic and mathematics and reviewed some challenging debates in the field with an eye to showing the existing theoretical limits of our most exact sciences. The situation regarding the ultimate philosophical adequacy of contemporary physics is the same. As with our comments on the foundations of mathematics, we are by no means advancing an argument denying the enormous practical and technological power of physics. The issue in question is whether physics as a cognitive enterprise is theoretically consistent and coherent. If it is not, it does not follow that parts of physics cannot have substantial technological application. Physics does, regardless of the logico-philosophical paradoxes which I now mention.

Economics, (Macmillan, London, 1999), pp. 55-58; J.W. Smith, “Shipwrecked by the Laughter of the Gods: The Epistemological Limits of Universalism,” in J.W. Smith (et.al.), *Global Anarchy in the Third Millennium?* (Macmillan, London, 2000), pp. 51-80.

⁶¹¹ See for example D. A. Rohatyn, “Against the Logicians: Some Informed Polemics,” *Dialectica*, vol. 28, 1974, pp. 87-102; J. Kekes, “Logicism,” *Idealistic Studies*, vol. 12, 1982, pp. 1-13; K. Devlin, *Goodbye Descartes: The End of Logic and the Search for a New Cosmology of the Mind*, (John Wiley and Sons, New York, 1997).

There are many popular books available outlining quantum mechanics and relativity. The philosophical implications of both theories are enormous. Beginning with quantum mechanics, we are able to conclude “that all nature is interconnected, and that the separateness and discreteness of living things in the common sensible world are illusory.”⁶¹² Needless to say, this challenges the metaphysical basis of much of daily life which is based upon things, ordinary objects such as people, being “separate” ontologically.

For the purposes of this exposition it is not necessary to outline quantum mechanics beyond the following elementary details.⁶¹³ The quantum theory arose from physicist Max Planck (1858-1947), who attempted to account for black body radiation from hot bodies. Black body radiation is emitted from hypothetical bodies that absorb all radiation striking the body. Planck proposed that energy is emitted in quanta or bundles (hence quantum mechanics). A quanta of energy is equal to $h\nu$, where h is the Planck constant (equal to 6.626176×10^{-34} Js (joules)) and ν is the frequency of the radiation, that is $E=h\nu$. Quantum mechanics was developed from this basic idea and is largely concerned with systems at the atomic scale and smaller, although there are systems exhibiting macroscopic effects.⁶¹⁴

One of the concerns of quantum mechanics is Heisenberg’s uncertainty principle named after Werner Heisenberg (1901-1976) who proposed it. The uncertainty principle says that the position and momentum of a particle cannot be simultaneously ascertained with complete accuracy. If Δx is the uncertainty in

⁶¹² M-W. Ho, *The Rainbow and the Worm*, (World Scientific, New Jersey, 2003), p. 197. Along the same lines see E. Laszlo, *The Interconnected Universe*, (World Scientific, Singapore, 1995); L. Schäfer, “Quantum Reality and the Consciousness of the Universe,” *Zygon*, vol. 41, 2006, pp. 505-532; H. P. Stapp, “Science’s Conception of Human Beings as a Basis for Moral Theory,” *Zygon*, vol. 41, 2006, pp. 617-621.

⁶¹³ For formal outlines of quantum mechanics consult L. D. Landau and E. M. Lifshitz, *Quantum Mechanics: Non-Relativistic Theory*, (Pergamon Press, Oxford, 1977); G. W. Mackey, “Quantum Mechanics and Hilbert Space,” *American Mathematical Monthly*, vol. 64, 1957, pp. 45-57.

⁶¹⁴ An example of a macroscopic quantum effect is superfluidity, the property of liquid helium to flow without friction at very low temperatures. See F. London, *Superfluids*, (Wiley, New York, 1950); D. B. Tilley and J. Tilley, *Superfluidity and Superconductivity*, (A. Hilger, Boston, 1986).

position and Δp the uncertainty in momentum, then $\Delta x \cdot \Delta p \geq h/4\pi$. Attempts to ascertain the exact position of a particle make it impossible to exactly ascertain the momentum of the particle and vice versa. There is thus an indeterminism at the atomic level. A single quantum particle will not have a definite location if the momentum of the particle is precisely ascertained. If there are multiple particles “then things are even worse: their wave functions [to be looked at shortly] may overlap, and we will be unable to distinguish particles by their distinct locations. But our common-sense notions seem largely to rely on continuously distinct trajectories for differentiating objects.”⁶¹⁵ Particles thus lack self-identity and thus are metaphysically vague; they are not individuals like familiar objects such as tables and chairs. Yet tables and chairs are somehow made of particles, a paradox which was mentioned in the last section. This is just the start of our metaphysical problems.

