CHAPTER 6

OVERVIEW OF THE DARWINIAN THEORY OF HUMAN BEHAVIOR

The small strength and speed of man, his want of natural weapons, etc., are more than counterbalanced by his intellectual powers, through which he has formed himself weapons, tools, etc., and secondly by his social qualities which lead him to give and receive aid from his fellow-men.[i] Charles Darwin

The Theory in Evolutionary Terms

This chapter starts with one of Darwin's most insightful sentences, which we have not as yet mined for meaning. Essentially, Darwin is saying that humans evolved bonded relationships (dB) with their fellow humans and a strong cognitive capacity (dC) as a superior way to adapt and hence survive as individuals—and therefore as a species; superior, that is, to having larger teeth and claws or greater speed. But pursing this strategy for survival also meant that humans had to shift from relating to their fellow humans primarily by competing for resource domination through brute strength and cunning to relating to other humans primarily by being cooperative and helpful. Humans had to become "domesticated" rather than "wild." To move naturally down this track of friendly cooperative relations, humans must have been motivated by an enduring and powerful "want" or drive to bond in long-term caring relationships, not merely in self-serving temporary alliances. Even all this would not have worked unless the evolving humans had also retained their drive to acquire essential resources for themselves. If they had become so intent on bonding that they neglected their own resource needs, they would not have made it. Humans with drives to bond could out-survive those without such drives by being more adaptive, but only so long as they did not lose their older drive to acquire. Yet having both of these drives would have put such humans into internal mental conflict. And this is what happened. It has worked because humans also evolved the cognitive capacity and the drive (dC) to think up ingenious ways to do both—to bond and to acquire simultaneously.

Imagine that you are a member of a hunter-gatherer tribe. Imagine that a long-time hunting partner of yours has been knocked unconscious by a blow from a wounded bear which the two of you had been hunting and had cornered against a rock ledge. The bear is hovering over your inert friend and periodically mauling him with his paw. You, his bonded friend, must now decide what to do—and quickly. Any thoughts you had about killing the bear for meat (dA) are forgotten. But one of your limbic drives (dB) is firing away full blast, telling your prefrontal cortex that you should pull your friend from danger regardless of cost, while another independent drive (dD) is also firing its strongest signals into your prefrontal cortex, telling you to run away from this danger as quickly as possible. These intense conflicting signals would surely and quickly get whatever conscious attention your brain could muster. And it is very difficult to say what the best action decision would be. You know what the preferred outcome would be: saving your friend without getting yourself badly hurt or killed. But do you have the cognitive capacity to size up the relevant details of the situation, including your own speed, strength, and technical resources, such as a spear? And what would be the most likely behavior of the bear? Can you calculate the odds of various scenarios? If the rescue has less than an even chance of success, the right choice would be to retreat and suffer the pains of bereavement and guilt. If the rescue has more than an even chance of success, the right choice would be to try. In any event, it is clear that the choice is real. It is not an illusion; and it is a *hard choice.*

The very fact that two highly conflicted drives are in action actually makes your chances of being adaptive enough to come through alive and with a very grateful friend better than those of any creature motivated only by a drive to defend or only by a drive to bond. A creature with only a dD in play would be programmed, *without a conscious choice*, to abandon his hunting partner. A hypothetical creature with only a dB in play would be programmed, *without a conscious choice,* to dash in to help his friend. It is the fact of having opposing independent drives that requires you to make a difficult *conscious* choice. But at this point, you can take advantage of your superior cognitive ability to think of many options and calculate their chances of success. Your choice, while still difficult, will have a much better chance of multi-dimensional success.

An experienced bear hunter might come up with a decision like this: Move or speak just enough to get the bear looking at you. Briefly stay very still while staring intently into the bear's eyes to hold its attention. Then move very slowly sideways, circling toward the rock ledge to give the bear a clear line of retreat away from you and your friend. Once in the proper position, start screaming and run at the bear, waving your arms and your spear. This is the moment of greatest risk—the bear might charge you. But with any reasonable luck your action will spook the bear into running away. These actions would reflect pressure from your drive to comprehend to use your cognitive equipment to come up with a smart action plan, one that takes into account your understanding that bears have a dD in their brain as well as a dA. If the bear runs away, your action will have made you a winner on all four of your drives. And this story should not strike anyone as demonstrating the behavior of an extraordinary human being; it is just a case of an ordinary individual using the good common sense that is available in the brains of all members of an *extraordinary* species.

Chimpanzee brains are not set up to contemplate choices about rescuing a fellow hunter in trouble. A chimp's brain, having only dA and dD to work with, faces the more limited conscious choice of fight or flight. In such circumstances, with only its dD and not its dA firing, a chimp would *automatically* take off—no conscious conflict so no conscious choice. (Although a female chimpanzee might behave somewhat more like the hunter if the "friend" were its own infant.) Only we humans are forced by our conflicting drives to make the harder choices and this is how we have become so highly adaptive and possessed of a higher level of consciousness. But this wonderful capacity has come at a price; there is no escape from the hard decisions that go with our freedom of conscious choice. This is the insight behind the story of Adam and Eve, the apple of knowledge and their expulsion from Eden..

There is a story making the rounds that also involves a dangerous wild animal and that provides an interesting contrast with our bear story. It seems that two young friends decided to interrupt their jungle walk to take a dip in a lake. As they were emerging from the water, they were horrified to see a tiger stalking them along the water's edge. One of the men quickly began putting on his shoes. The other asked

why. “So I will be able to run faster.” “That’s hopeless, you can’t outrun a tiger.” “I don’t have to,” the first replied as he started running, “I just have to outrun you.”

