PART ONE

DISCIPLINING THE INDIVIDUAL AND THE MIND

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The Individual in the Fragile Sciences

1 INDIVIDUALS AND THE MIND

Where does the mind begin and end? We think of the mind as tied to and delimited by individuals. Minds do not float free in the air or belong to larger, amorphous entities, such as groups, societies, or cultures. No, they are tightly coupled with individuals. Minds exist inside individuals, and the particular mind that any individual has constitutes an important part of what it is to be that individual. We may not know precisely when during ontogenetic development the mind begins to exist and when it ceases to exist. Indeed, we might think that there is no such precise time, and that to think otherwise is to fall into some sort of conceptual muddle. But that a particular mind's temporal boundaries are delimited by the life of the individual is reflected in both Western science and law.

Likewise, we might quibble about how far throughout the brain and central nervous system the mind extends spatially. But again, the boundary of the mind is no greater than the boundary of the individual. If it doesn't stop further in, in the brain, it at least stops at the skin.

There are ways in which these ideas about the mind may appear to be challenged by pervasive systems of thought beyond science. For example, on many religious views, at least something very like the mind is neither temporally nor spatially bounded by the body by which we usually identify an individual. Minds leave bodies when a person dies, and can find themselves in places beyond Earth, or in other bodies on Earth. This sort of view is even accommodated within analytic discussions of personal identity in philosophy. The soul of a prince may end up in the body of a pauper, or (in the modern version) a person's mind might be stored

in a computer and downloaded in other matter, or teletransported Star Trek-style to another spatial location.

In fact, such widespread views reflect and reinforce, rather than challenge, the tie between minds and individuals. For in effect what they do is identify an individual in terms of his or her mind. It is that very same individual who sins on Earth and is thus punished in the afterlife, and the very same individual who emerges from the teletransporter as the one who stepped into it. If this were not true, then Hell would deliver only a Kafkaesque notion of justice and desert, and teletransportation would be suicide and the creation of a new life all in one.

This book is about the boundaries of the mind. The preceding two paragraphs aside, it has nothing directly to say about religious thought or about work on personal identity. Rather, its focus is on the idea of the individual as a boundary for the mind in the cognitive sciences and the philosophy of mind. There are various strands to the idea that the individual serves as a boundary for the mind in those sciences, and I want to tease them apart, to probe and examine them, and to question at least some of them. I take seriously the idea that there are important senses in which the individual is not a boundary for the mind, but do so from within the confines of the cognitive sciences. This will involve saying much about what I think the mind is. And it will be hard to say much of use on this topic without also entering into discussion of what individuals are. That, I suggest, takes us immediately beyond the mind and the cognitive sciences to a larger arena within science.

2 INDIVIDUALS AND SCIENCE

The concept of the individual is central to how we think about the mind, about living things, and about the social world. The sciences that concern each of these domains – the cognitive, biological, and social sciences – have developed independently. Human agents are often taken to be paradigms of individuals in each of these sciences, what I shall collectively refer to as the *fragile sciences*. Yet there exists little systematic discussion of the roles and conceptions of individuals across the cognitive, biological, and social sciences. *Boundaries of the Mind* focuses on the role that the individual has played and continues to play in guiding our thinking about the mind within cognitive science. It conceptualizes that science (or, better, cluster of sciences) as part of a broader range of sciences, the fragile sciences, that use individuals as a touchstone. It aims to contribute and draw on the fragile sciences.

In everyday life human agents are our paradigm example of individuals. We take for granted human agents in our everyday lives, and they feature centrally in our myths, histories, literature, and artistic representations. They are perhaps the most familiar part of our landscapes and our memories. Individuals are not some theoretical abstraction or posit, but perceived and known things. They are something that we can feel sure about, something basic or foundational, something beyond question.

Individuals have also been taken for granted within the various explanatory enterprises that form part of contemporary science. But here the sense of security and surety can begin to dissipate as we register some of the variation that exists in just how human agents are thought of within the domain of the human sciences. Within evolutionary biology, human agents are conceived as animals with a phylogenetic history and a particular range of ecological niches. Within anthropology, human agents are interpreters of meaning and creators of culture. Within cognitive science, they are the locus for computational programs and modules. Within economics, rational decisionmakers, optimizers of utility. The claim that individuals play a central role in these sciences is platitudinous. Yet recognition of the various roles that individuals have in these sciences, and of the presuppositions and implications of such roles, have been limited enough to warrant using the platitude as a focal theme for a broader discussion of the individual in the fragile sciences.