The double-slit experiment was first performed by Thomas Young over 200 years ago and replicated with more sophisticated experiments numerous times later. Shine a beam of photons (light) onto an opaque screen which has two parallel slits. With both slits open the photons form dark and light interference patterns typically associated with the interaction of two or more waves. However, covering up one slit and attempting to ascertain which slit the photon went through (one photon can be emitted) results in interference patterns disappearing and particle-like behaviour being observed. The situation is not that the “particle” goes through one slit or the other, but we don’t know which one. In experiments where single photons are emitted, with both holes open, when millions of photons are fired at the screen, one at a time, the wave interference pattern is seen.⁶¹⁶ A single photon

⁶¹⁵ N. Huggett, “Identity, Quantum Mechanics and Common Sense,” *The Monist*, vol. 80, 1997, pp. 118-130, cited p. 118. See also M. Redhead and P. Teller, “Particle Labels and the Theory of Indistinguishable Particles in Quantum Mechanics,” *British Journal for the Philosophy of Science*, vol. 43, 1992, pp. 201-218; E. J. Lowe, “Vague Identity and “Quantum Indeterminacy,” *Analysis*, vol. 54, 1994, pp. 110-114; S. French and D. Krause, “Quantum Vagueness,” *Erkenntnis*, vol. 59, 2003, pp. 97-124.

⁶¹⁶ J. Gribbin, *Schrödinger’s Kittens and the Search for Reality*, (Weidenfeld and Nicolson, London, 1995), cited p. 5.

has gone through both slits simultaneously and upon reaching the other side, interfered with itself. According to a leading physicist Roger Penrose, the particle has passed through both slits at once and is in several places, simultaneously.⁶¹⁷ Researchers have observed individual photons simultaneously exhibiting particle-like and wave-like behaviour.⁶¹⁸ The philosophical problem here is that particles, the building blocks of our material world, have seemingly logically incompatible properties.

Another puzzling quantum mechanical phenomenon is that of superposition of states. Stated roughly, quantum mechanics is concerned as well with a wave function $\Psi(x, y, z)$ which is a mathematical function involving particle's spatial coordinates x, y, z . The wave function occurs in an equation called the Schrödinger equation, itself a mathematical equation connecting the wave function, Planck's constant, another mathematical operator called the Laplace operator, the particle's mass, total energy and potential energy. The square of the absolute value (i.e. take only the positive values, not the negative or ignore the “-” sign) of the wave function $|\Psi|^2$ is proportional to the probability of finding the particle at that point. In quantum mechanics a hydrogen atom may be such that the probability that it is at one energy level is 0.25 and the probability that it is at the next energy level is 0.75: this does not mean that the hydrogen atom is at either one or the other, but it is not known which. The atom does not behave like a commonsense object. Rather one considers the superposition of the two cases “the true state of the system is $\Psi(a)$ ” and “the true state of the system is $\Psi(b)$ ”, which more technically involves the wave function being the vector sum of the two state vectors $\Psi(a)$ and $\Psi(b)$.⁶¹⁹ This leads to the problem of Schrödinger's cat. A cat is in an isolated system with the following device. A mechanism shoots exactly one

⁶¹⁷ R. Penrose, *The Emperor's New Mind*, (Oxford University Press, New York, 1989), cited p. 298.

⁶¹⁸ As above.

⁶¹⁹ Gribbin, cited note 616, at p. 115; M. Ward, “Schrödinger's Cation Leaps into Reality,” *New Scientist*, June 1, 1996, p. 18.

photon towards a half-silvered mirror. Behind the mirror is a detector. It is given that the probability that the photon will pass through and hit the detector is 0.5. If this does happen, the cat is electrocuted by another device. If the photon is reflected, then the electronic device is not activated. Thus, according to quantum mechanics, the cat is in a quantum superposition of the “dead” and “alive” states, meaning that the cat is seemingly “dead-and-alive”!⁶²⁰ Considerable debate exists about the meaning of this situation as well. Taken literally it seems to mean that a “true contradiction” exists. Yet few physicists, and even paraconsistent logicians, seem willing to embrace such a stark option.