This story usually induces only a half-hearted laugh as the listener is genuinely startled by the inhuman diabolical ending. It is precisely the behavior of to be expected of a free-rider with no drive to bond.

Predictability of Human Behavior

Human behavior is notoriously difficult to predict. None of the social sciences have been very successful doing it. It is hard not only because behavior is always engaged in coping with a set of circumstances that are themselves highly variable, but because all humans, according to renewed Darwinian theory, bring conflicting motives to each new set of circumstances. Time after time, we humans are under pressure to choose the most *adaptive* response, a response that at least *satisfices***,** to draw on the concept developed by Nobel prize winning Herbert Simon, all our drives under the given circumstances. Scholars such as James and Dewey have called this theory of action “pragmatism.” The pragmatic rule is to “do what works for you in the given circumstances.” This is fine as far as it goes, but it fails to give us the criteria for judging “what works” for humans. The four human drives I postulate complete the theory of pragmatism; they are the human goals, the human criteria by which we can judge what works or does not work for us. While the renewed Darwinian theory will never achieve the accuracy of prediction often achieved by the physical sciences, I argue that it can make significantly more accurate predictions than the currently available alternative theories of human behavior. I believe it can predict better because it models more closely the choice process we call common sense, which is “what works” for humans.

One way to clarify this point is to ask the philosopher’s “what if” question in regard to each of the four drives. What if a person were born without a drive to acquire? Such a person, in order to survive, would have to be treated permanently as an infant, totally dependent on others for life-sustaining resources. What if a person were born without a drive to defend? Such a person would also have to be treated permanently as an infant, always protected by others from all the hazards of life.

What if a person were born without a drive to comprehend? Such a person would permanently act like an idiot, unable to learn the multitude of possible ways to cope with a complex world. Hare and his colleagues have already shown us what would happen if a person were born without a drive to bond. Such people, it seems, would be a permanent menace to others around them and these "others" would need to find special ways to protect themselves. For humans, all four drives are essential to lead a normal adult life that is highly adaptable to changing circumstances. To best predict human behavior, the observer must simply ask: Given the existing circumstances and the four drives, what would be the best possible way for a person to satisfice—or at least not violate—all four drives? The answer to this question is the best possible prediction of behavior. Of course, humans do make mistakes and this will generate prediction errors. And humans are also clever enough to come up, at times, with superior action plans that had not occurred to any predicting observer. But, when our proposed prediction process is accurate, isn't it by the use of the same prediction process that was used by the "winning" players of the "ultimatum game" discussed in Chapter 2? We saw then that humans around the globe demonstrated an effective "common sense" capacity to predict quite accurately the choices of other humans when those making the predictions had a stake in the outcome of the others' choices and also took account of their particular culture's way of skewing the parameters.

The renewed Darwinian theory also proposes that the newer drives found in humans, dB and dC, arose by means of a genetic trick. Let me explain. We truly value long-term friends for themselves, in an unselfish way, but this very drive to bond became dominant in the gene pool because, according to Darwin, it provided a competitive advantage which improved the survival chances of individuals and hence of the entire species. In other words, our desire for friends is sincere, but that sincerity has persisted in our gene pool because it conferred a survival advantage on our ancestors. We were essentially tricked into wanting friends for reasons we knew nothing about—for species reasons.

Perhaps this tricking process can be made clearer if we discuss it in relation to sex. Animals do not have sex primarily because they make a conscious choice to start a baby. As far as we can tell, all bi-sexual animals are pre-wired to get great pleasure

from the sex act. Individuals so pre-wired obviously will make more babies than ones who are disgusted by the sex act. So it was the "sex is fun" genes that made it into the next generation. Natural selection tricked us into making babies without which any species would, of course, die out. But knowing this does not make the sex act any less pleasurable. We are pleased to have been tricked. And think how much joy there would be in the world without children.

These evolutionary stories may also help clarify what is different in the minds of free-riders and why they behave so differently from everyone else. If one's brain does not contain the drive to bond, then one does not have to make the hard choices normal humans must make. In every situation, a free-rider's dA makes the choice, or really the non-choice, to act with unconflicted selfishness. (That is unless their dD signals them that it will be dangerous to go for the attractive acquisition. In such circumstances, they do have to make the more limited conscious choice of fight (dA) or flight (dD).) Such behavior looks to normal people like unbelievable super-selfishness. The free-riders' drive to acquire is probably no stronger than it is in normal people, but it has no opposing dB to check it. Free-riders are simply doing what comes naturally. Which means—although it is awful to contemplate—that they are *us* minus one saving grace.

Reviewing the Theory by Contrasting It with Conventional Assumptions

As an additional way to characterize the renewed Darwinian theory, I will contrast its propositions with some of the more conventional assumptions about a selected set of issues. I must add that these conventional assumptions are not straw men. They all have been proposed, in more complex and elegant forms, as serious theories of human behavior.

<u>Common Assumptions Regarding Human Behavior:</u>

<u>Common Assumption: No Drives</u>: At birth the human brain is a blank slate that gradually fills with learning and experience drawn from the culture into which the child is born. This is known as cultural determinism and was first spelled out by Locke. In this formulation, genetically-based unconscious drives, for all practical purposes, do not exist.

Contrasting RD theory Proposition 1: While culture and experience both have an enormous influence on the concrete behavior of humans, they are only part of the story. Our four innate drives provide the ultimate motives (*what* to go after) while the related innate skill sets along with culture and personal experience guide us in the given circumstances (*how* to go after it). The pre-frontal cortex integrates all the elements.

