Research Ethics

Edited by

Ruth Landau and Gaby Shefler

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Foreword

At the Hebrew University of Jerusalem, widely recognized as one of Israel's leading research institutions, we believe that understanding the world in which we live is among our most fundamental missions. Moreover, we are charged with training researchers and professionals to become preeminent scientists who will shape our future. This mission demands and requires introspection, in-depth questioning, and the probing examination of convention in an ongoing attempt to find answers.

When I speak about the world in which we live, I am of course referring to the world in its broadest sense. I refer to the physical world, from the smallest, most elementary particles to the entire universe and the distant galaxies. I refer to the living world, with all of its internal logic, to the world of all human societies, Israeli and others as well, and to the world of human spiritual creation.

The picture of a researcher facing his research subject as a detached, uninvolved and unaffected observer is overly simplistic and divorced from reality. Today, researchers and their research subjects are merged within a singular system marked by mutual influences and far-reaching implications. What generates this singular relationship is a web of observation, research and inquiry, and the examination of accepted conventions regarding controlled experimentation and direct intervention.

Moreover, researchers do not work in a vacuum. They are part of the society in which they live, part of a community of scholars, part of humanity as a whole. Their actions, the questions they pose, the experiments they perform, and the articles they publish are not autonomous acts standing alone. Rather, they represent active involvement and intervention in a complex system. Sometimes they are likely to have a profound impact on the lives of other people, on the path taken by society, on the natural environment, and perhaps even on the fate of the universe.

Therefore, beyond questions of proper or flawed methodology, reliability and objectivity, professional integrity and an obligation to truth, researchers cannot disregard ethical dilemmas involving justice

or injustice, propriety or impropriety. They cannot ignore the impact of their research and its methodology upon the destiny of humankind and other living creatures.

As our understanding of our world expands, and as we become more and more capable of producing technological and political tools based upon this understanding, these ethical dilemmas become increasingly difficult and disturbing.

Therefore, the Hebrew University considers grappling with these issues to be of utmost significance. The interdisciplinary workshop on research ethics, which we have been running for a number of years, is an attempt to generate fruitful discourse among researchers coming from various disciplines and holding diverse perspectives. The workshop seeks to provide researchers with the tools to cope with today's ethical dilemmas.

We are committed to excellence in research and to the continuing and tenacious effort to arrive at the Truth. We are also committed to the values embodied by respect for others, integrity and decency, as well as to the dictum of the Hippocratic Oath: "First, do no harm." This book is an important instrument for disseminating and assimilating these values. I am proud that the Hebrew University is at the forefront of this important field.

Menachem Magidor
Past President, The Hebrew University of Jerusalem

Introduction: On Research Ethics, Ethical Theories and This Book

Gaby Shefler and Ruth Landau

We believe that, basically, researchers' quest is to understand our world and contribute to its wellbeing. This search often involves dealing with frontiers new to humankind, and as such it raises moral and ethical questions. Researchers themselves seek guidelines in their scientific work, and thus develop various frameworks for advancing measures that will result in responsible and ethical conduct of research.

The inspiration for this book emerged from the interdisciplinary workshop on research ethics for university researchers and advanced research students at the Hebrew University in Jerusalem. The principles underlying this workshop and the extensive knowledge accumulated during its initial years were incorporated into the first book in Hebrew in the field of research ethics.

The interest of the research community in the book and the feedback we got from ethicists and researchers in Israel who have read it convinced us that the book, written by leading researchers from various faculties at the Hebrew University, may contribute to the universal knowledge on research ethics. This is the reason for the English version of our book.

It was never our intention to attempt to cover all types of ethical dilemmas in this book. In editing the book, we have chosen to focus on those fields in which the writers already had theoretical and practical experience and to make their collected writings available to experienced researchers as well as students in diverse research fields.

The purpose of this comprehensive introduction is to make these chapters intelligible and accessible to researchers in all fields. In the introduction, we summarize the topic of ethical dilemmas in research. We then discuss the selection of research questions and the matter of experimental trials. We also describe the two leading doctrines in the philosophy of ethics – relativism and objectivism – and examine their major concepts. Next, we briefly summarize four ethical theories: Kant's

theory of ethics, the utilitarian theory advocated by Bentham and Mill, Aristotle and virtue ethics, and the more modern theory of rights ethics, related to legislation for human rights. Finally, we refer to the bioethical principles of Beauchamp and Walters.

Ethics and Professional Ethics

A distinction must be made between ethics, which is concerned with theories of virtue and human morality, and professional ethics, which refers to the high standards of those working in a particular profession. The topic of professional ethics does not deal directly with morality but is unquestionably based upon it, for professionals are first and foremost human beings whose relations with themselves and others are guided by moral systems. Like other personality traits, morality also develops at an early age, and clearly has a major impact on an individual's choice of profession, adoption of a professional identity and development of appropriate professional conduct.