The standard answer to why we don't see cats in “dead-and-alive” states is that when we observe the system, there is a discontinuous jump from the superposition to a single state, either “dead cat” or “live cat.” The measurement postulate or projection postulate says, roughly, that when a measurement is made of the system the wave function “collapses” from a superposition to a single state, and how exactly it “collapses” is dependent upon the property measured. Thus, if the position of a particle is measured, then the wave function “collapses” so that a definite position is ascertained. At this point a metaphysical problem arises because “interaction with a conscious mind *bounds* the time by which state vector reduction must occur, and because physicists have understood to be unverifiable any prediction that occurs earlier, some physicists ... and many philosophers have taken consciousness *itself* to be the mechanism that brings about wave packet collapse.”⁶²¹ But – would wave packet collapse occur in deep space away from any

⁶²⁰ See P. J. Lewis, “What is it like to be Schrödinger’s Cat?” *Analysis*, vol. 60, 2000, pp. 22-29; D. Lewis, “How Many Lives has Schrödinger’s Cat?” *Australasian Journal of Philosophy*, vol.82, 2004, pp. 3-22; D. Papineau, “David Lewis and Schrödinger’s Cat,” *Australasian Journal of Philosophy*, vol.82, 2004, pp. 153-169; H. Putnam, “A Philosopher Looks at Quantum Mechanics (Again),” *British Journal for the Philosophy of Science*, vol. 56, 2005, pp. 615-634; N. Gisin, “New Additions to the Schrödinger’s Cat Family,” *Science*, vol. 312, 2006, pp. 63-64.

⁶²¹ G. R. Mulhauser, “Materialism and the ‘Problem’ of Quantum Measurement,” *Minds and Machines*, vol. 5, 1995, pp. 207-217, cited p. 208. See further, D. Albert, *Quantum Mechanics and Experience* (Harvard University Press, Cambridge MA, 1992); P. Mittelstaedt, *The Interpretation of Quantum Mechanics and the Measurement Problem*, (Cambridge University Press, Cambridge, 2004); D. Schoch,

conscious “mind”, and did it occur in the past before the evolution of consciousness? And *if* the “mind” does not have a separate “realm” of existence from the brain (itself made up of particles), the materialist account of mind, then how can consciousness physically produce a collapse of wave function when consciousness (for the materialist) is just a complex brain process (and ultimately just a complex interaction of particles)? If the “mind” is non-material and has a separate realm of existence, then there is just as much a puzzle explaining how this non-material phenomenon reduces state vectors.⁶²² Other approaches do not have a conscious observer collapsing the wave function as the “environment can also monitor a system, and ... such monitoring causes decoherence, which allows the familiar approximation known as classical objective reality.”⁶²³

The various interpretations of quantum mechanics arise primarily from dealing with the measurement problem. Here, for our purposes we will not attempt a thumbnail sketch of these positions beyond noting that each of these interpretations face challenging objections made by sharp minds in opposing interpretation camps. Thus, the view popular with most physicists, the Copenhagen interpretation of quantum mechanics, essentially takes an instrumentalist view of quantum mechanics, seeing it as a calculating and predicting mechanism, rather than attempting to make true or false statements about a mind-independent reality (realism “is the belief that the world exists independently of our knowledge [or

“On the Formal Connection of the Einstein-Podolsky-Rosen Argument to Quantum Mechanics and Reality,” *Erkenntnis*, vol. 29, 1988, pp. 269-278.

⁶²² G. Priest, “Primary Qualities are Secondary Qualities Too,” *British Journal for the Philosophy of Science*, vol. 40, 1989, pp. 29-37.

⁶²³ Z. Wojciech, “Decoherence and the Transition from Quantum to Classical,” *Physics Today*, vol. 44, 1991, pp. 36-44, cited p. 213. See further, M. Schlosshauer, “Experimental Motivation and Empirical Consistency in Minimal No-Collapse Quantum Mechanics,” *Annals of Physics*, vol. 321, 2006, pp. 112-149.

measurement] of it”).⁶²⁴ There are many criticisms of this position.⁶²⁵ For example, there can be no quantum state of a closed universe (meaning that the Copenhagen interpretation “cannot be applied to the space-time geometry of a closed universe in general relativity) because for the universe to go from a superposition of states to collapse to one state, there needs to be an external measuring apparatus to collapse the wave function, but that is impossible because there is nothing “outside” of the universe (ignoring the proposal of other universes and God!).⁶²⁶

An alternative “many worlds” interpretation of quantum mechanics attempts to avoid the problem of measurement of the Copenhagen interpretation by regarding every point in the wave function’s superposition as containing a state of the observer or measuring device as well as the state of the observed system so that with an interaction the observer state splits into various worlds or parallel universes with each world representing a possible outcome of measurement.⁶²⁷ This position avoids the “collapse of the wave function” and the measurement problem, but at the price of a plethora of *spiraling* universes. Faced with such metaphysical slums, some logicians have proposed that a revision of logic is needed,⁶²⁸ most radically, that our very concepts of “true” and “false” don’t hold

⁶²⁴ M. Luntley, *Language, Logic and Experience: The Case for Anti-Realism*, (Open Court, La Salle, Illinois, 1988).

