Belief Among Academics in Free Will and in the Veracity of Scientific Judgement

by

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Ph.D. Psychology

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Abstract

A review of the philosophical and psychological literature on free will is presented. Three major positions are identified: libertarianism, hard determinism and compatibilism (or soft determinism). The latter enjoys widespread and largely unchallenged support in psychology. Substantive conceptual and empirical grounds are presented which suggest that psychologists may be dismissing free will at their peril. It is argued, first of all, that belief in the reality of free will has profound implications for conceptions of human action, of moral responsibility, of the form and veracity of scientific accounts and of the validity of scientific reduction. Moreover, the results of a multi-disciplinary survey of academics reveal that 80% of those surveyed believe free will is real. Contrary to popular assumptions in psychology, determinism is not endorsed by many scientists outside of psychology, nor does belief in free will reflect naive belief in mind-body dualism. Modern libertarians reject both dualism and reductionism, distinguishing instead between different levels of scientific explanation. The findings are discussed in terms of their theoretical implications for cognitive, social and clinical psychology, and directions for further research are suggested.

Ph.D. Psychologie

Croyance Parmi les Académiciens en la Volonté Libre et en la Véracité du Jugement Scientifique

Brian D. Doan

Résumé

Une revue de la littérature philosophique et psychologique sur la volonté libre est présentée. Trois positions majeures sont identifiées: libertarianisme, déterminisme dur et compatibilisme (ou déterminisme doux). Ce dernier reçoit un appui étendu et non contesté en psychologie. Quoi qu'il en soit, nous avons matière conceptuelle et empirique à croire que les psychologues congédisent la volonté libre à leur propre péril. D'une part, il est démontré que des implications profondes proviennent de croyance à la volonté libre pour nos conceptions des actes humains, de la responsabilité morale, de la forme et la véracité des explications scientifiques, et de la validité de la réduction scientifique. D'autre part, les résultats d'une évaluation multi-disciplinaire démontrent que 80% des académiciens croient que la volonté libre existe. Contrairement aux présomptions populaires en psychologie, le déterminisme n'est pas endossé par la plupart des hommes de science à l'extérieur de la psychologie, et croyance à la volonté libre n'indique pas une adhérence à un dualisme de corps et d'esprit. Les libertariens contemporains rejètent aussi bien le dualisme que le réductionisme, distinguant au lieu entre des niveaux d'explication scientifique différents. Les résultats sont discutés en termes de leurs implications théoriques pour la psychologie cognitive, sociale et clinique, et des orientations pour les recherches à venir sont suggérées.

To Susan Bryson, for all
the richness and warmth
of her companionship.

PREFACE

There has been very little exploration in psychology at either the conceptual or empirical level of what it means to believe in free will. This thesis investigated what academics and professionals from various disciplines believe about free will and how their beliefs about it are related to their views on moral responsibility, on the form and veracity of scientific accounts and on the validity of scientific reduction. It provides an empirical baseline against which future studies of opinions on these matters can be measured. It serves to correct certain myths in psychology regarding the views of other scientists and nonscientists on free will and it provides conceptual clarification of issues that are central to psychological research and theory.

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I: INTRODUCTION

> Science is rooted in the will to truth.
> But the stake is not the instrument,
> it is man himself.
>
> (Max Wertheimer, *On Truth*, 1934)

The problem to which the present thesis addresses itself is belief in the reality of free will and its relationship to beliefs about moral responsibility and the limits of science. The body of this thesis is a set of responses from academics to five groups of questions. They were asked whether or not they believe (a) that free will is real, and (b) that people are genuinely responsible for what they do; (c) what form they believe scientific explanations must take; (d) whether, and in what domains of inquiry, scientific accounts are true; and (e) whether or not they believe that psychological phenomena are reducible to the subject matter of the physical or biological sciences.

Beliefs concerning these matters have not been explored in combination before in the field of psychology. Yet the position one takes with respect to any one of them has profound implications for what logically and consistently can be said about the rest. Taken together, a person's answers to each of these questions constitute his views on the ancient philosophical problem of free will *vs.* determinism. Accordingly, the present thesis takes as central among those five sets of issues the question of the reality of free will.

The reader may not have come across much discussion of the free will problem in the literature of empirical psychology. Ever since psychology separated itself from philosophy over 100 years ago, the investigation of

such issues by psychologists has been viewed as inappropriate or even disreputable. This is not to say that psychologists have not taken a position with respect to free will. With few exceptions, those who have addressed the problem at all have approached it from the standpoint of determinism (e.g., Boring, 1957; Hebb, 1949; Immergluck, 1964; Lefcourt, 1973; Skinner, 1971; Westcott, 1977, 1978). This bias towards determinism is most evident in the way psychologists conceptualize the problem. Typically it is characterized as a conflict between two sorts of evidence: that which is objective, scientific, and supports determinism, against that which arises from our comparatively unreliable subjective experience.

Superficially, this would seem to be an adequate way of viewing the problem. On the one hand, our experience of making decisions and acting on them is easily the most direct evidence we have for believing in the reality of free will. On the other hand, the enormous success of science in predicting and explaining phenomena is undoubtedly the best evidence we have for believing that determinism is true.

Nevertheless, this characterization of the problem is very misleading. In the first place, the free will problem does not result from conflicting sources of evidence, but rather from conflicting interpretations of evidence. While it is true that freedom is given in the subjective experience of performing an act, one's interpretation that an act is free does not depend on whether one subjectively experiences doing it. You are just as likely to interpret someone else's actions as free as you are your own. Freedom is deeply implicated in our ways of thinking about human beings. We hold one another responsible for what we do because we understand each other as free agents. We feel guilt and remorse when we

think we have conducted ourselves badly, and we look for evidence of the same in others. We take pride in doing well, and expect one another to give credit where credit is due. There is no *a priori* reason to assume that unlike our understanding of sticks and stones, our understanding of one another is based on illusion.

Most people would admit it was based on an illusion, however, if it could be shown that human cognition is reducible, say, to events, processes, or states of the brain, and if brain states are reducible through biochemistry and chemistry to physics. This is a crucial question in psychology: can decisions to act be reduced to brain states? If they cannot, then "deciding" can be taken as an emergent property of human beings. That would leave it unclear whether deciding to act is free or determined. Some have argued (e.g., Hebb, 1949; Fodor, 1975) that whether or not mental phenomena can be reduced to brain states is an empirical question which at least warrants investigation: if it can be done, perhaps it will; if it can't, it won't. Others (e.g., Macnamara, in preparation) claim that an analysis of intentionality shows that such a reduction is impossible. At the present time, we cannot say for sure one way or the other.

Psychologists rarely acknowledge that the reality of free will and the truth of determinism are open questions. They generally approach free will as an illusion to be explained away--asserting, for example, that people are no more than "naive dualists" with regard to "mind and body, free will and determinism" (Westcott, 1977; p. 249), and that our "common-sense perception [of human freedom]...leads to distorted images of reality" (Immergluck, 1964; p. 279).

It is an empirical question whether logical consistency characterizes the thinking of anyone on such matters as the reality of free will and moral responsibility, the form and veracity of scientific explanation, and the possibility of scientific reductions. Indeed, it is an empirical question that psychologists have answered in the negative without first examining the empirical facts. Before we can claim that people are "naive dualists" whose belief in the reality of free will is part of a "distorted image of reality," we need to find out: what *do* people believe?

For example: Do people believe--as many psychologists seem to--that a commitment to the scientific investigation of human behaviour somehow precludes the belief that human beings are truly free? The assumption made by psychologists who argue that scientific psychology is incompatible with a belief in the reality of free will is that psychological theories must be at least of the same type as, if not reducible to, those of the biological and physical sciences. Do other scientists believe this? Do educated nonscientists believe it? If not, what do they believe? That scientific psychology is impossible? On what grounds? Or, if possible, that it cannot be connected to other branches of science?

If there are some people who believe that free will is an illusion, do they also believe--as many philosophers have suggested is the case--that there is no meaningful way to justify the notion that human beings are morally responsible for what they do? Or, do they believe that we are responsible even though completely determined? If so, responsible in what sense? If not, how do they justify those social practices that involve us in rewarding and punishing each other for what we do? Finally,

do a person's beliefs concerning free will, moral responsibility, and the veracity of scientific accounts have any bearing on how he conducts his own life?

As tradition would have it, questions as to whether or not free will is real and whether or not scientific explanations are true belong in the domain of metaphysics. The present thesis does not. Its burden is purely an empirical one of characterizing what people believe. There will be no attempt here to offer a resolution to the free will problem, nor to make claims as to what is in fact real or true. As the history of psychological debate on the free will problem demonstrates well enough, one cannot make reasonable observations about a metaphysical dilemma by impaling oneself on one of its horns.

The fact that psychologists have done so is not without its irony: they usually claim they are *not* taking any particular metaphysical stance. Consider for example, Steiner's (1970) introduction to his study of "perceived freedom":

> Whether a defense [of the reality of free will] could be mounted is irrelevant to the discussion that follows. What is relevant is the fact that people often *believe* they enjoy freedom and that this belief appears to affect their behaviour in a wide variety of situations (p. 188).

The position was reiterated by Harvey, in 1976:

> ...for the purpose of inquiry into people's *perception* of freedom, the answer to whether or not they are really free does not have to be established. Regardless of the reality of freedom, it is an everyday empirical truth that people perceive and can report varying degrees of freedom in their activities (p. 73-74),

and again, as recently as 1977, with Westcott contending that:

> ...psychologists should abandon the disputes about free will as metaphysical truth, and should study free

> will as an experience which is the consequence of identifiable processes, and as a deeply held belief that has further consequences for behaviour (p. 250).

But Steiner (1970), Harvey (1976), and Westcott (1977) follow a tradition that traces back to the origins of modern psychology, to David Hume. Note, for example, that in all three of the above quotes, "belief" is equated with "perception" or "experience." For Hume (c.f., *A Treatise on Human Nature,* 1739), there is nothing to reality beyond what is given in sensation. Hume's psychology of belief was based on a deterministic psychology of sensation. Having accepted the Humean view, psychologists investigating perceived freedom invariably assume that all that is necessary in characterizing a person's beliefs about freedom is a good account of the sensory input--or, in their terms, an account of what is perceived or experienced.

Thus, it really comes as no surprise that in spite of their disavowal of any particular metaphysical stance, we find that Easterbrook (1978) has titled his monograph "*The Determinants of Free Will*," and we find Westcott (1977) stating that "...the experience of free will involves nothing other than the operation of rather well established psychological mechanisms which are all deterministic in format" (p. 259)--saying, in effect, that your belief that you act freely has no basis in reality. Westcott could not possibly say that without making metaphysical assumptions. The only surprise is his denial that he is begging the metaphysical question. The only doubt is that he does so in full consciousness of the issues.

In a marvellous essay entitled "*Physical Objects*," Macnamara (in press) shows that there are plenty of reasons for doubting the Humean

premise that knowledge or belief derives from the sensory array. Guided by Macnamara's claim, the point of departure for the present thesis is that it is unwise to simply jettison the question of the reality of free will, because it has such profound implications for psychology. Psychology assumes that determinism is true at its own peril. For if human beings are really free, then psychology will have to be made complex enough to fit them out for free acts. There is no use saying as some have (e.g., Boring, 1957; Rogers, 1961) that the question of the reality of free will is undecidable unless one is also prepared to say that there are undecidable questions in psychology. And that is something no one should say without a great deal of thought. Nor does it do to argue (as Hebb, 1949, and Westcott, 1977 do) that psychology ought simply to take determinism as a regulative principle or a simplifying assumption for the purposes of scientific inquiry. For that merely prevents us from examining what determinism is supposed to be and what sort of evidence might argue for or against it. It was Aristotle who first suggested that analyzing what is implicit in our ordinary thinking is as far as one can go in exploring what is real or true. After that there is no more evidence to look at. While I am not prepared to claim that Aristotle's analysis is the best we are going to get, it certainly seems to me to be the best place to start.

The five sets of issues mentioned above will come up in some depth in the discussion of the data, which consist of questionnaire responses and rather lengthy interviews with academics from various disciplines. In order to facilitate the reporting of the data, the reader will need more than a cursory introduction to the various ideas. The section below is designed to familiarize the reader with the basic vocabulary and to clear

the way for the more detailed introduction that follows.

Overview of the free will problem

In considering the problem of free will *vs.* determinism, we are faced with two or more sets of logically connected statements--presumably about matters of fact--which taken one set at a time affirm what would seem to many to be incontestably true. On the other hand, there is the set of claims that human beings are (a) free, and (b) morally responsible for at least some of their actions, and (c) for at least some of the consequences of their actions; (d) that certain consequences (or changes in the state of affairs) could not have come about without the assent and deliberate action of a person, and (e) that with regard to at least some of the things a person does, he could have done otherwise in each case.

On the other hand, there is another set of statements to the effect that (a) every event in the universe has an efficient (perhaps physical) cause, or (b) every event in the universe can be explained as governed in terms of natural and deterministic laws; (c) that whatever happens could not happen otherwise given the conditions under which the event in question occurs, and (d) a person's conscious decisions, choices and actions--like any other event in the universe--are the outcome of causal regularities that operate inexorably and exactly according to the laws of nature.

The logical consistency of what is asserted *within* each of the above sets of statements is not a problem. Moreover, most people are disposed to believe that the statements in either set (and very often in both) might very well be true. Paradoxically, however, when considered *together* the two sets of statements seem to be logically inconsistent. Specifically,

it strikes us as paradoxical or absurd to claim that a person really can choose among alternative courses of action, while at the same time maintaining that every event in the universe--including any course of action taken by a human being--is completely determined and could not have been otherwise.

There are two alternatives open in attempting to resolve the problem. One is the *incompatibilist* approach. An incompatibilist believes that the two sets of statements are in fact logically inconsistent or incompatible. If you believe this, you are logically committed to rejecting one set or the other as untrue. Thus, if you believe that all events in the universe are completely determined and that this is incompatible with the notion that man is free in any genuine sense, then you will maintain that what appears to us as freedom is really an illusion. Conversely, if you believe that man is in fact free in the sense that he has it in his power to choose and do otherwise than he does, and that this freedom is incompatible with the idea that all events in the universe are completely determined, then you will maintain that the deterministic view is simply false.

The other alternative is the *compatibilist* approach. The compatibilist believes that claims about both human freedom and universal determinism are true, and that if understood correctly, the two sets of claims are logically consistent. In other words, if you take the compatibilist approach, you are logically committed to showing that the apparent incompatibility between free will and determinism is based either on a misunderstanding of the problem or on some logical error in posing it. While many variants of the position exist, the classic compatibilist argument is (a) that the determinist thesis is true:

everything a person does can be explained as the lawful outcome of other events, *and* (b) that there is also a valid sense in which man can be said to be "free": he is free if he acts in the absence of external constraint or compulsion. That is, a person's decision to act in a particular manner is completely determined by his current wants, beliefs and desires, which are in turn determined by his genetic endowment and past experience, *and*, his decision to act that way is "free" if nothing or no one prevents him from doing what he wants to do, or forces him to do something other than what he wants to do.

For the purpose of this thesis, these two types of resolution to the free will problem are expressed best and most simply by means of three positions: Libertarianism, Determinism, and Compatibilism. The term *libertarian*, in this thesis, will refer to any person who believes that human beings are, in principle and often in practice, free to do otherwise when they act--free in a sense that is not compatible with a deterministic account of human behaviour. A libertarian believes that people really are free, and therefore that determinism--at least with respect to human action--is false. There are certain implications to believing this, since a libertarian distinguishes between mere random or indeterminate occurrences and genuinely free action. The latter is something for which the agent is morally responsible, because the choice of action is wholly up to him. Moreover, since the libertarian believes that reductionistic or deterministic accounts of human behaviour are inherently wrong, he is skeptical of their value as contributions to our understanding of human nature. Depending on what form he thinks scientific explanation must take, he may even believe that a science of

psychology is impossible.

The term *determinist* in this thesis will refer to any person who believes that a true deterministic account of human behaviour can be given, and that such an account is incompatible with the claim that a person sometimes can do otherwise than he does do. A determinist would argue that because free will is an illusion, people are never morally responsible for what they do. I will sometimes refer to a person who takes such a position as a "hard determinist."[1] He is logically committed to the position that nomological theories in general and/or causal explanations in particular will ultimately prove their worth in our quest for the truth. He is at least committed to the idea of the unity of scientific method across the diverse subject matter of the sciences, and he may or may not subscribe to the view that all branches of science will ultimately be reduced to theories of physics or chemistry.

The term *compatibilist* will refer to any person who attempts to reconcile our notions of human freedom with those of universal determinism. In effect, a compatibilist is one who believes that one can speak meaningfully of a person's "choices" or "decisions" as the efficient causes of his acts and the effects of other antecedent events, all of which can be explained (at least in principle) by means of universally applicable nomological principles. Compatibilists are often referred to as "soft determinists." Hard and soft determinists concur on the veracity of causal accounts of human behaviour. The difference between them is that while the former denies the reality of free will, the latter argues that

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[1]The distinction between hard and soft determinism originated with William James in 1884, and has since gained standard usage in philosophical discussions of the free will problem.

it is meaningful to speak of human beings as "free"--but only in the sense that they are often unconstrained or uncoerced by any external force. Moreover, the soft determinist will offer a justification both of moral praise or blame (usually on utilitarian grounds) and of reward or punishment (e.g., in terms of their causal efficacy in modifying human behaviour).

This thesis will deal with beliefs concerning the reality of free will largely in terms of the three positions outlined above. Much more than what has been presented so far needs to be said about what each position entails regarding the nature of man and his ethics, and what implications each poses for the form and the veracity of scientific explanation. We will begin with the case for free will, followed by the arguments for determinism and compatibilism respectively. Such has been the unquestioning bias in psychology that some effort will be spent in laying out the libertarian thesis so as to make it attractive--that is, to show that at the very least, it cannot simply be ruled out of court as mystical nonsense.

While the present topic requires some consideration of issues that normally fall within the domain of moral philosophy, the philosophy of mind and the philosophy of science, an exhaustive review of this literature would be impractical. The choice of ideas presented in the three introductory chapters that follow will be guided by the body of the thesis. I will confine myself to preparing the reader for the various issues that will be encountered there.

II: LIBERTARIANISM

> It is this unwavering, certain consciousness of freedom--a consciousness indifferent to experience or reason, recognized by all thinkers and felt by everybody without exception--it is this consciousness without which there is no imagining man at all.
>
> (Tolstoy, in his postscript to *War and Peace*, 1886)

This chapter examines what it means to believe in the reality of free will and what makes that belief a credible one. There are, of course, the arguments from direct experience. We decide, choose, and do what we choose. We try and sometimes fail. At times we feel proud, at other times guilty or remorseful for what we have done. One wants to say: "*There* is the evidence--we have all this deciding, choosing, and acting, and the subsequent pride or guilt as empirical proof that it makes sense to believe in the reality of free will."

Unfortunately it is not very credible evidence from a strict empirical point of view. The thing that makes us feel so strongly that the choosing and doing were done *freely*--indeed, what gives these activities their character as genuine choosing and doing--is the very thing for which we have no empirical test, no means of demonstrating. What makes the choosing and doing feel free is the conviction that one truly could be choosing and doing otherwise. But the fact is, no amount of choosing and doing can serve as positive empirical evidence that you could have done what you *in fact did not do*. Our main task in this chapter, therefore, will be to examine the grounds upon which the libertarian defends as true the conviction that one could do otherwise when one acts.

It should be noted that there is disagreement over what that conviction is about. To illustrate: there has been a long and often very technical debate among philosophers over the sense of "could" in "I could have done otherwise" (c.f., Austin, 1961; Hudson, 1970; Moore, 1912; O'Connor, 1971; Thomas, 1970; Wiggins, 1973; for the livelier discussions). At root, the debate is over the following. Some claim that "could" has a conditional sense, as in "I could have done otherwise *if* conditions had been other than they were." A conditional "could" is quite consistent with deterministic explanations of our actions, and does not entail the reality of free will. Libertarians on the other hand insist that "could have done otherwise" must be understood in a categorical or unconditional sense. That is, it has to mean: "I really could have done otherwise in that *same* (or an identical) situation!" In that sense, "could" does imply the reality of free will. The focus of this chapter then is on what it means to say "I (categorically) can do otherwise when I act." We will also want to pay close attention to the question: What difference does it make?

A. What Does "I Can Do Otherwise" Mean?

Whether our conviction that we are free to act otherwise than we do has a basis in reality or is mere illusion is a question of fact. Otherwise it would be of little importance. To ask "What does 'I can do otherwise' mean?" is really to ask for an explanation of what is conceived of as a fact. The explanation given will not establish free will as a fact, but it will make it intelligible. Before we begin, however, a note on explanation will be necessary since explanation is involved not only

here but also in connection with scientific judgements.

A note on explanation

Philosophers of science typically distinguish two main traditions in the history of ideas, which differ as to the conditions an explanation must satisfy in order to be scientifically respectable (c.f., von Wright, 1971). The contrast between the two views is usually characterized as "causal *vs.* teleological," or "mechanistic *vs.* finalistic" explanation. These distinctions are undoubtedly familiar to the reader. I will characterize them loosely for now, and more precisely as we move along. Thus, as first approximations: the causal-mechanistic tradition seeks to explain the relationship between events or phenomena by means of causal or nomological laws, while the teleological-finalistic tradition seeks to explain phenomena in terms of means-ends relationships, purposes and goals.

Both traditions have their roots in ancient history, and both have eminent proponents in the philosophy of science at present. Following in the causal-mechanistic tradition in recent years, for example, are such well known and respected thinkers as Carnap, Hempel, E. Nagel, Popper, and Quine. The teleological-finalistic tradition too has been ably represented of late by such notables as Dray, Winch, Anscombe, C. Taylor, and von Wright.

Historically, the account of free will as a reality belongs to the teleological-finalistic tradition of explanation. I do not mean to imply by this that there have been no libertarians who would identify themselves with the causal-mechanistic tradition (Descartes is one who would, and Kant, with some qualification would as well). It is just that their explanations of human free will have been unavoidably teleological. In

general, libertarians both explain and justify human actions in terms of reasons and intentions in a manner that is incompatible with the "covering-law" or "subsumption-theoretic" model of explanation that characterizes the causal-mechanistic tradition. Like Aristotle, who proposed both types of explanation in the first place, libertarians usually conceive of causal and teleological accounts as complementary. The two types are only seen as opposed by those who want to claim that causal explanation is all there is.

This will suffice to identify the type of explanation that is required in exploring the meaning of "I can do otherwise." As we shall see, it is one that conforms closely to our ordinary understanding of ourselves.

A-1. "You can do otherwise" means you have control over what you do

By definition, and accompanied by the "testimony of practical self-consciousness" (Campbell, 1951), the claim "you can do otherwise when you act" implies that you have control over your actions. This sense of control we have over what we do is conveyed in statements like: "Whether I do it or not is entirely up to me," or "It depends on me." The basis for this control is characterized as "will."

The will has been defined in various ways, all of which connote an inherent ability or power to act or move. Aristotle, for example, refers to it as a "moving principle" within the person (*Nichomachean Ethics*, III, $1113^{b}20$; p. 60). Aquinas defines it as a "faculty" and as an "inclination of the intellectual nature to its proper operations and end" (*Contra Gentilles*, IV, 19; in Gardeil, 1956, chap. 9). Descartes, considering it "formally and precisely in itself" wrote that he was "conscious of a will so extended as to be subject to no limits; ...and

which consists alone in our having the power of choosing to do a thing or choosing not to do it" (*Meditations on First Philosophy*, IV; p. 174-75). For Kant, "Will is a kind of causality belonging to living things so far as they are rational...It is able to work independently of determination by alien causes;...and therefore Will is, in all its actions, a law to itself" (*Groundwork of the Metaphysics of Morals*, III; p. 107).

Will, in short, is our explanatory construct for behaviour. It is what gives rise to behaviour. It is a conceptual primitive--unanalyzable, or, as Descartes put it, "indivisible...such that nothing can be abstracted from it without destroying it" (*Op. cit.*; p. 177). Will is not something observable. Rather, it is a construct of an *a priori* that explains why some observable events involving motion are perceived as being qualitatively different from others. Michotte's (1963) investigation of the criteria of application for both the construct of causality and of will (which he called "immanent causality") suggests that we infer the existence of will in certain circumstances in part because of what we observe and in part because that is how the mind works.

The freedom that is said to characterize the will of a human being is a rather special freedom. We do recognize that the behaviour of animals, fish and birds is free: they can run, swim or fly in whatever direction they want. But libertarians do not generally conceive of animals as having a free will.[1] Freedom of movement alone is not a sufficient condition for having a free will. On the other hand we do conceive of human beings as having a free will, even though some of them do not have

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[1] Some, however, may want to exclude certain very intelligent dogs, cats, chimpanzees and dolphins.

the freedom of action that the rest of us have.[2] We think their will is free regardless of how constrained they are, because constrained or not, they are *persons*.

Like the explanatory construct "will," the construct "person" is transempirical. I infer that you are a person, and you infer that I am. Neither of us knows how to tell for sure. According to most recent accounts (e.g., Anscombe, 1957; Dennett, 1978; Frankfurt, 1971; Macmurray, 1957; Mischel, 1969), one qualifies for personhood if one has what are called *second order intentions*. The only beings who can have second order intentions are those who are rational and conscious both of external facts and of their consciousness of them. They are beings to whom it is appropriate to ascribe intentional predicates such as "he knows, believes, doubts, desires, fears," and so on. To say that a person has second order intentions means that he can take a particular intentional stance toward his own intentional stance toward something else. For example, he can know that he wants to do something; he can doubt that he would enjoy doing something else; he can wish that he preferred to do yet a third thing. It is by virtue of the fact that we are persons--rational beings with second (or higher) order intentions--that our will is free. As Frankfurt (1971) put it, we are free to will what we want to will, or, to have the will we want.

In modern psychology this concept of will as an inherent ability of rational beings to control and direct what they do towards their own ends has not been popular. James (1890), Woodworth (1906), and McDougall

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[2]Emprisonment, blindness, amputation, even quadriplegia do not rule out a person's having a free will, though granted there may be severe limitations on how he exercises it.

(1908) were among the last to discuss it seriously as such (but see Bakan, 1975; Boring, 1957; Gilbert, 1970; Hebb, 1958; Koch, 1960; Westcott, 1977, for both laments and justifications).

Among social psychologists, recent research and theorizing about the significance of concepts such as "personal causation" (e.g., DeCharms, 1968, 1976; Harré & Secord, 1958; Heider, 1958) and "self-efficacy" (e.g., Bandura, 1978) as a "primary human experience" perhaps come closest to being investigations of our ordinary understanding of will. Indeed these lines of research have been partly responsible for some rather interesting developments in the larger domain of social psychology that concerns itself with the "naive analysis of action." I will say more about the thrust of these developments later.

A-2. Having a free will means that your actions are voluntary

Historically, Aristotle was the first to offer a systematic analysis of human action. In book II of the *Nichomachean Ethics*, he draws a fundamental distinction between actions that are *voluntary* and those that are *involuntary*. He defines involuntary action as that which occurs under conditions of compulsion or by mistake. His definition of compulsion is strict: actions are involuntary when their performance is forced by external circumstances while the agent contributes nothing. As for mistakes, Aristotle maintains that only those actions for which a man is "pained or repentful" are "involuntary due to ignorance," and even then, only when the action is performed out of the person's ignorance of the "particular circumstances of the action"--for example, in a situation where "one might want to touch a man as people do in sparring and really wound him" ($1111^{a}14$; p. 52).

On Aristotle's account, all voluntary acts are done freely, and, in the categorical sense, could be done otherwise or not at all. Thus, even though he allows that a person's "internal desires or appetite" may influence him against his better judgement to act badly, Aristotle held that the person nevertheless acts freely:

> For where it is in our power to act, it is in our power not to act, and vice versa; so that if to act where this is noble is in our power, not to act, which will be base, will also be in our power. ($1113^{b}7$; p. 59)

One of the distinctions which Aristotle makes in the *Nichomachean Ethics* ($1174^{a}13$ff.), as well as in *De Anima* ($417^{a}16$; $431^{a}6$) and the *Physics* ($201^{b}31$; $257^{b}8$) is between actions and movements. A movement, he said, is always carried out for the sake of something else and is therefore "incomplete," whereas an action may be "complete" insofar as it contains its end or final cause in itself, and is therefore carried out for its own sake. The interpretation of this distinction has been problematic. At times it seems as if Aristotle is referring to physically distinct entities (c.f., Hamlyn's 1953 discussion). Had E. C. Tolman (1932, 1959) addressed Aristotle's thinking on the matter, for example, he might well have remarked that it corresponds to his own distinction between "molar" and "molecular" behaviour.

Analytic philosophers, however, are now in general agreement that the distinction is a conceptual rather than material one, having to do with the meaningfulness or intelligibility of actions as opposed to movements. Melden (1961), for example, illustrates this conceptual interpretation by noting the difference between "sticking one's arm out a car window" and "signalling a left turn." The former describes a movement, and is

meaningless in and of itself. The latter describes an intentional act, where the reason (purpose, end, final cause) for its performance is contained in its description as an act of signalling.

I raise the distinction for two reasons. First, a number of writers have argued that while movements can be explained in terms of causal mechanisms, actions are more appropriately explained psychologically in terms of the person's reasons for acting (e.g., Anscombe, 1957; Braybrooke, 1965; Chisholm, 1957; Dray, 1957; Hamlyn, 1953; Melden, 1961; Mischel, 1969, 1975; Taylor, 1964; Winch, 1958). Explanations which give reasons are commonly understood as deploying a system of explanatory concepts that differs sharply from that of the natural sciences. It appeals to the agent's conception of things, to his beliefs, aims, intentions and desires, and can only be understood by taking the point of view of the agent to which such unobservable psychological states are ascribed. The type of inference involved is thus fraught with epistemological difficulties. Consequently, there has been considerable debate over the scientific acceptability of reason explanations and whether or not they can be reduced to a species of causal explanation. The issues are complex and I will discuss them in more depth below, under the heading "What difference does it make?"

Second, psychologists have been slow to acknowledge any distinction between action and movement. This resistance is due primarily to their identification of things "mental" with things "private," and to their adherence to the once prevalent doctrine of logical positivism which requires that scientific explanations be expressed in a "physical thing" language that does not involve interpretation from the agent's point of

view. This has effectively ruled out "action" as an acceptable topic in scientific psychology.

Accordingly, the tradition in psychology has been to interpret the problem of volition as one of discovering the mechanisms (conceivably neurophysiological) involved in the production of voluntary as opposed to involuntary *movement* only (c.f., Kimble & Perlmutter, 1971, for a review). In keeping with this approach, the terms voluntary *vs.* involuntary have been interpreted such that they refer to movements which are "consciously intended" as opposed to those which are either "automatized" or "reflexive." The discrepancy between this and Aristotle's original use of the terms becomes intelligible when we consider that Aristotle was concerned with distinguishing voluntary and involuntary *actions*--that is, actions that a person could have done otherwise or not at all, as opposed to those that are either done by mistake or externally compelled such that the person is forced to act "against his will."

That this is not a mere matter of interpretive hair-splitting will be obvious from the following example. Oedipus was forced off the road by a stranger. That is, he drove into a ditch *involuntarily*. Some of the movements he made in the process were undoubtedly automatic, some even reflexive perhaps. But the bulk of them would have been consciously directed (e.g., towards keeping the chariot upright, the horse in control, etc.). The point is, the voluntariness of the movements that constitute the act of driving into a ditch is incidental. What makes his act involuntary is the fact that Oedipus was forced into the ditch. It was not his intention to end up there.

Oedipus then kills the stranger. Let us say that he does so

voluntarily. Again, some of the movements involved are involuntary, others not. Saying that the act is voluntary refers to the fact that it was *his intention* to kill the man and he could have done otherwise. The stranger, however, turns out to be Laius, his father. Oedipus had not intended to kill his father. Therefore, he did *that* involuntarily--as Aristotle would say, "out of ignorance of the circumstances of the act." The rest of the story hardly bears telling to make the point. What proportion of his movements were done consciously, automatically or reflexively is less relevant than whether or not Oedipus acted as he intended to. He married Jocasta voluntarily, of his own free will. But marrying his mother? That was involuntary--another mistake.

A-3. Having a free will means that you can decide or choose what you will do

Having delimited the class of voluntary action to include those acts which are not externally compelled or done by mistake, Aristotle then makes a finer distinction. There are some things we do that are done by choice. They are voluntary acts, but not all voluntary acts are done by choice. That is, what is done by choice is a proper subset of what is done voluntarily. To illustrate the distinction, Aristotle suggests that although in both instances the individuals act voluntarily, "...the incontinent man acts with appetite but not with choice, while the continent man on the contrary acts with choice" (1111^{b}1; p. 53).

Note Aristotle's repeated assertion that acting according to one's desires or appetite is voluntary in the sense that one could have done otherwise. This is generally understood as implying that actions are *not* the uniquely determined outcome of one's internal (presumably

neurophysiologically based) impulses. Aquinas, writing in the thirteenth century, explained why he (and Aristotle) believed that this was so. The human will, he reasoned, is governed--not by some efficient or material cause--but rather according to some universal, rational principle (e.g., of truth and goodness). In daily life, however, we do not encounter absolute truth and goodness. What we are presented with are particular truths or goods. These particulars are *contingent*: that is, their truth or goodness is dependent on our judging them as such on the basis of some universal or ideal standard. Aquinas expressed it this way:

> Man acts from judgement, because by his apprehensive power he judges that something should be avoided or sought. But because this judgement in the case of some particular act, is not from a natural instinct, but from some act of comparison in the reason, therefore he acts from free judgement and retains the power of being inclined to various things. For reason in contingent matters may follow opposite courses, as we see in diallectical syllogisms and rhetorical arguments...And forasmuch as man is rational, it is necessary that he have free choice.
> (*Summa Theologica*, I, Q.83, Art. 1)

Our internal desires and inclinations are among the contingent, particular goods that we confront in daily life, and therefore there is nothing irresistible or compulsory about them. We can either act on them when we experience them, or we can evaluate them in terms of some ideal, rational standard or principle. The genuineness of the alternative makes either course a voluntary one: one could do otherwise.

If you choose the latter, however, you act with choice which involves "a rational principle and thought" (*Nichomachean Ethics*, $1112^{a}11$; p. 55). Choices, according to both Aristotle and Aquinas, are the outcome of rational deliberation, which is the central activity involved in what is commonly known as "practical reasoning." Aristotle was fairly strict in

his definition of deliberation. He held that we do not deliberate over things that cannot be produced by our own efforts. Moreover, the object of deliberation is always the means to some end, never the end itself. When a person deliberates over alternative means to some desired end, he makes a practical judgement using his intellect to determine the means he will adopt, and concurrently chooses it through an act of will.

From the libertarian's point of view, choosing one's actions is a paradigmatic expression of personhood. It entails all that we have considered above: first, that the agent is the type of being who takes an intentional stance toward objects or states of affairs (be they real or imagined)--he believes something, desires something, and so on. Second, it entails that the agent is rational and self-aware, the type of being who can take his own intentional stance towards things as the object of his awareness and will. He can judge the veracity of his beliefs and the value of his desires, he can reason that what he wants is worth striving for or not, and thereby determines his own ends and goals. Third, it entails that he can deliberate as to the course of action that would be most appropriate in attaining or producing the object or state of affairs that he wants. And from this it follows that the course of action he chooses is best understood and explained teleologically in terms of the agent's reasons for choosing it.