Kasher (2003) sees professional ethics in objective terms. He further sharpens the distinction between ethics as a moral system and professional ethics as a basic concept in defining a professional identity for the members of every profession.

Professional conduct is based upon a box of professional tools. Each and every professional must be familiar with these tools and must use them in making decisions and in coping with ordinary situations as well as those presenting special problems and difficulties.

Moreover, each profession is marked by unique professional values defining how its members perceive their role and the tools needed to carry it out. This perception is found in the ongoing interaction between the members of the profession and the general public whom they serve. Despite major similarities in the basic values of many professions, there are nevertheless differences, often fundamental in nature, distinguishing the values of one profession from those of others.

Professions do not exist in a vacuum, and professionals usually operate within a social framework of broader values, for example the democratic values of a democratic society or the values marking totalitarian, religious or other types of regimes.

Within the above confines, Kasher (2003) defines professional ethics as "a set notion of the practical ideal of conduct in a professional framework,

which is a well-defined framework of a specific human activity." This definition links professional ethics to unique professional conduct that is distinct from ordinary conduct. Such conduct is based upon training that educates professionals to strive for ideal behavior and for impeccable conduct in solving both ordinary and complex problems based upon a well thought-out perception of their profession and its significance. The moral makeup of professionals is integrated into their professional identity in the context of their performance as members of the profession.

Ethical Dilemmas in Research

Due to the speed and complexity of research development today, researchers can find themselves in situations that present ethical dilemmas. For example, a researcher can ponder over whether to include equal numbers of women, men and children in the research population, even if one group ostensibly appears more vulnerable than other groups. In contrast, in some cases it is not the researcher but rather other groups in society that identify potential ethical dilemmas in research activity. Research involving animal trials or fetal stem cell research, for example, presents more serious ethical dilemmas for some social groups than for others.

Ethical dilemmas derive from numerous sources, among them contradictory or contending values, competing loyalties, uncertainty and lack of clarity regarding society's values and goals, differences in interpretation of professional values and personal variations in ranking the importance of these values. What is correct? What is preferable? What is required? What is forbidden? What is the best way to achieve the best result while causing the least harm? What ethical solution is most appropriate and satisfactory? Questions such as these motivate those engaged in research ethics to seek appropriate tools for making ethical decisions.

Clearly the most effective way to limit ethical dilemmas during a research project is to prepare for them in advance. Such preparation requires in-depth thinking about the ethical issues likely to arise during the course of the research and the ways of coping with them.

The ideas proposed by Beauchamp and Walters (1994) for solving ethical problems in bioethics can also be adopted to solve dilemmas in research. Beauchamp and Walters suggest a number of methods that can help researchers solve ethical dilemmas:

1. Obtain as much objective information as possible. Information on the research topic can channel consideration of the dilemma to new directions. Supplementary information is a necessary though usually not sufficient condition for solving ethical dilemmas. Often it seems that even a shred of additional information would have helped avoid the dilemma in the first place. Sometimes, however, the disagreement revolves around how to interpret and verify the facts. For example, studies on people's willingness to donate organs for transplant must cope with the ethical problem of how to determine death.
2. Define the ethical dilemma clearly. Some ethical dilemmas derive from unclear definition of the issue. One example is the definition of the term "euthanasia." Does it refer to mercy killing, assistance in committing suicide, an individual's choice to die, or some other definition?
3. Rely upon an accepted ethical code. The ethical code of a particular profession has the advantage of at the very least underscoring the shared principles about which there is agreement within the profession. The problem with ethical codes is that they are usually too general and are difficult to implement in specific cases. This is particularly problematic when two principles valued equally within the profession contradict one another with respect to a given issue. For example, the obligation to maintain confidentiality with respect to research subjects conflicts with the benefits to be derived from waiving part of this confidentiality so that the research can help others.
4. Use dialectic analysis by giving an example and its contradiction. What would happen if one solution for an ethical dilemma is chosen, and what would happen if alternative solutions are chosen? For example, seeking to minimize risk to research subjects is in direct contradiction to the maximal gain to society as a result of the research.
5. Analyze the argument's pros and cons for a particular solution to an ethical dilemma. Among other things, such an analysis can expose errors in thinking, a lack of consistency and unexpected consequences.

The above proposals can be very helpful, but often they are not sufficient to solve complex ethical dilemmas in research.