So my first point about individuals and science is that while we can readily accept human agents as paradigmatic individuals, how such individuals are conceptualized varies across different sciences. This should occasion no real surprise, given that these sciences have developed with considerable autonomy from one another, and the central role that "the individual" plays in each. There are, however, various kinds of project that might take this as a point of departure. For example, there are historical investigations of specific conceptions of the individual, detailed comparisons of distinct traditions and thinkers across these disciplines, and synthetic overviews that weave a narrative revealing affinities and ruptures within these fields of thought. While the kind of project that I am undertaking incorporates historical, comparative, and synthetic perspectives, the unifying structure to it lies in the interplay between the role and conception of individuals and the way in which the corresponding sciences have developed.

In both common sense and the sciences we have a firm grip on what individuals are: They are individual human beings like you and me, and by extension, individual thinkers, organisms, and agents. What warrants

reflection, however, are the various ways in which these thinkers, organisms, and agents have been construed, respectively, in psychology, biology, and the social sciences. For these construals are pivotal to many of the most important and controversial topics in those sciences and the sort of sciences they become.

This brings me to a second point. How one conceives of individuals and the role that one ascribes to individuals structure and constrain how any "individual-focused" science is theorized and practiced. We can illustrate both of these points with an example from the biological sciences, that of the role of individuals in the theory of natural selection.

In the traditional Darwinian theory of natural selection, the individual organism plays the central role as the agent on which natural selection operates. Organisms are the individuals that bear phenotypic traits, that vary in their fitness within a population, and that, as a result, are selected for over evolutionary time. Organisms are the bearers of adaptations, such as thick coats in cold climates, or porous leaves in humid climates. They are the agents of selection. On Darwin's own view, units larger than the individual, such as the group, were (more or less) unnecessary, and units smaller than the individual, such as the gene, unknown.

By contrast, in the postsynthetic view of evolution by natural selection that is often glossed in terms of the concept of the selfish gene, individuals play a very different role. On this view, it is genes rather than individuals that are the agents of selection, and that come to play many of the roles (and have many of the features) that are ascribed to organisms on the traditional Darwinian view. On this view, individuals are not much more than ways in which genes get to propagate themselves. In terms that Richard Dawkins uses, they are the *vehicles* in which the real agents of selection, genes, the *replicators* in the story of life, are lodged. Genes are the bearers of adaptations, and the units between which variations in fitness provide the basis for the process of natural selection. Furthermore, not only is the individual organism no longer the agent of selection, but as Dawkins has also argued, it is only an arbitrary boundary for phenotypes, which should be seen as extending into the world beyond the organism.[1]

Each of these conceptions of the role of the individual in the theory of natural selection carries with it implications for a number of issues to which that theory is central. I shall mention just two here.

The first is what is usually called the problem of altruism. Altruistic phenotypes and behaviors are those that decrease the relative fitness of the organisms that bear them. On the traditional Darwinian view of natural selection, focused as it is on organisms and their reproductive

success, the existence of altruism represents a puzzle. If organisms are the agent on which natural selection operates, then natural selection will select those organisms that have a relatively higher level of fitness. Thus, organisms adapted to increase the relative fitness of *other* organisms, that is, decrease their own relative fitness, could not evolve through this process, except as incidental by-products. The problem of altruism, in this view, is how to explain the existence of organism-level altruism.

On the gene-centered view of natural selection, by contrast, this problem does not exist. Or, rather, it is solved by showing how altruism, so conceived, is a result of the process of natural selection operating on genes and maximizing their reproductive success. For copies of the same genes can exist in different organisms, and so altruistic behavior would be predicted by a gene-centered view of natural selection where organisms share significant proportions of their genes, such as when they are kin.