In short, the libertarian's position is that belief in the reality of free will is not merely the product of subjective sensation. Rather, it follows from our understanding of ourselves as persons. That is, the reality of free will is entailed by our *a priori* conception of our own nature--a conception, moreover, that is at the heart of our explanations

of everything that we do. The libertarian wants to say, as Dr. Samuel Johnson did, "Sir, we *know* our will is free, and there's an end on't!" The conviction is that strong. Unfortunately, he cannot tell us how we can know it. And he is therefore forced to admit that our conception of our own nature could be wrong, and the apparent reality of free will an illusion.

B. What Difference Does It Make?

We must now consider the broader implications of belief in the reality of free will. I will focus on what are generally considered to be the two most crucial domains affected by claims that free will is real or illusory. The first concerns our conceptions of moral or ethical conduct, the second concerns our conceptions of scientific explanation.

B-1. Free will and moral responsibility

One of the strongest claims made by the libertarian is that determinism rules out morality; it makes all questions of right and wrong invalid, and denies the existence of moral responsibility. As William James (1884) put it,

> Calling a thing [morally] bad means, if it means anything at all, that the thing ought not to be, that something else ought to be in its stead. Determinism, in denying that anything else can be in its stead, virtually defines the universe as a place in which what ought to be is impossible... What interest, zest or excitement can there be in achieving the right way unless...the wrong way is also a menacing and imminent way? And what sense can there be in condemning ourselves to taking the wrong way unless we need have done nothing of the sort?...I cannot understand regret without the admission of real, genuine possibilities in the world. Only *then* is it other than a mockery to feel, after we have failed to do our best, that an irreparable opportunity is gone from the universe. (*The Dilemma of Determinism*, 1956, p. 161-176)

The argument is known as "the principle of alternate possibilities." It asserts that a person cannot be regarded as morally responsible for what he does unless he could have done otherwise (c.f., Frankfurt, 1969; O'Connor, 1971). As far as incompatibilists are concerned--both libertarians and hard determinists alike--the principle of alternate possibilities expresses a relation of necessary conditionship between free will and moral responsibility. That is, it is taken to imply that the reality of free will is a necessary condition for justifiably holding a person morally responsible for his actions.

The idea that free will is a necessary condition for moral responsibility has been with us since antiquity. Even the Stoic philosophers--thoroughgoing determinists that they were--were forced to make room in their fatalistic cosmology for the reality of free will in order to secure a basis for their ethics. In a universe where "...the passage of time is like the unwinding of a rope, bringing about nothing new...[and where] Nothing occurs which was not to be" (Cicero, *De Divinitate*), the Stoics had to allow that man must nevertheless be free to accept or reject (but not alter) the inevitable unravelling of destiny. It was on the basis of his having this genuine, albeit limited, attitudinal freedom that the Stoics judged a man to be evil (if he resents what happens) or morally good (if he assents to whatever happens to him with the passionless resignation of the ideal Stoic sage).

It was Aristotle, however, some 300 years B.C., who first analyzed the necessary conditions for moral responsibility and showed that in practice we do assume the principle of alternate possibilities as the basis for all moral judgements. As he points out, we only praise or

blame actions that are voluntary, while those that are involuntary are pardoned or even pitied. Aristotle treated virtually all facets of the attribution of moral responsibility. He made subtle discriminations between actions done by mistake as opposed to those done in ignorance; he distinguished acts that are externally compelled in the strict sense from those done under conditions of threat or coercion; and he entertained a variety of mitigating circumstances that might influence whether a person is praised, blamed or pardoned for what he does. And throughout, we are struck by the necessity of one condition only: however subtle the distinctions we can make, however lofty the principles on which we base our moral judgements, it all ultimately hinges on whether or not the person acts of his own free will.

The principle of alternate possibilities became the basic premise of Christian ethics during the Middle Ages as well. In Augustinian thought, for example, man is held responsible for his actions by God. St. Augustine (354-430 A.D.) argued that if we did not have free will, God would be unjust to condemn us for sinning. But God is just, therefore He created us with a free will, knowing that we cannot act morally unless we choose to, and unless it is also possible for us to refrain from acting rightly and sin instead (c.f., *De Libero Arbitrio*, II). Later, St. Thomas Aquinas argued in a similar vein that the denial of the reality of free will "...is heretical, for it removes the basis of merit and demerit in human acts...it is not only contrary to faith but it overturns all the principles of moral philosophy" (*Quaestiones Disputatae: De malo*, 6).

Note: the claim that determinism overturns all the principles of moral philosophy depends on one's conception of morality. After all, a

number of influential moral philosophers have been determinists (e.g., Ayer, Broad, Hobbes, Hume, J.S. Mill, Nowell-Smith, Schlick, Sidgwick, Spinoza, and Stevenson, to name a few), and at least the compatibilists among them have tried to justify moral responsibility within a deterministic framework.

What is at issue in the domain of ethics between libertarians and determinists--if I may put it baldly and a little oversimply--is the objective reality of morality. Determinists are logically committed to a doctrine of subjectivism. They conceive of moral values as derived from man's desires and inclinations: we perceive as "good" those things which are instrumental in giving us pleasure, and as "evil" those things which cause us pain or are otherwise aversive. Morality is thus made relative to our needs and circumstances, and can be subsumed under deterministic laws. We will postpone further discussion of this doctrine of moral subjectivism until the chapters on determinism and compatibilism.

In contrast, the libertarian tends towards moral realism. It is this conception of morality as an objective set of principles of good conduct that requires the reality of free will. Following in the tradition that began with Socrates and Plato and further advanced by Aristotle, the libertarian views moral ideals like "goodness" as objective and absolute. Aristotle, for example, expressed the objectivity of ethics in terms of some final end--a moral goal which ideally ought to be pursued, "that which is always desirable in itself and never for the sake of something else" (*Nichomachean Ethics*, $1097^{a}15$; p. 11).

Kant, in the *Groundwork of the Metaphysic of Morals* (1785) makes a similar distinction between "hypothetical" and "categorical" imperatives,

the former applying to nonmoral actions that are good solely as a means to something else, the latter applying to a moral act that is done for its own sake, or done as an end in itself. Moore, in his *Principia Ethica* (1903), characterizes moral action as "intrinsically good." Both regard the moral principles by which we judge and guide our conduct as applying universally and impartially--in short, as objective standards which are to be followed "as a matter of principle."

Take altruism for example. By definition, an altruistic act is one which is done out of unselfish regard for the welfare of someone else--done purely because that is the morally right thing to do. The moral goodness of the act is a sufficient reason--indeed, it is the *only* reason--for doing it. Give the act any other explanation, as in "He looked out for the welfare of others because he wanted recognition and appreciation," or "because a certain biochemical process took place in his brain," and it can no longer stand as a genuinely altruistic act. The same is true, incidentally, of other moral principles (e.g., of generosity, honesty, and so on).

The reality of free will is a necessary condition for doing something purely because it is the right thing to do. From the moral realist's point of view, our moral judgements have no claim to validity unless a person has it in his power to act solely for moral reasons when he might just as well satisfy his own immediate inclinations. That is the *essence* of moral action. Take away the reality of free will, and with it go any grounds for claiming that there is any such thing as genuine altruism, real honesty, true generosity, and so on.

Aristotle, Aquinas, Kant and Moore were of the opinion that attempts

to define moral value instrumentally, that is, on the basis of the satisfaction of desire or the accretion of pleasure, effectively destroys morality altogether. Kant called such attempts "heteronomy" to contrast them with genuine morality based on the "autonomy of the will." Moore referred to them collectively as the "naturalistic fallacy." More recently, Campbell (1951), following in the same tradition, argued that the reality of free will is a necessary condition for the validity of the belief that a person can do what he conceives to be his "moral duty"--especially when it conflicts with "the expression of that system of conative and emotive dispositions which we call his 'character'" (p. 463). It is precisely in such situations of moral conflict, he maintains, when duty clashes with one's strongest desire and the person nevertheless rises to duty and "transcends his character as so far formed" that morality attains its true meaning and free will its subjective certainty.

B-2. Free will and scientific explanation

While the reality of free will appears to be essential both to the validity of our moral concepts and to the justification of ascribing moral responsibility to people for their actions, it has been the source of tremendously difficult metaphysical and epistemological problems for all domains of scientific inquiry. For however we conceive of ourselves, we must take into account the fact that we are parts and products of this universe in which we live. To consider that fact is to burden oneself with questions about how our understanding of the nature of a human being relates to our understanding of other natural phenomena.

We are, in the first instance, physical entities--as far as we can tell, made of the same stuff as everything else. If it is true that we

are *free* physical beings, then it would seem only logical to expect that our explanations of physical phenomena in general should somehow incorporate, permit, or at any rate be consistent with that fact.

On the whole, however, the physical sciences have suggested a view of the nature of physical phenomena that is logically inconsistent with belief in the reality of free will. The theories of classical physics feature exceptionless functional dependencies relating the states of physical systems as follows: given the state of a physical system at one or more times, its state at other times is uniquely determined (Grunbaum, 1957). Explanations derived from such theories subsume what is to be explained under some law or lawlike regularity (Hempel, 1966; Nagel, 1961; von Wright, 1971).

Accordingly, there have always been libertarians who have argued against the validity of causal-mechanistic explanations of physical phenomena on the grounds that a deterministic physics rules out the reality of free will. Since the existence of free will seems to be an incontrovertible fact, they argue, there must therefore be indeterminacy in the workings of the universe: at some fundamental level, genuine possibility must exist.

We know that the *doctrine of physical indeterminism* has had adherents since ancient times. Epicurus (340-270 B.C.), for example, held that the atoms which make up our universe deviate spontaneously or "swerve" in their course. He argued that the margin of indeterminacy introduced into the universe by this kind of irregular and unpredictable motion is what makes it possible for human beings to influence to some extent the course of their lives. During the past century, William James (1894) and

the philosopher-physicist Charles Pierce (1892) argued in favour of a revival of that view. It was Pierce who contended that:

> By supposing the rigid exactitude of causation to yield, I care not how little--be it but by a strictly infinitessimal amount--we gain room to insert mind into our scheme, and put it in the place where it is needed, into the position which, as the sole and self-intelligible thing, it is entitled to occupy, that of the fountain of existence; and in so doing we resolve the problem of the connection of soul and body. (1892, p. 12)

Claims concerning the validity of indeterministic conceptions of physical processes gained plausibility early in the present century following the development and introduction of Quantum Theory in the physical sciences. Not surprisingly, at least some philosophers and scientists have since argued that belief in the reality of free will is justified on the grounds that modern physical theories characterize a certain range and class of subatomic events indeterministically (e.g., Eccles, 1973; Eddington, 1928; Jeans, 1925).

There is little more than can be done here than to hint at the complexity and controversiality of the issues involved. It is generally acknowledged, for example, that Quantum Mechanics is indeed an indeterministic theory. However, the interpretation of the basis for this indeterminacy has been a subject of considerable debate (c.f., Bridgman, 1958; Grunbaum, 1957; Margeneau, 1967; Putnam, 1965; Scriven, 1957). On the one hand, a number of eminent physicists (e.g., Born, DeBroglie, Einstein, Planck) have maintained a thesis of "limited measurability." That is, they have maintained that any indeterminacy or "uncertainty" in quantum theoretic formulations is due to the fact that the theory provides an incomplete (technically speaking, an epistemically limited)

characterization of what in reality are completely determined microphysical events. The indeterminacy, in short, is in our *knowledge* of the state of physical systems, not in the systems themselves.

On the other hand, many physicists (e.g., Bohm, Bohr, Heisenberg, Schrodinger, Wheeler) have argued that the thesis of limited measurability depends for its validity on unwarranted assumptions (for example, about the disturbance in physical systems created by taking measurements of it, and about the existence of "hidden variables") that are not derivable from Quantum Theory itself. Their position, known as the "Copenhagen Interpretation," is that Quantum Mechanics provides a complete description of the state of physical systems at the subatomic level, and therefore, that indeterminacy in microphysical events is genuine and irreducible.

Although the Copenhagen Interpretation of Quantum Theory has gained acceptance as the "orthodox view" (c.f., Bridgman, 1958; Grunbaum, 1957), its legitimacy remains problematic. One source of difficulty, for example, is that it introduces serious anomalies into the explanation of macrophysical events (see Putnam, 1965, for a fascinating account). Moreover, even if the view that subatomic events are genuinely indeterministic turns out to be correct, and Quantum Theory does offer the necessary exemption from physical determinism that belief in the reality of free will seems to require, we will still be far from having explained anything. Indeed, it has been observed that to ground the reality of free will on the existence of indeterminate or essentially random microphysical events is to pose some rather difficult empirical and conceptual problems (c.f., Grunbaum, 1957; Immergluck, 1964; O'Connor, 1971; Ofstad, 1967; Westcott, 1977).

The central empirical problem is that we would require a detailed

explanation of how the occurrence of unpredictable events in the atoms making up a human brain can account for the brain events which correspond to "choices," "beliefs," "desires," "intentions," "moral prescriptions," and so on. Although at least two speculative neurophysiological explanations of this sort have been offered (Eccles, 1973; Sperry, 1977), there is reason to doubt that such an account is either practically or in principle realizable. The problem is, a neurophysiological account of this type entails the assumption that psychological events can be fully characterized in terms of brain events. We will consider some reasons for doubting this assumption later.

Even if we assume for the moment that the relevant neurophysiological explanation is realizable, there remains the conceptual problem of showing how moral responsibility can be secured by basing free will on spontaneous, essentially random, subatomic events. It has been pointed out in several places that while physical indeterminacy may be a necessary condition for the existence of freely willed actions, it is certainly not a sufficient one (c.f., Margeneau, 1967; O'Connor, 1971; Ofstad, 1961, 1967; Scriven, 1957). If it were, responsible choice, decisions and acts would be reduced to sheer capriciousness.[3] But morally responsible decisions and actions are not random or haphazard. They are usually thought of as consciously and rationally directed, and from that standpoint are not even unpredictable. As Margeneau (1967) expressed it, "Human freedom involves

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[3]This 20th century debate parallels a much older one. In medieval times, Scholastic philosophers often cited indifference as the defining characteristic of free will (*liberum arbitrium indifferentiae*). However, Aquinas, and later Descartes, showed how choices based on indifference, being essentially random, were no more subject to moral praise or blame than completely determined ones (c.f., Gilson, 1913; Ofstad, 1961).

more than chance: it joins chance with *deliberate choice*...Insofar and so long, as science can say nothing about this latter active, decisive, creative element, it has not fully resolved the problem of freedom" (p. 150).

I trust the dilemma we are in is clear: when we consider the reality of free will in the cold light of theoretical physics, we find ourselves caught between the devil and the deep blue sea. Physical events, states and processes are either completely determined, or they are not--either free will is an illusion, or it ultimately reduces to purely chance occurrences. Neither state of affairs satisfies what we have in mind when we think of ourselves as free.

Brute common sense tells us that there is more to the whole affair than that. We are not merely physical entities, we are biological organisms. To be sure, it has long been an ideal of science to subsume all natural phenomena under some comprehensive physical theory. And if that ideal were ever to be realized, the question of the reality of free will might well turn out to be a matter of those two alternatives (i.e., illusion *vs.* pure chance). Still, there have always been philosophers and biologists of unquestionable competence who have maintained that the subject matter and hence the logic of explanatory concepts in the biological sciences defy characterization in terms of the theories of physics and chemistry. And with their contentions comes a whole new set of considerations with a bearing on belief in the reality of free will.

At issue is the validity of the reductionist thesis that biology and all other "special branches" of science will someday be subsumed by physics and chemistry. Those who deny the possibility of reduction (e.g.,

Bergson, 1921; von Bertallanffy, 1967; Haldane, 1931; McDougall, 1929; Polanyi, 1958; E. S. Russell, 1930; Whitehead, 1947; Woodger, 1930) generally subscribe to some variant of the *doctrine of emergence*. They claim that biological phenomena have a *prima facie* distinctive character. Consider, for example, Polanyi's (1958) assertion that:

> Physical and chemical knowledge can form part of biology only in its bearing on *previously established shapes and functions*; a complete physical and chemical topography of a frog would tell us nothing about it as a frog unless we knew it previously as a frog (p. 342).

Before we examine the substance of the emergentist claim that biological shapes and functions cannot be subsumed under physicochemical terms and laws, we must be clear as to what is involved in the reductionist thesis. Strictly speaking, reductionism asserts a type to type correspondence between the terms and explanatory statements of any branch of science and those of a more basic science such as physics or chemistry (Fodor, 1975). Invariably, the science that is to be reduced contains theoretical terms (representing potential "emergents") that are absent in the physical sciences. Accordingly, suitable assumptions and principles have to be introduced in order to relate what is represented by terms in the one science to things and processes already represented in the other. Once this condition of connectibility is met; a condition of derivability must be satisfied. That is, all the explanatory statements of the reduced science must be logically derivable from the laws and coordinating definitions of the reducing science (Nagel, 1961).

The nature of the coordinating definitions between the two sciences is considered crucial in satisfying the condition of derivability. They must have the status of laws and must contain theoretical terms from both

the reduced and reducing science. Whether or not these "bridge laws" express *identity* relations between theoretical constructs in the two sciences has been a much debated issue. It is generally agreed, however, that they must express complete *coextensivity* between phenomena described in the reduced and the reducing science (c.f., Fodor, 1975; Hempel, 1966; Macnamara, in prep.).

The logic of an interscience reduction thus conforms to what is generally known as the "covering-law" or "subsumption-theoretic" model of explanation (Nagel, 1961; von Wright, 1971). It is deterministic in structure, and explains phenomena causally--that is, in terms of the (e.g., physicochemical) conditions sufficient for their occurrence. The reductionist thesis is incompatible, therefore, with belief in the reality of free will, and if true, literally rules it out. It follows that the validity of libertarianism depends on the falsity of the reductionist's claims.

Incidentally, in addition to the formal requirements of connectibility and derivability, an interscience reduction is expected to satisfy certain nonformal requirements as well. For example, it must be a significant reduction. It must "illuminate" us regarding the nature of phenomena that previously belonged in a special category. Ideally, the laws and assumptions of the primary science are expected to yield a unification of formerly unrelated laws and theories in the special science, and lead to the discovery of new laws. By implication, advances in the primary science are expected to yield corresponding advances in the reduced one.

There is unanimous agreement among philosophers of science that no fully satisfactory reduction of a life science to physics or chemistry

has yet been achieved. What is not agreed upon is whether it *can* be achieved. And that is a crucial issue where belief in the reality of free will is concerned. It is not enough to base the validity of the doctrine of emergence or the reality of free will on the present practical impossibility of reducing biological theories to physicochemical ones. The relevant reduction must be demonstrably impossible in principle.

Emergentists maintain that it *is* impossible in principle. In general, they base their claim on the notion that biological entities consist of parts and processes that are organized hierarchically and operate as an integrated whole. Consequently, they argue, properties emerge in such systems at higher levels of organization that are not reducible to (i.e., neither connectible to, nor derivable from) physicochemical accounts of their component parts.

As against this, proponents of the unity of science contend that the fact that organisms legitimately can be conceived of as hierarchically organized systems does not constitute an "in principle" case against the validity of reductionism. The doctrine of emergence, they suggest, only holds relative to some specific body of theoretical propositions in the physical sciences. The fact that many biological phenomena cannot be subsumed by physics or chemistry at present does not preclude the possibility that an ideally completed physicochemical theory may someday provide the statements from which currently "emergent" phenomena can be deduced and thereby explained.

It is not simply a matter of the irreducibility of the terms of a biological theory however. There is also the matter of the reducibility of its explanatory statements. Emergentists maintain that unlike

physicochemical processes, organic processes and behaviour are characteristically functional or purposeful. For example, they are understood as being directed towards the maintenance of the organism as a whole, and towards its increasing differentiation and hierarchical integration. Because of the manifest goal directedness and functional nature of such fundamental organic processes, the biological sciences are commonly regarded as requiring a distinctive category of teleological explanation. According to emergentists, teleological accounts are uniquely appropriate to the study of systems whose total behaviour cannot properly be construed as the product of the activities of their component parts.

Teleological explanations in biology can be distinguished from nonteleological ones by the presence in the former but not in the latter of terms like "the function of," "the purpose of," "in order that," and so on (e.g., "The function of kidneys is to eliminate various waste products from the bloodstream."). It is generally agreed that before a reduction of a biological theory to a physicochemical one can occur, it must first be shown that teleological explanations can be reformulated, without loss of asserted content, into nonteleological ones (Nagel, 1961; von Wright, 1971).

The question of whether they can or not is both highly technical and controversial in the philosophy of biological science. To date, it remains unresolved. On the one hand, cybernetic theorists, with their notions of "negative feedback" and "steering-" or "homeostatic mechanisms," have done much during the past five decades to extend the causal-mechanistic model of explanation into several areas of the

biological and behavioural sciences. Their success has lent plausibility to the claim that what appears to us as purposeful organic activity can be adequately explained in terms of concatenations of complex mechanisms which influence one another in a strict causal manner. The whole, in short, can be analyzed in terms of the mechanical operations of its parts. This in turn has bolstered the belief that the reduction of biological theories to a physicochemical one may be possible in principle.

On the other hand, organismic biologists contend that mechanistic and reductionistic analyses--while perhaps adequate for the study of self-regulatory processes which maintain the organism in steady states--cannot possibly capture the genuine teleological character of development, growth, and reproduction. They claim, for example, that while it may be possible to provide a detailed description of the physicochemical composition of a fertilized egg, it is nevertheless impossible to explain mechanistically the fact that a fertilized egg normally segments. Indeed, it is sometimes claimed that processes involved in the growth and development of a living system defy a physicochemical reduction because by their very nature they appear to contradict the most fundamental physicochemical laws (e.g., of motion and thermodynamics; c.f., von Bertallanffy, 1967; Nagel, 1961; E. S. Russell, 1930; Whitehead, 1947).

Where does all this leave the libertarian? Suppose the emergentist is right: biology does not reduce to physics or chemistry. If he is right, then he will have satisfied a necessary condition for the validity of belief in the reality of free will. But he will not have provided sufficient grounds. For even though irreducible, a biological theory might nevertheless be deterministic in structure. And if such a theory

accounted for human behaviour in any valid sense, then free will could not be considered real.

What the emergentist has not provided, in short, is any solid basis for believing that teleological (i.e., functional) explanations in biology are *incompatible* with causal-mechanistic ones. Evolution theory, for example, cannot be reduced to physics or chemistry. However, adaptation in nature as the result of natural selection is typically understood in deterministic terms: the validity of our explanation of the adaptive function of biological changes depends on the "nomic" or lawlike connection (a necessary or universal relation) between a particular evolutionary change and its outcome--namely, the survival of the species. In recent years, the term *teleonomy* has been used by several authors to refer to functional explanations in biology which depend on nomic connections and therefore conform to the subsumption theory or covering-law model of explanation (e.g., Ayala, 1970; Campbell, 1974, 1975; Mayr, 1965; von Wright, 1971). It is Campbell's belief, for example, that

> ...laws of biology, psychology, and sociology exist which are not described by the laws of physics and inorganic chemistry. These "emergent" laws are *compatible* with the laws of physics and chemistry, *but not derivable* from them. (1975, p. 1104)

If the irreducible, deterministic laws that Campbell (1975) refers to do in fact exist, then it is clear that the falsity of reductionism does not by itself provide a logically sufficient basis for the claim that free will is real. The libertarian, however, need not stop at conclusions derived from debates in the philosophy of biology. He can raise the debate a level: we are not merely biological organisms, we are organisms with a mind. Because we possess a mind, our actions are to be

understood as having a distinctive character relative to organic processes and activities in general. We infer the existence of conscious aims and intentions when observing actions but not when observing other behaviours, however functional they may be. Compare, for example, "John went to the corner to meet Mary," and "Kidneys eliminate wastes from the bloodstream." We infer that John did so intentionally, but not that kidneys do.

Before we go any further, it should be noted that the question of the validity of reductionism can be--and of course has been--posed with regard to the explanation of mind: are mental phenomena essentially distinct from physical ones (such as those occurring in brains, for example)? Arguments that they are have been grounded on the doctrine of emergence or alternatively on the doctrine of dualism. The former, wherein mind is understood as an emergent property in human beings, has its roots in the Aristotelian conception of the "psyche" or "soul" as the nature, or, as Aristotle preferred to express it, the *form* of a human being. The latter, which conceives of mind as an immaterial *substance* that is separate and distinct from matter, owes its origins to Descartes, and falls within the wider tradition in metaphysics which dates back to the Platonic doctrine of ideal forms.

The irreducibility of mind to matter has also been grounded on the notion of intentionality, which is understood as being the chief distinguishing characteristic of mental as opposed to physical phenomena. We owe our modern conception of intentionality to Franz Brentano, who wrote:

> Every mental phenomenon is characterized by what the Scholastics of the Middle Ages called the intentional (or mental) inexistence of an object, and what we might call, though not wholly unambiguously, reference to...

> an object...Every mental phenomenon includes something as object within itself...In presentation something is presented, in judgement something is affirmed or denied, in love loved, in hate hated, in desire desired, and so on...This intentional inexistence is characteristic exclusively of mental phenomena. No physical phenomenon exhibits anything like it. We can, therefore, define mental phenomena by saying that they are those phenomena which contain an object intentionally within themselves. (1874; 1973, p. 88-89)

In recent years, intentionality (in the broad sense that Brentano defined it) has occupied a focal position in the philosophy of mind and the theory of action (c.f., for example, Anscombe, 1958; Boden, 1970, 1973; Chisholm, 1957, 1967; Irwin, 1971; Madden, 1976; Mischel, 1964; Peters, 1969), in the philosophy of science (e.g., Dennett, 1971, 1978; Deutsch, 1960; Harré, 1970; Mischel, 1975; Quine, 1960; C. Taylor, 1964, 1970; von Wright, 1971), and most recently in the methodological debates of cognitive psychologists (e.g., Fodor, 1978, 1980; Macnamara, in prep.; Pylyshyn, 1980). Many agree that intentionality constitutes a serious problem for the reduction of theoretical statements in psychology to those of physiology, neurochemistry, or any other theory in the physical or biological sciences.

There are at least two clearly discernible sources for the difficulty. One is that intentionality embraces a unique set of relations between the mind and the extramental--relations that are not embraced by the physical sciences. A stick, for example, may be "longer than," "denser than," or "to the left of" another. But it can never enter into the kind of intentional relationship with another stick that *you* do when you "look at," "taste," "feel," "smell," "remember," "imagine," "think about," or "refer to" a particular stick.

The second source of difficulty has to do with a basic feature of intentional relations: everything depends on how the agent represents the objects of his intentions to himself. Consider Fodor's (1975) example of how an "economic exchange" cannot be explained in physicochemical terms. What qualifies (a) as an economic exchange in general, or (b) as a specific type of economic exchange in particular (e.g., a "loan" *vs.* a "sale" *vs.* a "debt payed"), and (c) what qualifies as acceptable economic goods to be exchanged, all depend entirely on the interpretations of the extramental events by the giver, the receiver, and possibly other observers. A country doctor accepts potatoes and eggs as payment for treatment of the farmer's son. An urban housewife pays the garage attendant for a full tank of gas by handing him a plastic card. A child places a coin on the counter for a candy bar. The physical instantiations of economic exchanges are potentially infinite in number, because what makes them all economic exchanges has nothing to do with their physicochemical composition. It has everything to do with the intentions of the persons involved in the exchange. Or again: an aging millionairess is asked to "sign in receipt of a registered letter," and unwittingly signs over her entire estate to a corrupt nephew. Was this an economic exchange? What physicochemical theory could possibly give the kind of answer that, say, a lawyer or a judge would be interested in?

A belief in the irreducibility of intentionality must not be confused with dualism. As Macnamara (1977) points out, there is nothing dualistic about the claim that a "penny"--and the economic system in which a penny obtains its meaning--cannot be subsumed under physicochemical terms and laws. It merely suggests that the type of explanations

provided by the physical and biological sciences are inappropriate for mental phenomena. Things intentional require a distinct category of explanatory concepts, not the hypothesis of a distinct metaphysical substance.

What remains unclear, however, is whether the irreducibility of intentionality (if true) provides the libertarian with anything more than necessary (but insufficient) grounds for believing in the reality of free will. It may well be that correct theoretical accounts of intentional phenomena are irreducible, but deterministic nonetheless.

The most relevant issue for the libertarian, therefore, is whether or not teleological explanations of intentional actions can be reformulated as causal-mechanical ones. Those who claim that valid causal accounts of human actions are possible are led to deny the reality of free will. The libertarian contends that such accounts are impossible. He draws much contemporary support from that branch of analytic philosophy known as Ordinary Language Philosophy, which is concerned with the analysis of (among other things) our use of ordinary explanatory statements. Consider the following examples:

1. The gunpowder exploded because it was ignited by a spark.
2. The jogger's breathing accelerated because of the increased drain of oxygen from his blood.
3. Alice took an aspirin because she had a headache.
4. John went to the store because he wanted a loaf of bread.

The libertarian maintains that while superficially similar in form, there is a fundamental difference between the first two and the second two explanations. Specifically, he argues that the former qualify as

genuine causal explanations whereas the latter do not. Although there is no complete agreement on the analysis of the concept of "cause," causal explanations are generally identified with explanations of the "Humean" type, which require (a) that cause and effect be defined independently (i.e., without reference to each other), and (b) that causality be construed as a purely contingent "regular conjunction" of two events. "Sparks" and "gunpowder," for example, can be completely described without reference to "explosions," and vice versa. Moreover, an explosion will occur with considerable regularity when a spark and gunpowder are brought into contact with each other. Accordingly, the statement "a spark *caused* the gunpowder to explode" is viewed as a genuine causal explanation.

The account of the jogger's accelerated breathing is not dissimilar--although as we saw above, the feedback and homeostatic mechanisms invoked make the explanation more complex. Regardless of the complexity of the full, detailed account, however, there is little doubt that the statement "oxygen depletion in the jogger's blood *caused* his respiration rate to increase" qualifies as a genuine causal explanation in the Humean sense (c.f., von Wright, 1971).

According to the libertarian, however, it is absurd to think that what follows the "because" in one's explanation of an intentional act (as in 3 and 4 above) is a cause in the strict sense of the word (c.f., Hamlyn, 1953; Mischel, 1964). Having a headache or wanting a loaf of bread does not cause one to take aspirin or go to a grocery store: one can always do otherwise. In an effort to relieve her headache, Alice could go for a walk in the fresh air, lie down to rest, or engage in

Transcendental Meditation. To obtain bread, John could also have it delivered, or he could try to bake it himself.

It will do no good to argue that there were other causal factors involved, for example, that it was raining, Alice was at work in the office, and had never heard of T.M., or, that John had neither phone nor stove. These are merely constraints in the situation. They do not play a causal role. Alice still could decide to go for a walk (in the rain), or go (straight home) to bed. John could go next door and ask to use the neighbour's phone or stove. Or, both Alice and John could choose to do nothing and simply tough it out. The point is, a causal explanation assumes a constant conjunction between events that is absent in the case of intentional actions. There is no lawlike connection between "having a headache" or "wanting bread" and doing any particular thing about either. It follows that the occurrence of a headache or a desire for bread cannot be viewed as (Humean) causes of any of the above-mentioned actions.

They may, however, form part of a good *reason* for doing any one of them. To give a reason for an action is to explain it teleologically. A reason describes the purpose of the act. It makes the action intelligible by invoking the intentions of the actor. A reason explains an action by showing how it was the appropriate or justifiable thing to do under the circumstances.

This distinction between reasons and causes is not a trivial one since it affects how the two types of explanation are verified (von Wright, 1971). For example, the truth of the causal explanation in 1 (above) depends on the regular occurrence of explosions when sparks are paired with gunpowder. However, unlike a causal explanation, the validity

of a reason does not depend on the existence of nomic connections between what is explained and what is invoked in the explanation. In saying that Alice took aspirin because she had a headache, one intimates that she thought it appropriate--perhaps even necessary and sufficient--to do so for relief. She may have been wrong. It might have been entirely unnecessary (or insufficient) to take aspirin. But the explanation for her doing it would nevertheless be correct. In short, while the truth of a causal explanation depends on lawlike connections, the validity of a reason depends on whether it accurately describes the actor's intentions.[4]

Even so, it has been popular to maintain that (a) the actor's intentions are genuine Humean causes of his actions, and (b) insofar as a reason expresses those intentions, reasons are therefore to be seen as a species of causal explanation (c.f., Brandt & Kim, 1963; Davidson, 1963, 1970, 1973). The libertarian, however, argues that this cannot possibly be true either. For unlike causes and effects, intentions and actions are not logically independent. The one cannot be unambiguously characterized without reference to the other. For example, you cannot argue that when a person sticks his arm out a car window, he is "signalling a turn," without reference to his intention to do so (c.f., Melden, 1961; Mischel, 1975; von Wright, 1971).

The Logical Connection argument has been cited by many writers as

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[4]This is so whether or not the actor is conscious of his intentions. Suppose you wish to claim that wanting a loaf of bread was not the "real" reason John went to the store--the real reason involved the grocer's wife and John's unresolved oedipal complex. Whether you are right or not still depends on whether it was in fact a reason of John's--a fact, incidentally, which suggests that psychoanalytic accounts are not genuinely causal (c.f., Macmurray, 1947, for related points).

proof positive that reasons cannot be causal explanations of intentional actions (e.g., Dray, 1957; Hamlyn, 1953; Hamlyn & Smart, 1964; Hampshire, 1959, 1963; Hart & Honoré, 1959; Kenny, 1963; Macmurray, 1957; Melden, 1961; Mischel, 1964, 1975; Taylor, 1964; Winch, 1958, von Wright, 1971). If they are right, then it would appear that the libertarian may have suitable logical grounds for his belief that free will is real.

Unfortunately, the status of the claim remains unclear. Some versions of the logical connection argument have been presented in an unconvincing manner (c.f., Mischel, 1975; Stoutland, 1970), and the sheer complexity of the issues has been an obstacle to clarification. It is generally agreed, for example, that any given segment of human behaviour can be described legitimately in several ways, with some of its descriptions involving intentionality, others not (c.f., Anscombe, 1957). Strict criteria for one descriptive stance over another have yet to be devised (Dennett, 1978). Consequently, it remains unclear as to when a reason or a causal explanation is called for.

It is not my intention to try to unravel all these problems, but merely to note that they are crucial to the libertarian position. Their importance also has been recognized recently in cognitive psychology (see above, p. 44) and among a number of social psychologists concerned with the development of a reasonable attribution theory (c.f., DeCharms, 1976; Kruglanski, 1973; and most recently, Buss, 1978; the critiques by Harvey & Tucker, 1979, and Kruglanski, 1979; and Buss' 1979 reply).

One of the major concerns of psychologists has to do with the implications of the reason *vs.* cause distinction for science. Some fear that it implies that Kant was right--that is, that a science of

psychological phenomena is impossible. Others (e.g., Fodor, 1980; Pylyshyn, 1980), maintain that the validity of the distinction between intentional and nonintentional phenomena (and the corresponding validity of rational as opposed to causal explanations of intentional acts) entails a highly restricted science of psychology--one that conforms to the tenets of methodological solipsism. Still others (e.g., Macnamara, in prep.), following in the tradition of Aristotle, Aquinas, and Brentano, contend that a scientific psychology that includes intentionality is possible without the restrictions of methodological solipsism, though it would not resemble the one we have at present. As we shall see later, judgements as to whether or not a science of intentional acts is possible depends not only on one's view of the nature of intentional acts, but also on one's view of the form of scientific explanation.