According to Shamoo and Resnik (2003), we are now living in the era

of science. Training researchers to engage in proper ethical-professional conduct in scientific research and to seek appropriate solutions for ethical dilemmas in their research requires that they have basic knowledge of ethics. Shamoo and Resnik, and others as well, divide the study of ethics as follows: theoretical or normative ethics, which focuses on examining general ethical concepts, theories and principles; applied or practical ethics, which investigates ethical issues arising from specific cases or defined fields. Research ethics is a branch of applied ethics that explores the ethical problems and dilemmas that occur while carrying out scientific research. Ethical issues and dilemmas in science can arise at any stage of the research, from definition of the research objectives and selection of the research population to the distribution of the rights to publish the research and the compensation received from it.

One of the central issues in the context of scientific research is the degree of objectivity in science and in research. By means of this objectivity, researchers attempt to reach some sort of "Truth," whose objectivity is also not necessarily agreed upon by all. In attempting to solve any ethical dilemma, in research as well, one of the basic questions is: "Is the moral/ethical judgment correct? Is the moral/ethical judgment objective?" The tension between the belief that morals and ethics are the result of individual or social rules and customs and the belief that there are absolute and universal morals and ethics in general, and particularly in science, leads us to a discussion of the issue of ethical relativism.

Relativism and Objectivism in Science

Ethical relativism is a doctrine or belief according to which moral/ethical values are relative to a given culture and cannot be judged outside that culture. Ethical absolutism, in contrast, is a doctrine maintaining that values are absolute and can be implemented anywhere under any circumstances. The tendency toward objectivity ties research and those engaged in it to ethical absolutism. Hinman (1994) believes that the relativistic perspective recognizes cultural and moral diversity among cultures and within cultures. One of the consequences of this recognition is that we must not judge what we are not familiar with. This leads to the often heard allegation: "Who made you the judge?" In other words, why should we object to any particular research study? How can those who are not experienced in a particular field determine the propriety of one

study or another? On the other hand, would it not endanger objectivity if we were to leave the assessment of whether to carry out research in the hands of researchers, who have an interest in its implementation?

A discussion of ethical relativism must distinguish between descriptive ethical relativism and normative ethical relativism. Descriptive – or cultural – ethical relativism maintains that different religions or groups of people can hold different moral beliefs, without taking a stand regarding the correctness of these beliefs. That is, the values of a given society are valid for that society and can be perceived as immoral by another society. According to this approach, members of one cultural group should not judge another culture, as in the practice of female circumcision in Africa or widow-burning in India. In research as well, we are witness to cultural differences with respect to how different issues are perceived, for example in approval of fetal stem cell research, in the legitimate use of physical punishment for children or in the agreement to sell genetic data bases of entire population groups.

Assuming that ethical relativism refers to a given culture, the question then becomes one of how to define a culture or a society. Can we, for example, speak about Israeli culture or the value system of Israeli society as a single entity? And if so, what group or value system are we referring to? to the Jewish value system or to that of other religions as well? to secular Judaism or Orthodox Judaism? to Ashkenazi Jews of European origin or to Mizrachi Jews who came from Arab countries? to male or female values? How and where should the boundary between one social group and another be set?

We must also consider the question of what the system of values is relative to. Does geographical location also have an impact upon our value system? What about historical era, family background, education and other factors as well? Due to all of these factors, the road from ethical relativism to ethical subjectivism is short. Indeed, there are those who claim that ethical relativism develops into ethical subjectivism, that is, moral values are not relative to a particular group but rather to each and every individual. Each person decides for himself what is moral. This subjectivism can also apply to different researchers in a given field. For example, one researcher in the field of biological warfare can set a particular boundary for himself, which he refuses to cross, while another researcher can set a different boundary or none at all.

According to Lawrence Hinman (1994), many philosophers do not accept ethical relativism, for they believe its moral variation does not

justify it. Nevertheless, there is no absolute consensus among philosophers regarding what is right, what is required, what is appropriate and what is objective. That is, absolute and unequivocal ethical values are difficult to determine, particularly in research. Yet the fact that there is no such consensus should not be interpreted as "everything is allowed" and "anything goes."

There are several objections to ethical relativism. One is the argument that inherent in ethical relativism are the seeds of its own undoing. For example, the option to select the genetic characteristics and gender of an unborn child may be the first step to future approval of cloning humans with defined characteristics to be mass produced, a practice many find objectionable. Ethical relativism also raises another important ethical problem. It serves as a defense against criticism, for if everything is relative, there is no place for supervision, criticism or evaluation. Hinman concludes that ethical relativism is not convincing, for at the point where two cultures clash it cannot show us the way. For example, are alternative treatments preferable to conservative treatments? Without an agreed-upon common language, scientific research has difficulty answering this question unequivocally. Nonetheless, ethical absolutism is not the answer either, for there is no agreement among different cultures on each and every issue. Even western researchers, who ostensibly share the same professional set of values, can hold differing religious beliefs or ideologies and therefore different perspectives toward research.