Common Assumption: One Drive: There is only one human drive—the drive to behave in one's rational self-interest. All impulses can be traced back by logic, and by the Spencerian caricature of Darwinism, to this one drive. This is the assumption of neoclassical economics.

Contrasting RD theory Response: This assumption is not as much wrong as incomplete. The drive to behave in one's rational self-interest is the same as dA, but there are three other independent powerful drives. To act with reference only to dA would be like running a four-cylinder motor with only one cylinder wired up to fire.

Common Assumption: Dozens of Drives: If there are unconscious innate drives, there must be scores of them and hence it is all too complex to make sense of.

Contrasting RD theory Response: There are only four ultimate drives of any significance. Any other independent impulses that might be found have so small an influence on human behavior that, for now, they can safely be ignored. The four-drive proposition is still open to the addition of other drives if others are empirically shown to be independent (not derived from the original four) and to have a significant influence on human behavior.

Common Assumption: On Drive Control: Human drives are subject to control by reason and cognition.

Contrasting RD theory Proposition 2: Drives can only be checked by another drive pushing in a different direction. Reason and cognition are essential in order to generate multiple options that can be reviewed by the drives to see how well these options simultaneously satisfice all four drives. This checking and balancing process is centered in the prefrontal cortex.

Common Assumption: On Skill Sets: The basic skills that humans develop to achieve their goals are entirely acquired, a product of mimicking, coaching, and learning from one's own experience.

Contrasting RD theory Proposition 3: Most of the multiple specialized skills that humans display are a product of both genetically-based predispositions for these skills and an individual learning process that draws heavily on the accumulated culture of one's society.

Common Assumption: On Human Choice: Science has proven that human choice is an illusion. Our behavior is pre-determined by automatic genetic processes over which we have no control.

Contrasting RD theory Proposition 4: The renewed Darwinian science of the human brain proposes that the defining feature of humans is choice itself. Our brain is designed to force us to resolve the hard choices that result from conflicting impulses generated by our innate drives.

Common Assumption: On Darwinism: As far as humans are concerned, Darwinism means the survival of the meanest, most ruthless people at the expense of all others.

Contrasting RD theory Proposition 5: Darwinism means the survival of the most adaptive, those individuals best able to choose behaviors that are appropriate to the realities of their complex and changing environment. For an intensely social and intelligent animal such as *H. sapiens*, this rarely means ruthlessness. Creatively reconciling and balancing the impulses of all four drives is the best built-in guide humans have to being adaptive, and, so far, it has proven very effective. These four drives evolved by the Darwinian mechanisms of sexual selection and social group selection, as well as by natural selection.

Common Assumption: On Morals Morals are cultural artifacts taught to people by social institutions such as religion in an effort to control primitive selfish impulses. Morals are a veneer over our basic urges.

Contrasting RD theory Proposition 6: A moral sense is present at birth and further develops toward maturity as an innate skill set that has evolved in humans to help them fulfill their drive to bond. This innate moral sense is further shaped by the

capacity of humans for moral reasoning based on their drive to comprehend as well as by cultural rules reinforced by social institutions.

Common Assumption: On Pair-bonding The choice of monogamous pair-bonding instead of any other options for adult sexual relationships is an individual choice based on personal preferences as influenced by contemporary culture.

Contrasting RD theory Proposition 7: Monogamous pair-bonding between two committed people has evolved as a species-wide solution to deal with the long-term dependence of human children on loving adult care and guidance. Variance from this solution, while it clearly does happen, can usually be expected to bring relatively adverse consequences for the children involved and hence for the species as a whole.

Common Assumption: On Emotions Emotions, which are holdovers from our ancestral species, almost always mislead us in today's world, Modern humans are well advised to ignore them or to try to override them with reasoning.

Contrasting RD theory Proposition 8: Emotions are the language of discourse between the unconscious and conscious parts of our brain. While not foolproof, emotions are an important guide to making wise and balanced choices.

Common Assumption: On Science and Religion Science and religion deal with completely different realms of life. Trying to link them together is a big mistake because one is built on faith and the other on empirical evidence.

Contrasting RD theory Proposition 9: As regards humans, science and religion are both searching for answers to the same questions: Who are we? Where did we come from? Where are we going? What is the meaning of human existence? There is every reason to continue the search using both religion's method of insightful revelation and science's method of induction from empirical evidence. As I will spell out in Chapter 9, there are now indications of a possible convergence of religion (based on insightful revelation) with science (based on evidence) on the origin of the Big Bang that started the universe.

Common Assumption: On the Underlying Nature of People: Most people we meet are basically like us. They generally have good intentions and can provisionally be trusted to treat us, most of the time, as we would wish to be treated.

Contrasting RD theory Proposition 10: The assumption above works very well with the vast majority of people, but a very small minority of people, known as free-riders, have no drive to bond or an associated conscience. This makes such people very dangerous to others and appropriate safety measures need to be taken.

Common Assumption: On the Changing of Mind-sets and Ideologies: If new ways of making sense of the world and or ourselves are backed up by evidence, people will readily switch their thinking

Contrasting RD theory Proposition 11: Given humans' universal drive to comprehend, people are always seeking ways of making sense of the world. But once people have found a mind-set of beliefs or ideology that feels coherent and right, they resist changing it. Changing one's belief systems requires a great deal of mental work which people are predisposed to avoid if possible. Thus, mind-sets are not frozen, but they are sticky. When they move it is more like a jump to a new mind-set than a gradual flow. Test this proposition by reflecting on your own reactions to the propositions above.