C. Concluding Remarks

Belief in the reality of free will poses broad, fundamental and unavoidably complex problems for which no definitive solutions have yet been found. It has not been the purpose of this chapter to argue that the libertarian is right, but rather to provide a sketch of what, if he is logically consistent, he might believe. Belief in the reality of free will is the conviction that we can do otherwise when we act. It is based on a conception of ourselves as persons--conscious, rational beings who have it in our power to deliberate, plan, and make choices as to what course of action we shall take. It forms the basis for our conceptions of morality, for the conviction that we can act according to objective moral principles, that we are justified in viewing ourselves as morally

responsible for what we do, and that we are legitimately subject to praise, blame, rewards and punishments for our conduct.

The libertarian's conviction that this is a valid conception of the human condition is at odds with the thesis that all events in the universe occur in a strictly determined manner. Accordingly, he is logically committed to notions that are incompatible with determinism, such as the occurrence of random or indeterminate physical events, the irreducibility of phenomena represented in psychological (and/or biological) theories, the falsity of causal-mechanistic explanations of human action, and the impossibility in principle of a psychology that denies the reality of free will. If he is wrong in some important way about any one of these things, then conceivably he is wrong about it all.

III: DETERMINISM

> We ought then to regard the present state of the universe as the effect of its antecedent state and the cause of the state that is to follow. An intelligence knowing at a given instant of time...all things of which the universe consists, would be able to comprehend the actions of the largest bodies of the world and those of the lightest atoms in one single formula;...to him nothing would be uncertain, both past and future would be present to his eyes.
>
> (de Laplace, *Analytic Theory of Probability*, 1820)

Berofsky (1966) points out that in discussions of human freedom, "it is not uncommon to omit a definition or clarification of the thesis of determinism, although reference to it may be made" (p. 1). Conversely, serious accounts of determinism are generally found in the context of methodological discussions in the philosophy of science where, for the most part, explanations of human freedom are barely considered. The present chapter attempts to bridge the gap somewhat. In it, we will examine what it means to believe in the truth of determinism, what makes that belief credible, and what difference it makes to believe that it is. As we shall see, it affects our understanding of human nature, of morality and moral responsibility, and our view of the scientific enterprise.

A. What Does "Determinism" Mean?

Determinism is the thesis that every event has a cause. Whatever else may have been said about causality, it is generally agreed that a

cause is to be understood as being any member of some set of conditions sufficient to produce an event (Honderich, 1973). Determinism, then, is the thesis that whatever occurs does so under conditions given which nothing else could occur (Taylor, 1958). To put it another way, determinism asserts that every event in the universe is related to other events by universal laws of nature (Ofstad, 1961).

The truth of determinism is logically incompatible with the reality of free will. Determinism cannot be true if it is a fact that we could (in an unconditional sense) do otherwise when we act. Determinism asserts that every event has some cause, and therefore that whatever we do is done under conditions given which we can do nothing else. If that is true, then it cannot also be true that we could in fact do otherwise. In short, if determinism is true, belief in the reality of free will must be based on illusion--i.e., on a misinterpretation of the facts.

Several components of our modern, scientific conception of determinism, as stated by Laplace (1820; quoted above), bear examination. We will begin by comparing and contrasting this conception with some of its more important historical predecessors.

A-1. Determinism and fatalism

Fatalism is the ancient doctrine that we are powerless to change our destiny. It asserts that we can only do what we shall in fact do. According to fatalism, the future is as fixed and unalterable as the past. Fatalism, like modern determinism, rules out the reality of free will.

Both fatalism and determinism have been formulated in crude and easily refuted terms. Fatalism, for example, is commonly misconstrued as a doctrine which denies any causal efficacy to our actions (c.f., Ayer,

1957; Grunbaum, 1971; Morganbesser & Walsh, 1962; O'Connor, 1971; Ofstad, 1967; Ryle, 1954; Williams, 1951; Wilson, 1955). This conception of fatalism, known since ancient times as the "Idle Argument" because it emphasizes the inherent futility of human acts (c.f., Cicero, *De Fato*, 1960), asserts that the outcome of any situation is unaffected by our efforts regardless of what we do. It is seen as implying, for example, that it would be pointless to bother learning how to swim, for if one is fated to die by drowning, then having the skill will be useless, and if one is not fated to drown, then knowing how to swim is unnecessary.

Similarly, there have been determinists during the past three centuries who have written in such a way that they denied the causal efficacy of human efforts--determinists like Baron d'Holbach, Schopenhauer, and Voltaire. Holbach, for example, reflecting on the implications of a mechanical view of the universe, argued as follows:

> You will say that I feel free. This is an illusion comparable to that of the fly in the fable, who, lighting upon the pole of a heavy carriage, applauded himself for directing its course. Man, who thinks himself free, is a fly who imagines he has power to move the universe, while he is himself unknowingly carried along by it. (cited in Edwards, 1958; p. 107)

The absurdity of such denials of man's efficacy in affecting the outcome of events is obvious: what reasonable person would maintain, say, that the survival of a diabetic in glucose shock does not depend on someone getting insulin to the victim within a specifiable amount of time? Who would argue that it is inherently futile to administer first aid, call an ambulance, etc., in a situation such as this?

For the most part, the more carefully formulated versions of both determinism and fatalism neither deny the causal efficacy of human action,

nor claim that what we do is futile or independent of what happens to us. The more thoughtful formulations of determinism assert that specifiable causes determine our actions and that these in turn causally determine the effects which ensue from them. Modern determinism is thus better regarded as a thesis that what happens to us is caused at least in part by what we do. Similarly, the ancient Stoics recognized the absurdity of the Idle Argument. It was part and parcel of their fatalistic cosmology that our actions make a difference--indeed, that they are *fated* to make a difference (c.f., von Arnim [ed.], *Stoicorum Veterum Fragmenta*, vol. II, 1964; Staniforth [trans.], *Marcus Aurelius*, 1964; as well as Cahn, 1967; Long [ed.], 1971; Mates, 1961).

In an important sense, then, modern determinism and ancient fatalism offer equivalent views of the universe as a place in which every event, including every human action, plays a causal role in what happens next and could not happen otherwise than it does.

A-2. Determinism and predestination

Nevertheless, there is a fairly substantive distinction to be made between ancient fatalistic doctrines and determinism as it is currently conceived. Fatalism, after all, was a religious doctrine. And to the extent that the ancient Greeks and Romans conceived of Fate as a *teleological force* governing events, their notions must be regarded as "predestinarian" rather than as merely deterministic.

To say that an event is predestined is not the same as saying that it is determined. Granted, the concept of predestination is deterministic. It asserts that all events cannot occur otherwise than they do. However, the notion of predestination goes beyond the deterministic thesis in

affirming that events happen as they were *meant* to occur--that is, as part of some larger purpose or plan.

Predestination received a considerable amount of attention in the religious writings of the Middle Ages, when Christian theologians (e.g., St. Augustine) began to reflect upon God's characteristics and relationship to the world. What became known as the Doctrine of Predestination was seen by some (e.g., Calvin, Jansen, and Luther) as entailed by the conception of God as an absolute, perfect, omnipotent being; given His nature, all events, including our every thought, desire and action, must occur according to His divine will, in the fulfillment of His divine ends, and could not occur other than as He intended.

The Doctrine of Predestination posed enormous problems for justifications of the theological doctrine that we are morally responsible for (and punished by God for) our sins. These problems were never resolved satisfactorily. They have ceased to preoccupy philosophers since the seventeenth century, when Descartes dismissed the matter as incomprehensible (c.f., *Principles of Philosophy*, 1641, princ. XLI; Haldane & Ross [trans.], 1973, vol. I).

Contemporary determinists generally reject the notion that the complete lawfulness of all events in the universe reflects some divine--or natural--purpose. Many of them subscribe to a view that became popular with the rise of science during the seventeenth and eighteenth centuries. This view, as Whitehead (1946) described it,

> ...presupposes the ultimate fact of an irreducible brute matter, or material, spread throughout space in a flux of configurations. In itself such a material is senseless, valueless, purposeless. It just does what it does do, following a fixed routine imposed by external relations...Nature is a dull

> affair, soundless, scentless, colourless; merely
> the hurrying of material, endlessly, meaninglessly.
> (p. 22ff.)

This was the view formalized in classical Newtonian physics. It characterizes the universe as a gigantic mechanism, as determined in its course as the operation of a clock--a mechanism whose operation does not require description with reference to the will, purpose, or plan of any supernatural force or divine being. And although most modern determinists no longer believe that Newtonian physics can be regarded as the universal science of nature, they still generally regard mechanical explanation as the *sine qua non* for science. Consequently, they regard the teleological flavour of the doctrines of fatalism and predestination as "animistic," "anthropomorphic," and "mystical"--that is, as just so much excess metaphysical baggage, unjustified by the empirical evidence, and with no place among the explanatory concepts of modern science (see, for example, Berofsky, 1966; Hebb, 1949; Hempel, 1966; Immergluck, 1964; Nagel, 1961; Skinner, 1971).

A-3. Determinism as universal predictability

Our more modern mechanistic conception of the universe is historically connected with the formulation of determinism as a thesis of theoretically universal predictability (Laplace, 1820, quoted above; see also Boring, 1957; Bridgman, 1927, 1936; Ducasse, 1958; Grunbaum, 1971; Immergluck, 1964; O'Connor, 1971; Schlick, 1936). According to this formulation, determinism is the thesis that the future can be completely predicted from the present. That is, it asserts that a certain kind and degree of *knowledge* about the present state of affairs can yield *knowledge* of future (or indeed past) states.

This formulation of determinism as theoretically universal predictability is sometimes referred to as "epistemic" determinism because it makes the truth of the deterministic thesis depend upon facts about human knowledge (O'Connor, 1971). It posits successful prediction as the litmus test of the deterministic thesis. In other words, it posits the success of science as the main evidence for believing in the truth of determinism.

Epistemic or scientific determinism has important historical antecedents--for example, in Aristotle's analysis of Logical Fatalism, and in the medieval writings on the problem of Divine Foreknowledge. For Aristotle, the main issue was whether or not determinism is entailed by the possibility of making true or false statements about future events. For the medieval theologians, the issue was whether or not determinism is entailed by the fact that God is omniscient and knows what we will do in the future. This connection between foreknowledge and determinism is carried in modern formulations where determinism is taken as asserting that all events can be *predicted* from a complete description of antecedent events together with knowledge of the laws relating events.

This characterization of determinism has been criticized on several grounds. O'Connor (1971) sums up the thrust of this criticism rather bluntly: if anyone claims that determinism is the thesis that all events are predictable, "...he is saying something that is either false or empty of content" (p. 69).

The falsity of this formulation of determinism is evidenced by the apparent impossibility of predicting various events--for example, (a) at the subatomic level, where it appears to be inherently impossible to

predict both the position and velocity of a particle at a given instant (Ducasse, 1958; O'Connor, 1971); and (b) in the domain of astrophysics, where it is impossible to predict certain events in the interior of the Schwarzschild radius of a Schwarzschild gravitational field of general relativity, or those inside the so-called "black holes" of our galaxy (Grunbaum, 1971). Additional evidence comes from Popper's (1950) demonstration that, for reasons related to Gödel's (1931) Theorem, no mechanical system (e.g., a computer) is capable of predicting all of its *own* future states, and therefore, that it is impossible for a human or a computer to predict all events occurring within a system if they themselves are constituents of that system (see also Grunbaum, 1971; Lucas, 1970; MacKay, 1967; O'Connor, 1971; Sellars, 1966). There is plenty that we cannot predict. If determinism and predictability are coextensive in their application, then contrary to what is generally maintained, determinism does not apply universally.

O'Connor's (1971) second charge that determinism as theoretically universal predictability is a thesis empty of content is based on examinations of the notions of "predictability" and "predictability in principle." The accuracy of any prediction depends on the precision of our measurements. These are always approximate. To the extent that our measurements are imprecise, our predictions will be satisfied by a *range* of events falling within the limits of measurement error. If determinism is to be equated with predictability, then we must concede that events are not *uniquely* determined, and therefore, that determinism is a much weaker concept than it has usually been taken to be.

It has often been suggested that limitations in our power to predict

events may be progressively removed by increasing our knowledge of the laws of nature, by improving our techniques of observation and measurement, or by improving our methods of analysis (Grunbaum, 1971; Hempel, 1966; Immergluck, 1964; Nagel, 1961; O'Connor, 1971). Often this proposal is accompanied by a reminder that determinism asserts *theoretically* universal predictability--in other words, that all events are predictable *in principle*.

The claim that all events are predictable in principle represents an attempt to strengthen the determinist thesis by minimizing the difference between events that can in fact be predicted and those that could be predicted if our knowledge were greater or our measurement techniques more precise. It tends to ignore the arguments from many quarters that events such as those mentioned above may be inherently unpredictable. More to the point, however, is the fact that it may be tautologous to say that an event that we cannot now predict is nevertheless predictable in principle. It may amount to little more than the vacuous statement that if we knew *enough*, we would, of course, know anything.

The upshot, then, is that determinism defined as theoretically universal predictability can scarcely be sustained as a defensible thesis. Accordingly, many writers are in general agreement that determinism must be distinguished from predictability, and that we must allow for the possibility that determinism may well be true independent of our knowing that it is, and regardless of whether or not we can predict future events.

A-4. Determinism as universality of causation

We began this chapter by defining determinism as the thesis that every event has a cause such that whatever occurs does so under conditions

given which nothing else could occur. We have seen that determinism is not equivalent to doctrines which assert that events are fated or predestined in accordance with the plan or purpose of some natural or supernatural intelligence, nor can determinism be equated with the thesis that all events in the universe are predictable--even in principle. In essence, determinism simply affirms that all events are uniquely determined according to a universal law, or principle, of causality (Nagel, 1961).

Various formulations of the principle of causality have been proposed during several centuries of discussion. The most common one has been in the form of the generalization: "Every event has a cause." An equivalent, and nearly as familiar, formulation is J. S. Mill's Principle of the Uniformity of Nature: "...what happens once, will, under a sufficient degree of similarity of circumstances, happen again" (*A System of Logic*, 1879, Bk. 3, Chap. 3, Sec. 1).

The word "cause" itself has been defined in various ways as well, ranging anywhere from ancient legalistic conceptions, through its more popular conception as an "efficient agent," to the more sophisticated, modern notion of cause as "invariable functional dependency" (c.f., Eacker, 1962; Nagel, 1961; Russell, 1914). There is probably no single, correct definition of what a cause is. Nevertheless, we can identify in a general way what it is about causality that is both common to most definitions and central to the determinist's thesis.

Statements of the form "*A* causes *B*" posit a particular kind of relation between events or states of affairs. Specifically, the relation is assumed to be "invariable," "regular," or "constant," in the sense that whenever the alleged cause *A* occurs so does the alleged effect *B*. The

cause is assumed to constitute both a necessary and sufficient condition for the occurrence of the effect. Causal relations are assumed to hold only between events that (a) can be characterized without reference to one another, and (b) that are spatially contiguous. When spatially remote events are described as causally related there is a tacit assumption that the events are termini in a cause-effect chain of contiguous events. When events separated by an interval of time are said to be causally related, they are assumed to be connected by a series of temporally adjacent events, with causes preceding effects in a continuous fashion. Finally, the causal relation between *A* and *B* is understood as being asymmetrical, such that *A* is the cause of *B* but *B* is not the cause of *A* (c.f., Honderich, 1973; Nagel, 1961; Ofstad, 1961; von Wright, 1971).

Ever since Hume's analysis, there has been a long and highly technical debate over whether one should interpret causality and sufficiency strictly in terms of constant conjunction or in terms of some stronger notion which incorporates an element of necessity (variously qualified as "logical," "physical," "causal," or "real"). The debate is very relevant to decisions in the philosophy of science as to what constitutes a "natural law" and how we distinguish law-like or "nomic" universals from accidental or *de facto* ones. Recent discussion concerning the logic of conditional statements together with arguments that *de facto* universals do not support counterfactual or subjunctive conditionals have gone a long way towards clarifying the difficulties in making such decisions (c.f., Chisholm, 1946; Goodman, 1947; Harré, 1970; Kneale, 1950; Madden, 1971; Maxwell, 1968; Nagel, 1961; Wallace, 1972; von Wright, 1971).

Although undeniably important, the details of this ongoing debate

need not concern us here, nor does it make any substantial difference to the present discussion if the reader prefers to understand causation in Humean terms (i.e., as constant conjunction) or in some stronger sense. As sketched above, the conditions under which a causal relation is inferred would apply regardless. And given that the present sketch provides enough of an inkling as to what it means to say that a particular event or class of events is caused, we must now return to our examination of the determinist's thesis that *all* events are caused.

What is the status of the claims that all events are caused or that what happens once is bound to recur given identical conditions? There is no generally accepted opinion on this. The principle of causality has been construed by some as a formulation of connections between events and process, and by others as a regulative principle for inquiry. Some regard it as an inductive generalization, some believe it to be *a priori* and necessarily true, while still others argue that it is a maxim, an expression of a resolution to treat the world as causally explicable. On the whole, proponents of these various views fall into two camps: (a) those who believe that determinism is an empirically testable hypothesis or a valid generalization based on empirically derived facts, and (b) those who do not.

There are good reasons for doubting that determinism has the status of an experimental hypothesis or scientific law (c.f., Ducasse, 1958; Nagel, 1961; O'Connor, 1971). Unlike genuine hypotheses or laws, the determinist's generalization that all events are caused is overgeneral. It is beyond all possible limits of confirmation, since it applies to all things at all times. It excludes nothing whatever from the logically

possible orders of events in the universe because it does not specify what factors determine the occurrences of which events, states, or processes.

Moreover, unlike scientific hypotheses or laws, the determinist's thesis is unfalsifiable. It is immune to refutation by any empirical evidence. If we fail to find the cause of a particular event, or if an effect follows upon one but not the other of what are believed to be two identical sets of initial conditions, we do not take this as evidence against determinism. We simply assume that circumstances were only superficially similar, that we have not looked hard enough, that there were concealed constituents or hidden variables, that we are not clever enough to isolate the relevant causes, or that we do not have sufficient technological expertise either to put the appropriate question to nature or make the relevant observations and measurements. We never conclude that the events in question had no cause. The truth of determinism can be maintained even if it asserts what is not supported by the facts.

Finally, it is widely accepted that the credibility of particular laws and theories in any branch of science may be strengthened by their logical connections with other well-established laws and theories. Not so for determinism: its credibility cannot be strengthened in this way because there are no other independently established laws of a comparable scope which can be brought into mutually supporting logical relations.

Libertarians typically argue that since determinism is not a candidate for the kind of empirical and logical support given to scientific hypotheses, laws and theories, we therefore have no basis for believing that determinism is true. Some of the more generous among them have been

willing to grant that the validity of the principle of causality has been demonstrated in certain areas of natural science, but they are unwilling to accept an unwarranted extension of the scientific picture. They opt for what Boring (1958) called "truncated determinism," conceding the appropriateness of causal explanations for various classes of macroscopic physical events, but denying their applicability in the subatomic realm, in certain areas of biology, and in the psychological and social sciences in general (c.f., von Bertallanffy, 1967; Eccles, 1973; Eddington, 1925; Jennings, 1927; Margeneau, 1967; O'Connor, 1971; Russell, 1946; Sperry, 1977; Taylor, 1958; von Wright, 1971).

It does seem fair to say that we have no satisfactory evidence for the truth of determinism in its unrestricted form as a thesis of universal causation, and therefore that we have no compelling reason to believe it. However, this is far from saying that we know determinism is false.

Many determinists acknowledge that the scope of the principle of causality precludes its candidacy as an established scientific law. They maintain instead that it has special status as a regulative principle for scientific inquiry, a methodological rule that must be taken for granted if we are to do science at all (e.g., Bunge, 1955; Davidson, 1970; De Broglie, 1939; Dennett, 1978; Grunbaum, 1971; Hebb, 1949; Immergluck, 1964; Nagel, 1961; Skinner, 1971; Westcott, 1977, 1978). Their position, in short, is that determinism has the status of a metaphysical principle: it describes the universe as it really is, independent of our ability to satisfy ourselves that it does. It relegates our failure to do so entirely to epistemic constraints--that is, to inherent limitations in our ability to observe, predict, and explain events.

The justification of metaphysical determinism poses enormously difficult problems. Anyone who wishes to maintain that determinism is true despite the fact that it can be neither confirmed nor falsified through empirical observation and experimentation, burdens himself with the task of providing a convincing account of how we can *know* that determinism is true. Aside from Kant, who conceptualized the deterministic thesis as a synthetic *a priori* whose necessary truth must be intuited, few have even attempted to meet the challenge.

For all that, we must bear in mind that determinism may be true whether we can know that it is or not.

B. What Difference Does It Make?

We must now consider the broader implications of belief in the truth of determinism. As in the previous chapter, we will focus on what are generally considered to be the two most crucial domains affected by the truth or falsity of the determinist thesis. The first concerns our views of the scientific enterprise, the second concerns our conceptions of moral responsibility and ethical conduct.

B-1. Determinism and scientific explanation

Much of what needs to be said under this heading is contained in the objections to libertarianism in Chapter II. The present section will serve to bring those objections together as the determinist's position on scientific explanation.

A determinist believes that in reality all events are causally related to others and are lawfully bound to occur under given conditions. Accordingly, his beliefs are most compatible with that methodological

tradition in the philosophy of science which seeks to explain the relationship between events in terms of causal or nomological laws. Explanations which conform to this "Covering-Law Model" (c.f., Hempel, 1966; von Wright, 1971) are "causal" in the broad sense that they explain why an event *has* to occur in terms of a law designating certain other events as necessary and sufficient to produce the effect in question. A determinist is logically committed to the view that causal theories represent the sole and supreme ideal for a rational understanding of reality.

Consequently, the determinist is likely to be a proponent of the unity of science--that is, one who believes that the explanatory statements in any branch of science should conform to the Covering-Law, or "deductive-nomological" model. If he is logically consistent, he will reject teleological explanations as invalid from the point of view of scientific methodology, and argue that what appears to us as purposeful activity in ourselves or in other organisms is best understood in terms of concatenations of complex (e.g., homeostatic) mechanisms which influence one another in a strictly causal manner. He will argue that progress in social and psychological science--as in any other branch of inquiry--depends on the discovery of causal laws relating behaviour to antecedent and attendant conditions--laws, for example, that relate what a person does to environmental factors, to the individual's cognitive and motivational states, to constitutional and historical factors, and to physicochemical states of the person's brain.

It follows quite reasonably from the determinists' point of view (with the aid of some additional assumptions about "reality" as meaning

"physical reality" only) that in the long run, psychological theories will be reduced to physicochemical ones. In other words, he may believe that psychological phenomena can in principle be fully explained in terms of laws governing physical and chemical events in the brain. Of course, he may be convinced that a reduction of this kind is impossible at present, but merely because our theories are currently inadequate or incomplete--a problem that from the determinist's point of view could feasibly be remedied through continued progress in both the physical and psychological sciences.

By the same token, the determinst has no reason to believe that "probabilistic," or "statistical" laws (which play a substantial role in physical, biological, and especially in social science) represent anything other than strictly causal processes. Statistical theories tend to be regarded by the determinist as mere "way-stations," temporary substitutes for more precise explanations of the exact causes of events. He believes that we only use probabilistic models because of the complexity of the processes we are trying to predict, or because of the physical impossibility of gaining access to all of the relevant causes involved. The determinist, in short, is disposed to believe that statistical theories in any branch of science are, *ex hypothesi*, incomplete.

We saw in the last chapter that the libertarian is committed to the view that causal explanations are not applicable to what in reality are freely willed human acts, and therefore that a science of psychology which is based on a deterministic conception of human beings is doomed to failure. In contrast, the determinist believes that there is nothing in this universe--human behaviour included--that cannot be completely

explained in causal terms, and therefore, that a science of psychology which conforms to the causal-mechanistic tradition will yield as much knowledge about its subject matter as the physical and biological sciences will yield about theirs.

It is important to note that I am not suggesting that it follows entirely from the determinist's thesis that causal-mechanistic theories will provide us with complete understanding of events and processes. I am merely suggesting that determinism entails that causal theories are *equally* adequate across the diversity of subject matter of scientific investigation. *How* adequate they are in general depends in part upon considerations that are, for all intents and purposes, orthogonal to the truth or falsity of determinism. A few words about such considerations are therefore in order.

A note on the cognitive status of scientific explanations

We are all realists in the context of everyday experience. Ordinarily, for example, we do not doubt our perception and understanding of our world as a place filled with substantial physical objects. We can, of course, but normally we do not. Similarly, as scientists we tend for the most part to be realists as well. That is, after we have assured ourselves that we have formulated and defined our theoretical terms as well as we are able and made what we believe to be all the relevant observations, we tend to assume that our theoretical statements are indeed statements about real things--in other words, that they are statements which are either true or false.

The validity of the realist view of scientific explanations and theories has been the subject of a long and inconclusive debate

encompassing highly technical problems of logic and scientific fact, as well as fundamental philosophical considerations about the nature of meaning and knowledge. The details of this debate need not concern us here, only the major divisions in points of view.

Opponents of the realist view of science generally adopt some variant of a position known as the *descriptive* thesis (Nagel, 1961). According to this position, we cannot assign physical reality to theoretical entities, and therefore our theoretical statements cannot be characterized as true or false, or even as probably true or probably false. The descriptive view of scientific explanations and theories has its roots in the phenomenalist writings of Berkeley, Hume, and J. S. Mill, all of whom held a subjectivist theory of knowledge. According to phenomenalism, knowledge of reality is inaccessible. The only knowledge we can ever have is knowledge of our sensory experience. By implication, scientific theories must be seen, not as having truth value, but rather as being more or less useful, symbolic instruments for organizing our experience and for ordering our experimental laws (c.f., Ayer, 1950; Bridgman, 1958; Carnap, 1936; Hobson, 1923; Mach, 1898; Pearson, 1937).

Whether one is a realist or a descriptivist has implications for one's views as to whether or not scientific theories--particularly those which conform to the causal model--really *explain*. The realist is committed to the view that a causal account, say, in terms of biochemical disturbances in the brain, is either a demonstrably true or false explanation of the behavioural signs and symptoms of "schizophrenia." He believes that it tells us why certain behaviour occurs by pointing to (a) certain chemical conditions that obtain in the brain, and to (b) one

or more lawlike statements relating behavioural with antecedent and attendant brain events.

The descriptivist, on the other hand, is committed to a strict interpretation of causality in Humean terms (i.e., of constant conjunction). Consequently, he maintains that--even if we forego questions of whether or in what sense schizophrenia is real--an "explanation" of that disease in terms of brain chemistry is not really an explanation. All it is, he argues, is a description of relations of concommitance and sequential order between certain events and processes. It follows that all science can do is describe as well as it can *how* things happens; it can never explain *why* they happen.

More issues are raised by this argument than we need discuss. What *is* important here, is how the realist-descriptivist debate compromises our ability to distinguish a determinist from a libertarian on the basis of their respective faith in science. I will proceed with this final point via an illustration.

Suppose we ask two people whether they believe that causal-mechanistic theories in psychology provide potentially true accounts of various facets of human behaviour. We could predict that if one of the two was a determinist, he would answer "yes" more often that the other, who believes in the reality of free will. However, we could expect our prediction to be correct only on the condition that both people were realists.

If one or both of them subscribed to the descriptivist view of science, the determinist would be indistinguishable from the libertarian. Regardless of what they believe about the "real" nature of human beings,

neither person would maintain that psychological science provides a (potentially) true causal account of behaviour if they both believe that the best *any* science can do is provide us with a superficial ordering of concommitant and sequential (sensory) events. On the other hand, if they are both realists about science, their answers should be readily distinguishable: the determinist should be the one to profess the greater amount of faith in the explanatory power of a deterministic science of psychology.

B-2. Determinism and moral responsibility

There are basically two views of moral responsibility open to the determinist, one espoused by incompatibilists, the other by compatibilists. The latter, which is also known as "soft determinism," will be examined in the next chapter. The present discussion will be restricted to the incompatibilist view, which is known as "hard determinism."

Like the libertarian, the hard determinist reasons that the reality of free will be a necessary condition for justifiably holding a person morally responsible for his actions. That is, he is of the opinion that you cannot be held responsible for what you did in any particular situation unless it was genuinely within your power to do otherwise at the time. Unlike the libertarian, however, the hard determinist maintains that no one is ever free in that sense. Accordingly, he believes that no one is ever genuinely responsible for what he does.

Hard determinism entails that we have no justification for praising or blaming, nor for rewarding or punishing anyone for their actions, nor for feeling remorseful, ashamed, guilty, or proud about our own conduct. It entails that our belief that we are justified in responding in any of

these ways rests on the *illusion* that we could have acted differently when, in fact, what we do is completely determined.

In ruling out the reality of free will, the hard determinist rules out the possibility that we could conduct ourselves according to any objective, moral standards. That is, he rules out the possibility of anyone performing a genuinely honest, generous, altruistic, or otherwise moral act (c.f., Chapter II). He is logically committed to a moral subjectivism in which our moral judgements themselves are understood as being causally determined. For example, he would maintain that we are determined to value as "good" that which is pleasurable, or that which ensures survival, and to value as "evil" that which is painful, noxious, harmful, or potentially hazardous to our survival.

At this point, it may be useful to identify a dubious claim on the part of some otherwise brutally consistent hard determinists. Occasionally, hard determinists have tried to soften the implications of determinism for ethics by suggesting that, after all, hard determinism offers a *humane* conception of things. Specifically, a complete understanding of the diverse causes and conditions, the causal chain of events and circumstances that inexorably lead one person to, say, kill another, entails our forgiveness and compassion rather than our (unjustifiable) condemnation and punishment.

It was with this kind of reasoning that the celebrated attorney, Clarence Darrow, successfully appealed to various juries in defense of the criminally guilty: If any of you, he would argue, had been reared in an environment comparable to that of the accused, or suffered from his hereditary defects, you too would be standing before the bench. Similarly,

it was with this same kind of reasoning that Sigmund Freud persuaded us that psychoanalytic theory was humane by virtue of its deterministic conception of human behaviour: Stop the moralizing, he argued, look at a person's motivation as it is; look at his aggressive and sexual impulses not as evil, but simply as the unconscious springs that determine the course of his every thought, aspiration, and action.

However persuasively presented, the suggestion that determinism is somehow more humane--that it offers a conception of human nature that is morally superior to libertarianism--is not supported by the deterministic thesis itself. Indeed, it is a contradiction in terms to argue that it is humane to forgive a person for his acts on the grounds that we are *all* determined. For on those grounds, both our understanding of what caused him to act and our forgiveness are also determined. We have no choice as to whether we succeed in understanding the person correctly, nor as to whether we succeed in forgiving him or not. It follows that there can be nothing humane or otherwise morally superior in doing what we (a) are completely determined to do, (b) cannot do otherwise, and (c) are therefore not responsible for.

There is little more to say about the hard determinist's conception of morality and moral responsibility except that, if true, the implications for humankind are tragic. As many hard determinists are quick to remind us, however, it can hardly be argued that determinism is false simply because we do not like what it entails (Edwards, 1958; Grunbaum, 1971; Immergluck, 1964).

C. Concluding Remarks

The purpose of this chapter has been to provide a sketch of what, if he is logically consistent, the determinist might believe. The determinist holds that all events are caused and could not occur otherwise than they do, a fact which rules out the reality of free will. He believes that all events can be explained as governed according to exceptionless natural laws. He is likely to be a proponent of the unity of scientific method, and to maintain that explanations in any branch of science, including scientific psychology, should conform to a causal-mechanistic model. If he takes a realistic view of scientific theory as providing potentially true or false statements about events, the determinist will profess a greater degree of faith that the causal model of explanation is the ideal method for understanding reality. He may see nothing that would inherently preclude our discovering strict causal laws in all branches of science or achieving the successful reduction of any science to physics or chemistry. He may, however, acknowledge a variety of epistemic constraints that render our theories incomplete, our laws probabilistic, and make theoretical reduction a practical impossibility.

Many determinists have adopted an ethical position known as "hard determinism." They believe that since we are never free we are therefore never morally responsible for what we do. They believe that the truth of determinism renders the concept of moral action meaningless and rules out any justification for feeling guilty or proud, or for praising, blaming, rewarding or punishing anyone for what they do. Some have suggested that determinism implies a more humane view of the human condition than that provided by libertarian moralists. However, this

appears to be indefensible. There would seem to be no way to mitigate the implications of the truth of determinism where ethical theory is concerned: if we are not free, we are not responsible and have no basis for making moral judgements about what happens. What happens is neither morally right nor wrong, it simply happens as it must.

IV: COMPATIBILISM

> The [compatibilist] thesis...is that there has never been any ground for the controversy between the doctrines of free will and determinism, that it is based on a misapprehension, that one of them strictly implies the other, that they have been opposed only because of our natural want of the analytical imagination.
>
> (Hobart, *Free Will as Involving Determination and Inconceivable Without It*, 1934)

Determinism and free will have traditionally been regarded as mutually incompatible. Consequently, resolutions of the free will problem have consisted largely of arguments that one or the other thesis is false. Some writers, however, have maintained that what is delusive or false is their apparent incompatibility, not their asserted content. Hobbes (1657) was one of the earliest to argue in favour of that resolution. "Liberty and necessity are consistent," he wrote (*Leviathan*, Chap. 21), "...every action of man's will, every desire and inclination proceedeth from some cause." Since then, the idea that free will can be reconciled with the strictest determinism has been very widely accepted (e.g., Ayer, 1946; Canfield, 1962; Davidson, 1963, 1970, 1973; Dennett, 1978; Flew, 1968; Hobart, 1934; Hume, 1748; Mill, 1874; Nowell-Smith, 1954; Schlick, 1939; Stevenson, 1950; Strawson, 1973). The examination of that idea and its implications is what this chapter is about.

A. What Does "Freedom and Determinism are Compatible" Mean?

Compatibilism is the thesis that determinism is true. The

compatibilist agrees with the hard determinist that all events are caused and therefore could not occur other than as they do. But he also maintains--apparently like a libertarian--that we really are free to do as we will. For this he has been called a "soft determinist." It is much harder to tell a soft determinist from a libertarian than it is to distinguish between the latter and a hard determinist. We want to be able to distinguish the soft determinist thesis from libertarianism. This calls for more subtlety than was required in the previous chapter.

Our task is not made easier by the fact that the compatibilist thesis has been formulated in various ways. For example, some have contended merely that our being determined does not contradict our being free (e.g., Hobbes, 1657; Mill, 1874); others (e.g., Hobart, 1934; Nowell-Smith, 1954) that our being free logically requires our being determined. There would be little profit in comparing the many variants of either formulation (but see Campbell, 1951; Canfield, 1962; Foot, 1957; Landsberg & Evans, 1970; O'Connor, 1971; and Young, 1974). I will confine the discussion in this section to the former, "core" formulation of compatibilism; it has been the most popular. Later, we will consider one other contemporary version of the compatibilist thesis, one which derives from methodological discussions in the philosophy of scientific psychology.

A-1. It means "You could do otherwise, *if*..."