Neither ethical relativism nor ethical objectivism (which stresses absolute values) solves ethical dilemmas. Hinman posits the path of ethical discourse as the most suitable way to arrive at solutions. This discourse must draw upon insights from both ethical relativism and ethical absolutism. From ethical relativism we should preserve the sensitivity to a value system that takes into account both our own background and that of others and that also recognizes that differences of opinion and lack of agreement on ethical issues are inherent to human existence. From ethical absolutism we should adopt the use of analytical and reasoned discourse and the belief that certain ethical positions are superior to others. For example, it is impossible to disregard the beliefs of participants in a given research study, even if their beliefs appear irrational to the researcher. Nonetheless, a researcher cannot overlook universal principles of justice or equality. It is here that ethical theories and principles can assist us as we examine ethical dilemmas.

Most of the chapters of this book focus on practical ethical issues faced

by researchers in different fields. Nonetheless, we also felt it appropriate to review the four ethical theories that provide professional researchers an ideological basis for coping with ethical dilemmas. Some of these theories are developed in depth in the chapter by Alon Harel.

Ethical Theories

Over the course of human history, philosophers have formulated numerous ethical theories. While it is difficult to state that one given ethical theory can provide a solution to ethical dilemmas, familiarity with these theories and their use can help solve such dilemmas. Each ethical theory stresses different aspects of the issue under consideration. Together these theories are more effective in facilitating an understanding of the complexity of an ethical dilemma than is any one individual theory.

Following are the major ethical theories that can be applied in research ethics: Kantianism, utilitarianism, virtue ethics and rights theory.

Kantian Theory

The Kantian theory was first developed in the 18th century by the German philosopher, Immanuel Kant. According to Kant, a moral person is someone who is capable of differentiating between a proper and an improper act and who can determine moral rules and live by them. A moral person is an autonomous individual who has chosen to live a moral life. Kant assumed that humans are rational beings and have the ability to make decisions. The proper action, according to Kant, is the one undertaken for the right reason. That is, the intention and motive of an action are more important than its outcome. Kant set out a number of categorical imperatives. One of the major imperatives determines that a moral person must act in a way so as to secure a universal law applicable to all. When making a decision, the decision-maker must ask, among other things, the following question: What would happen if everyone were to act in this way? For example, what would happen if researchers did not accurately record their findings? What if researchers were to appropriate for themselves the achievements of their colleagues? Another Kantian categorical imperative with major impact on the ethical standards of scientific research is the commandment to act in such a way that you always treat humanity as an end and never simply as a means. Thus, as Shamoo and Resnik (2003) argue, every individual has a moral

value simply by virtue of being human and therefore must not be harmed in any way.

Kantian theory is also known as deontological theory. It stresses individual responsibility to meet obligations. Hence, researchers seeking to conform to this theory will ask, among other things, what is their obligation to science, to their subjects as human beings and to their colleagues. These researchers will also ensure that their subjects receive the same fair treatment they themselves would expect to receive.

Theory of Utilitarianism

Utilitarianism is identified with the 18th century English philosopher Jeremy Bentham and the 19th century English philosopher John Stuart Mill. The theory maintains that the most moral act a person can perform is that which causes the most utility for the greatest number of people. Utilitarianism is a teleological theory for it relates primarily to the consequences of an action and is also known as a consequentialist theory. Numerous theoreticians who espouse the consequentialist approach emphasize different types of desired consequences. According to utilitarianism, intentions do not count for much; rather, the consequences and the expected utility of a particular action serve as the moral standard.

The doctrine proposed by Bentham and Mill, according to which an individual should act in order to promote the greatest good for the greatest number, is not so simple, for it raises numerous questions. How should "good" be defined? Who determines what is the greatest utility or what are the most favorable consequences? What is important – the short-term consequences or those for the long term? For whom should the utility or consequence be the best? What degree of negligible harm is legitimate and acceptable? For example, can expensive medications that delay the appearance of Alzheimer's symptoms by two or three months be considered to have "good" consequences? Is it better to slightly improve the quality of life for many or to drastically improve the lives of only a few?

The Theory of Virtue Ethics

The theory of virtue ethics is based upon the thinking of the Greek philosopher Aristotle, who lived in the 4th century BCE. This theory emphasizes the moral character of human beings. According to Aristotle, a moral individual is one who strives for excellence and virtuous living. An individual becomes a moral person according to how he lives his life

in practice, that is, according to his virtues. Someone who acts decently becomes a decent individual, and someone who acts bravely turns into a brave man. According to this approach, integrity is a transcendent character trait. An individual can be considered a person of integrity if his character, decisions and actions are congruent with virtuous behavior. In this context, a researcher may ask himself what kind of researcher does he really want to be? What is his ideal as a researcher? What boundary will he refuse to cross?