The Theory in Relation to Individual and Group Differences

In this book, I have focused consistently on the universals of human behavior because this crucial issue has been largely ignored by science since Darwin's time. My one conspicuous deviation from this focus has been the discussion of the free-rider phenomenon, a rare exception that is simply too dramatic and important to ignore. This focus on the universals does not, of course, mean that there are not important variations of behavior across individuals and groups, which a unified science of human behavior must strive to identify and to explain. Much of this work has already been done. I would argue, however, that a tested unified theory of behavior would make it much easier to proceed further, scientifically and practically, with our understanding of human differences.

There are, obviously, many lines along which human populations can be divided in order to study the differences. Think of the current interest in studying the differences between women and men—the gender difference. The recent book. *The Female Brain,* is an attempt to pull together some of these findings.[ii] The list of

interesting dimensions along which we can examine human differences can become virtually endless—race, ethnic cultures, sexual orientation, cognitive styles of learning, educational levels, income, class, forms of pathology, innate skills and talents, strength, physical dexterity, sibling birth order, family structure, occupation, height, skin color, hair color, hobbies . . . all the way to birthdates and favorite colors. All of these and many more have already been studied. Although these various differences will always be of interest, I argue that a firmer grasp of the universals will enable us not only to develop better explanations of differences but also to keep the differences in perspective, handling human diversity with less anxiety and with more appreciation.

Given the important role the four drives play in the renewed Darwinian theory, we must not forget the likelihood that there are individual differences in the strength of each of the four drives. For example, one setting where the analysis of such drive differences might throw fresh light is that of political coalitions and their dynamics. The analysts of political institutions have for long made use of four terms to characterize coalitions of political actors: right wing, left wing, progressive and conservative. The right wing puts emphasis on property rights and on individual achievement. The left wing puts emphasis on universal human rights and the common good. The progressives put emphasis on innovative ideas that might improve society. The conservatives put emphasis on traditional solutions to common issues and are cautious about new ideas. These four orientations seem to offer a remarkably good fit with the four RD theory drives in the following way: a set of people with a somewhat stronger dA would be more comfortable in a right wing coalition; those with a stronger dB would be more comfortable with a left wing coalition; those with a stronger dC with a progressive coalition; and those with a stronger dD with a conservative coalition.

The interplay of these four groupings and their paired combinations may be helpful to political scientists in explaining political dynamics of legislative bodies. In the normal course of operations a legislature will strive to handle conflicts of interest between these four groups by negotiating compromises that satisfices all four, and, by definition, maximizes none. In America the two major political parties have

historically shifted around in their way of positioning of the party in relation to these four orientations. In Theodore Roosevelt's administration the Republicans emphasized the progressive (dC) and the left wing (dB) combination, as we will see in Chapter 8. In Franklin Roosevelt's time it was the Democrats who built their coalition with this same combination. In Washington today the Republican administration has forged an opposite coalition of the right wing (dA) and the conservatives (dD). Political historians and psychologists who are interested could do a similar analysis of other administrations and other combinations.

To close off this issue I will offer just one additional extended example of how differences in human behavior can be better understood against the background of the universals of behavior that we have been discussing. In the last chapter, I finished the discussion of free-riders by citing the experiment in which Milgram acted as a particular kind of authority figure—a free-rider "experimenter" —who pushed his subjects, the "teachers," to obey his instructions and ruthlessly torture innocent "learners" in violation of the subjects' own dB-based consciences. I hypothesized—but certainly could not prove—that the "teachers" who followed instructions did so primarily out of a latent fear of punishment from the alpha-like authority figure, perhaps because their dD was stronger than their dB.

Enter now Bob Altemeyer, a psychologist who studies individual differences in regard to what he calls *authoritarian submission*. He explains: "By 'submission' to the perceived established authorities I mean a general acceptance of their statements and actions and a general willingness to comply with their instructions without further inducement."[iii] He ties this variable directly to Milgram's experiment as follows:

> [Authoritarianism submission] is an individual difference variable, a personality trait if you like, developed on the premise that some people need little situational pressure to submit to authority and attack others, while others require significantly more. We can find evidence of this individual difference even in Milgram's experiment. In two conditions of the initial study, the Learner sat in a separate room from the Teacher, which made it relatively easy for the Teachers to obey the Experimenter completely, as 64% did. In other conditions, however, the Learner sat right beside the Teacher… That made it

harder to obey the Experimenter, as you can imagine: "only" 35% proved completely obedient. In one case, then, the situation pushed people toward obedience; but in the other, it promoted defiance. In both cases some people acted differently from the majority. They defied when it was hard to defy, or they obeyed when it was hard to obey. Who were they?