⁶²⁵ M. Beller, “Experimental Accuracy, Operationalism, and the Limits to Knowledge –1925 to 1935,” *Science in Context*, vol. 2, 1988, pp. 147-162; M. Beller, “The Rhetoric of Antirealism and the Copenhagen Spirit,” *Philosophy of Science*, vol. 63, 1996, pp. 183-204.

⁶²⁶ Q. Smith, “The Anthropic Principle and Many-Worlds Cosmologies,” *Australasian Journal of Philosophy*, vol. 63, 1985, pp. 336-348, cited p. 339.

⁶²⁷ See B. S. Dewitt and N. Graham, *The Many-Worlds Interpretation of Quantum Mechanics*, (Princeton University Press, Princeton, 1973).

⁶²⁸ On quantum logic see J. Harrison, “Against Quantum Logic,” *Analysis*, vol. 43, 1983, pp. 83-85; N. Hallam, “An Argument in Favour of Non-Classical Logic for Quantum Theory,” *Analysis*, vol. 44, 1984, pp. 61-67; P. Gibbons, *Particles and Paradoxes: The Limits of Quantum Logic*, (Cambridge University Press, Cambridge, 1987). Gibbons argues that quantum logic fails to adequately solve the paradoxes.

at the quantum level, so that concepts more basic than those traditionally employed in logic and mathematics need to be employed.⁶²⁹

Another puzzling aspect of quantum phenomena is that of entanglement and nonlocality. Stated very simply suppose that two particles in pairs, such as an electron and a positron (the anti-particle of an electron) are considered. These particles have complementary properties such as for spin (this being the intrinsic angular momentum of a particle, which it has even at rest). Move the particles away from each other. The spins must equal zero by the law of conservation of momentum. However, if the spin of the separated electron is measured, then the positron's spin must be in the opposite direction, and likewise if the positron's spin is measured. The particles can be an arbitrary distance apart, even at ends of the universe and the same result (allegedly) is obtained.⁶³⁰ There is no known physical mechanism for particle "communication," for if "information" was exchanged, then it would need to travel faster than light, contrary to the special theory of relativity.⁶³¹

Some philosopher-physicists have argued that these results make it much more difficult to be a "realist" about quantum mechanics: one paper is entitled "Is the Moon There When Nobody Looks?"⁶³² and the answer, apparently, is "no."⁶³³

⁶²⁹ See R. Matthews, "Impossible Things for Breakfast, at the Logic Café," *New Scientist*, April 14, 2007, pp. 30-33; A. Döring and C. J. Isham, "A Topos Foundation for Theories of Physics: I. Formal Languages for Physics," (March 6 2001) at arXiv: quant-ph/0703060v1; C. J. Isham, "Is It True; or is it False; or Somewhere in Between? The Logic of Quantum Theory," *Contemporary Physics*, vol. 46, 2005, pp. 207-219.

⁶³⁰ J. Powers, *Philosophy and the New Physics*, (Methuen, London, 1985).

⁶³¹ E. F. Taylor and J. A. Wheeler, *Spacetime Physics*, (W.H. Freeman, New York, 1966); G. Vandegrift, "Bell's Theorem and Psychic Phenomena," *Philosophical Quarterly*, vol. 45, 1995, pp. 471-476; E. Winsberg and A. Fine, "Quantum Life: Interaction, Entanglement, and Separation," *Journal of Philosophy*, vol. 100, 2003, pp. 80-97.

⁶³² N. D. Mermin, "Is the Moon There When Nobody Looks? Reality and the Quantum Theory," *Physics Today*, April 1985, pp. 38-47.

⁶³³ N. D. Mermin, "Quantum Mysteries for Anyone," *Journal of Philosophy*, vol. 78, 1981, pp. 397-408. See also N. D. Mermin, "What's Wrong with These Elements of Reality?" *Physics Today*, June 1990, pp. 9-10; F. Arntzenius, "How to Discover that the Real is Unreal," *Erkenntnis*, vol. 38, 1993, pp. 191-202.

As A. H. Goldman has said in summary, the “prospects appear bleak ... for a realist interpretation of quantum theory.”⁶³⁴ However, quantum mechanics has been supposed by those believing in the objective mind-independent existence of an external reality, to provide a foundation or basis for other sciences such as biology. If the human mind is just the brain then the brain being material is composed of subatomic particles which cannot be understood from a “realist” perspective. This seems to generate a paradoxical ontological loop.