The libertarian insists that a person is only free or responsible if sometimes he could do otherwise than he does. What a person chooses or decides must be genuinely up to him. The reality of this capacity for alternative action logically entails the falsity of determinism. But the compatibilist does not deny outright that human beings have a capacity for

alternative action. He maintains that a person very often could do otherwise in a given situation, *if* he wanted to, or *if* he chose to. In other words, the compatibilist interprets the "could" in "he could do otherwise" in a *conditional* sense.

On the surface, there appears to be little in this interpretation of "could" that the libertarian would find objectionable. If we pursued the matter no further, we would likely conclude that libertarianism and compatibilism assert the same thing regarding our freedom of action. That would be a mistake. For on further examination we find that they do not mean the same thing at all.

The libertarian considers it completely redundant to say "he could do otherwise, if he wanted to." As far as he is concerned, it asserts what is vacuously true, since on his interpretation, "he could do otherwise" means literally that in some situations a person can, in fact, freely decide that he wants to do one thing or another, and act on his choice (c.f., e.g., Austin, 1961; Chisholm, 1964; O'Connor, 1971).

The compatibilist on the other hand sees nothing redundant in saying "he could do otherwise, *if* he chose to," or "*if* he wanted to." On the contrary, he believes that the *if*-clause following "he could do otherwise" states the *causal conditions* upon which it follows that a person acts as he does. That is, expressions like "if he wanted to" specify what conditions would be sufficient, should they obtain, to cause a person to do one thing rather than another.

It is easy to understand why it is often so difficult to distinguish between compatibilists and libertarians. They both speak of human beings in the same terms. They both maintain that we are beings to whom it is

appropriate to ascribe intentional predicates such as "he knows," "believes," "doubts," "wants," "fears," "desires," "hates," "intends," and so on. They both state that we can "do what we want," that we can "pursue goals," that we can make "choices," and "decide what to do," and that we do things "voluntarily."

Unlike the libertarian, however, the compatibilist understands human intentionality in a manner that is consistent with the truth of determinism. At root, his thesis is based on a deterministic psychology. It posits that all human behaviour is the outcome of an unbroken causal chain of genetic and environmental factors that determine for each of us a unique set of (presumably neurophysiologically based) psychological states--a set of desires, beliefs, values, attitudes, and goals, which prevail under specifiable, external circumstances, and in turn determine what we "choose" or "decide" to do in any given situation.

The upshot of any deterministic psychology is that while it may be true that we can do as we "choose," it is equally true that we can't help "choosing" as we do. Compatibilists are therefore committed to the idea that our conviction, after we have done something, that we (categorically) could have done otherwise in that same (or an identical) situation, is based on an illusion. As far as I know, Mill (1874) provided the original account:

> When we think of ourselves hypothetically as having acted otherwise than we did, we always suppose a difference in the antecendents: we picture ourselves as having known something that we did not know, or as not knowing something that we did know;...or as having desired something, or disliked something, more or less than we did. (*The Freedom of the Will*; in Berofsky, ed., 1966; p. 170)

According to compatibilist writers from the time of Mill (1874) onwards, the illusion of free will consists in our retrospective distortion of past events: (a) we imagine ourselves acting otherwise than we did under conditions slightly different from those which obtained when we acted, (b) we mistake this imagined situation for the real one, and (c) conclude (erroneously) that we could have done otherwise in the original situation when in fact we could not (c.f., Grunbaum, 1971; Immergluck, 1964; Westcott, 1977).

As mentioned earlier, there has been a protracted and highly technical debate over whether "could, *if* he wants to," expresses a *causal* conditional or not. It will suffice here to note that the matter is not yet settled. Libertarians maintain on various grounds that a causal analysis of intentional action, and indeed of intentionality in general, is inappropriate (c.f., Anscombe, 1957; Austin, 1961; Chisholm, 1964; Dray, 1957; Frankfurt, 1971, Hamlyn, 1953; Melden, 1961; Mischel, 1975; C. Taylor, 1964; Winch, 1958; von Wright, 1971). From their point of view, intentional acts are simply not causally explicable. Rather, they are explained and justified--literally, rationalized--in terms of a person's *reasons* for acting as he does.

In contrast, soft determinists maintain that our rationalizations are themselves a species of causal explanation (c.f., Brandt & Kim, 1963; Davidson, 1963, 1967, 1970, 1973; Ducasse, 1958; Hempel, 1961; Madden, 1971; Nagel, 1960; Strawson, 1973; R. Taylor, 1958; Young, 1974). Specifically, they contend that the beliefs and desires expressed in a person's reasons for acting are the efficient causes of what he does. Moreover, they argue that there exist conditions sufficient to produce

and thereby explain any given set of cognitive and motivational states occurring in a person at any given moment.

We can postpone an examination of the problems posed by the compatibilist's deterministic psychology. Regardless of who is right, it is clear that soft determinists and libertarians disagree fundamentally on how to conceptualize our capacity for alternative action. The latter understand it as a categorical power, the former as a conditional one, the reality of which is consistent with the truth of determinism. Nevertheless, they both maintain that we are really free. Because he believes our actions are caused, the soft determinist cannot mean that we are free in the libertarian sense. We must ask, therefore, "in what sense does the compatibilist's thesis allow that human beings are free?"

A-2. It means freedom from external constraint or compulsion

Once again, we are on ground where it is easy to mistake a compatibilist for a libertarian. Suppose we ask, with reference to a particular act, "Did the person do it of his own free will?" Both the libertarian and the soft determinist would answer, "Yes, his will was free,"--the one, however, meaning that it was genuinely within the individual's power either to do it or not, the other meaning quite simply that there was nothing in the circumstances surrounding the act to *compel* or *constrain* him in doing what he was completely determined to do.

The key to this difference in meaning lies in what freedom is contrasted with. The soft determinist argues that freedom consists--not in the absence of efficient causes for what we do--but in the absence of any outside interference with all this. Thus, we are "free" insofar as we are not prevented from following our strongest present motives, desires,

or inclinations. We are "free," in short, whenever we are doing what we want to do. The fact that our motives, desires, or wants, and our decisions to do what we want may be completely determined does not make them any less our own, any less "voluntary," nor therefore any less "free." We are only "unfree" when we are restrained from doing what we "will," or forced do to otherwise.

There is no denying that the notion of freedom *vs.* constraint, compulsion, and coercion, is important. If figures in politics, law, sociology, economics--in any context where civil rights and liberties, equality and justice are involved, in all discussions of the limits of the authority of society over the individual, and anytime there is a question of the voluntariness of an act. Soft determinists sometimes write in such contexts as if freedom from constraint was an alternative conception to that of freedom from causation. It is important to note, therefore, that while it is true that freedom in the former sense is consistent with determinism, it is also true that our being free from constraint does not exclude the possibility of our being free from causation as well. By itself, the question of whether and when our actions are free as opposed to constrained is neutral with regard to the question of the reality of free will as opposed to the truth of determinism. Accordingly, we find no inconsistency in the fact that the analysis of freedom and voluntariness in terms of the presence or absence of events, agents, or forces that constrain, compel or coerce a person to act against his will, has been a topic of concern to libertarians and determinists alike--writers, for example, as diverse as Aristotle, Aquinas, Johnson, Rousseau, Reid, Kant, Schelling, and James on the one hand, and Hobbes,

Voltaire, Locke, Edwards, Hume, Mill, Bentham, Tolstoy, Marx, and Freud on the other (c.f., Chomsky, 1973; Easterbrook, 1978; P. Edwards, 1958; Kenny, 1973; Westcott, 1978).

It is also worth noting that there is an ongoing debate over how to define the compatibilist conception of "free will." To define it simply as the "absence of constraint" has been problematic. For example, it seems to disallow any distinction between a person who obeys a law out of fear of threatened penalties, and one who obeys a law because the course of action permitted is one that he would have chosen in any case (c.f., Benn & Weinstein, 1971; Davidson, 1973; Frankfurt, 1969). It leaves us with no criteria upon which to decide whether the second person is free (since he is doing what he wants) or not (because he is constrained by a law). Some have suggested that such problems are eliminated if the conditions for being free are specified in terms of the absence of purely *physical* sources of constraint or compulsion. Others have urged that the conditions for being free are more adequately specified in terms of the non-restriction of *options* (c.f., Benn & Weinstein, 1971; the critique by Parent, 1974; and the Benn & Weinstein, 1974, reply). It is my impression that in most cases, terminological debates of this sort merely beg the more basic question: Is the mere fact that a person is not prevented from doing what he wants (or not made to do what he doesn't want) sufficient basis for the claim that his will is free?

This is not a conception of free will that satisfies the libertarian, who tends to view compatibilism as, in Wm. James' (1884) words, "a quagmire of evasion under which the real issue of fact has been entirely smothered" (1956; p. 149)--the issue being, of course, that if our acts

are completely determined, then no one ever has any real choices or options open to him, no genuine alternatives, no real decisions to make. "Free," perhaps, to do what we want, but not free to want what we want (Kenny, 1973), or to have the will we want (Frankfurt, 1971). In short, not really free at all.

B. What Difference Does It Make?

In view of the current popularity of the compatibilist thesis, we would do well to examine closely its implications. The main questions we need to consider are: (a) Does compatibilism secure what the libertarian wishes to preserve in the domain of ethics? Specifically, does it provide an adequate justification for moral responsibility, and does it preserve the meaning of the concept of morality? By the same token, (b) what advantage, if any, does compatibilism hold for the scientific enterprise? We shall address each of these questions in turn.

B-1. Compatibilism and moral responsibility

It was noted in the previous chapter that because they view the truth of determinism as incompatible with the reality of free will, hard determinists infer that human beings are therefore never morally responsible for their actions. The soft determinist, however, does not draw any such inference. On the contrary, he claims that there is no antithesis between determinism and moral responsibility. He argues that when we judge a person morally responsible for a certain action, we do indeed presuppose that the person acted "freely." But the freedom presupposed is not the contracausal freedom required by libertarians. It is nothing more than the freedom described above--freedom from constraint or compulsion. Since

determinism is compatible with freedom in this sense, the soft determinist argues that it is also compatible with moral responsibility (Edwards, 1958).

It is important to note the particular sense of responsibility that follows from the idea of freedom from constraint. As Hobart (1934) defined it, "A man is responsible when...he is *accountable* for the act, i.e., the act proceeded from him" (p. 23). Compatibilism asserts that we are justified in holding a person responsible for what he does, if we can find nothing in the external circumstances prior to, or at the time of the act, that compelled him to do what he did or constrained him from doing otherwise if he had wanted to. If he was free in that sense, and did what he wanted to do, then it was his act. And if it was his act, then he, and he alone, is responsible for it.

Unlike the hard determinist, the compatibilist sees no problems arising from his conviction that the person's beliefs, motives and desires are themselves completely determined by genetic and environmental factors outside the person's conscious control. "If we detest such acts," wrote Hobart, "we must detest that tendency in such men which produced them... Because the act proceeded in every sense from him, he is the one to be punished if punishment is required" (1934; p. 24).

There are a couple of standard objections in the literature to this sort of justification for the attribution of responsibility. Some have argued, for example, that if a person's actions are determined by causes over which he has no control, then in some basic sense they are not really *his* acts (c.f., Campbell, 1951; Dennett, 1978; MacIntyre, 1957). While there may be some merit in this line of attack, it has been stated in ways

that are difficult to defend. In any case, compatibilists typically protest that the objection is meaningless: Of course a person's actions are his, they answer, the acts flow from his character (c.f., Flew, 1968).

Sometimes the objection is grounded on the claim that a person's actions are properly his own only if they are performed by a "self" that transcends (i.e., is not determined by) his "character as so far formed" (Campbell, 1951). Others have suggested that at root the question of responsibility hinges on whether or not we have a hand in creating our own character (c.f., Edwards, 1958). If we do, then there is no doubt that we are responsible for actions that flow from our character. If, on the other hand, our actions are the causal outcome of a character which we had no hand in creating, then how can anyone justifiably praise or blame us for what flows from it?

More to the point, perhaps, is the libertarian's objection that *merely* being the unconstrained cause of one's own behaviour is not sufficient to justify being held responsible for what one does. For you can only be held responsible, the objection goes, if, in addition to being unconstrained or uncoerced, you also truly could have done otherwise in the given situation. Compatibilists, however, do not agree. The issue, they contend, is not whether a person could have done otherwise, but whether or not he did what he wanted to do. Thus, you will blame him if he poked you in the eye on purpose; you will demand satisfaction, retribution, punishment; but you will excuse him if he was shoved from behind.

But is it justifiable to blame and punish someone for injuring you on purpose, when his wanting to was simply the end in some causal chain of events, the inevitable outcome of various antecedent and attendant

conditions? The compatibilist offers what appears to be a well-reasoned answer. Rewards and punishments are justifiable on the grounds that they are causally effective in changing a person's character--or more specifically, in changing that system of attitudes, beliefs, desires and aversions which causes him to act as he does. Grunbaum (1971) advocated this position as it applies to criminal conduct:

> ...by responsibility for misdeeds, the [compatibilist means]...*liability for reformative or educative punishment*. Punishment is educative in the sense that, when properly administered, it institutes countercauses to the repetition of injurious conduct...He fails to see how the damage done by the wrongdoer is remedied by the mere infliction of pain or sorrow, *unless* such infliction of pain promises to act as a causal deterrent against the repetion of evil conduct...The implementation of this conception requires psychological and sociological research into *causal* connections, and the institution of a rational prison system. If kindness rather than punishment were to deter the recidivist criminal, then it is clearly rational to be kind. (p. 307; his italics)

The libertarian, however, objects that the claim that rewards and punishment *work* is not a sufficient basis--it is not even the right *sort* of justification--for their use. The relevant questions are, does the compatibilist thesis provide any valid grounds for judging a person's actions as *morally* right or wrong? Does it allow that the praise, blame, rewards and punishments which follow from our judgements will be *just*?

By and large, compatibilists have contended that the answer to both questions is "yes." Consider the following two statements. The first is by Mill (1884):

> The highest and strongest sense of the worth of goodness, and the odiousness of its opposite, is perfectly compatible with even the most exaggerated form of Fatalism. Suppose that there were two peculiar breeds of human beings, one of them so constituted as to be a blessing to all whom they approached; another of such original perversity

> that neither education nor punishment could...prevent them from being active in evil doings. Neither of these races of human beings would have free will; yet the former would be honoured as demigods, while the latter would be regarded as noxious beasts... and killed like any other creatures when there was no other convenient way of being rid of them. (1966; p. 173-174)

The second, by Hobart (1934), appeared a half century later:

> But moral severity! How can we justly be severe towards a *mere fact in nature*--in human nature? Because it is evil; because it must be checked. We intend to interfere with the expression of his nature. (p. 19)

The compatibilist asserts that our having a valid moral sense is perfectly consistent with the truth of determinism. Recall, however, that any determinist, whether of the hard or soft variety, is logically committed to a subjectivist view of morality. He maintains that our judgements of right and wrong are based on the set of values we have, values which are completely determined by a variety of cultural, sociological, and biological factors. Our judgements of right and wrong have no factual basis according to this view, nor are they analytically true. If they have any meaning at all, it is an *emotive* meaning (c.f., Albert, Denise, & Peterfreund, 1969; Ayer, 1949; Carnap, 1937; Schlick, 1939; Stevensen, 1944).

One of the more recent proponents of this conception has been Strawson (1973). In a fairly convincing analysis, he argues that our moral values and judgements are simply generalizations from ourselves to others of a variety of natural human reactions to the good or ill will, or indifference of others towards us. We naturally react to good will, for example, with gratitude. When injured, we react with resentment. When someone else is the victim of malevolence, we react with indignation. On

Strawson's (1973) account, the latter reaction is moral by virtue of its other-directedness--i.e., because it is experienced on behalf of another rather than for onself. But in either case, our reactive attitudes and feelings (e.g., gratitude, sympathy, resentment, forgiveness, compassion, indignation, benevolence, disapprobation, etc.) are fully explicable in terms of complex causal laws and mechanisms governing social interactions (c.f., also, Davidson, 1963; Dennett, 1978).

All causal accounts of morality and moral judgement share this feature of explaining our notions of right and wrong, good and evil, in terms of something else. Classic among such accounts are the various hedonistic theories which characterize our moral judgements as determined according to a pleasure principle: *viz.*, we value as "good" that which is pleasurable, and disvalue as "evil" that which is noxious or aversive. Egoistic moral theories make up the bulk of the rest within the compatibilist framework. They posit that we value as morally good that which enhances or ensures the existence of the individual or the species, and that we view as evil all that diminishes or threatens the individual's or the species' opportunities for self-enhancement or survival. Most current among these are the recent sociobiological acounts of moral conduct in general, and of "reciprocal altruism" in particular (c.f., D. Campbell, 1974, 1975; Pugh, 1977; Wilson, 1975).

What bothers many about compatibilism is that it invariably reduces morality to something more "basic" in our nature--frequently something that falls short of what we would like to call "moral." It seems to preclude the possibility of our choosing to do what we consider to be morally right, *regardless* of how unpleasant or even dangerous that

particular course of action may be. It seems to rule out the possibility of a person ever, say, "rising to duty" purely for the sake of duty itself, or his opting for civil disobedience in the face of extreme penalties or death. Indeed, some libertarians have suggested that the fact that people can and do conduct themselves in these ways on occasion indicates that the compatibilist thesis must be false (e.g., Campbell, 1951; O'Connor, 1971).

But compatibilists for the most part see nothing to worry about in this objection. They grant that some deterministic theories of morality leave much to be desired, but then again, those particular theories may be inadequate. As they point out, the fact the hedonism or egoism may be false does not invalidate the fundamental thesis: namely, that morality--as Mill put it, "the *highest* and *strongest* sense of the worth of goodness" --is perfectly consistent with the truth of determinism. They are in general agreement in other words, that we can accept determinism and go on morally praising, blaming, rewarding and punishing our children, our friends, our heroes and malefactors, all with a clear intellectual conscience (c.f., Easterbrook, 1978; Edwards, 1958; Flew, 1968; Pugh, 1977).

Libertarians, however, remain bothered. We must regard our moral values and judgements as formed in response to free inquiry, they insist, for otherwise we cannot count them as genuinely moral (Hampshire, 1959). If something is to be counted as morally good or right, then it must be so independent of the state of our glands or any other antecedent causal factor. It must be *objectively* good, and the only way we can hope to be sure it is, is if we are free to recognize and judge it as such, and to act accordingly--i.e., to choose a particular course of action purely

because it is the right course, not because we are caused so to choose. Unless we are free in this sense, the libertarian contends, there can be no validity to the claim that any of our actions are morally right or wrong, and therefore no justification for any social practices that pretend to have a basis in such claims.

Compatibilists do not concede that an objective morality is possible. For these soft determinists, morality is a subjective matter and nothing more. Their evidence is that our moral attitudes and beliefs typically have taken a great variety of forms at different times and in different cultures, invariably reflecting the local and temporary features of any given culture or community. Moreover, because they view moral judgements as normative at best (Ayer, 1949), the soft determinists do not believe that moral praise or blame, rewards and punishments, are ever just in any absolute sense. The best we can do is justify these practices on *utilitarian* grounds; that is, on the grounds that they serve the purposes and best interests of the majority.

When all is said that can reasonably be said, one may be left with a sense that to cast morality in terms of social utility alone is to leave out something vital in one's conception. Our task, however, is not to seek a better resolution, but to adequately represent the compatibilist's thesis as it stands, and the "utilitarian-educative" formulation of morality and responsibility which it entails. I can do no better in this regard than to quote Strawson (1973), who argued on behalf of the soft determinist that

> ...his view is the right one. It is far from wrong to emphasize the efficacy of all those practices which express or manifest our moral attitudes, in regulating behaviour in ways considered desirable...

> What is wrong is to forget that these practices, and their reception, the reactions to them, really *are* expressions of our moral attitudes. When we do remember this, we...ward off the dangers it seems to entail, without recourse to the obscure and panicky metaphysics of libertarianism. (p. 25)

B-2. Compatibilism in psychology

There is no need to discuss the implications for scientific explanation that arise from the compatibilist thesis, since they are the same as those discussed earlier in connection with determinism (see Chap. II, Sec. B-2, Chap. III, Sec. B-1). The present section will be devoted instead to a few specific contributions--and confusions--in the field of social psychology that are directly attributable to compatibilist views, and which will serve to further distinguish the compatibilist thesis from its incompatibilist counterparts.

My confining the topic in this manner should not be taken to imply that only social psychologists are compatbilists. Quite the contrary, I think that most psychologists who are committed to determinism are best regarded as compatibilists. Indeed, I think it could be reasonably argued that compatibilism is presupposed by any causal or mechanistic account in which intentional predicates occur.[1] The point bears mention because psychologists typically have not attended to the important distinction between compatibilist and incompatibilist formulations of the free will problem. As a consequence, they typically fail to distinguish between compatibilist and libertarian conceptions of freedom and morality--a failure which has resulted in both unjustifiable derogation of

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[1] A strict incompatibilist might argue that intentional predicates such as "choose," "decide," etc., cannot occur in *true* causal-mechanistic accounts.

compatibilists (e.g., as being "naive dualists;" c.f., Westcott, 1977; p. 249) and indefensible claims about human freedom and dignity (e.g., Skinner, 1971).

The failure in psychology to recognize the distinction between hard and soft determinism is due at least in part to a common misconception of the historical relationship between belief in determinism and the development of scientific psychology. Immergluck (1964), for example, stated that "When both classical and eighteenth century vitalism and voluntarism gave way to a broad acceptance of philosophic determinism, the road seemed cleared to establish psychology unambiguously as a science of behaviour" (p. 270). If anything, however, history suggests that it was really the other way around. That is, if there was anything in particular that eased resistance to determinism during the seventeenth, eighteenth and nineteenth centuries, it was the idea, promoted by compatibilists such as Hobbes, Locke, Hume and the Mills, that a scientific analysis of the mechanisms governing human thoughts, motives and actions, was not only consistent with belief in the reality of freedom and responsibility, but essential to a better understanding of them.

While there are exceptions, philosophers currently regard the compatibilist thesis in the form advanced by the early British empiricists as involving a naive conception of mental causation (Kenny, 1973). They consider it incorrect to posit wants, beliefs, and the like as mental events which determine what we do. The reason is that causal statements in which mental predicates occur often turn out to be vacuous. Apparently, they do not satisfy the minimum requirement for a causal relation, namely, that cause and effect be independently derivable (e.g., Hamlyn & Smart,

1964; Honderich, 1973; Melden, 1961). For example, if the only evidence for my having a particular superstitious belief is that I do not step on cracks in the sidewalk, then the statement "Brian's odd gait is *caused* by his superstitious belief" cannot qualify as a valid explanation. It is simply an empty tautology, much like saying that the "soporific power" of opium causes one to fall asleep.

To avoid the problem of vacuity, compatibilists in psychology have sought to characterize mental events in terms of something other than what they are invoked to explain. Radical behaviourists, for example, have generally looked for environmental conditions sufficient to produce specific behaviours, thereby hoping to eliminate problems surrounding the validity of characterizing behaviour as being caused by mental events. There is a fairly wide consensus that radical behaviourism has not achieved much in the way of explaining human behaviour--a consensus that has been accompanied by a relegitimization of cognitive psychology over the past thirty years or so. One example of the type of problem behaviourism cannot accommodate is that what makes my actions "superstitious" has little to do with what's "out there." It has everything to do with some odd assumption I have made about the world: namely, that there is a relationship between the occurrence of one event--stepping on a crack in the sidewalk--and that of another--i.e., some subsequent misfortune. The point is, one simply cannot rule out the agent's point of view.

Another solution has been to look for the relevant brain events that are necessary and sufficient to produce mental ones. Very closely aligned to the neuropsychologists and physiological psychologists who have pursued that solution, are those cognitive psychologists who seek to model

psychological events and processes in computers and who hope that eventually their computer models will serve as models of the brain. As we saw in Chapter II, however, there appear to be substantial problems with the thesis that theoretical statements about psychological processes are in principle reducible to physical characterizations of brain events. Accordingly, it has been argued by compatibilists (e.g., Honderich, 1973) that determinism in psychology is best formulated in ways that do not carry any implication of the identity or non-identity of brain states and conscious states.

Progress in the scientific methodology of psychology in recent years has been accompanied by much talk in philosophy about *levels* of explanation (e.g., Ryle, 1949), and the idea that any given segment of human behaviour can be given different descriptions--some of which are deterministic (e.g., descriptions in terms of bodily movements, physiology, etc.) while others are not (e.g., intentional characterizations), but all being equally valid (c.f., Anscombe, 1957; Hamlyn, 1953; Kenny, 1973; Mischel, 1975). Psychologists often differentiate between various levels of explanation as well (c.f., Dennett, 1978), but in this case the differentiation is occasioned merely by the apparent impossibility of reducing theories at one level to those of another, and not necessarily because psychologists assume that determinism operates only at the physicochemical or physiological levels. Although there are exceptions, psychologists in the majority continue to take a causal-mechanistic view of voluntary behaviour under any description (c.f., Kimble & Perlmutter, 1971) in the grand tradition of the early compatibilists.

Nowhere is that tradition more evident than in the field of social

psychology, where the concepts of "freedom" and "personal control" have played central roles in much of the research and theorizing in recent years (e.g., Brehm, 1966; Brehm & Cohen, 1962; deCharms, 1968; deCharms & Shea, 1976; Easterbrook, 1978; Harvey, 1976; Heider, 1958; Hendrick, 1943; Jones & Davis, 1965; Kelley, 1967; Kelly, 1955; Langer, 1975; Lefcourt, 1973; Steiner, 1970; Westcott, 1977, 1978; White, 1959; Woodworth, 1958; Worchel & Andreoli, 1970; Wortman, 1976). It is in this area of psychology that we find compatibilism at its empirical best; that is, where psychologists have turned their attention to the measurement of our subjective judgements of how much choice, freedom, causal efficacy, and personal control we enjoy under various experimental and naturalistic conditions.

Investigators in this area have turned up some interesting results. They have found, for example, that people have a greater sense of choice or freedom when the difference in the attractiveness of their options is small rather than large or nonexistent (Harvey & Johnston, 1973; Westcott, 1977). They have also found that people will state that they have greater choice the more positive, or, on occasion, the more uncertain the consequences of their various alternatives (Bramel, 1969; Jellison & Harvey, 1975; Kruglanski & Cohen, 1974). On the other hand, people apparently perceive themselves as having less choice when they expect all of their options to yield either negative consequences or greater costs to themselves. As a rule, it appears that after a course of action has been taken, an actor's ratings of how free he was in selecting it will decrease as a function of the magnitude of the negative consequences that ensued (Harvey, Harris, & Barnes, 1975; Jones & Nisbett, 1972). When observing

others, however, they tend to attribute greater freedom to the actor the more serious the consequences of what he did (Bringle, Lehtiner, & Steiner, 1973; Davidson & Steiner, 1971; Steiner, Rotermund, & Talaber, 1974).

It has also been found that people tend to rate themselves as having more freedom as a function of the number of available options; but this finding can be attenuated if the actor has to spend more than what he feels is a reasonable amount of time evaluating the alternatives (Harvey & Jellison, 1974; Toffler, 1970). Nevertheless, studies of a phenomenon known as "psychological reactance" suggest that when the number of available alternatives is threatened or diminished, people generally will behave in a manner suggesting that they are motivated to restore their options or keep them open (Brehm, 1966; Wicklund, 1974; Worchel & Andreoli, 1976).

It is perhaps no wonder that we do. There is a growing body of evidence to suggest that a greater sense of freedom from constraint is positively correlated with how much we enjoy what we do (Brock & Becker, 1967), how competent we feel we are (Bandura, 1978; Harvey & Jellison, 1974; Jellison & Harvey, 1973), and how much control over our actions we believe we have (Cialdini & Mirels, 1976; Harvey & Harris, 1975). Moreover, there is evidence of a positive relationship between feelings of personal control and the degree of one's physical well being (Schulz, 1976), and the degree to which people accommodate to stress (Glass, Reim, & Singer, 1971; Glass & Singer, 1972; Lefcourt, 1973). Feelings of helplessness on the other hand, have been implicated in the occurrence of reactive depression (Klinger, 1975; Seligman, 1974, 1975; Weiss, Glazer, & Pohorecky, 1974; Wortman & Brehm, 1975), and, in the elderly, have been

found to correlate with--and may even contribute to--various types of disease onset and bodily deterioration (c.f., A.P.A. Task Force on Health Research, 1976).

It is also worth noting that people make systematic *errors* in their judgements of the amount of control they exert over events. They exaggerate their ability to influence uncontrollable outcomes such as those which occur in games of chance, for example (Henslin, 1967), and they underestimate the extent to which their behaviour in real life situations is controlled by situational or external forces (Lerner, 1970, 1971, 1975). To be sure, there is compelling evidence that people have difficulty assessing contingencies between events in general, apparently because we tend to focus on positive or expected relationships when they obtain, while ignoring instances where such relations do not hold (Chapman & Chapman, 1967; Nisbett & Wilson, 1976; Smedslund, 1963; Ward & Jenkins, 1965). Given our predilection for error in judging contingency in general, it comes as no surprise that investigators have found that we can be induced to misjudge contingencies between our own behaviour or intentions and various outcomes.

The illusion people have that they produced an event when in fact their behaviour was irrelevant, can be induced when the event in question is congruent with what the person wanted to happen. Moreover, the illusion can be enhanced by factors such as how often the person has attempted to produce that particular outcome prior to its occurrence, what proportion of his attempts were successful, and what sequences or patterns of successes and failures obtained over time (Jones, Rock, Shaver, Goethals, & Ward, 1968; Langer & Roth, 1976). The illusion of

control can also be induced and enhanced in ambiguous settings--e.g., in settings where it is difficult to assess the relative contributions of chance or skill. Thus, investigators have found that when a game of chance is made to look like a game of skill, e.g., by having the person compete against an opponent, by having him actively choose and select his responses, and by having him bet in advance on a particular desired outcome, participants will tend to believe that what they did determined the outcome (Langer, 1975; Wortman, 1975, 1976), and they will also work harder and persist longer in the face of failure when they do believe it (Dweck, 1975).

One striking consequence of our tendency to believe we have control over events that are in reality uncontrollable, is the extent to which apparently innocent victims of misfortune experience guilt. It has been shown, for example, that cancer victims (Abrams & Finesinger, 1953), the parents of terminally ill children (Chodoff, Friedman, & Hamburg, 1964) and others who have lost a loved one (Averill, 1968), as well as rape victims (Medea & Thompson, 1974) and victims of natural disasters (e.g., fire, flood, earthquake; c.f., Lerner, 1975; Lifton, 1963; Lindemann, 1944; Walster, 1967), are prone to attribute the uncontrollable negative events in their lives to what they believe are their own prior mistakes or misbehaviour. They experience guilt, become preoccupied with whatever previous conduct might have led them to "deserve" what has happened, and will sometimes engage in moral or altruistic behaviour (Janis, 1951; Kubler-Ross, 1969; Wortman, 1976) to ward off further danger or death, or in an effort to reduce the likelihood of further misfortune.

Besides, a number of laboratory studies have found positive

relationships between perceived freedom and control and perceived responsibility for the consequences of one's actions (Collins & Hoyt, 1972; Harvey, Harris, & Barnes, 1975; Kruglanski & Cohen, 1973; Wortman, 1975), including responsibility for unforeseeable negative consequences (Pallak, Sogin, & Van Zante, 1975; Sogin & Pallak, 1976). Apparently, subjects who take responsibility for unforeseeable negative events, are subsequently more likely to comply with a request to do a "good deed" (Cialdini, Darby, & Vincent, 1973; Regan, 1971). It bears noting that in the majority of these studies, the outcomes are entirely under the experimenter's control, not the subject's. The subject's judgements of his own responsibility, and his subsequent behaviour, thus turn out to be a function of the variables that induced the illusion of control, and have little to do with any real contingency between what the subject did and what happened.

In my opinion, much of the investigation in these areas provides rich information about the conditions that influence our estimation of how much freedom, choice, control and responsibility we have for our actions and their consequences. It is crucial to note, however, that this research has little or no direct bearing on the question of belief in the reality of free will. While this may seem like an obvious point, it is not widely recognized. For example, virtually every paper on "perceived freedom" and its correlates makes reference to the free will problem, and in many cases, the authors maintain that they are measuring or manipulating the lay person's belief that he or she is really free.

It is evident from their reports that investigators assume that their subjects believe in the reality of free will (while they themselves

subscribe to a deterministic view). But that is by no means a safe assumption. Any determinist among the subjects might agree to estimate how "free" (i.e., unconstrained) he was in the experimental situation, without implying that he believes himself to be free in any other sense. The subject, like the experimenter, might believe firmly that his "choices" are completely determined, but that he nevertheless (a) has an awful lot of choice (given the range of options provided by the experimenter), (b) that he is completely free (nobody forced him to choose one way or the other), and (c) that he is responsible for the outcomes of his choice (in the same sense that a computer is responsible for an error on your paycheck). This subject's responses would be indistinguishable from those of his libertarian counterpart. It follows that investigators of perceived freedom have little ground upon which to assume that their subjects believe in the reality of free will when all they have asked for are reports of perceived latitudes of movements and perceived contingencies between events. If they are indeed interested in belief in the reality of free will, they have not yet asked the relevant questions.

Nor it is legitimate to infer--as some investigators evidently do (e.g., Harvey, 1976; Kruglanski, 1979; Langer, 1975; Lefcourt, 1973; Steiner, 1970; Westcott, 1977)--that their findings provide support for the truth of determinism. It has been suggested, for example, that because a person can be induced to believe that he is making things happen when he is not, freedom and control are therefore merely subjective illusions. This is simply fallacious reasoning. The fact that people can be misled under some conditions into falsely believing they are in control, is no evidence that they actually lack control in all other

situations. To say that it is, is to make a very peculiar sort of generalization--as peculiar as grounding the truth of determinism on evidence that people *accurately* perceive themselves (as sometimes happens) as having no options in a given situation, nor any control over what happens next.

C. Concluding Remarks

If compatibilists are right, then our actions, decisions, choices, beliefs, values, and the like, are all completely determined; they are justified in claiming that we are "free" only to the extent that we act in the absence of external constraints; that we can only do otherwise under suitably different conditions, and that we are "responsible" for the consequences of acts that are causally attributable to ourselves. It also follows that the only justification for holding people morally responsible, for praising, blaming or rewarding them for what they do, is a utilitarian-educative one--i.e., that these practices are causally effective in producing socially desirable behaviour, that they do not serve ends that are moral in any absolute sense, but rather, that they only serve those ends that are desirable from a consensual or normative point of view. And finally, if the compatibilists are right, it follows that a causal-mechanistic approach to psychological processes is the appropriate one, and that progress in the field of scientific psychology will consist in the further development of deterministic explanations of human behaviour.

In pointing out that compatibilists in the field of social psychology have made unwarranted assumptions in the process of conducting research on perceived freedom, choice, and control, I do not wish to imply that those

assumptions are wrong. They may be right in their assumption that people usually believe in the reality of free will. Whether they do or not is an empirical question--one that is addressed directly in the present thesis, though the people examined are those who may be expected to have given the matter the most informed consideration.