Elms and Milgram (1966) found that the twenty defiant ones scored rather low on a pioneering measure of personal authoritarianism, the California Fascism Scale; whereas the twenty obedient ones, whom the Experimenter could get to shock a helpless victim sitting at their side, scored much higher."[iv]

Altemeyer describes in his book how he went on to develop a more reliable questionnaire-based measure of *authoritarian submission,* a trait that can predict with reasonable accuracy the more obedient response (the high scorers to the questionnaire) and also the more defiant response (the low scorers) of people to situations such as the one that Milgram posed.. Altemeyer suggests that the people who are more obedient to authorities are driven by fear (a stronger loading on dD?). Could Altemeyer's high-scorers on authoritarian submission possibly be the kind of people who signed up to follow Hitler? Altemeyer, in his final chapter, states that his systematic data, collected from a broad sample of North Americans, clearly answers: Yes, they are. People who score high on his scale "are the people who, *driven by fear* [italics added] and huddling in… self-righteousness, could create the wave that would lift the monsters among us to power. And once the monsters acquire the powers of the state, their evil explodes."[v] Altemeyer spells this out further:

Few people, unless they are familiar with the history of fascism, understand that people as ordinary as you and I, and our friends, and neighbors, might bring down democracy if the going got tough enough… Can one credibly talk about fascism in the North American context as we approach the year 2000? Is it even remotely possible that the horrors of Nazi Germany could someday occur in Canada or the United States?…

Although the Nazis did monstrous things, it is a mistake to think that only ardent fascists and psychopathic killers became Nazis. Adolph Eichmann

struck some as a bland person, not particularly anti-Semitic, who basically wanted to advance his career and so worked hard to impress his superiors. His evil was “banal.” I can also imagine that many of those who made the arrests and transported the victims to the death camps would have been described as “good, decent people” by their families and neighbors. So would many of those who ran the slave labor camps in which hundreds of thousands of prisoners perished and maybe even the SS soldiers who massacred whole villages. You can be an ordinary Joe, or Lieutenant Calley, and still do terrible things. One of the things Americans learned about the militias [unofficial para-military groups such as were found in Michigan following the Oklahoma bombing] in an Associated Press story dated April 27, 1995, was that they were ”ordinary people who feel pushed.”

If you think our countries [referring to Canada and the United States] could never elect an Adolf Hitler to power, note that David Duke would have become the governor of Louisiana if it had just been up to the white voters in the state… About a quarter of American state legislators are already poised to “stomp out the rot.” And if you think a North American dictator could not find the people he needed to kill Jews, or professors, or Communists, or trade union leaders, or defiant clergy, or religious minorities, or the mentally “unsuitable,” or whomever he wanted to eliminate, then you might recall what Milgram found.

I am now writing the last page in my last book about authoritarianism. So for the last time, I do *not* think a fascist dictatorship lies just over our horizon. But I do not think we are well protected against one. And I think our recent history shows the threat is growing. Fascism has proven as vile and persistent in this century as prejudice, which has shown it can be quietly passed from generation to generation even when the state vigorously discourages it. And unlike Communism, fascism cannot be expected to fail because it makes some fatally wrong assumptions about human nature. Instead, democracy seems to be fighting the current here; by depending on tolerance, when fear and dislike come so easily; by asking for generosity of

spirit, when selfishness is so natural; by championing equality, when hierarchy seems so inevitable.[vi]

Since Altemeyer could be misunderstood, I must clarify that his submissive authoritarians are *not* free-rider psychopaths. In talking to Altemeyer I learned that he knows little about the work of Hare and others on the rare psychopaths, the people Darwin called monsters. Altemeyer is focusing his work on the much larger number of people who are vulnerable into being conned into following clever psychopaths. These are people who have all the four drives but seem to have a tilt toward a stronger drive to defend that gives them this vulnerability. To clarify this distinction in regard to the current concern with 'terrorists', Osama bin Laden and some of his top fellow leaders may very well be psychopaths. But we can be very sure that the people who drive the car bombs and strap on the explosives are not psychopaths. Psychopaths would *never* engage in any such self-sacrificing behavior. Altimeter's submissive authoritarians are the likely candidates for those deadly jobs and clever psychopaths know how to recruit them. We can choose to put the terrorist label on either set of people but to put it on both sets is to totally confuse ourselves. Without psychopathic leadership the submissive authoritarians are fairly harmless.

Some kinds of individual differences, such as those found in free-riders, the super authoritarians, and also, unfortunately, in the very different but related ordinary people called submissive authoritarians, do call out for our special attention. Much more well-focused research needs to be given to both of these different kinds of people.

Reviewing the Criteria for Judging the Renewed Darwinian Theory

In Chapter 1, I posed six criteria to be met by a unified theory of human behavior. It had to (1) be empirically testable; (2) be universal or valid across different cultural settings and historical periods; (3) be as simple, parsimonious, teachable, and actionable as possible; (4) be able to work across levels of analysis—back and forth from the individual to the species level; (5) offer a stronger explanation of key human behaviors such as coconsciousness, free will, decision-making and morality, than other available theories; and (6) promote consilience, that

is unity, between the major findings of all the various social and natural sciences bearing on human behavior. To what extent does the renewed Darwinian theory meet these demanding criteria? Does it offer a better understanding of human behavior than other available alternatives?

Is the Renewed Darwinian Theory Testable?

Milton Friedman, in a defense of neoclassical economics, argued that it is not crucial to test empirically the axiom that human beings are rational, self-interest maximizing actors. What is far more important is to test the accuracy of the predictions that derive from this axiom. If human beings behave in ways that appear consistent with this assumption, Friedman contends, we should embrace neoclassical economics because of its brevity and predictive power.[vii]

I expect the renewed Darwinian theory to be put to a more difficult test than the one proposed by Friedman. I believe that the propositions of RD theory can and should be tested empirically, as well as by the accuracy of their predictions. The basic elements can be tested because they have a concrete biological basis. The drives, the skill sets, and their coordination by the prefrontal cortex are all rooted in the physical structure and dynamic interconnections of our brains. I am not a neuroscientist, but I think, for instance, that the drive hypotheses can be verified or falsified by imaginative experiments using brain scanning methods to observe where and how our brains react to various stimuli. I expect that different parts of the brain's limbic center will record activity depending on whether the stimulus triggers the drive to acquire (such as pictures of luxury cars, chocolate desserts, or sexual activity), the drive to bond (such as pictures of family and friends and symbols of collectives with which one is closely identified), the drive to comprehend (such as abstract pattern-recognition puzzles), or the drive to defend (such as pictures of heights, snakes, spiders, and other hazards). As I have indicated so far, the preliminary evidence from experiments conducted along these lines supports the existence of the four drives.