The Theory of Rights

Ethical theories of rights are relatively new. They are unique in that they direct consideration of an ethical dilemma toward a discussion of the rights of those involved in the dilemma. The past several decades have seen the development of legislation regarding human rights. This legislation also has direct implications on research, for it protects research participants, whether directly or indirectly, from violations of their human rights. Researchers whose research involves any factors that may affect humans must be sensitive to the rights of those involved in the research and must also acquire the relevant knowledge. Moreover, not only do human beings have rights; animals do as well, as protected by relevant legislation. Hence, for each and every research project, the researchers must examine and understand the rights of all those involved.

Ethical Principles

The ethical principles formulated by Beauchamp and Walters (1994) for bioethics are appropriate for other fields of research as well. Like ethical theories, the following three ethical principles are important tools for analyzing and solving ethical dilemmas: respect for an individual's autonomy, beneficence and justice.

The term "autonomy" refers to individual liberty, to the right to be free to make decisions without outside influence or coercion. It is based upon the assumption that human beings possess the cognitive abilities to understand, plan and make decisions. The mere fact that human beings are autonomous entities does not immediately grant them the proper respect as human entities. The principle of respect for an individual's autonomy is tantamount to respect for his right as a human being to make independent decisions while preserving his dignity, privacy and

responsibility for his own actions. For an individual to make multifaceted decisions, he clearly must be knowledgeable about the topic in question. The principle of autonomy necessitates intense deliberation in the case of research subjects whose abilities are limited, for example children, old people or those who are cognitively impaired.

The objective of most research studies is to "do good" in some way. In research, the principle of beneficence obligates researchers to ask questions similar to those raised by utilitarianism. How should "good" be defined? What "good" is under consideration, and for whose benefit? Is it a short-term "good" or a long-term "good," and what is the cost of attaining it? As in medicine, it seems that every research project should adopt the view that first and foremost causing harm to the subjects should be avoided.

The principle of justice, which cannot be isolated from the other two ethical principles, refers to the fact that in research, as in treatment, resources and access to them must be allocated justly and equitably. Although historically this principle was not unequivocally implemented in the past, in research today consciousness in this regard is on the rise. One of the central concepts of this principle is that each case should be treated equally. Moreover, equals should be treated equally and exceptional cases should be treated exceptionally, as advocated by Rawls (1971). Thanks to this concept, broader population groups are now being included in research studies, including those not represented in the past. Based upon the principle of justice, those who allocate funds for research must now carefully consider what topics should be invested in and to what extent.

About the Book

This book, written by senior researchers on the faculty of the Hebrew University in Jerusalem and their students, contains 16 chapters organized into five sections.

Section One – History – describes the history of research ethics at the Hebrew University and the current situation in the field.

In the first chapter, Professor Ariella Oppenheim, a faculty member of the Hebrew University-Hadassah Medical School who served as chairperson of the Central Ethics Committee at the Hebrew University for five years, describes the deliberations and processes leading up to the

establishment of the committee. Among other things, the proponents of the committee's establishment considered the efforts to achieve scientific comprehensiveness, the need for control and supervision, the need to establish proper learning and training procedures and the need to set up ethical standards for scientific research, including general guidelines applicable to all university researchers as well as guidelines applicable to researchers in the different faculties.

The second chapter, "Research Ethics: Milestones and Trends," is written by Professor Ruth Landau, a faculty member of the Paul Baerwald School of Social Work and Social Welfare at the Hebrew University who served for three years as director of the workshop on research ethics. In the chapter, Professor Landau describes current trends in scientific research ethics. She discusses the need for adhering to and safeguarding what is permitted and what is prohibited, for cooperation between researchers and research centers, for relating to the social context in which the research is carried out, and for proper ethical training of researchers. The chapter also outlines the five fundamental values essential to academic teaching and research – honesty, trust, fairness, respect and responsibility-and explains that codes for professional ethical conduct are built through social processes based upon these values. The chapter reviews the major ethical treatises – the Nuremberg Code, the Declaration of Helsinki and the Belmont Report – which serve both as guideposts and as means of controlling and supervising scientific research. At the end of the chapter, Professor Landau reviews the current state of affairs of ethics and scientific research in Israel, of which this book is an integral part.

The next section is titled Values in Scientific Research. It comprises four chapters that discuss the philosophical and ethical thinking involved in research work.