V: STATEMENT OF THE PROBLEM

> Are there not somewhere, forced options in our speculative questions, and can we not...wait with impunity 'til the coercive evidence shall have arrived? ...In the great boarding-house of nature, the cakes and the butter and the syrop seldom come out so even and leave the plates so clean. Indeed, we should view them with scientific suspicion if they did.
>
> (Wm. James, *The Will to Believe*, 1896)

While social psychologists may be right to assume that most people do believe in the reality of free will, it is the contention of this thesis that they are mistaken in treating the notion of genuine free will as naive and dispensable in scientific psychology. For one thing, the reality of free will has such profound implications for ethics and for our conception of the nature of psychological science. For another, all that we have considered so far suggests that as psychologists we are at present a long way from being justified in deciding who is right and who is wrong about the reality of free will.

However, we do have important contributions to make in addressing the question of whether and to what extent people recognize the implications of accepting or denying the reality of free will. For if they really are naive, it would be useful to gather evidence of this--evidence that their views are disreputable or uninformed, that they assume contradictory things about free will and science, or that they fail to see the implications of their beliefs about free will for ethics and for their notions about moral responsibility. How shall we go about gathering such evidence? The first question we must ask is whether or not people believe in free will.

1. On the reality of free will and moral responsibility

We can ask them directly of course. Those who say "no" will have told us something. But we would not be sure what those who say "yes" would be telling us. They might be libertarians telling us that they believe that under some given conditions there really are genuine alternatives open to us when we act. Or, they might be compatibilists telling us that they believe our actions really are unconstrained and uncoerced at times (though completely determined), and that we might possibly do otherwise, but only under suitably different determining conditions.

It would help to ask them directly nonetheless, and it would also help to put the question in more specific terms: Do we have some degree of real control over what we do? and, Do we have any real power to choose or decide how we shall act? We might expect compatibilists and libertarians alike to answer "yes" to these questions also. All the compatibilists would mean, however, is that we exercise control over what we do in the same mechanical sense that a "homing" torpedo directs its own course toward a target, or a thermostat governs the amount of heat delivered by a furnace. We would have the opportunity, having asked them these different sorts of questions, of finding out what the respondents mean when they say we really do exercise control and make real decisions.

It would be of some interest as well to ask whether or not they believe that we are genuinely responsible to some degree for what we do. The libertarian would say that we are--i.e., that our actions are to be judged according to objective moral standards of what is good and bad, right and wrong. The compatibilist might say we are responsible too,

insofar as our acts are not attributable to some external agent or force, but he should deny that our actions can be seen as right or wrong. We have to be careful about what they mean here too.

Those who claim that we are not really responsible for what we do should be the same people who would deny that free will is real--that is, those who believe that we never have any real control over our actions, nor any real power to choose or decide. They would be hard determinists.

2. On the form and veracity of scientific explanations

Assuming that some people believe in the reality of free will while some do not, and that others only seem to, we want to know whether they believe correspondingly different things about the veracity of scientific accounts of physical and biological phenomena as well as psychological ones. It would help in this context if we first have some idea as to how they view the form of scientific explanation. Do they believe that science explains what causes things to be as they are, or do they believe that all science can do is describe regularities in events? Those who believe the latter might be expected to hold the opinion that our scientific understanding of *any* phenomenon is now, and always will be, extremely limited. Moreover, they might deny determinism simply because they discount causal claims of any sort.

Those who believe that science explains phenomena causally on the other hand, might be expected to exhibit more faith in both the actual and potential capability of science to get at the true nature of things. But we might also expect this faith to vary according to whether or not they believe in the reality of free will. Among the causalists, there should be no quarrel between libertarians and determinists over the

veracity of scientific accounts of inorganic, physical processes--unless, of course, some libertarians subscribe to the idea that indeterminacy at the subatomic level is a fundamental fact of nature, and that indeterminacy pervades all levels of being. Nor should they disagree over the truth of causal-mechanistic theories of nonhuman organic phenomena, unless some libertarians believe that there are emergent processes in that domain which defy a mechanistic analysis.

On the other hand, we would expect them to disagree on the veracity of causal accounts in psychology. Specifically, we might expect libertarians to believe that there is little hope for a deterministic science of psychology. We would like to know whether they believe in any scientific approach to psychology. In contrast, hard and soft determinists alike might be expected to believe that a causal mechanistic approach in psychology will at least pay off in the future if it has not already begun to.

3. On the validity of reductionism versus emergentism or dualism

If there are such differences of opinion on the veracity of scientific accounts, it would be helpful to have some idea of their basis--to know, for example, whether libertarians subscribe to a doctrine of dualism--i.e., conceive of the mind as a substance that transcends physical matter--or whether they believe in the notion of emergence--i.e., the view that certain (e.g., mental) phenomena cannot be subsumed under laws and theories by which we understand their component (e.g., physico-chemical) parts. By the same token, it would be useful to know whether or not the faith that determinists have in a causal-mechanistic psychology is based on a belief in the reductionist thesis. It is possible that some of

them do not subscribe to reductionism, but believe that psychological processes are deterministic nonetheless--explicable, for example, in terms of so-called "teleonomic" theories (c.f., Chap. 2).

We might expect the relationships between these various beliefs to hold for libertarians, determinists and compatibilists, only to the extent that the respondents have been logically consistent in forming their opinions. But these are highly complex and difficult issues. It seems *a priori* improbable that all of the respondents would have all of their intuitions aligned in a coherent fashion. We must note whether they recognize any gaps or contradictions in their own beliefs and if so, how they rationalize them.

4. And whom should we ask?

Although I have never put it to the test, I will venture that almost anyone from the age of, say, ten or eleven--provided he or she is bright enough and that the issues are laid out clearly for him or her--could express an opinion on various aspects of our topic. However, to question a random sample of the general population in sufficient numbers to represent it adequately in its diversity would be impractical to say the least. I felt it would be sufficient as an initial investigation to lay out the issues as clearly as possible for the reader, and to sample a variety of expert opinions.

The respondents in the present study are academics. We will examine the beliefs of a cross-section of scientists in different areas of study, professionals who dispense legal, industrial, medical and psychological services, and academics devoted to the literary arts. Relatively speaking, all are "laymen" as concerns the question of the reality of free

will. That is, they are not formally required to be experts on it in order to work in their field.

Accordingly, the reader will find that academic philosophers are absent in the present survey. The decision not to include them was a discretionary one. It could be argued, for example, that their expert opinion would be of particular value in a survey such as this. I agree: I believe their views are adequately represented in the introductory chapters. Indeed, those chapters represent a body of findings in their own right. To include philosophers in the empirical survey seemed redundant. Moreover, they would have had an unfair advantage relative to the rest of the sample, by virtue of their familiarity with the philosophical literature on the problem. I opted instead to focus the empirical portion of this thesis on the views of experts from other fields, who are for the most part comparable to one another in their degree of sophistication on the question of the reality of free will.

A few words will be necessary to describe how the survey was conducted. The results are unavoidably complex. It will be best if we consider them systematically and discuss the findings as we go along. When we are done, we can consider the implications of the results for psychology.

VI: THE EMPIRICAL STUDY

> But isn't the view that mental events are somehow cut of a different cloth and in essence basically different from physical and biological events, simply a return to classical dualism, allegedly long abandoned in modern behavioral science?
>
> (L. Immergluck, *Determinism-Freedom in Contemporary Psychology*, 1964)

Method

Subjects

Out of 179 who were contacted, a total of 130 (114 male and 16 female) faculty members from seven academic departments of McGill University agreed to serve as respondents in the present survey. All held Ph.D.'s or an equivalent degree (e.g., M.D., L.L.M., D.C.L.). The mean age of the respondents was 41.3 years, and ranged from 25 to 77 years.

Twenty-three psychologists were approached and 20 of them (18 men, 2 women) participated, as did 20 (16 men, 4 women) out of a possible 22 biologists, and 20 (19 men, 1 woman) out of a possible 28 physicists. Among the physicists who responded, six identified themselves as theoretical physicists. About half of the remaining 14 said they specialized in some area of "high energy" physical research (e.g., nuclear energy, light), while the other half were devoted to research in some area of "low energy" or solid state physics (e.g., crystals and other solids). Respondents from biology were specialists in genetics, molecular biology, terrestrial and aquatic ecology, in about equal numbers. Among the psychologists were experts from the areas of physiological psychology, ethology, learning and motivation, cognitive and developmental psychology,

social and clinical psychology.

The above three disciplines were selected to provide a broad range of perspectives from within the scientific community. A non-scientific perspective on free will and science was sought in the Faculty of English. Twenty-seven academics from that department were approached and 20 (17 men, 3 women) responded. Among these 20, three were specialists in the dramatic arts, and the rest were devoted to one or more areas of fiction, poetry and drama from the Elizabethan, Victorian, and Modern periods. Four of them also specialized in communication arts (e.g., film and video).

In addition, respondents were solicited from the Faculty of Management, the Faculty of Law, and from the Department of Psychiatry in the Faculty of Medicine. The latter medical specialty was selected because it brings a background and approach to human emotional and cognitive phenomena that differs from that of psychologists. All of the 22 psychiatrists who were approached (with the exception of three M.D.'s completing their fourth year of a psychiatric residency) held cross-appointments with the Royal Victoria Hospital. Twenty (18 men, 2 women) responded. Five of these identified themselves as biological psychiatrists engaged in biochemical research. Three of the remaining 15 specialized in behavioural approaches to treatment, and four were psychoanalysts. The rest professed a general psychodynamic approach to psychotherapy.

Twenty-five members of the Faculty of Law were contacted in an attempt to sample the unique perspective of the legal profession toward free will, responsibility and the veracity of scientific judgements. Only 11 of them (7 men, 4 women) agreed to participate. Several of those who declined did so on the grounds that demanding consultative work in

addition to their academic duties precluded their availability. At least four declined on principle: in their view, their professional training required them to suspend their prejudices and beliefs, and stick purely to empirical evidence. They would not commit themselves as representatives of the legal profession to an opinion on the reality of free will. All 11 who did participate reported that the request to communicate their personal beliefs was not in conflict with the demands of their profession. Among them were specialists in criminal and civil law (e.g., family and contract law), comparative law, and medical law.

Out of 32 members of the Faculty of Management who were contacted, 19 (all men) responded. All of those who did not gave pressing consultative as well as heavy summer teaching duties as reasons. Those who did respond were specialists in various areas of the management profession, including commercial and industrial management, applied mathematics, international finance, and marketing research. It was felt that their perspective on organizational processes would bring yet another unique set of considerations to bear on the present topic.

Table 1 summarizes the composition of the sample in terms of the number, age, sex, and religious background of the respondents from each of the seven disciplines surveyed.

Materials

Prior to the present study, there existed no devices for surveying belief in the reality of free will and the veracity of scientific accounts. One had to be devised. Initially, semi-structured interviews were considered as possibly being the best vehicle for getting at subtle differences between people's views on these complex matters. However, it

TABLE 1

Composition of the Sample

Discipline	Percent Return Rate	Age $\bar{X}$ yrs. (s.d.)	Sex M:F	Religious Background				
				Prot.	R.C.	Jud.	Oth.	None
Psychology	87.0	39.3 (10.7)	18:2	12	2	5		1
Physics	71.4	44.4 (11.4)	19:1	6	6	2	3	3
Management	59.4	39.7 (10.1)	19:0	10	3	4		2
Biology	90.9	41.7 (8.4)	16:4	14	1		1	4
Psychiatry	90.9	35.5 (10.6)	18:2	4	10	2	2	2
Law	44.0	35.5 (9.0)	7:4	3	7			1
English	74.1	47.3 (11.2)	17:3	12	4	1	1	2
Overall	73.9	41.3 (11.0)	114:16	61	33	14	7	15

was felt that the use of an interview format alone would either restrict the sample size too much, or, barring that, would pose enormous difficulties for analysis. It was decided that a questionnaire supplemented by selected "in depth" interviews would provide an opportunity to sample the views of a relatively large population with greater measurement precision, and still do justice to the complexity of the issues.

The reader undoubtedly appreciates some of the difficulties involved in constructing a questionnaire adequate to our topic. Pilot testing of various formats for the items with graduate and undergraduate students in psychology revealed a number of the problems. It was found, for example, that more often than not, people were somewhat uncomfortable answering forced-choice questions such as "Do you believe that free will is real or illusory?" They generally found it frustrating not to have an opportunity to qualify their answers.

On the other hand, scalar questions of the type that ask "How *much* freedom do you have when you act?" or "How *much* choice do you have?"--while permitting respondents to qualify their beliefs (albeit in a limited quantitative way)--were invariably interpreted as questions about the degree to which the person felt unconstrained in choosing or acting. Such questions did not adequately address the respondent's belief that his freedom is real or illusory.

It was also found that pilot respondents were greatly assisted when the question was preceded by a brief preamble which sketched the nature of the underlying issue. This seemed to focus the question for them. Besides, they reported increased levels of confidence in their answers to

items presented with a greater degree of specificity (e.g., items which asked for their views on the truth of scientific accounts in a particular domain of inquiry). There was a trade-off to consider, however. Both the length of the questionnaire and the redundancy of the items increased as a function of the specificity of the questions. This was seen as an aggravation to some pilot respondents and raised concerns about a like reaction from busy academics. But even more worrisome, longer versions of the questionnaire induced in some a preoccupation with the internal consistency of their responses to conceptually related items. This in turn interfered substantially with their completion of the questionnaire, and even produced greater response uncertainty for some of them.

Finally, it was observed that some respondents, regardless of how the questions were framed, reported less confidence than others about certain of their beliefs. Measurement of the subjective certainty with which an individual holds a particular belief had not been entertained initially. However, based on feedback from pilot respondents, a measure of confidence seemed worth including in the survey of academics--if for no other purpose, than at least as a check on the clarity of the items.

In the end, a 28-item questionnaire was constructed. It was short enough to be completed within 30 to 40 minutes. As such, it did not induce any untoward preoccupation with redundancy or internal consistency. At the same time, it contained questions of sufficient focus and variety to allow the respondent to communicate his beliefs with confidence and a comfortable degree of subtlety. A copy of the complete questionnaire can be found in Appendix A.

Twenty-four items make up the body of the questionnaire. Half of

these address the truth of our understanding of the nature of various things, the other half address the reality of free will. All 24 items take the following form. Each one consists, in the first place, of a brief two-sentence preamble identifying one or both of two opposed viewpoints on what is real or true regarding the issue in question. The preamble is followed by a question as to what the respondent himself believes to be real or true in this case. A 10-point rating scale was provided for his answer. More will be said about this scale in a moment. The respondent then used one of two 9-point scales that followed the first to indicate his level of confidence in his answer. The wording of the items was such that the respondent was asked in each case to give his opinion on the reality of the freedom, or the truth of the understanding, of people in general--not his own or anyone else's in particular, but of the typical human being.

The 12 "free will" items (hereafter FW items) addressed some aspect of three related notions: a) that people exercise real control; b) that people have real power to choose or decide; and c) that people are genuinely responsible. In order to avoid the problem of respondents misinterpreting the FW items as asking how unconstrained they believe people are, they were asked to rate--not how *much*, but rather how *often* people have some degree of real control, real power to decide, and genuine responsibility. The items addressed specific areas of responsibility and control: i.e., a) over one's actions, and b) over the consequences of one's actions. Two items addressed the reality of one's power to decide a) how to act, and b) whether or not one will act at all. Another item addressed the matter of responsibility for decisions not to act, and three asked whether people have any real power a) to choose their

friends, b) to choose a career, and c) to decide to quit smoking. A schematic summary of the questionnaire items is presented in Table 2.

The 10-point rating scale provided for the respondent's answer to each item combines elements of a forced-choice with those of a quantitative judgement. The respondent was asked how often such and such is the case, and was presented with two alternatives: a box labelled "never," and a 9-point scale labelled "rarely" at one end, and "always" at the other. Given the preamble, it was clear to the respondent in each case that "never" implied that our sense that we can choose, that we control what we do, or that we are responsible for our conduct, is illusory. If they believe the contrary, respondents were faced with the opportunity to communicate via a temporal scalar judgement the extent to which they believe that free will plays a role in our lives.

Two of the 12 FW items addressed the respondent's estimate of the inherent limitations of human freedom and responsibility. These items were identical in format to the rest, except that they asked how much genuine control or responsibility it is possible to attain. The respondent could answer "none at all," or indicate that he believed some amount between "a small fraction" and "complete" control or responsibility is possible. These two items were designed for comparison with the respondent's estimates of how much true scientific understanding is possible.

The 12 items on understanding (hereafter U items) also divide into three sets. One set addresses beliefs concerning the extent to which ordinary experience provides us with true understanding of the nature of a) matter, b) nonhuman biological forms, c) human intelligence, and d)

TABLE 2

Schematic Summary of the Scalar Items of the Questionnaire

12 U items:		
How much of our *common-sense understanding*		(C-S. U.)
is true of...	matter?	(M)
	living things?	(L)
	emotion?	(E)
	intelligence?	(I)
How much of our *scientific understanding*		(Sci. U.)
is true of...	matter?	(M)
	living things?	(L)
	emotion?	(E)
	intelligence?	(I)
How much true *understanding* is *possible* of...		(U. Pos.)
	matter?	(M)
	living things?	(L)
	emotion?	(E)
	intelligence?	(I)
12 FW items:		
How much real *control* over our actions		(Pos. C)
genuine *responsibility* for our actions		(Pos. R)
...is it *possible* to attain?		
How often do people have real *control* over...		
	their actions?	(CA)
	the consequences?	(CO)
How often are people genuinely *responsible* for...		
	their actions?	(RA)
	the consequences?	(RO)
	not acting?	(RXA)
How often do people have real power to *decide*		
or *choose*...	how to act?	(DA)
	not to act?	(DXA)
	a career?	(Ca)
	friends?	(Fr)
	to quit smoking?	(Xs)

human emotion. They were presented in a format similar to that of the FW items.

The "common-sense" U items (C-S. U.) were designed for comparison with a second set that address beliefs concerning the extent to which science provides a true account of matter, living things, intelligence and emotion. For both sets, the respondent had the option of indicating either that "none" of our understanding is true, or that some proportion between "a small fraction" and "all of it" is true.

A third set of U items asked for the respondent's opinion of how much true scientific understanding of matter, living things, intelligence and emotion, is attainable in principle (i.e., independent of current scientific achievements). Again, the respondent could indicate in each case that he believed either that no true understanding at all is possible, or that some amount between "a small fraction" and "complete" understanding is indeed possible.

The 12 FW and 12 U items were presented three to a page in an alternating fashion (i.e., a FW item followed by a U item, then another FW item, and so on). The items within both sets were presented in random order.

Four additional items appeared at the end of the questionnaire. Two addressed the respondent's conception of real decisional power and of genuine responsibility for one's acts: that is, does he take the libertarian view that a person's decisions and actions are not completely determined, or does he allow (as the compatibilist does) that a person makes real decisions and is genuinely responsible for what he does even though he is completely determined to decide and act as he does? The

other two addressed the respondent's view of the form of our scientific and our common-sense understanding of the nature of things: do they consist of causal explanations or of descriptions of regularities in events? All four were forced-choice items accompanied by a 9-point confidence rating scale. These items were conceived of as "position" items that would aid in the interpretation of responses to the 24 items in the body of the questionnaire.

The entire questionnaire, including instructions on how to fill it out, was 10 pages in length. Each copy of the questionnaire was packaged in a brown, manilla envelope bearing the author's return address.

An additional series of questions was devised for the purpose of interviewing selected respondents in greater depth. These questions addressed themselves to the views and assumptions underlying the participant's scalar responses to the questionnaire. They are described in detail in the next section. A portable cassette tape recorder (Sony, Model TC-44) and 120 minute (60 min./side) magnetic tape cassettes were used to record these semi-structured interviews.

Procedure

The study was conducted in two phases. Phase One consisted of the distribution, collection, and preliminary analysis of the questionnaires. Phase Two consisted of selected interviews with academics who had participated in the initial survey.

The search for participants was conducted in person by the author, who visited the offices and laboratories of individual faculty members from each of the seven departments. On initial contact, the author introduced himself and explained that he was conducting a survey of belief

in the reality of free will for his doctoral dissertation in psychology. The faculty member was then asked if he would be willing to participate in the study, and told that his participation would involve approximately 30 minutes of his time to complete a series of rating scales, which he was then to return to the author in a sealed envelope via the inter-departmental mail service within two to three weeks. If he agreed to participate, he was given a copy of the questionnaire and asked to read the instructions to ensure that they were clear to him. If the faculty member expressed interest in the aims of the study, he was told only that the relationships between various beliefs were of interest, and that detailed feedback would be available after the study was completed.

It was then explained that subsequent interviews would be held with some of the participants. The faculty member was asked if he would be willing to take part in such an interview in the event that he was selected. His response was noted for later reference.

Attached to the instruction sheet of the questionnaire was a form requesting the respondent's name, phone number and mailing address along with his/her age, sex, level of education, current position, and religious background. The form was pointed out to the faculty member, and he was told during the initial contact that his responses to the questionnaire would be completely confidential and that his anonymity was guaranteed, but that his name, phone number, and address were needed in the event that he had to be recontacted for clarification of his responses, to arrange an interview, or if he requested feedback on the results of the survey. Assurance of confidentiality was also included in the written instructions to the questionnaire.

The academic departments surveyed ranged in size from roughly two to three dozen full-time faculty members (excluding the psychiatrists, who held cross-appointments with teaching hospitals). An attempt was made to obtain a sample of at least 20 respondents from each discipline. Accordingly, each department was visited on a daily basis until 20 faculty members had been (arbitrarily) contacted and had accepted a copy of the questionnaire. Exactly three weeks after the initial contact, those academics who had not yet returned a completed questionnaire were sent a memorandum to remind them. No further attempt was made to solicit their participation. Those who did not return the questionnaire within one week of receiving the memorandum were discarded as prospective respondents and a corresponding number of new participants were sought according to the same procedure. The process was repeated over a four month period until 20 questionnaires were received from each department, or, as was the case in the faculties of law and management, until all available members of the department had been contacted and invited to participate.

For Phase Two of the study, the selection of interviewees was based on an initial cluster analysis of the questionnaire data. The resulting clusters each contained respondents from three or more disciplines in varying proportions. The two or three predominant disciplines represented in each cluster were identified as target disciplines from which to select interviewees. The selection of individuals from within a particular discipline was based on the respondent's "distance" from the center of the cluster. The rationale for this procedure was that respondents nearer to the center of the cluster (i.e., whose distance score was small) would more adequately represent the views of their colleagues in the same

cluster than those who were outliers in the cluster.

Accordingly, the respondent from a given target discipline in a given cluster who had the smallest distance score was contacted by phone and asked if he would agree to discuss his views in greater depth in the context of a recorded, semi-structured interview. If he/she declined or could not be reached, the next respondent nearest the cluster center was contacted. The process was repeated until interviews were arranged with at least one faculty member from each predominant discipline in each cluster.[1]

Twenty respondents were interviewed in all. Nineteen of them were interviewed in their office or laboratory. One was interviewed in his home. An effort was made to establish good rapport with the interviewee and a relaxed atmosphere for discussion. Although the flow and direction of the interviews varied as a function of the different interests of each respondent, the same core set of questions was asked in each case, in a more or less fixed order. The questions ran roughly as follows:

a) Do you believe that people have some degree of real choice and real control over what they do, or do you believe that people are actually completely determined by genetic factors, their background, and current environmental factors?

b) Do you believe that people are genuinely responsible for what they do? Morally, or in some other sense?

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[1] Some six months after the last interview was completed, an error was discovered in the algorithm of the cluster analysis program, effectively invalidating the initial analysis. The data were reanalyzed and yielded an optimal solution consisting of six clusters, as reported below. Fortunately, the new analyses were sufficiently like the old that there was no need to carry out new interviews.

c) Do you take any religious considerations into account in your views of free will and moral responsibility?

d) There has been a popular notion in science that eventually all the "special" branches of science--biology, psychology, sociology, economic science, and so on--will be reduced to physics and chemistry. The underlying assumption is that all events and phenomena are ultimately physical in nature and can be completely accounted for by physical theories. Do you believe that the subject matter of all the sciences is reducible to physics and chemistry?

e) Another popular notion since the development of Quantum Theory in nuclear physics is that the existence of indeterminacy at the subatomic level provides a basis for the reality of free will. Others disagree. What is your view on this?

f) Some scientists have argued against reductionism by appealing to the notion of emergent properties--the notion that organisms are organized and function as a system or whole such that many of their properties cannot be explained or described in terms of their physical or chemical components. Do you believe that this notion has any validity?

g) Another argument against reductionism in psychology is a dualistic one--the idea that the mind is something other than physical matter. Do you believe that this notion has any validity?

h) Do you see any limits on scientific progress in understanding and explaining the human mind?

i) What attracted you to your discipline? Do you consider the work you do to be compatible or in conflict with your beliefs about free will?

In the course of discussing each of these issues, further questions

were asked, where necessary, to achieve greater clarity or to obtain an elaboration of certain points. Each interview lasted approximately 60 minutes. All interviews were conducted within four to six months from the time the interviewee completed the questionnaire.

Data Analysis and Rationale

We have two sources of data to consider. There are the responses of 130 academics from various disciplines to the questionnaire. There are also interviews with a selected group of 20 of them. The bulk of the data analyses were aimed at the classification and interpretation of the questionnaire responses. Some of those analyses served as a guide for selecting people to interview. This section describes the mechanics of the classification process and the rationale behind the methods that were used.

Recall that the questionnaire is made up of two types of items: the four "position" items and the 24 scalar items. The scalar items were designed to measure the academics' estimates of the veracity and the limits of our understanding and the extent and limits of our freedom and responsibility. The position items were designed to assist in the interpretation of the scalar responses.

What can the scalar items tell us? The 12 FW items ask how often we exercise real control and choice, how often we are responsible for what we do, and how much control and responsibility is attainable. They provide a means of identifying hard determinists--that is, the ones who would rate that we are never really free or responsible.

However, the FW scalar items cannot be used to distinguish

libertarians from soft determinists, since both groups can be expected to estimate that we are free some of the time, without meaning the same thing. Two of the position items were designed to distinguish libertarians from soft determinists. One asked under what conditions a person has real power to decide what to do. The other asked under what conditions a person is genuinely responsible for what he does. In both cases, the respondent could endorse a statement consistent with libertarianism[2] or one consistent with soft determinism.[3] If he endorsed the libertarian position, it was inferred that his scalar estimates of how often we are really free and responsible were estimates of the extent and limits of genuine free will. If he endorsed the soft determinist option, it was inferred that his FW ratings merely represented estimates of how unconstrained we are. The validity of the inference was examined in the interview.

The scalar U items tell us how much true understanding the academics believe we have and can attain of physical, biological and psychological phenomena. However, these items do not tell us what the respondents believe to be the form of that understanding. Two of the position items were designed to clarify this. One asked whether the respondent believed that true scientific understanding consists of "an accurate explanation

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[2] i.e., a person has real power to decide (and genuine responsibility for his actions) if "he makes the decisions (and performs the actions) himself, and...his decisions (actions) are not completely determined by his heredity, past experience, or by the situation he is in."

[3] i.e., a person has real power to decide (and genuine responsibility for his actions) on the minimum condition that "he makes the decisions (and performs the actions) himself, even though his decisions (actions) may be completely determined by his heredity, past experience, and the situation he is in."

of what causes things to be as they are," or merely "an accurate description of orderly patterns in the way things are." The other item asked the same with respect to common-sense understanding. It was predicted that those who endorsed the "causalist" option would, in general, give higher estimates of the veracity of our understanding than those who endorsed the "descriptivist" view (see Chap. 3).

Further, it was predicted that causalist libertarians and causalist soft determinists--although indistinguishable from one another in virtue of their FW ratings--would respond differentially to some of the U items. Specifically, it was predicted that the causalist libertarians would give lower estimates than the soft determinists of the veracity of causal explanations of human emotion and intelligence.

The position items provide a relatively crude, binary measure of who are the libertarians and determinists in the sample, and who among them subscribe to a causalist as opposed to a descriptivist view of the form of human understanding. Responses to these items were in the form of nominal data and were therefore analyzed non-parametrically. Chi-square analyses were performed on the frequencies with which one position or the other was endorsed across disciplines and in relation to various patterns of response to the 24 scalar items. Unless otherwise indicated, they are two-tailed tests.

It was reasoned that the patterns of responses to the 24 scalar items might offer a means of identifying more subtle variations in the beliefs of respondents who otherwise subscribe to the same general position. A mere glance at the philosophical literature shows that not all libertarians believe exactly the same things, nor do all compatibilists

and hard determinists. I wanted to ensure that in selecting people to interview, the widest range of opinion would be sampled. Accordingly, an attempt was made to identify common and distinctive patterns of response to the scalar items of the questionnaire. The interviewees were then selected from each of the resulting groups according to the procedure described in the last section.

The technique employed was a cluster analysis which sorts patterned data using multivariate cluster centers. It accomplishes this by grouping the response patterns of the various academics in such a way that those within each resulting cluster are quite similar, and the various clusters differ from one another.

Clustering techniques vary according to the methods used for generating cluster centers and for modifying them to fit the data. For the present analysis, the method employed was iterative relocation. This method is widely used for unsupervised algorithms (i.e., which start the clustering from a set of randomly selected patterns or "seeds"). A random start was thought to be preferable, since hierarchical methods of cluster analysis are more sensitive to the initial cluster center choices and may result in gross errors.

The metric or dissimilarity measure used was the Euclidean distance, in 24 dimensional space, between each point (i.e., each respondent's pattern) and the previous iteration's cluster centers. The membership decision was based on the minimum distance to a cluster center. Convergence was reached when no point changed membership.

The cluster analysis was performed using the BMDPKM program (revised 1979). It is a very flexible packaged program. The user

specifies the number of variables that will be analyzed and what form the data should take (e.g., standardized or unstandardized). The user also specifies in advance how many clusters are to be constructed. In the present case, the scalar responses were subjected to several clusterings, ranging from three to nine clusters with both standardized and unstandardized data. The various groupings were then examined and compared.

The six-cluster solution on unstandardized data was chosen based on the minimum pooled within-cluster variance. The six-cluster solution was stable using a hierarchical average linkage algorithm and also when standardized data were used. In the interests of parsimony, the seven-, eight- and nine-cluster solutions, which contained tiny (e.g., 3 or 4 member) clusters were not considered.

The main disadvantage of the cluster analysis is that it has no test of significance associated with it, and hence no measure of good or bad clustering. It can sort the data into as few or as many groups as one wishes without any indication that the solution discriminates poorly between the clusters. It could be, for example, that the six clusters overlap so much that it would be misleading to treat them as distinct groups.

The multivariate analysis of variance (MANOVA) provides a means of testing the distinctiveness of the clusters. A one-way MANOVA was performed on the response patterns, with clusters as the independent variable. It is important to note that the MANOVA was conducted for descriptive purposes only--i.e., to provide criteria for determining differences between the clusters. I have performed significance tests as

if the clusters had been independently obtained. However, since the clusters were actually identified *a posteriori*, the analyses should not be regarded as genuine tests of significant differences, but merely as providing a useful method of determining whether there are contrasts between the clusters of response patterns that are worthy of description.

The MANOVA employed in the present study also incorporates a discriminant analysis. The discriminant analysis determines the coefficients of the linear combinations of the items which best discriminate between the clusters. The results of this analysis provide a means of identifying and interpreting how the clusters differ.

Differences between the six clusters could have occurred in as many dimensions as there are degrees of freedom for the cluster effect. The analysis therefore yielded five discriminant functions. In interpreting the results of multivariate data analyses, parsimony is always a prime objective. Huberty (1975), for example, suggests that two discriminant functions are often sufficient to account for the bulk of the variation between groups. In the present case, it was concluded that the first three functions describe meaningful contrasts between some of the clusters. The basis for that conclusion is outlined below.

Each discriminant function consists of a set of 24 coefficients or weights--one for every questionnaire item. They can be applied to the data to determine both (a) which items best discriminate the clusters, and (b) which clusters are maximally contrasted by them. The theoretical significance of each function can then be evaluated through an examination of the relevant responses of the contrasting groups. The best discriminators were identified by determining which weighted items were

more strongly correlated with each function. The sum of the 24 weighted responses of each cluster indicate which clusters are contrasted by each function and to what degree.

Having outlined the mechanics and rationale of the data analysis, the way is cleared for a concise presentation of the relevant findings. The first part of that presentation will address the responses to the position items. This will establish who are the libertarians and determinists, and what view they take of the form of understanding. Then we will consider the results of the cluster analysis and the follow-up MANOVA and discriminant analysis.

Once this overview of the results of the survey has been presented, we will turn to the task of theoretical analysis. We will address the academics' conceptions of free will and explore their concomitant views on reductionism and moral responsibility. Selected excerpts from the interviews with respondents from the various clusters will be brought in to help interpret the responses of the sample. A summary highlighting the results and a brief general discussion will follow.

Results and Discussion

Who believes in the reality of free will?: Responses to the position items

It appears that 80% of the academics surveyed believe in genuine free will. One hundred and four of them endorsed the libertarian conception of human decisional power and responsibility. That is, they indicated that they believe real decisions and genuinely responsible actions are not completely determined by heredity, historical and

situational factors. Moreover, all of them estimated in the body of the questionnaire that we do in fact have some degree of real control, choice and responsibility for what we do, at least some of the time.

Only 26 (or 20%) of the academics endorsed the determinist option in the questionnaire. That is, they indicated that they believe a person's decisions and actions may be completely determined. Twenty-two of them also estimated in the body of the questionnaire that we often control our acts and make choices, and are often responsible for what we do. It was inferred that they are compatibilists (or soft determinists). In contrast, the four remaining determinists had rated that we *never* have any degree of real control, choice, or responsibility for what we do. It was inferred that they are hard determinists.

What is their view of the form of understanding?

Ninety-three (or 71%) of the academics--a clear majority--favoured the view that science provides causal explanations of phenomena. The remaining 37 (or 29%) endorsed the view that scientific understanding merely consists of descriptions of orderly patterns and regularities in events. As shown in Table 3, there was a tendency for the respondents to endorse the same view of both scientific and common-sense understanding. We will be concerned primarily with their view of scientific understanding.

There is no relationship between what positions the academics endorsed regarding free will and what view they endorsed of scientific accounts. As shown in Table 4, many of both the libertarians and determinists are causalists, and some of both are descriptivists.

The main finding of interest so far is that an overwhelming majority of the academics believe in the reality of free will and a very substantial

TABLE 3

The Form of Scientific and Common-Sense Understanding: Observed and *Expected* Frequencies of Causalists and Descriptivists

		Scientific Understanding: Causalists	Scientific Understanding: Descriptivists
Common-Sense Understanding: Causalists 59		52 *42.2*	7 *16.8*
Common-Sense Understanding: Descriptivists 71		41 *50.8*	30 *20.2*
Total = 130		93	37

$\chi^2(1) = 14.61, p < .005$

TABLE 4

Beliefs Concerning Free Will and the Form of Scientific Understanding: Observed and *Expected* Frequencies

		Libertarians	Determinists
Scientific Understanding: Causalists 93		77 *74.4*	16 *18.6*
Scientific Understanding: Descriptivists 37		27 *29.6*	10 *7.4*
Total = 130		104	26

$\chi^2(1) = 1.59, p > .40$

number of them also believe that science provides causal explanations of things. Whatever one's initial response to this finding--be it relief or scorn--one has to admit that the majority have endorsed the more optimistic conceptions of human capabilities. Indeed, even those who endorse determinism apparently favour the more optimistic version of that thesis. Most appear to be soft determinists; hard determinism figures almost not at all.