In regard to free-rider testing, the brain scanning evidence of missing affective signals from the limbic area, cited in the last chapter (Kiehl[viii]), can serve as a model for much more extensive testing using this methodology. It would also be possible for

evolutionary psychologists to contribute to this effort by conducting carefully designed experiments with neutral and emotionally-loaded words using EEG methodology. Geneticists should be able to identify the genetic signature of psychopaths, if it exists. Perhaps identifying the genetic differences between prairie and montane voles will point to the location in our DNA of the genes involved in humans. If the free-rider hypothesis is confirmed, this alone would provide strong support for the entire renewed Darwinian theory, since it would simultaneously offer strong evidence of the existence of dB in normal humans..

In addition to testing the theory's biological micro-foundations, it is possible to test its macro-predictions. In any given situation, people will attempt to reconcile the different and often competing tugs of their four drives, but their final *specific* choice of resolution is not predictable in the kind of detail possible in large parts of the physical sciences. The theory is, in this sense, not deterministic. It allows one to predict only in terms of probabilities. What the theory predicts with assurance, however, is that, over time, any normal individual will behave in ways that reflect all four drives. Moreover, the behavioral pattern of a large enough cross-sectional sample of individuals responding to the same situation (such as an ultimatum game experiment) will also reflect all four drives.

The theory also predicts that individuals will enjoy an adaptive advantage to the extent that they are able over time to fulfill to a reasonable level—that is to satisfice—all four of our basic human drives. This is also predicted for all social institutions that satisfice all the four drives of all their involved stakeholders. Individuals and institutions that focus on maximizing one drive at the expense of the others will be less adaptive over time I argue that these important propositions are testable and I will discuss specific ways in Part IV. One way for the reader to confirm or refute my argument that the new theory is testable is to return to the twelve propositions stated earlier in this chapter and try to imagine empirical ways to test each one. It will obviously take some highly creative work, but I think it is possible.

Is the Theory Universal?

The anthropological literature (see Murdock for a classic review[ix]) offers us no example of a society or culture whose members did not display some measure of each of the four drives in their behavior, along with the various cognitive elements of the RD theory. The one important exception to the universality of the four drives is the free-riders, a very small minority whose genes express neither the drive to bond nor its associated moral sense.

To be more specific about the universality of each of the four drives:

- *The drive to acquire (dA).* The tendency for people to seek status distinctions, which satisfies their drive to acquire, is universal. As Michels[x] discovered, even in the most egalitarian societies, some measure of distinction or status—the iron law of oligarchy—inevitably surfaces.
- *The drive to bond (dB).* As hard as it is to create a communal utopia in which everyone is equal, it is equally hard to create a true Hobbesian state in which everyone is at war with each other. Even in highly competitive arenas, people develop bonded relationships and respect the mutual commitment implied by these relationships. Putnam's[xi] study of the perennial strife that has characterized the history of southern Italy shows that, even in this landscape of vicious competition, there are bonds that unite people into tightly knit groups.
- *The drive to comprehend (dC).* It is found in every society and cannot be stamped out. Whether it was the Inquisition in the Dark Ages, the Cultural Revolution in China, or the Pol Pot regime in Cambodia, efforts to suppress the drive to comprehend inevitably ended in failure. We might be tempted to imagine that somewhere in the world there are remote societies, disconnected from modern civilization and frozen in time, where nothing has changed or been learned in centuries. Yet, as the anthropologist Levi-Strauss[xii] has noted, whenever it seems that such a society has been found, the so-called "savage" mind is found to be just as engaged in forever learning and creating new mental patterns as our "civilized" minds.

- *The drive to defend (dD).* Members of even the most peaceful societies will defend themselves when their property, loved ones, or beliefs are attacked. This universal tendency to defend against aggression has been underscored by Wilson[xiii] after a comprehensive review of the anthropological evidence.

Is the Theory Simple, Parsimonious, Teachable, and Actionable?

Good theories must follow Occam's principle: "As few (variables) as you can; as many as you must." So why four drives? Why not three? Or seven? Or maybe just one?

I would be happy to oblige Occam by declaring one or two of the independent drives as derivative instead of primary and independent. The most obvious choice would be to treat dB and dC as derivatives of dA. But this would remove from our innate nature the very traits that I believe make us truly human and so different from the other primates. The independence of these drives is what has created the very human feature of high-level conscious choice with its surge of greater adaptability, our major competitive advantage over other earthly creatures. Having four drives rather than just one or two gives humans significantly greater choice, more degrees of freedom to be adaptive. Note, however, that the term "competitive advantage" is itself now outmoded by the new theory. We could as accurately call it our "cooperative advantage" or our "learning advantage" or our "defensive advantage." We need all four drives, all four directions, not just dA, on the human navigational compass. Let us simply speak, as Darwin himself did, of an "adaptive advantage."

When it comes to adding more drives, I will be glad to do so if others can be proposed that are independent, cannot be derived from the basic four, and have a significant influence on human behavior. I do think a case might be made for separating the sexual drive (possibly in combination with other pleasurable bodily experiences) from the drive to acquire, thus adding a fifth drive. This could be indicated if the brain modules and circuitry underlying sex are entirely different from those involving the acquisition of material resources. This change could be accommodated without making major shifts in other features of the theory.