Professor Alon Harel, a member of the Faculty of Law of the Hebrew University, presents a broad view of the moral justification for ethical guidelines in research from the philosophical perspective. He describes two types of moral theories in detail: consequentialist theories, in which a good end justifies the means, and deontological theories, according to which sometimes it is permissible to act in a way that does not result in optimal or desirable outcomes. Among the consequentialist theories, Professor Harel distinguishes between act utilitarianism and rule utilitarianism. He then offers an in-depth discussion of the concept of rights and how they should be preserved and respected. Next, the

chapter describes deontological ethics and research ethics and examines the degree to which one can justify the other. The comparison between the two theories illustrates the complexity involved in making decisions while carrying out research and the concomitant philosophical and practical difficulties.

Professor David Heyd of the Department of Philosophy and chairperson of the Central Ethics Committee of the Hebrew University examines the philosophical and practical issues involved in standardizing genetic research and practice. After defining the concept of standardization in genetic research and discussing the moral aspects of this research, Professor Heyd proposes a number of levels of standardization: institutional standardization such as that adopted by universities for their research projects, national standardization and international standardization. Next, Professor Heyd discusses two aspects of the insoluble tension between philosophy and policy – identity and control – and considers them from both the individual and the social perspective. The second part of the chapter describes and discusses the status of genetic standardization in Israel. It outlines the work of the Bioethics Advisory Committee of the Israel Academy of Sciences and Humanities and reviews legislation for regulating genetic research and practice. In conclusion, Professor Heyd analyzes the short history of genetic standardization in Israel and lists eight points representing the strategy of compromise in normative regularization of genetic practice: availability; ministerial, judicial and institutional judgment; therapy vs. improvement; human cells vs. human beings; plants and human beings; somatic cells vs. germ cells; limitations on insurance; strict control vs. openness; and gradual normative changes.

Dr. Daniel Attas lectures at the Hebrew University School of Business Administration and was the initiator and coordinator of the first interfaculty seminar in research ethics at the Hebrew University. His chapter focuses on the issue of academic freedom and research funding. He analyzes the monetary sources used to fund academic research and their potential to have an impact upon research directions and even on publication of research results. Conflict of interest is one of the terms Dr. Attas uses to describe the moral problems involved in research work funded by commercial organizations. The author goes on to discuss the concept of academic freedom, how it can be preserved and how it is essential to independent and objective research work. Academic freedom is a relative term, and there are guarantees that help preserve it. The suggested solutions include regulation, abolishing the relation between

researchers and sources of financing, and structural separation of industry from academia. The author does not disregard the importance of financial resources in carrying out wide-ranging research projects, but he does clearly note the possible risks and deviations inherent in the relationship between resources and research.

Professor Hermona Soreq, Dean of the Faculty of Mathematics and Natural Sciences at the Hebrew University, considers the tension between the pressure to publish and the need to conceal. Her chapter discusses the moral dilemma of researchers engaged in fields in which the benefit of their findings is in dispute. Researchers' obligation to be honest, to publish their findings accurately and to cooperate with others often clashes with being forced or being forbidden to publish based upon political, defense or humanitarian considerations. The chapter provides examples from the fields of nuclear development and chemical and biological warfare. Finally, Professor Soreq confronts the ethical problems related to the new biology, primarily in the area of behavioral genetics.

The next section, Research Participants, comprises three chapters. The first was written by Professor Marco Caine, a urologist and chair of the Helsinki Committee at the Hadassah Ein Kerem Hospital for 14 years. In this chapter, Professor Caine presents clearly and in detail the fundamental and practical issues involved in scientific and medical experiments using human subjects. The chapter outlines the Helsinki Committee's make-up, tasks, working procedures and main points of concern in reviewing and approving research proposals: research justification, confidentiality, funding and its impact on researcher independence, issues of professional insurance, benefit vs. risk analyses, informed consent and how to obtain it, and the use of placebos. This chapter offers a wealth of relevant information for researchers whose studies involve human subjects.

The next chapter was written by Dr. Zelina Ben-Gershon, Deputy Chair of the Council for Experimentation on Animal Subjects, and late Professor Rami Rachamimoff. Professor Rachamimoff was a faculty member at the Hebrew University-Hadassah Medical School, Chief Scientist of the Ministry of Health and former Chair of the Council for Experimentation on Animal Subjects. In the chapter the authors describe the use of laboratory animals in Israel. The chapter opens by reviewing the development of regulation of animal testing in Israel, from private initiatives to legislation and institutional committees. Next, the authors provide a number of tables presenting impressive data on the scope of

animal use for research purposes compared to animals killed for food or as the result of pest control. The rate of animal use for research purposes in Israel is also compared to that in other countries. After presenting the facts pointing to the minimal use laboratory animals in Israel, the authors explain the great importance of animal use in basic research, in advancing health and medicine and in preventing suffering, in testing and manufacturing materials and devices, particularly for medicinal purposes, and in education and teaching. The chapter concludes with a discussion of human rights and the rights of laboratory animals. It describes the major principles in humanitarian treatment of laboratory animals, among them various ways to reduce the number of animals used to a minimum, to refine the research so that any distress or suffering involved is kept to a minimum, and to continue to pursue ways to replace techniques that cause animals to suffer with alternative techniques.