Estimates of human freedom and understanding: Responses to the scalar items

As described earlier, the scalar responses to the questionnaire were subjected to a series of cluster analyses in an attempt to identify different patterns of response to the various items. The results of the cluster analysis were then used to guide the selection of interviewees. This was done to ensure that the full range of opinions expressed by the sample as a whole would be represented in the interview data.

It was found that the simplest, stable solution consisted of six clusters--that is, six groups of academics who responded differently in some way to the questionnaire.[4] We will call them clusters "A" through "F". The cluster centers (i.e., the mean ratings of each cluster to the 24 scalar items) are presented in Figure 1. Do not be alarmed at the complexity of the response patterns. For the moment, we need only attend to their general features (e.g., the overall magnitude of the different patterns, and the relationship between responses to the U and FW items).

The first question that arises is whether the resulting clusters are

[4]The composition of the clusters is detailed in Appendix B. The means and standard deviations of the cluster centers are tabled in Appendix C.

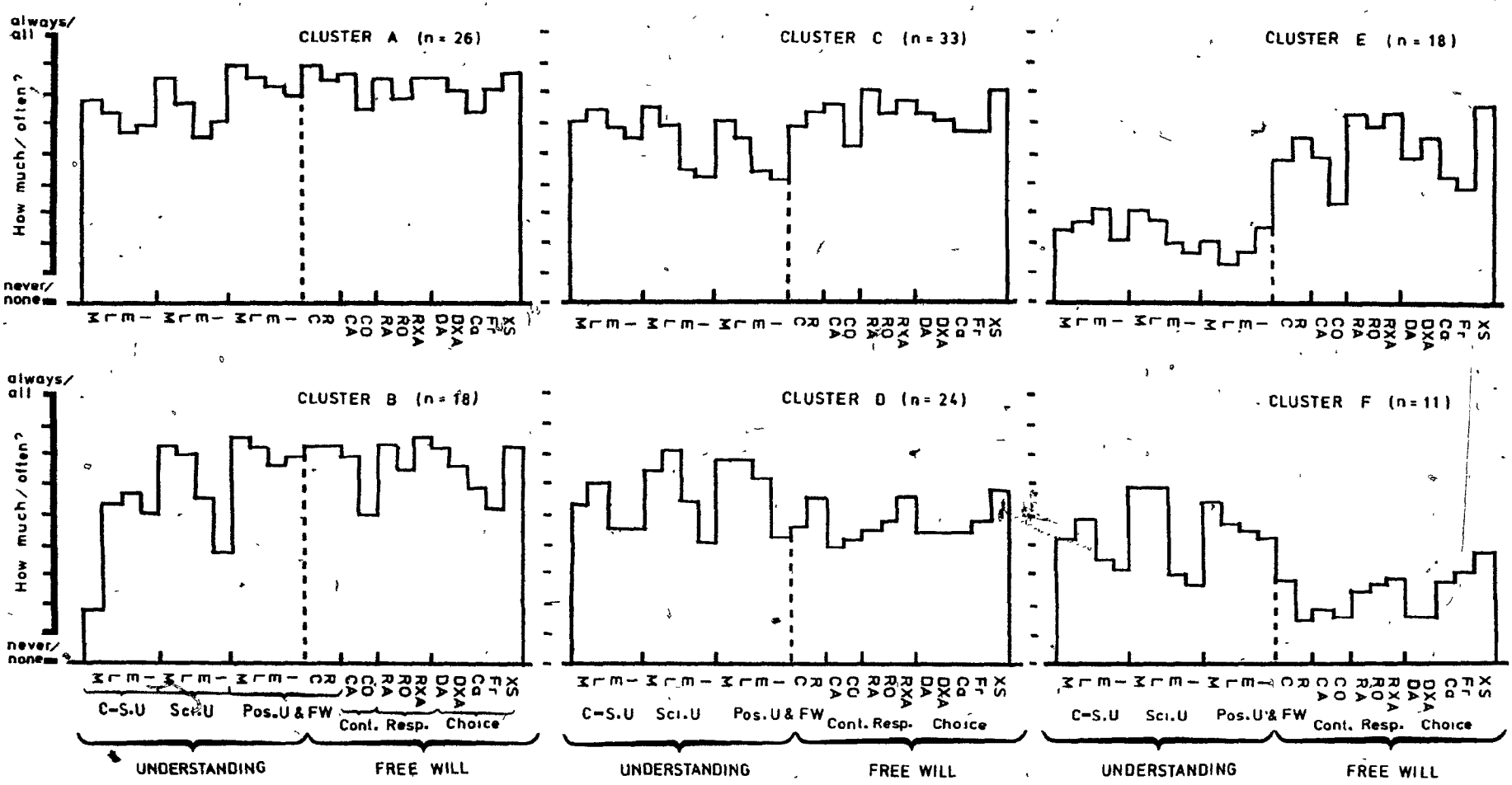

Figure 1: The cluster centers: Average patterns of response of six clusters to the 24 scalar items.

in fact different. Since the cluster analysis itself gives no indication of this, a one-way MANOVA was conducted on the clusters of response patterns. This necessitated treating the clusters as if they were independently obtained, though they were defined *a posteriori*. Nevertheless, the results of the analysis serve to guide the identification of the most salient differences between the clusters.

The multivariate test of no differences indicated a very low probability that the cluster analysis converged on a totally overlapping solution: *Multivar.* $F(120,501) = 5.059$, Pillai-Bartlett trace criterion = 10.377, $p < 0.0001$ (c.f., Appendix D). It does not specify which clusters differ, nor in what respects, but it does suggest that at least one of the clusters differs from at least one other in response to one or more variables. A discriminant analysis was employed in order to determine which items contributed most to the distinctiveness of which clusters.

The analysis yielded five discriminant functions. As explained in the previous section, the first three functions were selected as providing the most meaningful description of the major contrasts between the clusters. Together, these three functions account for 92.3% of the total variation among the respondents in the sample.

The three functions were applied to the response patterns of each cluster. This yielded a canonical representation of the major differences between the academics in their responses to the questionnaire as a whole. The results are depicted in Figure 2. It is a three-dimensional representation. Each of the three axes in the figure represents one of the discriminant functions. Each of the 130 academics is depicted as a point in the surrounding "discriminant space". The greater the distance

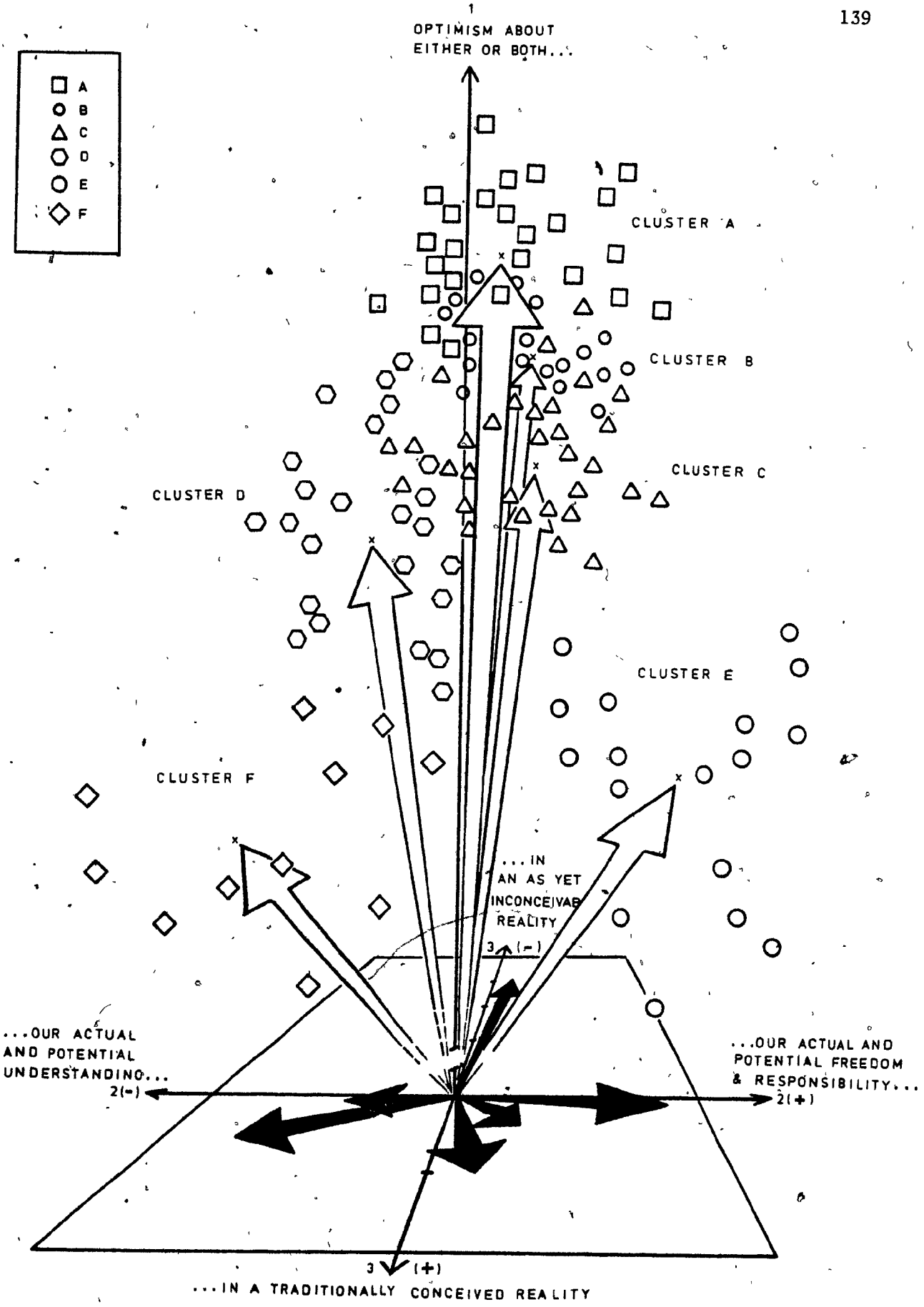

Figure 2: A three-dimensional canonical representation of the six clusters of academics.

between any two respondents, the greater the differences between their respective patterns of response to the questionnaire. Different shapes are used to designate cluster membership. The large white arrows point to the location of the six cluster centers relative to the three discriminant dimensions. (The shadows cast on the floor of the figure provide the clearest view of how the clusters are contrasted along the two horizontal dimensions.)

The three dimensions depicted in Figure 2 have been labelled to suggest that the clusters of academics differ primarily:

(+1) As to how *optimistic* they are in their estimation of...

(-2) Our actual and potential *understanding*,

and/or (+2) Our actual and potential *freedom* and *responsibility*,

in (+3) A traditionally conceived reality,

or, in (-3) As as yet inconceivable reality.

The basis for this interpretation of the configuration will become clear as we go along.

The first dimension (represented by the vertical axis) accounts for 59.3% of the variation between the clusters. As indicated by the correlations between the individual items and this function (see Table 5), all 24 items contribute to some degree in discriminating one or another cluster from the rest in the vertical dimension. By relating the cluster centers in Figure 1 to their respective positions along the vertical axis of Figure 2, the reader will see immediately why I have called it a dimension of optimism: it contrasts those who gave generally high estimates

TABLE 5

Discriminatory Power of the Scalar Items: Pearson Product-Moment Correlations Between the Items and the Three Discriminant Functions

	Discriminant Functions		
	1	2	3
U Items:			
C-S.U.M	0.356**	-0.188	0.755**
L	0.476**	-0.308**	0.176
E	0.462**	0.018	0.013
I	0.621**	-0.100	0.127
Sci.U.M	0.590**	-0.362**	-0.059
L	0.478**	-0.508**	-0.091
E	0.593**	-0.282*	-0.062
I	0.645**	-0.141	0.290**
U.Pos.M	0.660**	-0.450**	-0.078
L	0.730**	-0.513**	-0.105
E	0.676**	-0.490**	-0.096
I	0.584**	-0.162	-0.187
FW Items:			
Pos.C	0.669**	0.310**	-0.078
Pos.R	0.634**	0.466**	-0.112
CA	0.677**	0.492**	-0.032
CO	0.599**	0.163	0.129
RA	0.527**	0.577**	-0.048
RO	0.383**	0.435**	-0.018
RXA	0.544**	0.462**	-0.142
DA	0.687**	0.461**	-0.094
DXA	0.572**	0.526**	-0.022
Ca	0.516**	0.206	0.020
Fr	0.535**	0.092	0.222
XS	0.462**	0.339**	0.008

* $p < 0.001$

** $p < 0.0001$

of both our potential freedom and understanding (i.e., the members of clusters A, B, C and, to a lesser extent, D) from those whose estimates of either were generally low (i.e., clusters E and F).

The second dimension (represented by the lateral horizontal axis in Figure 2) accounts for an additional 18.5% of the variation between the clusters. As shown in Table 5, the U items of the questionnaire are negatively correlated with the second function, whereas the FW items are positively correlated with it. In effect, this dimension pits faith in understanding against faith in freedom. Those whose estimates of freedom and understanding are roughly of the same magnitude (e.g., clusters A and B), fall nearest to the origin of the second dimension. The function discriminates best between respondents whose estimates are biased in favour of either the U or the FW items. Specifically, those whose FW estimates are quite low relative to their U ratings, are pulled towards the left side of the configuration (e.g., cluster F). In contrast, those whose U estimates are low relative to their FW responses are pulled towards the right side of the configuration (e.g., cluster E; c.f., their respective response patterns in Figure 1).

The third dimension accounts for yet another 14.5% of the variation within the sample. It serves mainly to contrast clusters A and B, which are otherwise not distinguished along the other two dimensions. I have interpreted this third dimension as detecting different views of reality. Later, excerpts from the interviews with respondents from both clusters will clarify what this means. For the moment, it will suffice to note that the relevant discriminators of clusters A and B in the third dimension are the items which address the veracity of our common-sense

understanding of matter and that of our scientific understanding of human intelligence (c.f., Table 5).

Now take a look at Figure 3. It shows what positions were endorsed by the academics from the various clusters. Note that it is the majority of the academics--those who endorsed both a libertarian conception of decisions and actions and a causalist view of scientific accounts--who, in general, also gave the higher estimates of both our potential understanding and our potential control and responsibility for our acts. Note too that there are soft determinists scattered through this optimistic group of causalist libertarians. Indeed, half of the soft determinists in the sample make up the most optimistic group (cluster A). There are subtle but important differences between their responses and those of the libertarians in clusters B, C, and D. We will examine those differences more closely in the next section.

Figure 3 also shows that a high proportion of the academics who make up the less optimistic clusters are descriptivists. Cluster E, in particular, is dominated by descriptivists. As was seen in Figure 1, that group gave the lowest estimates of our actual and potential understanding of phenomena at all levels of inquiry.

Cluster F contains the four hard determinists of the sample who gave relatively high estimates of our understanding, but rated that we never have any real control, choice, or responsibility for what we do. They clustered with a small handful of libertarians who, unlike those in any of the other groups, estimated that we do have real free will, but only rarely can we exercise it.

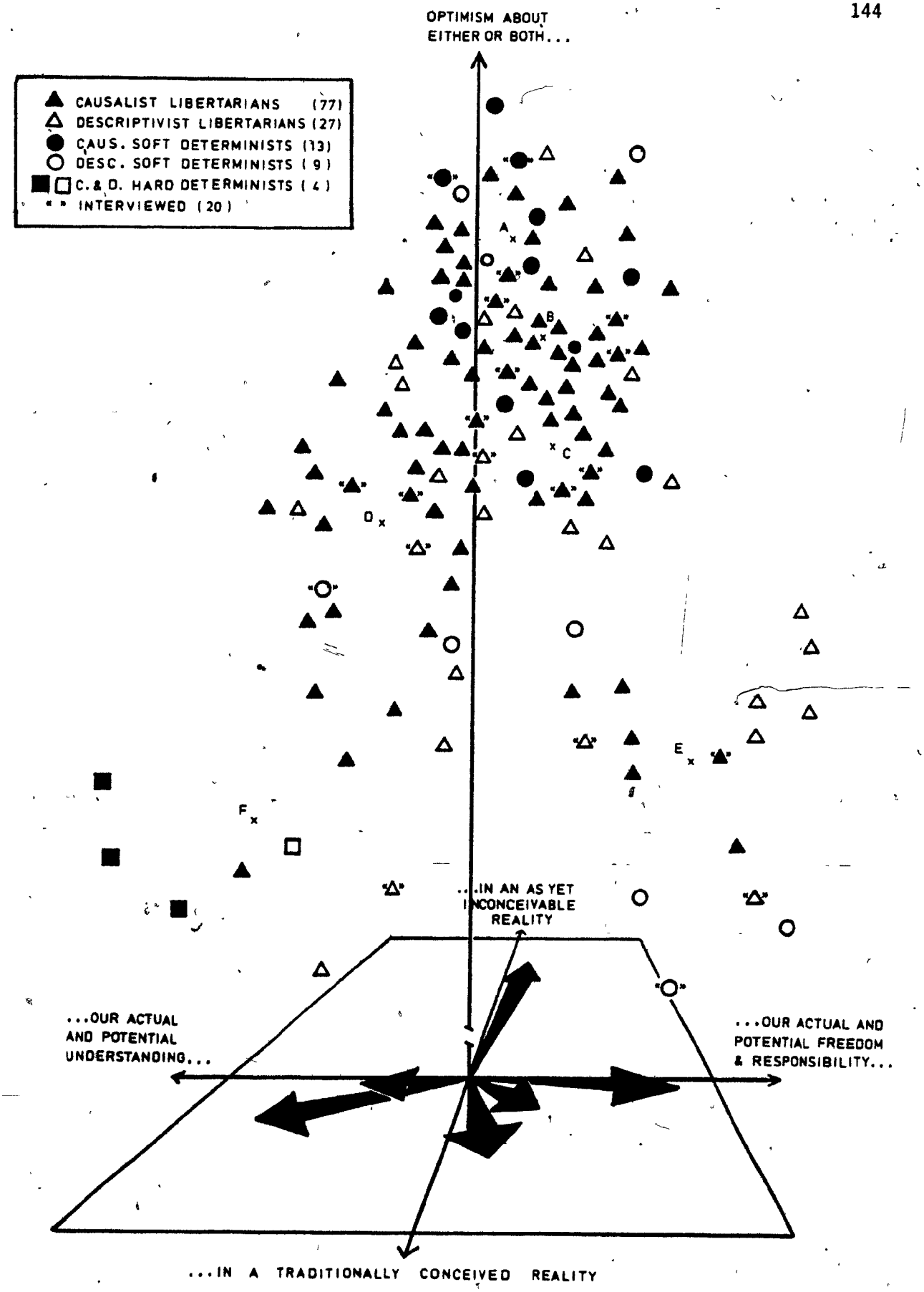

Figure 3: The canonical representation of the six clusters and the positions they endorsed.

What about their discipline?

McGill is a good North American university. The academics in the present sample are much like those one would find in many comparable universities. Like most such institutions, McGill does not select or retain its biologists, physicists, its faculty of Law or English, etc., on the basis of their beliefs about free will or their views on science. I think we can safely assume that the positions taken and the opinions expressed in the present study by the members of the different departments reflect the views of academics from those disciplines in many other institutions of research and higher learning.

As shown in Table 6, the present sample is characterized by uniformity across disciplines and diversity within. Consider their responses to the form of understanding, for example. The ratio of causalists to descriptivists varies hardly at all across the departments, $\chi^2(6) = 6.20$, $p > 0.60$, n.s. That is, there are roughly seven causalists to every three descriptivists in all departments. Moreover, the members of each department are distributed through nearly all the clusters. Every department has its share of optimists and its representative pessimists, and in nearly all disciplines there are a few who either doubt the magnitude of our potential to control and take responsibility for our acts, or who believe that truth is largely inaccessible.

In general, four out of every five academics from a given discipline seem to believe in the reality of free will. There is one notable exception, however. There appears to be a higher proportion of determinists (50%) in psychology than in the other disciplines, $\chi^2(1) = 13.36$, $p < 0.005$. This finding may come as a surprise to some; perhaps it

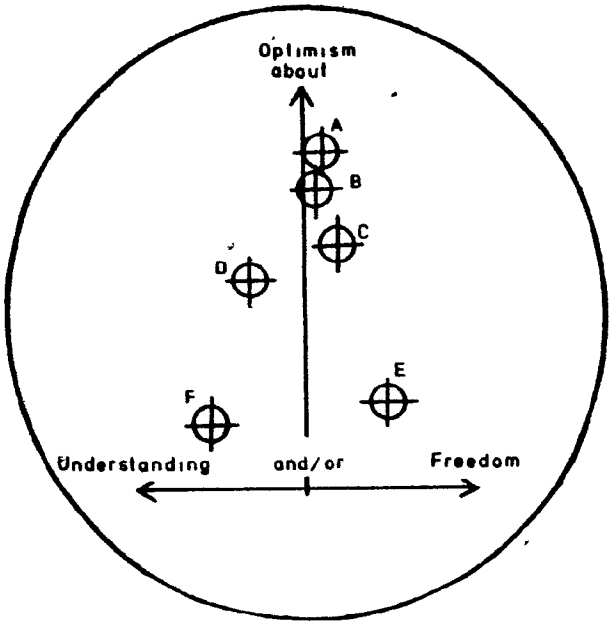

TABLE 6

Cluster Membership and Positions Endorsed by the Academics from Each of Seven Disciplines

Disciplines	Clusters						Positions on...			
							Science		Free Will	
	A	B	C	D	E	F	Caus.	Desc.	Libert.	Determ.
Psychology (20)	7	3	2	5		3	15	5	10	10
Physics (20)	6	3	6	3	1	1	15	5	15	5
Management (19)	6	4	4	2	2	1	16	3	16	3
Biology (20)	5	2	7	3	3		15	5	17	3
Psychiatry (20)	1	1	6	6	5	1	11	9	16	4
Law (11)		2	4	2		3	6	5	10	1
English (20)	1	3	4	3	7	2	15	5	20	
Totals:	26	18	33	26	18	11	93	37	104	26
							$\chi^2(6)=6.20$		$\chi^2(1)=13.36$	
							$p>0.60$ n.s.		$p<0.005$	

will confirm the expectations of others. Either way, it certainly highlights just how dismissive psychologists are of genuine free will.

Moreover, it brings us straight to the very issues that are of greatest concern in this thesis. The evidence from both the present opinion poll and the current psychological literature suggests that a substantial number of psychologists take it for granted that belief in free will is naive--that it is either based on illusion, or arises out of confusion about what it means to be free. It is pertinent to note, however, that one can find little if any discussion in the psychological literature as to what are suitable criteria for deciding whether a belief is "naive" as opposed to "informed." Writers such as Immergluck (1964) and Westcott (1977) imply that determinism has the greater claim to credibility because it is the more "scientific" view. But it is not at all clear what *that* is supposed to mean. If it is supposed to mean that determinism is endorsed by most scientists, then it would appear that Immergluck (1964), Westcott (1977) and others are wrong. The present evidence, at least, suggests that determinism is *not* endorsed by many scientists outside of psychology--not even in the natural sciences (e.g., physics and biology).

Of course, the fact that determinism does not seem to enjoy as much support among scientists as psychologists have assumed, cannot be taken to imply that determinism is therefore false. But it does call into question whether its current status in psychology is justified. And it begs us to ask whether belief in free will is really so naive as some psychologists have maintained.

It is to these questions that the remainder of this report is

addressed. The reader, I am sure, will find this next section most interesting. In it, we will examine the views of the determinists and libertarians in a more critical light. The main focus of our analysis will be on the results of the in-depth interviews with representatives from both sides of the debate. We will examine and compare their views on free will and moral responsibility, their opinions on the possibility of successful scientific reduction, and their faith in science. Then, in the final chapter, we will consider the implications for psychology of what they said.

Who was interviewed?

The reader may have noted earlier, in examining Figure 3, that 20 interviewees were selected from the six clusters of academics. They were representatives from all seven disciplines--five psychologists, four biologists, three psychiatrists, and two each from physics, English, Law and Management. There were proportionally as many libertarians to determinists interviewed as occurred in the sample as a whole (i.e., 16:4); likewise for the ratio of causalists to descriptivists (13:7).

Were they what they seemed to be?

It should be noted first of all, that all 20 interviewees, without exception, indicated that they were aware that there is no clear answer to the question of whether human beings are free or determined. Moreover, all of them--libertarians and soft determinists alike--expressed the view that we are "free within limits," or "free within a certain framework"--that is, subject to limitations imposed by our genetic endowment, prior experience, and present circumstances. The main difference between the libertarians and soft determinists was that the former denied that our

decisions and actions are *completely* determined, whereas the latter did not. Consider, for example, what two libertarians from cluster B said. One, a female[5] Law professor said:

> It's obvious that I'm influenced by my education, background, and so on. But in spite of those influences, I believe that I have a choice to do *A* rather than *B*...Within limits, yes, people really are free...even someone who has had bad experiences in his childhood, for instance, and is influenced by that and conditioned by that, can still do something about it--can decide to go see a psychiatrist about it, if you want, and try to improve on that bad basis.

The other, a nuclear physicist, said:

> I believe that a good part of the explanation [of what people do] would be some combination of circumstances... their surroundings, their education, their traditions, economic factors,...which push us in some directions rather than others. But I don't think this is really absolute. There is something that we could call free will which is also very important.

With one exception, all 16 libertarians indicated that the sort of freedom and choice they had in mind was the freedom to do otherwise when we act. A female, evolutionary biologist from cluster C, for example, had this to say:

> Why do I think that we have free will? Because you can plot a course of clear alternatives, and choose *rationally* among them...Of course, you can always argue: "Oh, it's not really a free choice, you just think it is; but when you look back at it, you did this and you didn't do that, and that's how it *had* to be." Well, sometimes you *can* reverse things and sometimes you can't...I know, when I have made choices which are bad, in retrospect I can say they were wrong--not just because of the information that was available to me--but [because of] the emotional state I was in, I didn't think it through...But I can *also* see how at the time I really had the power to make the decision and to decide otherwise. (her emphasis)

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[5]Unless so specified, all interviewees are male.

The exception was a geneticist from cluster C who was quite reticent about discussing his views on free will. He would say little more than that he believes we are really free and that his belief is based on a feeling he could neither articulate nor substantiate. I could not tell whether he meant "free" in the soft deterministic or libertarian sense.

Otherwise, the only variation I could detect in their views on human freedom was that the libertarians from cluster F (whose FW ratings were so low) believe that our capacity to exercise genuine free will is extremely limited. As a Law professor from cluster F put it:

> I believe there's a certain amount of free will and real choice. But the mythology is much wider than the reality. Our choices may be much more limited than the legal system would maintain.

It should be noted that one of the four interviewees who endorsed the soft determinist option in the questionnaire presented himself as a libertarian in the interview. He was a clinical psychologist from cluster D. He had endorsed the determinist option merely "as a scientist," he said, and claimed that otherwise, he assumes the reality of free will. More will be said about his views and those of his libertarian colleagues from cluster D later.

The other three who endorsed the determinist option would not grant that one's decisions and actions are ever independent of determining factors. One, a senior psychiatrist from cluster E, explained his position as follows:

> I am convinced there is no free will. Oh, you can argue it, but I don't think and I don't feel there is free will. For very pragmatic reasons, I believe in some free--not *will*, but free*dom*. As Hebb pointed out, even a rat has some "free choice" in a maze. So we could discuss it in *that* sense, but I really don't think we have free will.

The only sense in which the soft determinists would allow that human beings are free, is in the sense that their acts and choices are sometimes taken without external interference, constraint or coercion. A nuclear physicist from cluster A expressed it quite simply: "People," he said, "are 'free' within a certain framework to orient their activities and so on, but clearly, the genetic makeup of the person and behavioural patterns he has learned determine this." An experimental psychologist from cluster A gave a more subtle account:

> Look, let me put it this way: it may in theory be true that everything is determined, but a good deal of internal checking, comparing, evaluating and choice is both possible and must be considered as part of the philosophical and political environment.

He went on to explain that in his view, both humans and other animals have the capacity to assess situations, predict outcomes and evaluate their choices against a "reference system which is usually some simple moral framework." He explained all this in cybernetic terms--that is, in terms of "self-regulation," based on "internalized controls" and "feedback mechanisms." "The concept of free will," he insisted,

> ...simply is the process of going through these "choices" and making the one that seems most apt in terms of the moral or social standards you've internalized. And that is clearly consistent with the known potential of human behaviour and the way in which any organism works.

It was in all respects a classic, soft deterministic, mechanical account.

Their views on the validity of reductionism

Theoretically, one would expect a determinist to believe that ultimately, "the way in which an organism works" is to be understood in physicochemical terms. That is, one would expect him to be a reductionist.

Fodor (1975) distinguishes two versions of the reductionist thesis.

One version he called "type reductionism," the other, "token reductionism." Both versions assume a purely physical reality. Type reductionism further assumes that all the theoretical terms and laws of psychology can be completely mapped onto, subsumed by, or reduced to neurophysiological terms and laws, which are in turn reducible to physical and chemical explanations. Simply put, type reductionism assumes a physical universe in which events of any type can be explained in physical terms. Token reductionism, on the other hand, does not assume that bridge laws can in practice be constructed to permit a complete reduction of psychological accounts to physicochemical explanations. It assumes a purely physical universe while assuming the *practical* impossibility of a unified science.

In contrast, a person who believes in the reality of free will should be logically committed to rejecting type reductions as impossible *in principle*. He may, for example, be committed to a view of the universe as purely physical, but believe that the mind is an emergent property of our physical organization, and therefore that mental events and processes are inherently irreducible. Alternatively, he may commit himself to dualism and maintain that the mind is immaterial and hence irreducible.

All three soft determinists maintained that the reductionist thesis is true. The deterministic psychiatrist from cluster E expressed his view on the matter in the most emphatic terms. "I really don't see the mind," he said, "as being anything different from anything else in the universe;"

> ...there is no difference, really, between physics and psychology. The mind is the same as a computer, say, or anything else. There really is no difference. I am nothing more than a temporary collection of atoms. I happen to be here, and it doesn't make a damned bit of difference.

The nuclear physicist from cluster A rejected both dualism and emergentism as "too simple," and expressed considerable faith in the eventual realization of type reductions between psychology and physics:

> The whole business of thought is understood so little. I think it will be...
> *Q. In physical terms?*
> I suppose so...The two major questions you could ask me--and nobody can really answer them yet--What is the origin of all the material, broken down into its smallest quarks and such; and also, What is the origin, the mechanism, by which we have thoughts? Maybe they are linked together and we'll end up with the same thing...some mathematical symmetry, which when you finally analyze it appears to manifest itself as those particles which have these properties, and gives matter as we have it and thought...I'm sure that in the long run, there will be some link found which will wrap all this up.

The soft deterministic psychologist from cluster A prefaced his answer by saying that he felt reductionism "is an overflogged horse"--particularly in psychology--and that "no one really knows whether psychology or biology is reducible to physics." He was of the opinion that reductionism is probably true, but his personal preference was for the "token" version of the thesis:

> If it [psychology] can be reduced to anything, it's got to be physiology. Now, ask the physiologists what they know, and you'll still find yourself quite a ways from any ultimate reduction...It may be in principle possible to reduce one to another, but it's not necessary...I don't see reduction in that sense as an absolute essential ...I'm not against it, but it's just one part of the game.

Given their belief that the reductionist thesis is valid, it is not surprising that many of the soft determinists, like the two causalists quoted above, gave uniformly optimistic estimates of how much true scientific understanding is possible of matter and living things, as well as of human emotion and intelligence. Their average estimates of our

potential understanding (on a scale where 9 = complete understanding) were:

	Matter	Living Things	Human Emotion	Human Intelligence
$\bar{X}$ =	7.923	7.539	7.231	7.077
s.d. =	(0.845)	(0.989)	(1.306)	(1.598)

(c.f., the U.Pos. responses of cluster A in Figure 1.)

Not all soft determinists were as optimistic as those in cluster A, however. Some were descriptivists. Indeed, the one I interviewed from cluster E was the only interviewee who actually called himself a "pessimist." His conviction that determinism and reductionism are true had led him to conclude that *no* true understanding is possible of anything at all. He explained his position as follows:

> Maybe it sounds too abstract and counter-intuitive, but I believe like Kant in the *Critique of Pure Reason*. He says that there are things which you cannot explain. Or, you can go to Heisenberg's Principle of Uncertainty in a modern way. I really feel that...we are made of some stuff as the universe. So it's very difficult to think that scientifically we could explain things because we are made from the same stuff. We can go further and further, but it will just prove that there are more and more problems. So I really don't share this faith in knowledge, that given time, we will be able to solve these riddles and finally put things in order. I'm certain that we can't.

His argument bore some resemblance to one advanced by the late biologist-philosopher, J. B. S. Haldane, who once maintained that "If my mental processes are determined wholly by the motions of atoms in my brain, I have no reason to suppose that my beliefs are true, and hence no reason for supposing my brain to be composed of atoms" (*Possible Worlds*, 1927, p. 209). The argument is intriguing, but apparently indefensible. Indeed, Haldane himself later repudiated it, and according to O'Connor (1971), contemporary philosophers generally agree that the argument lacks both

logical and conceptual support.

In any event, there appear to have been few soft determinists in the present sample who subscribe to so pessimistic a view of human understanding. For the most part, the compatibilists seem to agree that reductionism is valid, and that mechanistic accounts are as appropriate in psychology as they are in other domains of science.

In contrast, all of the libertarians interviewed rejected the view that true accounts of psychological phenomena can be given in terms of biological or physical theories. The only equivocal response came from the geneticist from cluster C, who was so reluctant to discuss his belief in free will. He seemed to subscribe to a token reductionist view. He maintained that reductionism may be valid in principle, but that the human mind is so complex that explanations of mental phenomena in terms of brain events will always be a practical impossibility. Given his reluctance to rule out reductionism, it is perhaps no wonder that he was unsure that he could substantiate his conviction that human beings are really free.

There was no equivocation, however, on the part of the 16 other libertarians. Their views were such that in one way or another, they all rejected the notion that psychological phenomena can be explained in terms of physicochemical events or processes. Consider, for example, the response from a libertarian social psychologist from cluster C. He contended that "when you get a biological system in the form of a human being or an animal,"

> ...there's an individuality and a distinctiveness of that organism, an absolutely fascinating individuality... Reductionism misses these beautiful clusterings on the way down.

A professor of English from the same cluster simply laughed and said:

> Some kind of circuitry! Does that view get any farther than saying that it is "some kind of circuitry?" Does that really explain what *comes out*? Some of these "circuits," I think, would be very difficult to account for in scientific terms. We can explain a great deal, and will explain more and more through physics and various sciences connected with medicine and so on, but what the sciences by and large will always fail to do, it seems to me, is to account for *imagination*. That seems to defy quantification--and various kinds of qualification. And yet, imagination seems to me to be one of the central functions of the human being. (his emphasis)

Another English professor, this one from cluster E, went on at some length about his objections to the reductionist thesis:

> I don't find myself able to accept it. And the chief reason that I don't is that it doesn't leave any place for an experience that is very intense and very vital, and that is, the experience--not only of my own Self--the sense that I have an interior selfhood--but also the very powerful sense that I have, say, right now, that I'm in the presence of another Self--that you are as interior a being and as much a center of reflection as I am. Now, that is not to say that I pretend that I can penetrate or share your interior quality with you. But the very fact that I'm aware that there is another one out there...is a testimony to me that there is something more than physics and chemistry--at least insofar as I can follow it--just doesn't account for...And I suppose the closest I can come to it, is using these terms that may not, in fact, take us very far. "Self" is one of the terms. I use it to imply the possibility of self-reflection...*That* is not accounted for in the concepts or the language of physics and chemistry.