The Theory of Relativity and Quantum Mechanics, Clash

Things get worse. The quantum theory is logically and metaphysically incompatible with Einstein’s theory of relativity. To see this, let’s give a thumb nail sketch of relativity, the philosophical basics without the mathematics. Albert Einstein (1879-1955) proposed a special and general theory of relativity.⁶³⁵ The special theory of relativity, proposed in 1905, referred only to inertial frames of reference. An inertial frame of reference is one where objects move in straight lines with a constant velocity unless acted upon by an external force. A frame of reference is a mathematical construct consisting of a set of axes, typically assumed to be at rest so that the coordinated position (x, y, z, t) can be given for a time t. Stated very roughly, the special theory of relativity states that (1) the laws of physics are the same in all frames of reference and (2) the velocity of light c in a vacuum is constant and independent of the velocity of an observer. It is a logical consequence of this that a body’s mass will increase with its velocity and the energy of a body bears the relation to its mass defined by $E=mc^2$.² In the general

⁶³⁴ A. H. Goldman, *Empirical Knowledge*, (University of California Press, Berkeley, 1991), cited p. 257.

⁶³⁵ See H. A. Lorentz and A. Einstein (et al.), *The Principle of Relativity*, (Dover Publications, New York, 1952).

theory of relativity (1915), accelerated systems and the influence of gravitational forces are considered. Space and time are merged into a four dimensional space-time continuum. Gravity arises from an interaction between masses and space-time, as masses curve space, thereby producing a gravitational field.⁶³⁶

One of the best known ramifications of the general theory of relativity in the popular consciousness is the (alleged) existence of black holes, objects formed through the gravitational collapse of stars. The general theory of relativity predicts that at the center of a black hole there is a singularity where the laws of physics breakdown because the density becomes infinite.⁶³⁷ Here is the first problem of inconsistency, ignoring the idea that there could be a singularity beyond physical law (whatever that means). Matter destroyed by the singularity will also have all “information” about the matter also destroyed, which conflicts with quantum mechanics, “which states that information can never disappear from the universe.”⁶³⁸ A minority of physicists believe that there are no black holes. Hüseyin Yilmaz of Tuft University argues that there is no experimental evidence of an actual event horizon for there is only evidence of collapsed stars, more massive than neutron stars with hot accretion discs (this being where matter captured by an alleged black hole becomes compressed and hot, emitting x-rays).⁶³⁹ George Chaplin at the Lawrence Livermore National Laboratory California and Nobel laureate Robert Laughlin of Stanford University, believe that black holes could be dead stars formed by quantum mechanical processes. They are disturbed about problems arising from the physics of black holes, such that light from an object falling into a black hole is so intensely stretched by gravity that observers will see

⁶³⁶ C. M. Will, *Was Einstein Right? Putting General Relativity to the Test*, (Oxford University Press, Oxford, 1993); K. S. Thorne, *Black Holes and Time Warps: Einstein's Outrageous Legacy*, (Papermac/Macmillan, London, 1994).

⁶³⁷ J. Earman, “Cosmic Censorship,” *Philosophy of Science Association*, vol. 2, 1992, pp. 171-180, cited p. 171.

⁶³⁸ Z. Merali, “Three Cosmic Engimas, One Audacious Answer,” *New Scientist*, March 11, 2006, p. 8.

⁶³⁹ See J. G. Cramer, “General Relativity without Black Holes,” in *Alternative View* at <http://www.npl.washington.edu/av/altvw100.html>.

the object remain at the event horizon forever – also inconsistent with quantum mechanics.⁶⁴⁰

Another exotic consequence of general relativity is the theoretical possibility of time travel involving wormholes: space-time structures or “tunnels” said to link two “universes” or two different locations in space.⁶⁴¹ We will not explore these issues in great detail beyond noting that time travel can result in scenarios where the causality principle, that causes must precede their effects, is violated. A well-known argument against the possibility of time travel is that I could travel back into time and kill my younger self.⁶⁴² However, my existence is a necessary condition for my trip back into time to have occurred at all, so if I do not exist, the postulated act of time travel would result in a contradiction. In the philosophical literature, philosophers have defended the logical possibility of time travel by arguing that actions such as attempting to kill one’s earlier self would always fail.⁶⁴³ Physicist Paul Davies speculates that something happens to prevent it, to limit free will, but doesn’t say what.⁶⁴⁴ Some argue that a distinction between

⁶⁴⁰ As above.

⁶⁴¹ P. Davies, *How to Build a Time Machine*, (Allen Lane, London, 2001).