Rabbi Professor Yigal Shafran, a lecturer in ethics at the Hebrew University Medical School and Faculty of Agriculture, examines the use of laboratory animals from the perspective of *Halakhah* (Jewish law). Relying closely on the sources, Rabbi Shafran discusses the ethical dilemmas between animal suffering and the hope for curing human beings, between causing certain harm to an animal and the possibility of helping a human. The *halakhic* response to this dilemma relies on three basic components: destruction, suffering, and the status of science and scientific experiments in Jewish law. This response is based upon weighing these three components. In the chapter, Rabbi Shafran focuses on the notion that just because something is permitted does not mean it should be done. He then examines the fine distinction between benevolence and ethics. The chapter concludes with the statement that promoting animal welfare is a moral commandment in Jewish law, whose fulfillment is dependent upon maintaining proper human relations, understanding the sanctity of the Torah and respecting the authority of God.

This section of the book ends with a case study presenting ethical dilemmas involved in using animals in research.

The fourth section of the book includes two chapters focusing on the ethical dilemmas arising from planning and implementing research studies. The first chapter was written by Dr. Gil Goldzweig, who served for five years as a methodological and statistical consultant for research students in the Psychology Department at the Hebrew University. In the

chapter, he points to the limited attention paid to ethical issues related to methodology and statistical data analysis. The chapter raises two fundamental points: the tendency of researchers to overestimate their knowledge about statistical analysis and researchers' conscious as well as unconscious temptation to distort research results. Dr. Goldzweig stresses how important it is for researchers to be aware of these two points. Next, he discusses a series of issues: the nature of the research protocol; the use of qualitative research methods; sampling deviations; inclusion and exclusion criteria; questionnaire sampling; sample size; negative results and refuting hypotheses; calculation, sampling and other errors; post hoc testing; replicating the research. Dr. Goldzweig also discusses how research findings are presented, including selecting the descriptive measures, wording the presentation and the impact of the graphical presentation on data interpretation.

The next chapter, written by Professor Shmuel Razin of the Hebrew University Medical School, focuses on the ethics of scientific publication. This topic is of crucial importance, for all scientists spend a great deal of their time preparing their research findings for publication, whether independently or in collaboration with their colleagues. The topic entails numerous dilemmas and conflicts of interest. After explaining the critical importance of scientific publication to a scientist's career, Professor Razin describes the major types of publications in the experimental sciences: articles, short research reports, notes, book chapters, electronic journals and conference proceedings. He distinguishes between publications undergoing peer review and those whose scientific review is limited or non-existent. After describing ways of teaching ethics in science and scientific publication, he goes on to consider a number of important issues. Among them are authors' names and the order in which they are listed, the publication rights of post-doctoral guests, the problem of those who "go along for the ride," the inclusion of lab technicians' names, authors' responsibilities, and the issue of author seniority. The chapter also discusses scientific peer review of research articles, research proposals and research grant proposals. The author presents the processes and ethical dilemmas involved in such review, such as maintaining confidentiality, assessment objectivity and responses to referees and journal editors. Professor Razin also discusses unethical conduct in scientific publication and presents a number of examples of misconduct, including fabrication of results, falsification of results and

plagiarism. In conclusion, Prof. Razin examines questions of research funding, patent registration and the sharing of materials.

This section ends with three case studies, together with discussion questions and responses from leading U.S. researchers in the field. The first is related to collaboration and giving credit, the second to the statute of limitations and the third to rules of fair play.

The chapters forming the last section of the book refer to various scientific implementations.

The chapter written by Liat Linde, Professor Rafael Falk and Professor Batsheva Kerem of the Hebrew University Faculty of Life Sciences describes the goals of the Human Genome Project and the ethical dilemmas posed by these goals. The chapter begins by describing the project. It explains the makeup of DNA, emphasizing the importance of molecular base pair sequences and outlining the significance of the project and its applications. The primary applications are medical, and are related to identifying genes involved in various illnesses and attempting to develop treatments. These treatments involve generating genetic changes that will limit the progress of a disease or lead to its disappearance. The chapter stresses the importance of studying the genetic sequences of different ethnic groups and of closed and secluded populations in order to identify diseases and syndromes related to this seclusion. Decoding the human genome can also be applied to studying the history of contemporary populations; reconstructing the molecular clock can help determine evolutionary timetables indicating when populations branched out genetically from a common ancestor. The project has also had a major impact on developments in legal and criminal investigations that use identification and forensics, as well as on genetic research on personality and behavioral traits and how they are affected by the environment. The authors review the history of the project from 1990 until today and conclude the chapter with a discussion of the ethical issues raised by the project. They discuss general ethical questions related to control and use of the very powerful information gleaned from Human Genome Project. The first question is that of ownership of genetic information. Does it belong to the person from whom the sample was taken, to the researcher who decoded it or to society as a whole? They also consider questions of human cloning, which is the focus of the next chapter in the book. Other questions relate to diagnosis and discovery of illnesses in elderly people and in fetuses. The chapter concludes with a discussion of the dilemma

of registering a patent on the project, since it involves discovery and not invention.