The only other repeatedly suggested additional drive that warrants discussion is a drive for power. Power in human affairs can usefully be defined as the clear capacity of one person to influence another to behave in ways that they would not otherwise do. For example Milgrim clearly had, in this sense, power over his experimental subjects. Could a drive for power over others be the universal single drive underlying all our others, dA, DB, dC and dD? This proposition has to be taken seriously since only a bit of reflection indicates that an individual who can be more successful than another in achieving any one of the four drives has some capacity thereby to use the fruits of their superior performance to influence any less successful other. The resource rewards of dA performance can obviously be used to influence others—think of the power of having more money. The same is true of dB; think of having more devoted friends and allies. The same is true of dC; think of the power over others of having more valid knowledge. And finally in regard to dD; think of the power of the person with a gun over the person without a gun. Mao in fact said that all power comes out of the barrel of a gun. This analysis has generated four different kinds of real-life power that is derived from the superior performance of the four drives and I find it difficult to think of any other important kinds of power over others. So to repeat the question is power a drive in our unconscious brain from which all four drives of the RD theory of human behavior can be derived? For me the answer is very clearly negative for the following reasons.

The human imagination is capable of conceiving that a drive for power can explain it all, but this explanation by no means fits the observable facts of how the human brain actually works. If the power hypothesis were true it would be a matter of indifference to us whether we achieved the desired power differential over others by the dA or the dB or any other route. There would, therefore, be no conflict between the drives and no need for conscious choice. We would all be engaged in an ultimate Hobbesian war of each against all other for power by any means possible. Such a species could not for any length of time pass the ultimate test of survival. It would not be adaptive. Such a species would simply self destruct.

According to the RD theory of human behavior, the only people whose behavior somewhat resembles such a hypothetical power driven person would be that

of a psychopath. For them the absence of the drive to bond can make them appear to be obsessed with power. But, I would argue, that this appearance would be an illusion created by their single-minded obsession with acquisition, and that achieving power over others by securing powerful authority positions in social hierarchies is simply an obvious means to that end of acquiring more resources, not an end in itself. The idea that a power drive needs to be seriously considered as a fifth drive does not sand up to analysis and much less as the universal drive underlying all drives. Even in normal four-drive humans the seeking of power is only a means used to succeed in fulfilling the basic drives.

No other serious candidate drives have so far appeared.

In writing our *Driven* book Nitin Nohria and I clearly thought that a parsimonious set of drives would be far better than a long list. There can be no question that the more powerful scientific theories have been the simple ones. Think of Newton's one law of gravitation, his three laws of motion, the three laws of thermodynamics, or Darwin's V/S/R mechanism. Remember, as a cautionary tale, the chaotic search for dozens of drives that William James inadvertently triggered. The original idea was to have a short list headed by such drives as hunger and sex. Then candidates for additional drives came in from all directions. With no clear criteria for what constituted a drive and what constituted evidence of its existence, the list quickly expanded to a ridiculous length and the theory became useless. Nohria and I did not wish to follow that example. It is fortunate that as few as four drives are enough to cover the topic of ultimate human motives. It helps the theory be teachable and actionable. But, of course, since these drives were selected by the evolutionary process to make us adaptable, what else would we expect? These four fit nicely inside our cranium and we only need to use them effectively.

Does the Theory Work across Multiple Levels of Analysis?

The need to develop multi-level models has been addressed by many scholars of human behavior, especially Coleman, an eminent sociologist.[xiv] Although Coleman's framework—unfortunately, I would say—bought into the single-utility model of neoclassical economics, it did demonstrate not only the need but also the

feasibility of moving from the level of the entire socio-economic system down to the level of the individual and back again. The renewed Darwinian theory works relatively seamlessly across all levels of analysis—from the individual to the family and local community to the corporation and the nation-state and on to the entire species—using the same language and theoretical propositions.

To the extent that people organize themselves through implicit and explicit social contracts into collectives in order to pursue their drives, these collectives will reflect the four drives shared by their members. But we must be careful not to anthropomorphize social institutions. An organization or a nation does not have a drive to acquire or to bond, or a memory, or a nervous system that controls muscular action. Only human beings have the four drives and the apparatus of the prefrontal cortex to help integrate them. Social institutions thrive to the extent that they provide their members opportunities to reasonably satisfy their four drives. Institutions that do not are eventually changed or cease to exist. Thus the viability of social institutions, at any level of analysis, can be assessed using the renewed Darwinian theory. Important social institutions can be carefully structured to take account of how the human brain works; in Chapter 7, I will offer the U.S. Constitution as a prime example of this process. It is in this sense, rather than in attributing the drives found in human brains to our social institutions, that the theory is applicable across levels of analysis.

Does the Theory Offer Better Explanations of Key Human Behaviors?

In Chapter 1, I listed some key aspects of human behavior that a unified theory would be obliged to explain better than current theories do. I believe that, for each of these aspects, I have offered an explanation that arguably advances existing theory. Summary statements have been made for each of the listed aspects and need not be repeated here. As a reminder, the items in the Chapter 1 list were: ultimate motives (discussed in Chapter 2), significant degrees of free choice (discussed in Chapter 3), the role of emotions in human choices (discussed in Chapter 3), the sense of self (discussed in Chapter 3), how humans evolved to our present state from earlier forms (discussed in Chapter 4), morality and conscience (discussed in Chapter 5), and

the predictability of human behavior (discussed in Chapter 6). This leaves only human consciousness, which, although discussed at various points above, is such a key topic that it needs further explanation.