⁶⁴² I. Semeniuk, “No Going Back,” *New Scientist*, September 20 2003, p. 28-32.

⁶⁴³ On the time travel debate see generally P. Horwich, “On Some Alleged Paradoxes of Time Travel,” *Journal of Philosophy*, vol. 72, 1975, pp. 432-444; D. Lewis, “The Paradoxes of Time Travel,” in R. Le Poideven and M. Macbeth (eds.), *The Philosophy of Time*, (Oxford University Press, Oxford, 1993), pp. 134-146; A. Carlini (et al.), *Time Machines: The Principle of Self-Consistency as a Consequence of the Principle of Minimal Action*, (Nordita 95/49A, Copenhagen, 1995); D. King, “Time Travel and Self-Consistency: Implications for Determinism and the Human Condition,” *Ratio*, vol. 13, 1999, pp. 271-278; W. Grey, “Troubles with Time Travel,” *Philosophy*, vol. 74, 1999, pp. 55-70; P. J. Nahin, *Time Machines: Time Travel in Physics, Metaphysics and Science Fiction*, 2nd edition, (American Institute of Physics, New York, 1999); T. Chamber, “Time Travel: How Not to Defuse the Principle Paradox,” *Ratio*, vol. 12, 1999, pp. 296-301; P. Dowe, “The Case for Time Travel,” *Philosophy*, vol. 75, 2000, pp. 2000, pp. 441-451; J. Abbruzzese, “On Using the Multiverse to Avoid the Paradoxes of Time Travel,” *Analysis*, vol. 61, 2001, pp. 36-38; A. Richmond, “Time-Travel Fictions and Philosophy,” *American Philosophical Quarterly*, vol. 38, 2001, pp. 305-318; G. C. Goddu, “Time Travel and Changing the Past: (Or, How to Kill Yourself and Live to Tell the Tale),” *Ratio*, vol. 16, 2003, pp. 17-32; A. M. Richmond, “Gödelian Time Travel and Anthropic Cosmology,” *Ratio*, vol. 17, 2004, pp. 176-190.

⁶⁴⁴ P. Davies, cited note 641, at p. 108. Davies goes on to criticise the notion of “free will,” but it is far from clear that the removal of “free will” would prevent the Grandfather paradox, for all that is required is the act of self-annihilation, even if the act was at the time of performance not “free” but fully determined by physical events etc.

local possibility (i.e. the time traveler can do the physical tasks to kill her former self) and *global* possibility (i.e. there is no possible world where the time traveler dies as a youth, then travels back into time), resolves the paradox.⁶⁴⁵ Others disagree.⁶⁴⁶ Surprisingly enough, in the light of the considerations about true contradictions discussed earlier, no one as far as I am aware has proposed that perhaps the contradiction in time travel is realised as a “true contradiction.” Perhaps this is one experimental way of showing situations where objects can both exist and not exist! In light of all that we have considered in this discussion, that may make as much sense as anything else!⁶⁴⁷

Some have argued that on Einstein’s theory the unfolding of history is an illusion because the past, present and future all exist in an unchanging block universe of the four dimensional space-time continuum, so there is no reason why there can’t be “causes” from the “future.”⁶⁴⁸ On this view the world consists of timeless phenomena, with the whole of “history” all set out and complete. Time, in the sense of an object, non-mind-dependent “now” is an illusion.⁶⁴⁹ But if the past and future are not real (in the sense of being mind-independent, whatever that means), then there can be no “past” to travel “to,” so there cannot be time travel as such.⁶⁵⁰ Worse, the determinism of the Einsteinian worldview is logically incompatible with the probabilism of quantum mechanics, the idea that there are

⁶⁴⁵ D. N. Kutach, “Time Travel and Consistency Constraints,” *Philosophy of Science*, vol. 70, 2003, pp. 1098-1113.

⁶⁴⁶ J. Earman, *Bangs, Crunches, Whimpers, and Shrieks: Singularities and Acausalities in Relativistic Spacetime*, (Oxford University Press, New York, 1995), cited p. 175.

⁶⁴⁷ Thus, X journeys back in time and kills her earlier self, perhaps before birth. Thus X does not exist. But X still exists as suicidal time traveller. X has therefore broken her own historical time line and become an historical “outsider.” Returning “back to the future,” the world has gone on as if X has never existed. But, X still exists. Hence X both “exists” and does “not exist.”

⁶⁴⁸ P. Barry, “What’s Done is Done...” *New Scientist*, September 30, 2006, p. 36-39, cited p. 36.