It appears that even those extremely reserved libertarians from cluster F reject reductionism. The lawyer who was interviewed from that cluster had this to say:

> I think that it [reductionism] just doesn't answer--it cannot answer--certain underlying questions about the nature of things. It just can't tell you how these particles are supposed to interact...Science misses the fact that there are considerable interactions that are

> beyond reduction...The mind, of course, is dependent on the brain, but human nature goes beyond the mechanisms of the brain...Science cannot explain the workings of the mind because mind is the synthesizer of experience.

A psychiatrist from cluster D argued in a similar vein that "there are complex levels of organization, and if you try to reduce the lower levels, it's *meaningless*. It's simply impossible." A Management professor from the same cluster said much the same thing, and the clinical psychologist from cluster D was no less adamant: "Intelligence," he said, "is a concept far beyond any simple, one-level way of analyzing it. But it's not just that the whole is more than the sum of the parts. The whole is not even in parts. Intelligence is something besides the chemical, or whatever."

One very important thing to note about the position taken by the libertarians in this study is that their rejection of the reductionist thesis was not based on a belief in dualism. As the clinical psychologist went on to say:

> The problem with dualism--particularly in an area like clinical psychology--is that it's so easy to use mentalistic explanations for things which in fact are not explanations, but rather *post hoc* statements that have no way of being proven correct or incorrect...And there are many writings that I just won't accept because they are dualistic.

Consider, moreover, what the libertarian physicist from cluster B argued: "Nature is only one thing," he said, "There is only a material manifestation of nature." From his point of view, the reason reductionism is invalid is because "We have to deal with different aspects of nature with different tools...in order to deal with different sorts of problems which have their own characteristics." He wanted to make it quite clear

that one could dispense with both dualism and reductionism if one accepted the notion of emergence:

> One might think there's a contradiction between the two things. If man is part of nature, he is also material. Then why is he free and responsible for what he does? Well, I think that's simply a manifestation of the fact that man is the highest stage of development in any living being in nature. He has reached such a complex, advanced stage of development that in spite of being himself a part of nature, there is such a thing as free will and responsibility on his part.

The evolutionary biologist from cluster C was also clear about the fact that her rejection of reductionism did not reflect a belief in dualism. She argued that the mind is dependent on the brain but not explicable in terms of brain mechanisms. Her reason: "With increasing complexity, with increasing intelligence, with increasing self-awareness, we got past the point at which we were biological mechanisms."

In line with this sort of argument, a number of interviewees argued that strictly causal accounts of mental phenomena are inadequate. One, for example, an applied mathematician from cluster D, advocated a teleological, "systems" approach to the study of human beings which would incorporate "an analysis of the individual's goals." A psychiatrist from that cluster also argued for a teleological approach. He emphasized the importance, in his view, of the concept of "a person, who wants--and who thinks, says, and does what he wants." He contended that scientists and clinicians alike should, "instead of trying to find out what *causes* present behaviour--think about the *aims* of the person."

Variations in the libertarians' faith in science

Together, the libertarians who dominate clusters B, C and D constitute a fairly optimistic majority. Some were less optimistic than others,

however, about our potential scientific understanding of psychological phenomena. The libertarians from cluster C, for example, gave much lower estimates of our actual and potential understanding of human emotion and intelligence than of matter and nonhuman living organisms. Their average estimates of how much true understanding is possible were:

	Matter	Living Things	Human Emotion	Human Intelligence
$\bar{X}$ =	5.909	5.455	4.393	4.272
s.d. =	(1.774)	(1.603)	(1.539)	(1.719)

(c.f., the U.Pos. responses of cluster C in Figure 1.)

In contrast to the uniformly high estimates of the soft determinists in cluster A, the cluster C estimates of our possible understanding seem to reflect what Boring (1958) referred to as "truncated determinism"--the view that causal explanations in science will yield considerable understanding of matter and nonhuman organic forms, but will fail to account for much in psychology.

The libertarians from cluster D were equally reserved about how much scientific understanding of intelligence is possible, but they gave somewhat higher estimates than cluster C of what understanding can be gained of human emotion, as well as of matter and living things. Their average ratings were:

	Matter	Living Things	Human Emotion	Human Intelligence
$\bar{X}$ =	6.708	6.708	6.167	4.333
s.d. =	(1.922)	(1.398)	(1.633)	(1.904)

There are a couple of interesting things to note about the cluster D libertarians. Unlike cluster C, which is well represented by all seven

disciplines, cluster D is dominated by academics and professionals with applied interests (c.f., Table 6). Moreover, what was singular about all four interviewees from that cluster was that they were the only ones to express disinterest in the free will problem. They simply took it for granted that we are free. What they *were* interested in was the exploration and discovery of the many ways in which the exercise of genuine free will is curtailed, constrained, and otherwise affected. Consider, for example, the reaction from one applied psychologist:

> Is it necessary to pin an origin on volition? Other than to say that it's characteristic of human behaviour? My gut reaction is that it's not that free will needs to be allowed, it's that we need knowledge of the constraints on it.

What seemed to go along with this more applied orientation to human behaviour was a common view of science. All four respondents, regardless of whether they endorsed the descriptivist or the causalist option in the questionnaire, expressed in interview the opinion that the sciences do explain--that is, they do not merely describe patterns in things--but that these explanations can never be shown to be true in any absolute sense, only more or less useful at a given point in time. To quote the applied psychologist:

> When science produces an explanation of a system that turns out to have some conceptual or predictive utility, if it helps you to understand better, then it's explained something.

and the clinical psychologist:

> I'm convinced that much of what we're dealing with now as factual will be re-explained in many other ways...The facts are there, but we explain them differently. And they will be explained much differently by further generations.

Of all the interviewees but one from the other optimistic clusters we have considered (A, B, and C), none took this relativistic, instrumental view of scientific accounts. The only exception was the soft deterministic psychologist from cluster A, who claimed that the best measures of the "goodness" of a scientific theory are its "utility" and its "aesthetic properties." The rest all gave a clear impression that they believe that Truth--while terribly difficult to attain--is nevertheless possible.

This finding of a group of "instrumentalists" in the sample was unexpected, and points to a limitation of the questionnaire. Too few position options were provided. The respondents from cluster D seemed to regard both the causalist and descriptivist options as too extreme. As Nagel (1961) portrayed it, their "instrumentalist" view of scientific accounts lies somewhere between the view that science merely describes regularities and the view that it explains the natural causes of things. The instrumentalist view has roots in neopositivism and draws much of its substance from the work of philosophers like Wittgenstein, Goodman, and Ryle. It emphasizes the cognitive status of scientific theories, but without going as far as the so-called "Regularity Theory" would.

It was the unanimous view of the interviewees from cluster D that a good deal of human behaviour is predictable, and that where understanding is needed, a prediction is as good as a cause by scientific standards. In this respect, their position seems to coincide with the view described in Chapter 3 as "epistemic," or "scientific determinism." It would thus appear that the respondents of cluster D are best viewed as libertarians by conviction and soft determinists by profession--applied scientists and clinicians concerned with gaining useful understanding of the constraints

on our freedom and the predictable regularities in our behaviour. Being libertarians, they agree with their colleagues of cluster C that reductionism is not a valid thesis. Nevertheless, their predominant concern with the limits of free choice and action seems to have led them to a somewhat more reserved view than cluster C of how often we exercise real control over our actions and how often we make genuine decisions (see Figure 1). Being instrumentalists, they are also more optimistic than cluster C about the utility (if not the veracity) of scientific accounts of some psychological phenomena--notably, of human emotions.

The libertarians from cluster B were more optimistic than those from cluster C or D about how much understanding we can attain. Their estimates of the possibilities, like those of the soft determinists of cluster A, were uniformly high across the subject matter of physics, biology and psychology:

	Matter	Living Things	Human Emotion	Human Intelligence
$\bar{X}$ =	7.500	7.278	6.611	6.833
s.d. =	(1.150)	(1.227)	(1.539)	(1.689)

Although equally optimistic about the eventual outcome of our efforts to understand ourselves and this universe of which we are a part, there is evidence that the libertarians of cluster B and the soft determinists of cluster A do not agree on what form that understanding will ultimately take. As mentioned earlier, clusters A and B are contrasted in the third discriminant function. Specifically, they differ in their estimates of how much of our ordinary understanding of matter and our scientific understanding of intelligence is true.

The estimates given by the two clusters of the veracity of our current

scientific and common-sense understanding of matter, living things, emotion and intelligence are depicted in Figure 4. Note that cluster A (unlike the majority of the respondents in the sample) attributed a substantial degree of truth to current scientific accounts of intelligence. We have already seen that the two soft determinists from cluster A who were interviewed subscribe to reductionism. Note too that their average estimate of the veracity of our common-sense understanding of matter is nearly as high as that of our scientific understanding. The physical world, they seem to be saying, is much as it appears to be. Indeed, the evidence from the interviews suggests that the conception of reality espoused by the soft determinists of cluster A may be none other than the traditional mechanical view of the universe that Laplace (1820) maintained "we ought now to believe." Consider, for example, the formulation offered by the nuclear physicist from cluster A:

> I think the actual incremental behaviour of the universe is according to strict physical laws, and that these physical laws we are beginning to understand more and more. Now, of course, probability plays a significant role in our understanding, but we have learned how to deal with all this in physics and mathematics. Quantum Mechanics, for example, is based to a large extent on this. Now, Newtonian Mechanics on the other hand, is an extremely good representation of everyday phenomena... If you press this into certain areas of nuclear physics though, you get into certain difficulties. And that's where Quantum Mechanics takes over. But it's just a matter of scale. And Quantum Mechanics--for large scale objects--blends into Newtonian Mechanics.[6]
> *Q. Do you think human beings fit into that scheme too?*
> Yes, I think all the actions that go on in our body--though medical science doesn't really understand them yet--are based on what will eventually be well-established chemical reactions governed by physical laws, say, of osmosis and that sort of thing.

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[6]Actually, this view is not without its detractors. For an interesting discussion of the difficulties that arise when Quantum Mechanics is applied to large scale phenomena, see Putnam (1965).

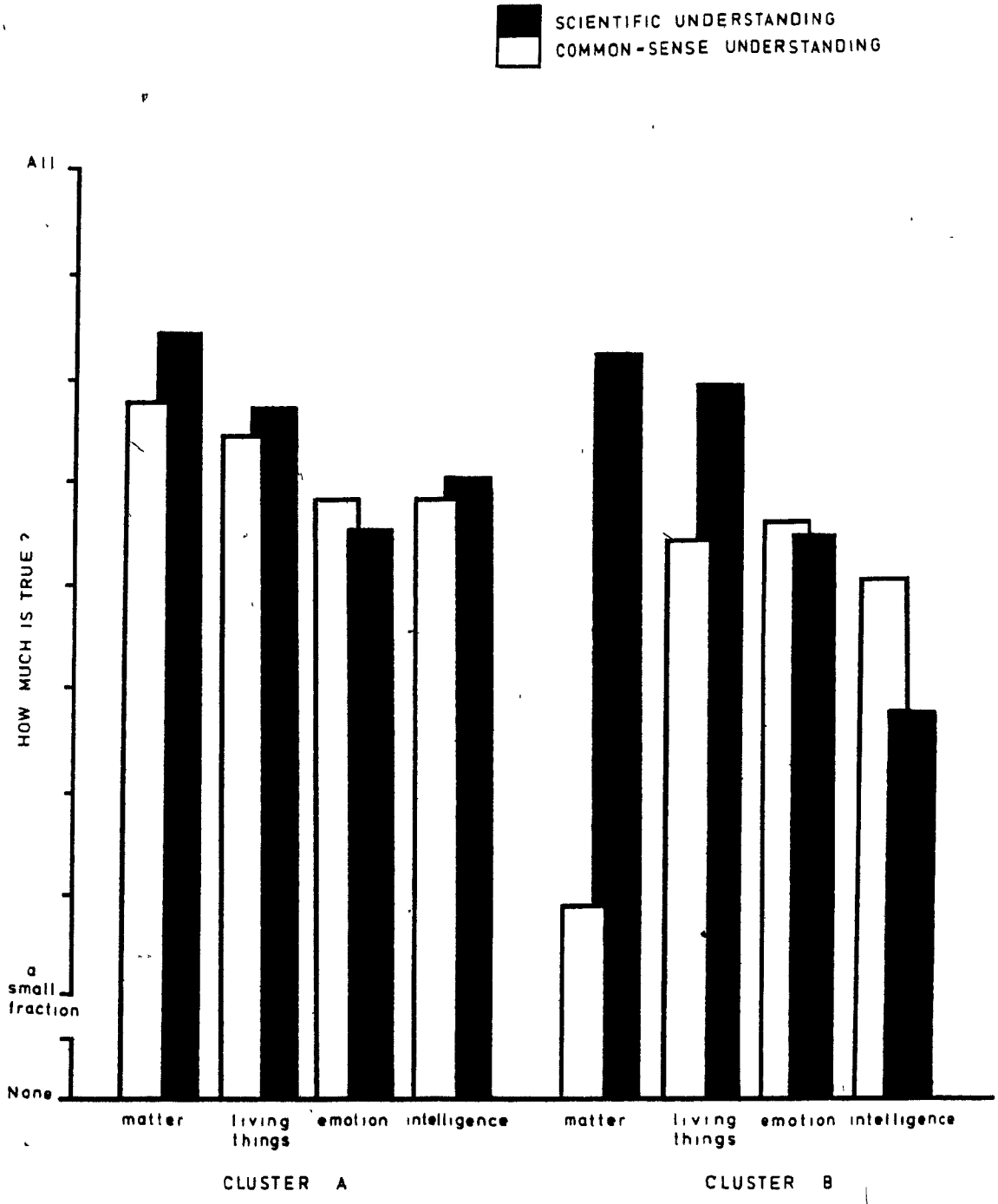

Figure 4: The veracity of common-sense and scientific understanding: Mean ratings of clusters A and B.

Figure 4 shows that in contrast to cluster A, the libertarians of cluster B attributed considerably less truth to our current scientific understanding of human intelligence. Indeed, their view is that our ordinary, common-sense understanding of intelligence is much more accurate than current scientific accounts. More important, however, is the fact that whereas cluster A accorded as much truth to common-sense as to scientific understanding of matter and living things, cluster B did not. Quite the contrary, they attributed almost no truth at all to our ordinary understanding of matter. The physical world, they seem to be saying, is not as it appears to us in ordinary experience. At any rate, that is what the interviewees from cluster B maintained. Consider, for example, the lawyer from that cluster. She was a science fiction fan with an interest in life after death, other worlds, and parapsychological phenomena. She was reticent about discussing her views on science because, she said, "my scientific culture is about nil." Nevertheless, she did say that reductionism "...is foreign to my outlook, if you must know:"

> It's conceivable, it is certainly conceivable, for instance, that there is life after death; that the mind is just a sort of energy inhabiting the body and disappearing into the atmosphere afterwards... People are doing experiments with people who have been comatose and dead, for instance, and have been in the so-called "other world" and came back. Maybe there's nothing to it. But suppose that in a hundred years, or in five hundred years, it is shown that there is something to it...Well, I believe it's possible.

Her point was, if it is true that mental phenomena--including, perhaps, such phenomena as "extra-sensory perception"--do reduce to brain events, then they do so in a manner

> ...which is much more sophisticated than we can even conceive, with the state of knowledge as it is now...It might be, for instance, that we are linked

> to some super power--which to me is not God as described in the Bible or the Koran, or whatever, but a force.

It is of interest to note that this lawyer's fascination with the "paranormal" was shared by the soft deterministic psychologist from cluster A. Quite independently, he too expressed great curiosity in the experiences related by people who have been "on death's door and survived to tell about it." However, whereas the lawyer seriously entertains the possibility that such reported experiences are more or less veridical, the psychologist contended that such experiences are most likely reducible to events of a much less fantastic kind, such as "...some peculiar brain functions under conditions of oxygen deprivation."

Note that what is at issue here is not whether they believe in the survival of a "soul" or "mind" per se, but the underlying assumption about physical reality which either allows for the existence of such a thing, or precludes it as a possibility. It is precluded in the traditional, mechanical conception that appears to have been endorsed by the soft determinists of cluster A. But cluster B apparently rejects that particular conception. From their perspective, current reductionistic accounts are inadequate where mental phenomena are concerned, and our understanding of the physical world as it presents itself in ordinary experience is almost totally inaccurate. Their assumption is that we haven't but the foggiest notion of the nature of this matter of which our universe consists, and no idea at all how rational thought and free acts derive from it. Their questionnaire responses and their comments in interviews suggest that they are banking on the future--banking on the possibility that ultimately, mind and brain, free will and determinism,

will be reconciled in a true scientific account of a currently incomprehensible world.

We have already seen that the descriptivist libertarians who dominate cluster E do not share the same degree of optimism about science that was expressed by any of their libertarian colleagues in the other clusters (c.f., Figures 1 and 3). The average estimates given by the respondents in cluster E of how much understanding is possible were remarkably low:

	Matter	Living Things	Human Emotion	Human Intelligence
$\bar{X}$ =	2.111	1.389	1.500	2.555
s.d. =	(2.423)	(1.243)	(1.200)	(2.572)

One interviewee from cluster E--the professor of English who argued that reductionism precludes any account of consciousness and self-awareness--explained his low ratings as follows:

> I find it almost laughable when I'm told that knowledge in the last 20 years has increased by a factor of such and such, whereas in the thirteenth century it only accumulated at some lesser rate...The model of knowledge seems to me to be a wholly objective one, as though knowledge were a kind of depository of units that existed apart--not only from the knower, but from the act of knowing...But I have trouble with that because it seems to me that "knowledge" is ultimately an *activity*...So I just find the notion of cumulative knowledge very difficult.

He felt compelled to give low estimates of our possible understanding because he saw the rating scales as implying this cumulative model of "objective knowledge" which he finds so objectionable. The point is, he subscribes to a relativist theory of truth. His contention was that if one accepts the view that we are free and that knowing is an intentional,

creative act, truth automatically becomes a relative, contingent thing. As he himself put it, "How do you accumulate *moments of knowing?*"

Two biologists from cluster E were also interviewed. Both were fresh-water ecologists, and both had endorsed the descriptivist view of science in the questionnaire. The senior of the two saw no place for causality in the natural sciences:

> Look, causal relations are quite clear in a machine that you build, where you pull a lever and this happens, then that happens, and so on. The trouble is, it happens wherever we see patterns. We think causally and so we try to make nature into a causal system, when causal relations are very difficult to establish. What we really establish are correlations between various things...So I prefer to think in correlational terms rather than in causal terms.

His younger colleague was much impressed with that point of view:

> I'm trying very hard to get out of causality in my own science. It's hard because we all think that way, of course, but I think it's become restrictive in science...And so I'm trying to get rid of "explanations," and "understandings," and "causalities," and what have you, and trying very hard just to make predictions.

These two libertarian biologists were among the small handful of respondents in cluster E who--like the deterministic psychiatrist discussed earlier--estimated that no true understanding is possible of anything at all. Unlike the psychiatrist, however, the libertarian biologists were of the opinion that there is genuine randomness in subatomic events. Indeed, the more senior of the two reported that not only does he believe that subatomic events are essentially indeterminate, but that it is a hobby of his to collect evidence of genuinely random biological phenomena. He mentioned his favourite example and asked if comparable reports of random phenomena are documented in the psychological

literature. His basic assumption was that if essentially random events occur at the microscopic level, they necessarily occur at higher levels.

Earlier, we noted that a number of contemporary philosophers are skeptical that physical indeterminacy provides a sufficient basis for belief in the reality of free will. They do not see how rational choice--so essential to the exercise of free will--can be predicted of random events. Physical indeterminacy may be a necessary condition, they contend, but it is not sufficient. I asked the other interviewees about their views on Quantum phenomena and whether they believe there are essentially random events in nature. The two soft deterministsfrom cluster A maintained that the so-called "indeterminacy" of Quantum Physics is merely a manifestation of an incomplete theory, not an indication that genuine randomness exists. In contrast, most of the libertarians from the other clusters were open to the possibility that essentially random subatomic events do in fact occur. Unlike the biologist from cluster E, however, most of the libertarians expressed strong doubts about the relevance of physical indeterminacy for scientific psychology.

Their views on moral responsibility

As we saw in the introductory chapters, the entire matter of the validity of moral judgements and the justification of the attribution of responsibility is exceedingly complex. We saw that soft determinists typically point to the efficacy of the practices of punishment and of moral condemnation and approval in regulating behaviour in socially desirable ways. To this, the libertarian objects that our notion of responsibility cannot rest on the simple causal efficacy of punishment--that *just* punishment and *moral* blame imply moral guilt, and guilt implies

moral responsibility, which in turn implies real free will and the falsity of determinism. The soft determinist disagrees. He concedes that these practices imply freedom in a sense, but only in a sense that is consistent with determinism. He argues that a person is responsible as long as he is free from constraint or compulsion by another, or as long as he is not mentally deficient or suffering from a mental disorder.

The libertarian acknowledges the importance of making such distinctions between voluntary and involuntary acts, but argues that if so-called voluntary acts are determined, then the person cannot really do otherwise and therefore does not really *deserve* credit, praise, rewards, condemnation or punishment.

The 20 interviewees were asked whether or not they believe that people can justifiably be held responsible for what they do. All of them--the three soft determinists and the 17 libertarians alike--responded that people are responsible for their actions to the extent that their acts are performed voluntarily or are consciously controlled. A number of the libertarians remarked that the question of responsibility is redundant with the question of the reality of free will. The one is automatically entailed by the other, they said. Moreover, they all contended that the attribution of responsibility is inappropriate under some conditions: for example, in the case of "a well-intentioned mistake," or if the actions in question were performed by a child or a mental defective, or, as one lawyer put it, "without the *Mens Rea*." Several respondents argued that more often than not, responsibility is not attributable solely to the person, but must be shared by the society in which the person lives.

The question as to whether or not *moral* responsibility is justified

turned out to be more problematic than I had imagined. Of all the topics discussed in interviews, this one was greeted with the greatest uncertainty by the respondents. In a few cases, there was a strong negative reaction on the part of some scientists at the mere mention of the word "moral." As it turned out, they were particularly concerned that they would be asked to comment on such things as the morality of the proliferation of nuclear arms, or of the use of nuclear energy in general, or the morality of recent advances in the area of genetic engineering, and so on. In view of their sensitivity, and not wanting to jeopardize the discussion of other matters, I am afraid I probed less deeply and less effectively on this topic than one ideally might have.

A number of the respondents were fairly candid, however, and differences of opinion between soft determinists and libertarians emerged. When asked whether people are morally responsible for their actions, most of the libertarians readily said "Yes, definitely." However, they all hastened to add that their own personal notion of what is "moral" is largely the product of social and cultural influences. They expressed strong doubts that there are grounds for claiming that acts are intrinsically right or wrong.

Both the libertarians and the soft determinists expressed the view that some "moral obligations" probably hold for all people. "Not harming one's fellows" was mentioned by libertarians and determinists alike. Some libertarians, however, went further than that. The English professor from cluster E, for example, maintained that it is everyone's moral duty to make use of their free will:

> Freedom being a gift that belongs to the nature of a human being, I think it's the responsibility of a human

> being to exercise his free will...I think that people are under a moral obligation to exercise the freedom that is available to them in any situation.

In a related vein, both the evolutionary biologist and a psychiatrist from cluster C maintained that one is morally obligated to work at becoming as self-aware as one can, since in their view, self-understanding is the key to maximizing the rationality of one's choices, and, by implication, for maximizing one's freedom and responsibility. The libertarian psychiatrist contended that the primary aim of psychotherapy is to help people to distinguish genuine, moral guilt from neurotic guilt. He said he considers it a moral duty of his patients to face their responsibility for real errors of judgement and action (as opposed to imagined failures) and to do their utmost to learn how to prevent the recurrence of conduct that is harmful to themselves or those around them.

The tone of the discussion of morality was somewhat different with the soft determinists. They maintained that everyone has a "sense of morality" but that what we call right or wrong is completely determined by socio-economic, cultural, and various other environmental factors. One soft determinist was of the opinion that a person is only truly responsible for events that occur in his immediate *physical* surroundings. A person can justifiably be held responsible, he contended, for not intervening if he is present, say, while another person is being mugged or robbed. He doubted, however, whether people can be said to have any responsibility "of a higher order" for events that lie outside their immediate surroundings. He cited the call to help refugees from other countries as an example. To speculate, he said, on our responsibility in such matters "gets you into a tenuous sort of situation that I think is beyond

argument."

Another soft determinist offered the following as his personal ethical position:

> I'm not, myself, able to distinguish utilitarianism from "morality" in the sense that I think if people behave in a way that they minimize the ill effects on others, everybody will be *happier*. That's a form of utilitarianism, and it's usually consistent with what people teach as a "higher morality." And I don't think it's necessary to decide whether these things are "moral" principles because in the long run they make sense and society needs them--regardless of how they're motivated.

Some libertarians disagree that a utilitarian ethic is equivalent to what they understand as morality. They feel that it leaves out something vital in our conception of moral action. For some, like the libertarian lawyer from cluster F, the determinist's conception of responsibility has far-reaching implications:

> Without free will, there is no concept of responsibility, not really. In law, we translate that concept of responsibility into "capacity." And what we are actually talking about is a capacity for free will. For someone to say "I am genetically or environmentally compelled to do something," well, the law couldn't accept that...If we accepted that as a notion, we would move into a period of *totalitarianism*. You would be on trial for what you *are*. Right now, you are tried for what you do. But if determinism were accepted, we would move to a sense of social correction by social engineering, genetic engineering, and psychosurgery...The rule of law is fundamental to any kind of democracy that is built on individual rights. We could scrap the whole system--scrap the whole fundamental basis for it and believe in determinism, believe in social engineering. Then the Law would simply be a mechanism for carrying it out...But *I* think that's a *choice* we have. It's a choice.

One soft determinist expressed a point of view that would likely confirm the libertarian's worst fears. He stated that he personally

subscribes to "a purely situational morality." "In my opinion," he said,

> ...the majority has the right to put a person away, let's say for capital punishment. Not on moral grounds, but for *elimination*. I would eliminate people who don't follow majority rule, not because the majority is right, but purely because it's pragmatic.

Despite striking differences of opinion such as these, in the final analysis it is the similarities between the respondents' views on moral responsibility that are most salient. There was a common denial of the justifiability of revenge, for example. But perhaps most important, all of the respondents, whatever moral position they find most attractive, maintained that the ultimate justification for any social practices relating to the attribution of responsibility is simply that without the *assumption* of individual responsibility, the social order would collapse.

VII: GENERAL DISCUSSION

> A Beethoven string-quartet is truly, as someone has said, a scraping of horses' tails on cats' bowels, and may be exhaustively described in such terms; but the application of this description in no way precludes the simultaneous applicability of an entirely different description.
>
> (Wm. James, *The Sentiment of Rationality*, 1892)

Many psychologists treat the notion of genuine free will as naive. They assume that it is based on illusion, and that in reality our every thought, decision and action is completely determined. Many of them believe that human cognitive processes are, in principle, fully explicable in terms of the operation of physiological and neurochemical mechanisms in the brain.

We saw in the introductory chapters that there are strong theoretical grounds for not being so dismissive of free will. For one thing, universal determinism seems to be less compelling a thesis than many psychologists presume. For another, there appear to be reasonable grounds for doubting whether intentional acts can be causally or mechanistically explained, and lately, some fairly thought-provoking arguments have emerged in philosophy and psychology favouring the view that mental phenomena may not be reducible to brain events.

Moreover, the results of the present survey of academics suggest that few people outside of psychology subscribe to this deterministic thesis. Even among psychologists, half believe in the reality of free will. That is, they believe that our thoughts and actions are not completely

determined and that human nature is such that we have it in our power, at least some of the time, to choose and do otherwise than we do.

It is commonly assumed by deterministically-oriented psychologists that the notion of free will need not be taken seriously because it is rooted in a dualistic conception of mind and body. They presume that most people who believe in free will have a "prescientific," "supernaturalistic," or "mystical" belief in the existence of a self-sustaining, extra-physical mind or "soul." The present findings, however, suggest otherwise. The dualism of former times appears to have been replaced, in the minds of most academics, by a dualism of (or many-levelled) science. With the possible exception of one academic who expressed an abiding fascination with science fiction and things supernatural, all the libertarians who were interviewed claimed that they do not find a dualism of mind and matter credible or intellectually satisfying. All preferred the view that there is but one (physical) reality, and that free will and mind are emergent properties of matter organized in the form of a human being.

This finding that most academics reject dualism is revealing: developments in the physical sciences over the past century have had an enormous impact on the intellectual community at large. Their views of matter have changed. Free will and rationality are now commonly believed to be predicated of matter. Moreover, far from being naive, the views expressed by most of the libertarians in the present study have the support of reputable philosophers of science.

What are the implications for psychology? The present findings speak to the relations between physiological and cognitive psychology. They tell us that we cannot be sure that the primitive terms of psychology will ever

be the same as the primitive terms of physiology. Following in a tradition that is as old as Aristotle and as recent as Austin, Wittgenstein, and Ryle, the dominant opinion of the academics in the present study is that the theoretical terms and laws which are appropriate at one level of analysis--say, at the physiological level--may be completely irrelevant at the psychological level.

Can there be a science of mind if the libertarians are right? The answer, of course, depends on one's view of science. There were some academics in the present sample who seem to believe that there can be psychological and social sciences only in the sense of giving causal explanations of human behaviour. Since they also maintain that causal accounts are inappropriate in psychology, their tendency was to answer in the negative and to estimate that progress in psychology will be relatively limited.

On the other hand, there are many libertarians who subscribe to a broader conception of science, and who gave considerably more optimistic estimates of how much true or useful scientific understanding is possible of psychological phenomena. What are ruled out, in their view, are mechanistic explanations in cognitive psychology, not the possibility of having a science of human cognition and behaviour.

If the libertarians are right, psychologists have their work cut out for them. Much study is needed to determine the boundaries of cognitive psychology. Take mathematics, for example. Mathematics is the exploration of mathematical intuition and therefore of mathematical competence. Linguistics, Logic, Ethics, and so on, are explorations of other areas of competence. All appear to be part of the natural subject

matter of cognitive psychology. If the libertarians are right and mechanistic explanations are inappropriate in such areas, then psychologists will have to devise better ways of accounting for these complex human capabilities. Or again: Do mechanistic accounts adequately capture perceptual and sensory processes? That would depend on whether perception and sensation are seen as falling within the boundaries of cognitive or physiological psychology.

Social psychologists, it seems, have implicitly adopted a soft deterministic view of human freedom. They have assumed, for example, that the investigation of belief in free will involves little more than the measurement of people's judgements (and misjudgements) of the external constraints on their actions and choices, and of the degree to which outcomes are caused by what they themselves do.

The present findings strongly suggest that further progress in this area of research depends on a more precise and much more sympathetic examination of what the libertarian believes and of why he believes it. This conclusion appears to be inescapable. It holds regardless of whether or not the majority are right to believe that free will is real. The point is, they do not share the soft determinist's conception of human freedom, or of human decisions and actions.

To claim, as the libertarian does, that a decision or action was taken freely is to say that it (categorically) could have been done otherwise. This implies that it was done by an agent or person who is rational and conscious both of external facts and of his consciousness of them. It implies that his acts are characteristically intentional, that they belong in a different conceptual category than movements, and that

they require a distinct category of explanation. Actions--freely willed actions--are to be explained in terms of reasons--reasons which clarify, justify, or excuse; which explain, in short, in terms that preclude the relevance of a causal account.

What this means is that in all probability, current social psychological models of "lay explanations of action" require radical revision. Social psychologists in the majority assume that research in this area constitutes an exploration of our ordinary notions about what *causes* people to act as they do. The present findings suggest that more often than not, the participants in attribution research may not be attributing causes at all, but rather giving reasons and justifications for their own and others' conduct.

That the two are very different activities has been noted in the field before. To date, however, the distinction between reason giving and causal attribution has largely been ignored and apparently is poorly understood (see, e.g., Harvey & Tucker's, 1979, and Kruglanski's, 1979, dismissals of Buss, 1978). Much study is needed at both the conceptual and empirical levels to clarify this important distinction between reasons and causal accounts, and to establish criteria by which reasons are evaluated, classified, and how and when they justify, vindicate, or excuse.

The present investigation of belief in free will suggests that psychologists also have plenty of thinking to do about the attribution of responsibility. To date, social psychologists have been content, for the most part, to equate the attribution of responsibility with the identification of who or what was the cause of some outcome. All indications are that this is a wholly inadequate conception. In a world

where women and men take themselves and others as beings with a free will, the question of greatest concern regarding responsibility, more often than not, isn't "Who did it?," but rather, "Who *should* have?"

Additional questions are raised by the finding in the present study that soft determinists and libertarians differ in their views on ethics and moral responsibility. Further studies are needed to assess whether determinists and libertarians also differ in their views on social and political freedom. For example: Do they differ in their notions of human rights?

This study did not attempt to address whether belief in free will has any bearing on what people do. One suggestive bit of evidence did turn up, however, which may encourage further investigation. There was a clinical psychologist and three psychiatrists among the interviewees. The psychologist and two psychiatrists were libertarians. The other was a determinist. The libertarian clinicians said that they conceptualize what they do in educational terms. That is, they see their role in therapy as one of helping clients to better understand themselves and their problems, and of assisting them to find suitable solutions. All three rely on a combination of behavioural and "insight-oriented" techniques.

In contrast, the deterministic psychiatrist contended that "personality change" may be brought about through psychotherapy regardless of whether or not the client achieves any understanding of his/her difficulties. He reported that he uses traditional psychoanalytic techniques with a few of his patients, while the majority he treats under hypnosis. "Biochemical research with hypnosis is how I got into that," he said.

The possibility that a practicing clinician's views about free will

may have some bearing on what treatment techniques he favours may have important implications. Fisher and Farina (1979) report that the public's views of emotional difficulties are uncertain and easily influenced by the practitioner, and that there are important consequences to changing their views of mental disorders along a "social-learning-biosocial" continuum. Specifically, these authors found that individuals exposed to a description of mental disorders which emphasized the role of genetic and somatic factors (a) placed less value on thinking about the cause and solution of their emotional problems, (b) believed they could do less on a personal level to control their problems, and (c) were more likely to use alcohol and/or drugs to relieve emotional distress.

In view of the present findings, one wonders whether a deterministic conception of human functioning sometimes leads to counterproductive approaches to the solution of problems in living. And one wonders whether they are counterproductive precisely because the "treatment" itself--be it the exclusive use of medications, hypnosis, or operant conditioning techniques--conveys the message to the client that the problem and its solution lie outside the domain of his or her conscious control.

It seems to me that to address such questions empirically (as Fisher *et al.*, 1978, 1979, have begun to do) will have greater impact in the clinical and applied areas of psychology than will continued polemics between those, on the one hand, who contend that the solutions to life's problems depend on the maximization of human freedom and dignity, and those, on the other, who contend that the solutions lie beyond such things.

Concluding Remarks

Beliefs concerning the reality of free will, moral responsibility, and the form and veracity of scientific accounts have changed over the centuries, and will undoubtedly continue to evolve. The present investigation, conducted in the late 1970's, sampled the opinions on free will and science of a group of academics and professionals from various disciplines in a leading Canadian university. It provides a baseline against which future investigations of beliefs on these matters can be compared.