A second issue for which the individual- and gene-centered views of natural selection have implications is how important higher-level selection is in shaping the tree of life. Such selection operates on agents larger than the individual, anything from temporary dyads, to demes, to species, to whole clades. Both the traditional Darwinian and the gene-centered view are skeptical about the need to posit higher-level selection, and posit higher-level selection only when explanation at their preferred level is not empirically adequate. On the traditional Darwinian view, these higher-level agents are conceptualized very much *as* organisms in that they are seen as sharing many properties ordinarily ascribed to organisms. But on the gene-centered view, groups, species, and clades are simply larger pools of genes, different sized vehicles, if you like, but never truly the agents of selection.[2]

This example brings out another dimension to discussion of the individual in the cognitive, biological, and social sciences. Human agents are the paradigmatic individuals in these sciences, but they are neither the only entity that serves as an individual nor always the most central such entity. Entities both smaller (for example, information-processing modules) and larger (for example, whole species) than our paradigm individuals are sometimes conceptualized either as individuals or as having many of the properties possessed by paradigmatic individuals, and thus as being like individuals. Sometimes it is these entities that are central to the relevant sciences, with our paradigm individuals receding to the background. We can raise the same questions about the conception and role of such entities as we have about our paradigm individuals. As I will

argue in the final chapters, this may be true even when our focus is on cognition, and where the relevant individuals are groups of some kind.

3 THE FRAGILE SCIENCES

I have introduced "the fragile sciences" as shorthand for the cognitive, biological, and social sciences, and here I want to say something about the neologism itself. Given that human agents are paradigmatic individuals in these sciences, one might think that "human sciences" is descriptively more informative. But like "behavioral sciences" or "special sciences," this is a term whose connotations are more misleading than helpful, and whose extension differs from that of the range of sciences that I have in mind.

The first respect in which this is true is that "the human sciences" denotes simply those sciences that attempt to understand human nature in one or more of its dimensions: biological, psychological, behavioral, social. The term thus suggests continuities between humanistic studies of human nature that precede the disciplinization of the psychological and social sciences in the nineteenth century and subsequent, disciplinary-based research that I shall not discuss at all. Roger Smith's *The Norton History of the Human Sciences* is an excellent work with this focus, but my concern is largely with conceptions of the individual that postdate the formation of psychology and the various social sciences as distinct disciplines.

A second but related reason for not speaking of the human sciences is that even if human agents are paradigmatic individuals in the cognitive, biological, and social sciences, their conceptualization here seldom even attempts to capture the essence of humanity or to grapple with the loftier goals of earlier inquiries, such as "man's place in nature." The conceptualization of the individual has become more partial and less encompassing, but also more closely tied to models, techniques, and research strategies in particular sciences. It is these ties, rather than the study of human agency or human nature, that interest me.

A third reason to coin a term rather than make do with an existing one, such as "the human sciences," is that the greater part of the biological sciences, as well as a sizable portion of the cognitive sciences, have at least as much to say about nonhuman as about human agency. The scientific study of intelligent capacities has sometimes been used as a brief characterization of cognitive science, to which artificial intelligence, the study of such capacities in machines, has been, historically and substantially, a

major contributor. Human beings constitute one special object of study within zoology. If "the human sciences" is taken, as it often is, to refer to psychology plus the social sciences, then we need a term that refers to these plus the biological sciences.

But why *fragile* sciences? Two brief reasons. The first is that it both parodies and transcends traditional divisions between the sciences: between the natural and social sciences, hard and soft science, and the physical and human sciences. As a sometimes philosopher of science, I have found these dichotomies too often driving views of the nature of science, and as inevitably privileging the natural, the hard, and the physical over the social, the soft, and the human. "Fragile sciences" serves as a partial counter to these tendencies pervading not only philosophy but also education, popular culture, and science itself. The second is the cluster of ideas that fragility calls to mind. Fragile things can be easily broken, are often delicate and admirable in their own right, and their labeling as such carries with it its own warning, which we sometimes make explicit: Handle with care! But they are also both strong and weak at the same time, and their fragility lies both in their underlying physical bases and in how it is that we treat them. No doubt, "fragile sciences" triggers other meanings, and should two reasons not be reason enough, let that be a third. Welcome to the fragile sciences!