Professor Abraham Steinberg is a professor of medical ethics at the Hebrew University Medical School and a specialist in Children's Neurology at the Shaarei Zedek Medical Center in Jerusalem. In his chapter, he focuses on stem cell research and discusses the medical, ethical and religious aspects of these experiments. After reviewing the scientific background, Professor Steinberg describes the potential uses of stem cells in basic research, in experiments using new drugs to cure degenerative diseases, and in developing entire and differentiated organs for transplantation. Along with explaining the importance and value of stem cell use, Professor Steinberg also reviews the risks involved, such as passing along infectious agents or uncontrolled multiplication of transplanted stem cells. Next, the chapter outlines the possible sources of stem cells. Among the pre-fetal sources are surplus fertilized ova, fertilized ova produced for the express purpose of generating stem cells, ova fertilized by means of cloning and parthenogenesis (ova fertilized without sperm). Also mentioned are miscarried or aborted fetuses and stem cells taken from adults. After this review of stem cell sources, Professor Steinberg discusses the ethical and religious background of these issues. The chapter describes the dilemma in determining the fine balance between the need to develop therapies for those suffering from serious illness and the prohibition against harming pre-fetuses. The chapter ends with a number of conclusions, the most important of which is the trend toward permitting and encouraging stem cell research.

The chapter written by Professor Hanokh Czosnek of the Faculty of Agriculture of the Hebrew University in Rehovot focuses on ethical issues in agricultural research and development. The chapter opens with a discussion of the conflict of interest between producing food for the masses and preserving the ecological systems for the coming generations. Next, utilitarian ethics in agricultural research and development is discussed, with emphasis on the growing public involvement in learning about and influencing agricultural development and surplus. The chapter presents the tension between the monetary benefits to the farmer or the producer and the overall benefits and harm to the public and the environment. The core of the chapter is dedicated to the ethical issues involved in developing genetically engineered agricultural crops and their impact on the environment, on human health and on the socioeconomic fabric. The chapter concludes by posing questions for the future and outlining a plan

for integrating the use and consumption of engineered vegetables with traditional or natural vegetables, to be realized through basic research relying upon ethical considerations.

The final chapter is by Professor Gaby Shefler, a member of the Department of Psychology at the Hebrew University of Jerusalem and former chairperson of the Israel Psychological Association ethics committee. In the chapter, Professor Shefler reviews the unique ethical problems in psychological research. First he surveys the different sets of ethical guidelines relating to various aspects of research. Then he notes the special problems raised by implementation of psychological research, pointing to six topics unique to this field: deception necessitated by the fundamental need not to reveal the nature of the experiment to the research participant; the use of placebo, which raises technical and ethical issues in psychotherapy research; the ethical problems in the use of concealed observations and examinations, which may be inevitable but at the same time violate the subjects' privacy, often without their knowledge; the clearly obvious and not so obvious possibilities for being harmed by participating in the experiment; obtaining informed consent to participate in an experimental trial, especially in the case of those with limited mental and intellectual abilities (who, coincidentally, are often the proper focus of research attention in this field). Finally, Professor Shefler discusses the issue of publishing therapeutic theories as an accepted research and learning method in clinical psychology. This section also ends with two case studies. The first deals with the researcher's obligation to warn about exposure to AIDS. The second considers the ethical questions arising in psychological research involving children and adolescents at risk.

At the beginning of this introduction, we noted that it was never our intent to attempt to cover all fields of research. Nevertheless, we believe we have succeeded in presenting a considerable number of philosophical and practical issues common to all researchers and universal among different scientific communities. In addition, we focused on a number of distinctive applications with specific issues, and we are convinced there are many more like these. Although the book does not cover the entire field, we believe that any researcher mulling over ethical questions in a planned or current research project can find the book helpful, both in the specific field of research and as an outline of principles that can be applied to areas we did not cover. It is our hope that reading this book will make researchers in Israel and worldwide more aware of and sensitive to proper ethical conduct.

This is the proper place to thank each and every one of the chapter authors, all of whom are preeminent scientists and philosophers from the Hebrew University in Jerusalem and among the elite of the Israeli scientific community, for contributing their wisdom and experience to this pioneering collection of articles.

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