⁶⁴⁹ See A. Grünbaum, *Philosophical Problems of Space and Time*, (Knopf, New York, 1963); F. Ferre, *Being and Value: Towards a Constructive Postmodern Metaphysics*, (State University of New York Press, Albany, 1996); S. F. Savitt, “The Replacement of Time,” *Australasian Journal of Philosophy*, vol.72, 1994, pp. 463-474.

⁶⁵⁰ See Abbruzzese, cited note 643, at p. 36.

fundamentally probabilistic quantum events.⁶⁵¹ There is thus an ontological clash between the theories at a most fundamental level, because on the one hand quantum mechanics posits a physically real absolute difference between the past and the future (there is only one past, but many alternative possible futures) while special relativity does not. There are other, more technical reasons for supposing that the theories of relativity and quantum mechanics logically conflict.⁶⁵²

Quantum electrodynamics (QED) attempts to unify quantum mechanics, electromagnetism and special relativity, and has been able to make exceedingly accurate predictions. But QED has metaphysics of point-particles, assuming that point particles like an electron are essentially mathematical points. As electrical force increases as the distance increases, this means that the electron would have infinite energy. Now if this was so, then QED predicts that the electron must have an infinite mass which is contrary to experimental observation: the electron has a rest mass of approximately $9.1093897 \times 10^{-31}$ kgs. To deal with this problem a mathematical method of renormalisation was developed which effectively eliminates the infinities and allows the right results to be obtained once the electron's empirically correct mass is slotted in.⁶⁵³ However, the attempt to incorporate gravity into QED leads to deeper problems of infinities. QED conceives of particles as point-mass particles, so applying general relativity leads to the view of point-mass particles surrounded by a sea of virtual gravitons (a

⁶⁵¹ On the logical incompatibility between relativity and quantum mechanics see C. W. Rietdijk, "A Rigorous Proof of Determinism Derived from the Special Theory of Relativity," *Philosophy of Science*, vol. 33, 1966, pp. 341-344; C. W. Rietdijk, "Special Relativity and Determinism," *Philosophy of Science*, vol. 43, 1976, pp. 598-609; N. Maxwell, "Are Probabilism and Special Relativity Incompatible?" *Philosophy of Science*, vol. 52, 1985, pp. 23-43; N. Maxwell, "Are Probabilism and Special Relativity Compatible?" *Philosophy of Science*, vol. 55, 1988, pp. 640-645; H. Stein, "On Relativity Theory and Openness of the Future," *Philosophy of Science*, vol. 58, 1991, pp. 147-167; D. Z. Albert and A. Galchen, "A Quantum Threat to Special Relativity," *Scientific American Magazine*, March 2009, at <http://www.scientificamerican.com/article.cfm?id=was-einstein-wrong-about-relativity>.

⁶⁵² H. Krips, "Quantal Quandaries," *Australasian Journal of Philosophy*, vol.52, 1974, pp. 133-145; M. Sachs, "On the Incompatibility of the Quantum and Relativity Theories and a Possible Resolution," *Hadronic Journal*, vol. 5, 1982, pp. 1781-1801.

⁶⁵³ On renormalization and quantum electrodynamics see M. E. Peskin, *Introduction to Quantum Field Theory*, (Addison-Wesley, Reading MA, 1995).

graviton being a hypothetical particle exchanged in gravitational interaction). According to QED the quantum vacuum is bubbling with virtual particles which come into existence and pass out of existence so rapidly that they cannot be directly observed (or rather they are mathematical constructs to enable the quantum mechanics to work out). The quantum vacuum therefore should be an enormous reservoir of energy, which according to general relativity, should bend space into a sphere with the diameter of the universe being only a few kilometers. But, this is not so. Paul Davies sums up this problem of the non-renormalising of quantum gravity as follows:

Any point-like particle (e.g. an electron) would be surrounded by a virtual gravitational cloud containing infinite energy. But because energy is a source of gravitation, gravitons themselves contribute to the total gravitational field. (In effect, gravity gravitates.) So each virtual graviton in the cloud surrounding the central particle possesses its *own* cloud of yet more gravitons clustering around *it*, and so on ad infinitum: clouds around clouds around clouds...and each cloud contains infinite energy.⁶⁵⁴

String theory has abandoned the idea of quantum mechanics that matter is built up of point-masses as the ultimate building blocks of the universe and sees the universe having as its fundamental building block “strings” that vibrate in 10-dimensional space. There are three normal spatial dimensions, the time dimension and six other dimensions that take various topologies (shapes). Elementary particles arise from the modes of vibrations of these strings. String theory, to say the least is enormously mathematically complex; as string theorist Brian Greene has said “the mathematics of string theory is so complicated that, to date no one even knows the exact equations of the theory.”⁶⁵⁵ The theory has been subjected to

⁶⁵⁴ P. Davies, *The Goldilocks Enigma: Why the Universe is Just Right for Life*, (Allen, Lane, London, 2006), cited p. 126.