4 INDIVIDUALISM IN THE COGNITIVE, BIOLOGICAL, AND SOCIAL SCIENCES

One way in which the role of the individual has been made prominent in the fragile sciences is via the defense of one or another form of individualism. I have examined individualism in psychology in detail elsewhere, concluding with the suggestion that the relationship between the various individualistic theses in psychology, biology, and the social sciences deserved substantive exploration. While that exploration does not exhaust the content of either *Boundaries of the Mind* or the broader project of which it is a part, the relationship between these individualisms constitutes a reference point for discussion of individuals in the fragile sciences. I shall begin to discharge the promissory note that there is something to be gained by considering "the individual" across the fragile sciences by sketching a common, simple framework in terms of which these forms of individualism can all be understood.[3]

In psychology and the cognitive sciences, more generally, individualism is the thesis that psychological states should be construed without

reference to anything beyond the boundary of the individual who has those states. This is the thesis that Jerry Fodor has called *methodological solipsism*, and it requires that one abstract away from an individual's environment in taxonomizing or individuating her psychological states. A more precise and common expression of individualism in psychology says that psychological states should be taxonomized so as to supervene on the intrinsic, physical states of the individuals who instantiate those states. (A property, A, supervenes on another, B, just if no two entities can differ with respect to A without also differing with respect to B.) Those who deny individualism are *externalists*. In Parts Two and Three I shall develop several varieties of externalism about the mind. Individualism about mental states requires, and will there receive, more detailed articulation. I briefly note three things about it here.[4]

First, individualism is a normative thesis about how one ought to do psychology: It proscribes certain views of our psychological nature – those that are not individualistic. For this reason, I consider individualism in psychology as a putative constraint on the sciences of cognition.

Second, this constraint itself is claimed to derive either from general canons governing science and explanation or from entrenched assumptions about the nature of mental states themselves. It is not construed as an *a priori* constraint on how one does psychology, but one derivative from existing explanatory practices that have met with considerable success in the past.[5]

Third, combining the previous two points, approaches to the cognitive sciences that are not individualistic are both methodologically and metaphysically misguided. They go methodologically awry in that the most perspicuous examples of explanatorily insightful research paradigms for cognition or for science more generally have been individualistic in the corresponding sense. Included here are computational approaches to cognition and the taxonomy of entities in science more generally by their causal powers. Given the successes that such individualistic approaches to the mind have had, those rejecting individualism are left in methodological limbo.

Externalist approaches to the mind go metaphysically awry in two corresponding ways: Either they relinquish our only real insight into the nature of mental causation – cognition is computational – or they imply that the mind is not governed by principles that apply more generally to the physical world – such as the supervenience of a thing's properties on its intrinsic, causal powers.

These three features of individualism in psychology are shared by individualistic theses in both the biological and social sciences. There are various forms that individualism can take in the biological sciences. For now I elaborate on an example that I have already mentioned, that concerning the agents of selection.

In evolutionary biology there has been a sustained and continuing debate over the agents of selection: At what level or levels in the biological hierarchy – from the very small, such as cells and their constituents, to the very large, such as whole species or larger taxonomic units, such as genera or families – does the chief force of evolutionary change, natural selection, operate? Three putative agents of selection have been most frequently proposed and defended: the individual organism, with individual selection being what I have already referred to as the traditional Darwinian view; the gene, a unit inspired by the rise of population genetics through the evolutionary synthesis, with genic selection associated most often with George Williams and Richard Dawkins; and the group, with discussion of the process of group selection experiencing a contemporary revival, due largely to the work of David Sloan Wilson and Elliott Sober. While much of the debate over the agents of selection concerns the relative strength and thus importance of each of these selective forces – individual, genic, and group – there is a strand to the debate that has concerned *the* level at which selection operates, and thus, which is less pluralistic than is suggested by such a construal of that debate. It is this strand that I want to focus on here.[6]

In the context of this debate over the agents of selection, individualism is the view that the organism is the largest unit on which natural selection operates. Thus, proponents of genic selection who claim that natural selection can always be adequately represented as operating on genes or small genetic fragments are individualists about the agents of selection, as are those who adopt the traditional Darwinian view that allows for only individual-level selection. Like individualism in psychology, individualism in evolutionary biology is a putative normative constraint that derives from existing explanatory practice, and whose violation, according to its proponents, involves both methodological and metaphysical mistakes. Let me explain.

Individualism about the agents of selection implies that individual organisms act as a boundary beyond which evolutionary biologists need not venture when attempting to theorize in considering the nature of what it is that competes and is subject to natural selection, and thus evolutionary change. By focusing on the individual and what lies within it, one