At the present time, an overwhelming majority of academics in both the sciences and the arts appear to believe in the reality of free will. Determinism seems to be endorsed by no more than 20% of the academics in the present sample. In psychology, however, determinism is endorsed by roughly 50%. Most are soft deterministS. Hard determinism figures almost not at all.

The modern libertarians reject the validity of reductionism and deny that mechanistic explanations are appropriate for psychological phenomena. Contrary to popular assumptions in psychology, however, most libertarians believe that a successful science of the human mind and of human behaviour is possible. The dualism of former times has been discarded and most libertarians appear to believe that mind and free will are predicated of matter. They believe that the subject matter of psychology may require unique primitives and a distinct category of explanation which take into account the emergence of rationality and free will in human beings.

The claims of the modern soft determinist are, on the surface, deceptively similar to those of the libertarian. The distinctions between

the two positions are easily blurred and confused. To date, those distinctions have never been clearly drawn in the psychological literature, and the fundamental differences between soft determinism and libertarianism remain largely unacknowledged.

It will be interesting to see whether the distinction between soft deterministic and libertarian conceptions of human cognition and behaviour will be drawn more often by psychologists in the years to come. Current trends in philosophy and in the academic community in general suggest that it likely will. It is hoped that the present thesis has contributed in presenting it as a distinction with important implications for psychological science.

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APPENDIX A:

THE QUESTIONNAIRE

INSTRUCTIONS

The following questionnaire asks for your personal opinions about a number of things that may be REAL or ILLUSIONS. For example, we often feel that the sun rises and sets, but most people would agree that this is an illusion. Astronomers discovered long ago that in reality, the earth rotates around its axis. Other questions ask about what you believe we can have TRUE knowledge about. For example, some people might claim that what astronomers say about the planets may not be TRUE.

The questions in this questionnaire have been argued about for many years, and there may be no universally accepted right or wrong answers to them. THE BEST ANSWER IS YOUR PERSONAL OPINION.

For each question you are asked to choose one of two answers. Please read each question completely, then choose either the A or B answer, BUT NOT BOTH. Then, on the scale provided, be sure to indicate how confident you are in the answer you chose.

HERE IS AN EXAMPLE, FOLLOWED BY AN EXPLANATION:

In your opinion, how often do people have a REAL right to do what they want?

A. never [ ] B. rarely |__|__|__|__|✓|__|__|__|__|__| always

How confident are you that for this amount of the time, people do have a REAL right to do what they want?

not at all |__|__|__|__|__|__|__|__|✓|__| completely

How confident are you that people never have a REAL right to do what they want?

not at all |__|__|__|__|__|__|__|__|__| completely

As you can see, the person who answered this question checked the B part, because he felt that people do have a real right to do what they want some of the time. The person then marked down that he was quite confident about this. (IF he felt that people never had a real right to do what they want, he would have checked the A part, and indicated how confident he was in that answer.) PLEASE BE SURE TO ANSWER ALL QUESTIONS IN PARTS I and II.

All of the information in this questionnaire will be completely confidential. However, because I may contact you later to clarify some questions, I would appreciate your filling in the form below. Once the information has been coded to ensure your confidentiality, the form will be detached from the rest of the questionnaire. If you would like feedback on the results of this study when it is completed, please check the box below. THANK YOU VERY MUCH.

NAME: ______________________ **PHONE NO.:** ____-________

SEX: male [ ] female [ ] **DATE OF BIRTH:** |day|mth.|yr.|

EDUCATION: ______________________

OCCUPATION: ______________________

WHAT RELIGION YOU WERE RAISED IN: ______________________

MAILING ADDRESS: ______________________

[ ] Yes, I would like feedback on the results of this study.

PART I

PLEASE NOTE: CHECK A OR B FOR EACH QUESTION, BUT NOT BOTH.
THEN INDICATE HOW CONFIDENT YOU ARE IN THE ANSWER YOU CHOSE.

Think about the chair you are sitting on. It is probably made of some substance like wood or plastic, and metal. MATTER such as this looks and feels solid to our ordinary senses. Most people have at least some understanding of what MATTER like this is, but some wonder if even the little bit we think we know about MATTER is TRUE or not.

In your opinion, how much of our ordinary, common-sense understanding of what MATTER is, is actually TRUE?

A. none whatever

B. a small fraction ... all of it

How confident are you that this amount of our common-sense understanding of what MATTER is, is TRUE?

not at all ... completely

How confident are you that none of our common-sense understanding of what MATTER is, is TRUE?

not at all ... completely

Some people wonder if we are REALLY responsible for what we do, or if the feeling that we are RESPONSIBLE for what we do is actually an ILLUSION, and has no basis in reality.

In your opinion, how often are people ACTUALLY RESPONSIBLE to some degree for what they do?

A. never

B. rarely ... always

How confident are you that for this amount of the time, people ACTUALLY are RESPONSIBLE for what they do?

not at all ... completely

How confident are you that people are never ACTUALLY RESPONSIBLE for what they do?

not at all ... completely

Biologists try to go beyond our common-sense understanding of LIVING things: They generally agree that LIVING things are made up of natural chemicals which are organized in cells.

In your opinion, how much of our scientific understanding of what a LIVING thing is, is actually TRUE?

A. none whatever

B. a small fraction ... all of it

How confident are you that this amount of our scientific understanding of what a LIVING thing is, is TRUE?

not at all ... completely

How confident are you that none of our scientific understanding of what a LIVING thing is, is TRUE?

not at all ... completely

PLEASE NOTE: CHECK A OR B FOR EACH QUESTION, BUT NOT BOTH.
THEN INDICATE HOW CONFIDENT YOU ARE IN THE ANSWER YOU CHOSE.

Many people feel that under normal circumstances, they have some power to CHOOSE and PLAN what CAREER to pursue. But some people doubt this. They think that although we might feel we can decide on a career, in reality the career we pursue is determined by factors we are not aware of.

In your opinion, how often do people have some degree of REAL power to CHOOSE what career to pursue.

A. never ___ B. rarely ___ always

How confident are you that for this amount of the time, people actually have some REAL power to CHOOSE a career?

not at all ___ completely

How confident are you that people never have any REAL power to CHOOSE a career?

not at all ___ completely

Many psychologists hope they can eventually attain complete, TRUE understanding of the nature of INTELLIGENCE. Others claim it is not possible to ever have any TRUE understanding of what INTELLIGENCE is.

In your opinion, how much TRUE understanding of the nature of INTELLIGENCE is it POSSIBLE to attain?

A. none whatever ___ B. a small fraction ___ complete

How confident are you that it is POSSIBLE to attain this amount of TRUE understanding about what INTELLIGENCE is?

not at all ___ completely

How confident are you that it is IMPOSSIBLE to attain any TRUE understanding about what INTELLIGENCE is?

not at all ___ completely

Some people think that if we DECIDE to, we can rid ourselves of habits like smoking. Others believe that although a person might feel he can decide to stop smoking, in reality this decision has nothing to do with whether he stops smoking or not.

In your opinion, how often do people have some degree of REAL power to DECIDE to stop smoking?

A. never ___ B. rarely ___ always

How confident are you that for this amount of the time, people do have some REAL power to DECIDE to stop smoking?

not at all ___ completely

How confident are you that people never have any REAL power to DECIDE to stop smoking?

not at all ___ completely

PLEASE NOTE: CHECK A OR B FOR EACH QUESTION, BUT NOT BOTH.
THEN INDICATE HOW CONFIDENT YOU ARE IN THE ANSWER YOU CHOSE.

Think about LIVING things such as a blade of grass or an earthworm. Unlike non-living things, LIVING things grow, reproduce, and eventually die. Most people have at least some understanding of what a LIVING thing is, but some wonder if even the little we think we know about LIVING things is TRUE or not.

In your opinion, how much of our ordinary, common-sense understanding of what a LIVING thing is, is actually TRUE?

A. none whatever

B. a small fraction ——— all of it

How confident are you that this amount of our common-sense understanding of what a LIVING thing is, is TRUE?

not at all ——— completely

How confident are you that none of our common-sense understanding of what a LIVING thing is, is TRUE?

not at all ——— completely

Many people feel that not only are we responsible for what we do, but we are also RESPONSIBLE for the CONSEQUENCES of what we do. They think we are RESPONSIBLE for whether the results of what we do are good or bad.

In your opinion, how often are people ACTUALLY RESPONSIBLE to some degree for the CONSEQUENCES of what they do?

A. never

B. rarely ——— always

How confident are you that for this amount of the time, people ACTUALLY are RESPONSIBLE to some degree for the CONSEQUENCES of what they do?

not at all ——— completely

How confident are you that people are never ACTUALLY RESPONSIBLE for the CONSEQUENCES of what they do?

not at all ——— completely

Psychologists try to go beyond our common-sense understanding of INTELLIGENCE. They have devised tests to measure INTELLIGENCE, and they have developed theories about how the brain works.

In your opinion, how much of our scientific understanding of what INTELLIGENCE is, is actually TRUE?

A. none whatever

B. a small fraction ——— all of it

How confident are you that this amount of our scientific understanding of what INTELLIGENCE is, is TRUE?

not at all ——— completely

How confident are you that none of our scientific understanding of what INTELLIGENCE is, is TRUE?

not at all ——— completely

PLEASE NOTE: CHECK A OR B FOR EACH QUESTION, BUT NOT BOTH.
THEN INDICATE HOW CONFIDENT YOU ARE IN THE ANSWER YOU CHOSE.

Many people feel that we have some power to DECIDE whomwe will be FRIENDLY with. But some claim that even though we often feel this way, in reality whether we are friendly or not is determined by the situation and factors we are not aware of.

In your opinion, how often do people have some degree of REAL power to DECIDE whomthey will be friendly with?

A. never ___ B. rarely ___ ___ ___ ___ ___ ___ ___ ___ ___ always

How confident are you that for this amount of the time, the power people feel they have to DECIDE who they will be friendly with, is actually REAL?

not at all ___ ___ ___ ___ ___ ___ ___ ___ ___ completely

How confident are you that people never have any REAL power to DECIDE who they will be friendly with?

not at all ___ ___ ___ ___ ___ ___ ___ ___ ___ completely

Scientists try to go beyond our common-sense understanding of MATTER. The studies they do make them think MATTER is made up of tiny particles no one can see, which are even smaller than atoms.

In your opinion, how much of our scientific understanding of what MATTER is, is actually TRUE?

A. none whatever ___ B. a small fraction ___ ___ ___ ___ ___ ___ ___ ___ ___ all of it

How confident are you that this amount of our scientific understanding of what MATTER is, is TRUE?

not at all ___ ___ ___ ___ ___ ___ ___ ___ ___ completely

How confident are you that none of our scientific understanding of what MATTER is, is TRUE?

not at all ___ ___ ___ ___ ___ ___ ___ ___ ___ completely

Some people wonder if we really have FREE WILL or if what we experience as free will is actually an ILLUSION of freedom. Many people feel they have some CONTROL over what they do, but some people claim that this feeling is an ILLUSION and has no basis in reality.

In your opinion, how often do people have some degree of REAL CONTROL over what they do?

A. never ___ B. rarely ___ ___ ___ ___ ___ ___ ___ ___ ___ always

How confident are you that for this amount of the time, people do have some REAL control over what they do?

not at all ___ ___ ___ ___ ___ ___ ___ ___ ___ completely

How confident are you that people never have any REAL control over what they do?

not at all ___ ___ ___ ___ ___ ___ ___ ___ ___ completely

PLEASE NOTE: CHECK A OR B FOR EACH QUESTION, BUT NOT BOTH.
THEN INDICATE HOW CONFIDENT YOU ARE IN THE ANSWER YOU CHOSE.

Think about the many EMOTIONS people have. At times we are happy, at times sad, angry, or afraid. Most people have at least some understanding of what it is to feel EMOTIONS, but some people wonder if what we think emotions are is TRUE.

In your opinion, how much of our ordinary, common-sense understanding of what EMOTIONS are, is actually TRUE?

A. none whatever

B. a small fraction ... all of it

How confident are you that this amount of our common-sense understanding of what EMOTIONS are, is TRUE?

not at all ... completely

How confident are you that none of our common-sense understanding of what EMOTIONS are is TRUE?

not at all ... completely

Sometimes we feel that in a certain situation we could have acted differently than we did if we had CHOSEN to. Some people claim that this is an ILLUSION, because in reality we have no such power to choose what to do--we could never have done anything different than what we did.

In your opinion, how often do people have some degree of REAL power to CHOOSE how they will act in a particular situation?

A. never

B. rarely ... always

How confident are you that for this amount of the time, people do have some REAL power to CHOOSE how they will act in a particular situation?

not at all ... completely

How confident are you that people never have any REAL power to CHOOSE how they will act in a situation?

not at all ... completely

Many scientists hope they can eventually attain complete, TRUE understanding of the nature of MATTER. But some people claim we can never have any TRUE knowledge of what MATTER is.

In your opinion, how much TRUE understanding of the nature of MATTER is it POSSIBLE to attain?

A. none whatever

B. a small fraction ... complete

How confident are you that it is POSSIBLE to attain this amount of TRUE understanding of what MATTER is?

not at all ... completely

How confident are you that it is IMPOSSIBLE to attain any TRUE understanding of what MATTER is?

not at all ... completely

PLEASE NOTE: CHECK A OR B FOR EACH QUESTION, BUT NOT BOTH.
THEN INDICATE HOW CONFIDENT YOU ARE IN THE ANSWER YOU CHOSE.

Many people think that not only do we have some control over what we do, but we also have some CONTROL over the CONSEQUENCES of our actions. They think we can actually influence whether what we do turns out well or badly.

In your opinion, how often do people have some degree of REAL CONTROL over the CONSEQUENCES of what they do?

A. never ___ B. rarely _____ always

How confident are you that for this amount of the time, people do have some REAL control over the CONSEQUENCES of what they do?

not at all _____ completely

How confident are you that people never have any REAL control over the CONSEQUENCES of what they do?

not at all _____ completely

Think about people's INTELLIGENCE. We can learn and perform complicated tasks, and often behave in clever ways. Most people have some idea what INTELLIGENCE is, but some people claim that whatever we think INTELLIGENCE is, it is probably not TRUE.

In your opinion, how much of our ordinary, common-sense understanding of what INTELLIGENCE is, is actually TRUE?

A. none whatever ___ B. a small fraction _____ all of it

How confident are you that this amount of our common-sense understanding of what INTELLIGENCE is, is TRUE?

not at all _____ completely

How confident are you that none of our common-sense understanding of what INTELLIGENCE is, is TRUE?

not at all _____ completely

Some people think that if we wanted to, we could actually become completely RESPONSIBLE for what we do. Others claim we can never be genuinely responsible for any of our actions.

In your opinion, how much GENUINE RESPONSIBILITY for our actions is it POSSIBLE to attain?

A. none whatever ___ B. a small fraction _____ complete

How confident are you that it is POSSIBLE to attain this amount of GENUINE RESPONSIBILITY for our actions?

not at all _____ completely

How confident are you that it is IMPOSSIBLE to attain any GENUINE RESPONSIBILITY for what we do?

not at all _____ completely

PLEASE NOTE: CHECK A OR B FOR EACH QUESTION, BUT NOT BOTH.
THEN INDICATE HOW CONFIDENT YOU ARE IN THE ANSWER YOU CHOSE.

Psychologists and psychiatrists try to go beyond our common-sense understanding of EMOTIONS. Among other things, they have studied the complex physical reactions which cause us to feel afraid or angry in threatening situations.

In your opinion, how much of our scientific understanding of what EMOTIONS are is TRUE?

A. none whatever

B. a small fraction ——— all of it

How confident are you that this amount of our scientific understanding of what EMOTIONS are, is TRUE?

not at all ——— completely

How confident are you that none of our scientific understanding of what EMOTIONS are is TRUE?

not at all ——— completely

Many people feel that when they are faced with an unpleasant task, they can sometimes CHOOSE not to do it. But some people claim that even though we may feel we can occasionally CHOOSE not to do something, in reality CHOICE is never involved--the fact that we don't do some things is determined by the situation and factors we are not aware of.

In your opinion, how often is the CHOICE not to do some unpleasant task actually a REAL choice?

A. never

B. rarely ——— always

How confident are you that for this amount of the time, the CHOICE not to do some unpleasant task is actually a REAL choice?

not at all ——— completely

How confident are you that the CHOICE not to do some unpleasant task is never a REAL choice?

not at all ——— completely

Many biologists hope they can eventually attain complete, TRUE understanding of the nature of LIVING things. But some people argue that we can never have any TRUE knowledge of what a LIVING thing is.

In your opinion, how much TRUE understanding of the nature of a LIVING thing is it POSSIBLE to attain?

A. none whatever

B. a small fraction ——— complete

How confident are you that it is POSSIBLE to attain this amount of TRUE understanding of what a LIVING thing is?

not at all ——— completely

How confident are you that it is IMPOSSIBLE to attain any TRUE understanding of what a LIVING thing is?

not at all ——— completely

PLEASE NOTE: CHECK A OR B FOR EACH QUESTION, BUT NOT BOTH.
THEN INDICATE HOW CONFIDENT YOU ARE IN THE ANSWER YOU CHOSE.

Many people feel that they are RESPONSIBLE when they don't do something they believe they should have done. Others claim that this feeling is an ILLUSION, and that we are never REALLY responsible when we don't do something we think we should have done.

In your opinion, how often are we ACTUALLY RESPONSIBLE to some degree for not doing something we think we should have done?

A. never ___ B. rarely ___ ___ ___ ___ ___ ___ ___ ___ ___ always

How confident are you that for this amount of the time, we ACTUALLY are RESPONSIBLE to some degree when we don't do something we think we should have done?

not at all ___ ___ ___ ___ ___ ___ ___ ___ ___ completely

How confident are you that we are never REALLY RESPONSIBLE for not doing something we think we should have done?

not at all ___ ___ ___ ___ ___ ___ ___ ___ ___ completely

Many scientists who study emotions hope they can eventually attain complete, TRUE understanding of the nature of EMOTIONS. But some people doubt that we can ever have any TRUE knowledge of what EMOTIONS are.

In your opinion, how much TRUE understanding of what EMOTIONS are, is it POSSIBLE to attain?

A. none whatever ___ B. a small fraction ___ ___ ___ ___ ___ ___ ___ ___ ___ complete

How confident are you that it is POSSIBLE to attain this amount of TRUE understanding of what EMOTIONS are?

not at all ___ ___ ___ ___ ___ ___ ___ ___ ___ completely

How confident are you that it is IMPOSSIBLE to attain any TRUE understanding of what EMOTIONS are?

not at all ___ ___ ___ ___ ___ ___ ___ ___ ___ completely

Some people think that if we put our minds to it, we could eventually gain complete CONTROL over our actions. Others claim we can never have any REAL control over what we do.

In your opinion, how much REAL CONTROL over our actions is it POSSIBLE to attain?

A. none whatever ___ B. a small fraction ___ ___ ___ ___ ___ ___ ___ ___ ___ complete

How confident are you that it is POSSIBLE to attain this amount of REAL CONTROL over what we do?

not at all ___ ___ ___ ___ ___ ___ ___ ___ ___ completely

How confident are you that it is IMPOSSIBLE to attain any REAL CONTROL over what we do?

not at all ___ ___ ___ ___ ___ ___ ___ ___ ___ completely

PART II

Please complete each sentence below by choosing the statement that you believe is CLOSEST TO BEING TRUE. Then indicate how confident you are that the answer you chose is closest to being true.

1. In my opinion, TRUE common-sense understanding consists of...

A. ...an accurate description of orderly patterns in the way things are. ☐

B. ...an accurate explanation of what causes things to be as they are. ☐

How confident are you that the answer you chose is closest to being true?

not at all |_____|_____|_____|_____|_____|_____|_____| completely

2. In my opinion, a person is GENUINELY RESPONSIBLE for his actions if...

A. ...he actually performs the actions himself, even though his actions may be completely determined by his heredity, past experience, and the situation he is in. ☐

B. ...he actually performs the actions himself, and even though he may be influenced by many things, his actions are not completely determined by his heredity, past experience, or the situation he is in. ☐

How confident are you that the answer you chose is closest to being true?

not at all |_____|_____|_____|_____|_____|_____|_____| completely

3. In my opinion, TRUE scientific understanding consists of...

A. ...an accurate description of orderly patterns in the way things are. ☐

B. ...an accurate explanation of what causes things to be as they are. ☐

How confident are you that the answer you chose is closest to being true?

not at all |_____|_____|_____|_____|_____|_____|_____| completely

4. In my opinion, a person has some REAL power to DECIDE what to do if...

A. ...the person makes the decisions himself, even though his decisions may be completely determined by his heredity, past experience, and the situation he is in. ☐

B. ...the person makes the decisions himself, and even though he may be influenced by many things, his decisions are not completely determined by his heredity, past experience, or the situation he is in. ☐

How confident are you that the answer you chose is closest to being true?

not at all |_____|_____|_____|_____|_____|_____|_____| completely

APPENDIX B

COMPOSITION OF THE CLUSTERS

CLUSTER A

	RESPONDENTS			POSITIONS[1]			DISTANCE FROM
DISCIPLINE	SEX	AGE	REL.BKGD.	C-S.	SCI.	F.W.	CLUSTER CENTER
Bio.	m	45	prot.	d	c	l	4.26
Psych.	m	30	prot.	d	c	l	4.48
Manag.	m	35	r.c.	c	c	l	4.59
Psych.	f	31	prot.	d	c	sd	4.78
* Phys.	m	58	prot.	c	c	sd	5.01
Bio.	m	34	none	c	c	l	5.02
Bio.	m	35	prot.	c	c	l	5.72
Psych.	m	30	prot.	c	c	sd	5.75
M.D.	m	30	jew.	d	d	sd	5.79
Phys.	m	41	r.c.	c	c	l	6.10
Manag.	m	34	jew.	d	d	l	6.14
Bio.	m	31	prot.	c	c	l	6.41
* Psych.	m	41	prot.	d	d	sd	6.62
Manag.	m	31	prot.	d	c	l	6.66
Manag.	m	31	none	d	c	sd	6.94
Bio.	m	39	prot.	d	d	l	7.20
Manag.	m	46	prot.	c	c	l	7.36
Psych.	m	59	prot.	c	c	sd	7.92
Eng.	m	39	r.c.	d	c	l	7.97
Phys.	m	39	other	c	c	sd	8.18
Phys.	m	39	r.c.	d	d	l	8.23
Phys.	m	32	r.c.	d	c	l	8.28
Manag.	m	34	jew.	c	c	l	8.64
Psych.	m	37	jew.	d	c	sd	8.64
Psych.	m	36	r.c.	d	c	l	9.17
Phys.	f	77	prot.	c	c	l	9.89

[1] d = descriptivist
c = causalist
l = libertarian
sd = soft determinist
hd = hard determinist

* interviewed

CLUSTER B

	RESPONDENTS			POSITIONS			DISTANCE FROM
DISCIPLINE	SEX	AGE	REL.BKGD.	C-S.	SCI.	F.W.	CLUSTER CENTER
Eng.	m	47	none	d	c	1	4.06
* Phys.	m	39	jew.	d	c	1	5.73
Eng.	f	44	prot.	c	c	1	5.81
* Manag.	m	47	r.c.	d	d	1	6.29
Phys.	m	45	prot.	d	c	1	6.33
Bio.	f	56	none	c	c	1	6.53
Manag.	m	56	prot.	d	c	sd	6.70
Law	f	29	r.c.	c	d	1	6.94
Manag.	m	34	jew.	d	c	1	7.70
Phys.	m	41	prot.	d	c	1	7.72
* Law	f	44	prot.	c	c	1	7.79
Eng.	m	43	prot.	c	c	1	7.79
M.D.	m	36	r.c.	c	c	1	8.01
Manag.	m	40	none	d	c	1	8.01
Psych.	f	60	jew.	d	d	sd	9.05
Bio.	f	42	prot.	c	c	1	9.16
Psych.	m	35	prot.	d	c	sd	9.19
Psych.	m	49	jew.	d	c	1	9.30

CLUSTER C

	RESPONDENTS				POSITIONS			DISTANCE FROM
	DISCIPLINE	SEX	AGE	REL.BKGD.	C-S.	SCI.	F.W.	CLUSTER CENTER
	Phys.	m	32	r.c.	d	c	1	4.75
*	Eng.	m	57	prot.	c	c	1	4.93
	Law	m	30	prot.	c	d	1	5.07
	Bio.	m	45	prot.	c	c	1	5.10
*	Psych.	m	56	prot.	c	c	1	5.15
	Bio.	m	47	prot.	c	c	1	5.32
*	Bio.	f	29	prot.	d	c	1	5.39
	Manag.	m	50	prot.	c	c	1	5.45
	Law	f	36	r.c.	c	c	1	5.47
*	Bio.	m	58	prot.	c	c	1	5.52
	Phys.	m	38	r.c.	d	c	1	5.84
*	M.D.	m	36	r.c.	c	c	1	6.25
	M.D.	m	37	jew.	d	c	1	6.40
	Law	m	52	r.c.	c	c	1	6.65
	Manag.	m	66	prot.	c	c	1	6.67
	M.D.	m	41	r.c.	c	c	1	6.78
*	Psych.	m	29	jew.	d	d	1	6.98
	M.D.	m	40	prot.	c	c	1	7.01
	Bio.	f	52	prot.	c	d	1	7.06
	Phys.	m	37	none	c	c	sd	7.07
	Phys.	m	41	prot.	d	d	1	7.34
	M.D.	m	30	r.c.	c	c	1	7.59
	Eng.	f	35	prot.	d	c	1	7.61
	Phys.	m	42	none	c	c	sd	7.93
	Eng.	f	37	jew.	c	c	1	7.94
	Eng.	m	41	none	d	c	1	8.14
	Bio.	m	34	r.c.	c	c	1	8.17
	M.D.	f	39	prot.	d	c	1	8.51
	Law	m	49	prot.	c	c	1	8.84
	Bio.	m	43	none	c	c	sd	9.77
	Phys.	m	46	none	d	d	1	10.16
	Manag.	m	37	prot.	c	c	1	11.23
	Manag.	m	36	prot.	c	c	sd	12.05

CLUSTER D

	RESPONDENTS			POSITIONS			DISTANCE FROM
DISCIPLINE	SEX	AGE	REL.BKGD.	C-S.	SCI.	F.W.	CLUSTER CENTER
Phys.	m	40	other	c	d	1	5.43
Psych.	m	33	prot.	d	d	1	5.94
* Manag.	m	35	jew.	c	c	1	6.08
Psych.	m	28	r.c.	c	c	1	6.10
Law	f	36	r.c.	d	c	1	6.55
Eng.	m	36	prot.	d	c	1	6.88
M.D.	m	30	r.c.	d	d	1	6.92
* Psych.	m	31	jew.	d	c	1	6.99
M.D.	m	41	prot.	c	c	1	7.12
Eng.	m	45	r.c.	d	d	1	7.49
M.D.	m	31	r.c.	d	c	1	7.51
Law	m	29	r.c.	c	d	1	7.71
* M.D.	m	41	other	c	d	1	7.75
Phys.	m	62	prot.	c	c	1	7.83
Psych.	m	38	prot.	d	c	1	8.17
* Psych.	m	39	prot.	d	d	sd	8.17
Eng.	m	33	other	c	c	1	8.64
Phys.	m	54	r.c.	d	c	1	9.15
M.D.	m	60	other	d	d	sd	9.76
M.D.	m	37	r.c.	c	c	1	9.95
Bio.	m	39	prot.	d	c	1	10.04
Bio.	m	48	prot.	c	c	1	10.35
Bio.	m	40	other	c	c	1	10.87
Manag.	m	29	prot.	c	c	1	12.24

CLUSTER E

	RESPONDENTS			POSITIONS			DISTANCE FROM
DISCIPLINE	SEX	AGE	REL.BKGD.	C-S.	SCI.	F.W.	CLUSTER CENTER
Eng.	m	38	prot.	d	d	1	5.26
Manag.	m	39	prot.	c	c	1	6.91
* Eng.	m	52	prot.	d	c	1	7.25
M.D.	m	30	r.c.	d	c	1	7.35
M.D.	m	36	none	d	d	1	7.41
M.D.	f	29	r.c.	d	d	1	7.62
Eng.	m	63	prot.	d	d	1	8.49
Eng.	m	65	prot.	c	c	1	9.54
Phys.	m	54	jew.	d	d	1	10.14
Manag.	m	48	prot.	d	d	1	10.27
Eng.	m	71	prot.	d	c	1	10.50
* Bio.	m	32	prot.	d	d	sd	10.63
M.D.	m	33	r.c.	d	d	sd	10.72
* Bio.	m	50	prot.	d	d	1	10.75
Eng.	m	60	r.c.	d	c	1	11.68
Bio.	m	34	none	c	d	sd	12.05
* M.D.	m	52	none	d	d	sd	13.90
Eng.	m	41	prot.	c	d	1	14.96

CLUSTER F

	RESPONDENTS			POSITIONS			DISTANCE FROM
DISCIPLINE	SEX	AGE	REL.BKGD.	C-S.	SCI.	F.W.	CLUSTER CENTER
Law	m	25	none	d	c	1	7.43
Psych.	m	35	prot.	c	c	1	7.70
Eng.	m	42	prot.	d	d	1	7.95
* Law	m	29	r.c.	d	d	1	8.29
M.D.	m	57	prot.	d	d	1	9.05
Eng.	m	57	r.c.	d	c	1	9.71
Manag.	m	26	r.c.	d	c	1	9.94
Phys.	m	31	other	c	c	hd	12.65
Psych.	m	32	prot.	d	c	hd	13.06
Psych.	m	56	none	d	c	hd	14.44
Law	m	31	r.c.	d	d	hd	16.30

APPENDIX C

Summary Table of the Cluster Centers: Means and Standard Deviations

Items:	Cluster A n = 26 $\bar{X}$ s.d.	Cluster B n = 18 $\bar{X}$ s.d.	Cluster C n = 33 $\bar{X}$ s.d.	Cluster D n = 24 $\bar{X}$ s.d.	Cluster E n = 18 $\bar{X}$ s.d.	Cluster F n = 11 $\bar{X}$ s.d.
C-S.U.M	6.808 (1.234)	1.889 (1.079)	6.121 (1.341)	5.416 (2.205)	2.667 (2.679)	4.091 (2.773)
L	6.423 (1.579)	5.444 (2.036)	6.303 (1.262)	5.958 (1.706)	2.889 (2.166)	4.818 (2.401)
E	5.885 (1.657)	5.611 (2.004)	5.757 (1.751)	4.625 (2.039)	3.333 (2.473)	3.364 (2.461)
I	5.923 (1.383)	5.056 (1.893)	5.697 (1.551)	4.583 (1.717)	2.278 (1.487)	3.000 (1.949)
Sci.U.M	7.462 (1.029)	7.278 (1.526)	6.515 (1.093)	6.458 (1.933)	3.222 (2.602)	5.636 (2.111)
L	6.731 (1.614)	6.944 (1.259)	6.000 (1.854)	7.000 (1.285)	2.833 (2.282)	5.727 (2.328)
E	5.577 (1.793)	5.500 (1.917)	4.606 (1.499)	5.458 (1.744)	1.889 (1.367)	2.727 (2.101)
I	6.077 (1.440)	3.778 (1.865)	4.182 (1.285)	4.083 (1.816)	1.833 (1.201)	2.455 (1.966)
Pos.U.M	7.923 (0.845)	7.500 (1.150)	5.909 (1.774)	6.708 (1.922)	2.111 (2.423)	5.273 (2.832)
L	7.539 (0.989)	7.278 (1.227)	5.455 (1.603)	6.708 (1.398)	1.389 (1.243)	4.546 (2.841)
E	7.231 (1.306)	6.611 (1.539)	4.394 (1.539)	6.167 (1.633)	1.500 (1.202)	4.273 (2.573)
I	7.077 (1.598)	6.833 (1.689)	4.272 (1.719)	4.333 (1.904)	2.556 (2.572)	4.091 (2.879)
Pos.C	7.885 (0.711)	7.167 (0.707)	5.879 (1.556)	4.542 (1.532)	4.778 (2.365)	2.818 (2.857)
Pos.R	7.231 (1.275)	7.222 (1.003)	6.303 (1.510)	5.542 (1.179)	5.556 (1.997)	1.636 (1.748)
CA	7.538 (1.029)	6.889 (1.491)	6.424 (1.393)	4.083 (1.472)	4.944 (2.262)	1.727 (1.737)
CO	6.269 (1.991)	4.944 (1.893)	5.212 (1.691)	4.208 (1.744)	3.111 (2.272)	1.636 (1.858
RA	7.423 (1.239)	7.167 (1.201)	7.000 (1.346)	4.542 (1.769)	6.111 (2.139)	2.545 (2.339)
RO	6.615 (1.899)	6.389 (1.577)	6.363 (1.799)	4.750 (1.917)	5.778 (2.510)	2.727 (2.328)
RXA	7.385 (1.444)	7.500 (0.707)	6.546 (1.543)	5.542 (1.351)	6.111 (1.779)	2.909 (2.300)
DX	7.462 (1.392)	7.167 (0.857)	6.303 (1.262)	4.500 (1.383)	5.000 (2.326)	1.818 (1.662)
DXA	7.000 (1.523)	6.500 (1.791)	6.152 (1.202	4.542 (1.503)	5.444 (1.886)	1.818 (1.722)
Ca	6.308 (1.871)	5.778 (1.896)	5.727 (1.329)	4.458 (1.641)	4.111 (1.967)	2.909 (2.343)
Fr	7.115 (1.657)	5.167 (1.978)	5.818 (1.550)	4.833 (2.140)	3.778 (2.557)	3.091 (2.587)
XS	7.769 (1.243)	7.222 (1.957)	7.030 (1.630)	5.792 (1.841)	6.611 (1.685)	3.818 (2.892)

APPENDIX D

Summary Table of the One-Way Multivariate Analysis of Variance on the Average Responses of the Six Clusters to the 24 Scalar Items of the Questionnaire

Multivariate F (120, 525) = 5.0591 *

Pillai-Bartlett Trace Criterion = 2.6813

Univariate F-Tests:

SOURCE	M.S. HYPOTHESIS (d.f. = 5)	M.S. ERROR (d.f. = 124)	F
U Items:			
C-S.U. M	82.084	3.436	23.889 *
L	35.218	3.130	11.251 *
E	25.761	3.993	6.451 *
T	42.284	2.655	15.927 *
Sci.U. M	45.929	2.822	16.275 *
L	47.052	3.087	15.244 *
E	45.516	2.908	15.650 *
I	45.009	2.443	18.424 *
U.Pos. M	85.142	3.274	26.004 *
L	101.650	2.292	44.349 *
E	88.556	2.506	35.333 *
I	63.409	3.916	16.193 *
FW Items:			
C	60.285	2.656	22.696 *
R	57.457	2.093	27.440 *
CA	75.434	2.365	31.896 *
CO	45.427	3.579	12.691 *
RA	57.923	2.623	22.079 *
RO	32.743	3.886	8.426 *
RXA	39.882	2.302	17.323 *
DA	68.008	2.222	30.602 *
DXA	52.042	2.426	21.455 *
Ca	27.817	3.128	8.894 *
Fr	39.095	3.995	9.785 *
XS	30.558	3.523	8.674 *

* $p < 0.0001$