⁶⁵⁵ B. Greene, *The Elegant Universe*, (Jonathan Cape, London, 1999), p. 19.

book-long critiques by leading physicists Lee Smolin (*The Trouble with Physics*⁶⁵⁶ and Peter Woit (*Not Even Wrong*).⁶⁵⁷ The general conclusion of these physicists is along the lines of the comments of Sheldon Glashow, winner of the 1979 Nobel Prize in Physics, that string theory “has failed in its primary goal, which is to incorporate what we already know into a consistent theory that explains gravity as well.”⁶⁵⁸ Smolin agrees.⁶⁵⁹ Ian Marshall and Danah Zohar sum up the situation in these words:

The problem with “quantizing gravity” is that it puts the cart before the horse. It tries to distill a quantum extract out of General Relativity without ever confronting the deep incompatibility between the two theories. Despite half a century of work by some of the best minds in physics, science seems no closer to bringing quantum theory and relativity together. Placed side by side, the two theories contain such mutual inconsistencies that they can never be welded together... A new and deeper theory is needed. But it cannot simply be thought up by an enterprising physicist. It demands new physical insights beyond anything in current theories.⁶⁶⁰

The Fundamental Impasse: The Limits of the Human Mind

Well aware of these theoretical difficulties, physicist Paul Davies has said:

Perhaps we have reached a fundamental impasse dictated by the limitations of the human intellect. ... [R]eligion was the first great systematic attempt to explain all of existence and ... science is the next great attempt. Both religion and science draw their methodology from ancient modes of thought honed by many millennia

⁶⁵⁶ L. Smolin, *The Trouble with Physics: The Rise of String Theory, the Fall of a Science, and What Comes Next*, (Houghton Mifflin Company, Boston, 2006). See also J. Baggott, *Farewell to Reality: How Fairytale Physics Betrays the Search for Scientific Truth*, (Constable, London, 2013).

⁶⁵⁷ P. Woit, *Not Even Wrong: The Failure of String Theory and the Search For Unity in Physical Law*, (Basic Books, New York, 2006).

⁶⁵⁸ Anonymous, “Viewpoints on String Theory: Sheldon Glashow,” at <http://www.pbs.org/wgbh/nova/elegant/view-glashow.html>, cited p. 3.

⁶⁵⁹ Smolin cited note 656, at p. 191.

⁶⁶⁰ I. Marshall and D. Zohar, *Who’s Afraid of Schrödinger’s Cat?* (Quill, William Morrow, New York, 1997), cited p. 291.

of evolutionary and cultural pressures. Our minds are the products of genes and memes. Now we are free of Darwinian evolution and able to create our own real and virtual worlds and our information processing technology can take us to intellectual arenas that no human mind has ever before visited, those age-old questions of existence may evaporate away, exposed as nothing more than the befuddled musings of biological beings trapped in a mental straight jacket inherited from evolutionary happenstance. The whole paraphernalia of gods and laws, of space, time and matter, of purpose and design, rationality and absurdity, meaning and mystery, may yet be swept away and replaced by revelations as yet undreamt of.⁶⁶¹

If there are such epistemological limitations of the human mind, then as argued in this work, most of our challenging problems in fields such as ethics and the Social Sciences, are likely to lack optimal solutions, and we will have to suffice with muddled through answers, which give “good enough” results to keep the game of life in play. Incentives for patient compliance are one example of this, but the epistemological crisis problem ripples throughout human knowledge and affairs, especially in all matters related to the study of human behaviour. After all, if the most precise and technical sciences of humanity seem to be “shipwrecked by the laughter of the gods,” the softer sciences have even less chance of avoiding their laughter, or even their scorn.⁶⁶²

⁶⁶¹ Davies, cited note 654, at p. 293.

⁶⁶² “Whoever undertakes to set himself up as a judge of Truth and Knowledge is shipwrecked by the laughter of the gods.” Albert Einstein, quoted from R. McCann, “Is a Judge of Knowledge shipwrecked by the the Laughter of the Gods?” At: [https://philosophynow.org/issues/100/Is a Judge of Knowledge Shipwrecked by the Laughter of the Gods](https://philosophynow.org/issues/100/Is_a_Judge_of_Knowledge_Shipwrecked_by_the_Laughter_of_the_Gods).

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