With respect to consciousness, the renewed Darwinian theory supports the existing neuroscience theory that the modules of the prefrontal cortex, particularly the dorsolateral cortex, are the locus of consciousness. The theory adds only the explanation that the agenda of issues to be addressed in terms of deliberate conscious choices is generated by conflicting impulses sent from the four individual drives. Having four drives, rather than only the two possessed by non-humans, adds to the number and the significance of conflicted issues that are juggled by the prefrontal cortex, and this heightens the level of human consciousness compared to that of other primates. To test these ideas further I will cite in its totality what Francis Crick, the Nobel-prize-winning co-discoverer of the DNA code, has written to summarize a theory of human consciousness which he published, in 1998. I will indicate by parenthetical insertions how the Darwinian theory follows closely in the track of Crick's theory and helps to flesh it out.

Consciousness—Not a Thing But A Process

The explanation of consciousness is one of the major unsolved problems of modern science. Indeed, the overwhelming question in neurobiology today is the relation between the mind and the brain. In the past the mind (or soul) was regarded as something separate from the brain but interacting with it in some way. But most neuroscientists now believe that all aspects of the mind, including its most puzzling attribute, consciousness or awareness, are likely to be explainable in a more materialistic way as the behavior of large sets of interacting neurons. As William James, the father of American psychology, said a century ago, consciousness is not a thing, it a process. Until recently, however, most cognitive scientists and neuroscientists felt that consciousness was either too philosophical or just too elusive to study experimentally. But in my opinion, such timidity is ridiculous. I believe that the only sensible approach is to press the experimental attack until we are

confronted with dilemmas that call for new ways of thinking. The major question that neuroscience must answer is as follows: What are the differences between the active neuronal processes in our heads that correlate with consciousness and those that don't? Are the neurons involved of any particular type? What—if anything—is special about their connections and firing? Although, in the long run, an all-embracing theory taking in emotion, imagination, dreams, mystical experiences and so on will be necessary, my work assumes that all the different aspects of consciousness involve a basic common mechanism (or perhaps a few such mechanisms). I hope that understanding the mechanism for one aspect will go most of the way to helping us understand them. So my colleague Christof Koch and I, thinking it wise to begin with the aspect of consciousness likely to yield most easily, selected the mammalian visual system because firstly humans are very visual animals and secondly because so much work has already been done on it.

I hold that the biological usefulness of visual consciousness in humans is to produce the best current interpretation of the visual scene [by means of the placement by the drives of Damasio's markers on visual signals of importance to the self] in light of past experience (either our own, [stored in the long-term memory in the neocortex] or that of our ancestors embodied in our genes [as genetic memories in the limbic modules]), and to make this interpretation directly available for a sufficient time to the parts of the brain [the prefrontal cortex] that contemplate and plan voluntary motor output such as movement or speech. But there actually seem to be two systems: the rapid action "on-line" or unconscious system [that controls action when there are no conflicting impulses from the drives] and the slower, conscious "seeing system" [whenever there is conflicting firing of impulses from the drives]. To be aware of an object or even an event the brain has to construct a multilevel (for example, lines, eyes, faces), explicit, symbolic interpretation of part of the visual scene. A representation of an object or event will usually consist of representations of many of the relevant aspects of it, which are likely to be distributed over different parts of the visual system [and built up with

feedback loops as long-term memories in the six layers of the cortex.] Much neural activity is needed for the brain to construct a representation, most of which is probably unconscious [agreed].

The term “visual consciousness” almost certainly covers a variety of processes. When one is actually looking at a visual scene the experience is very vivid, whereas the visual images produced by trying to remember the same scene are much less vivid or detailed. I am concerned here mainly with the normal, vivid experience. Some form of very short-term memory seems almost essential for consciousness but this memory may be very transient, lasting for only a fraction of a second, Psychophysical evidence for short-term memory suggests that if we do not pay attention to some aspect of the visual scene, our memory of it is very transient and can be overwritten by subsequent visual stimulus [agreed].

Although working memory expands the time frame of consciousness, it is not obvious that it is essential. [The renewed Darwinian theory differs on this point by arguing that the working memory of the dorsolateral cortex is essential for holding selected marked aspects of the current visual scene and combining them with items which have been called up from long-term memory in order to generate multiple optional action scenarios that will be judged by feedback to the drives before voluntary decision-making.] Rather it seems to be a mechanism for bringing an item or a small sequence of items into vivid consciousness, by speech or silent speech. In a similar way, episodic memory, enabled by the hipocampal system, is not essential for consciousness but a person is severely handicapped without it.

[High-level] Consciousness, then, is enriched by visual attention, though attention is not essential for visual consciousness to occur. Attention is either caused by sensory input or by the planning parts of the brain. Visual attention can be directed to a location in the visual field or to one or more moving objects [by the anterior cingulate cortex]. The exact neural mechanisms that achieve this are still being debated. But in order to interpret visual input the brain must arrive at a coalition of neurons [the four drives]

> whose firing represents the best interpretation of the visual scene [the implications for self-survival registered by the drives], often in competition [competition between the drives] with other possible but less likely interpretations.[xv]

To add one final note on consciousness, I would cite John Searle, the well-known philosopher of the science of the mind, in his (quite negative) review of *Seeing Red: A Study in Consciousness.* He leads off his review by saying, "After having been neglected for most of the twentieth century, the subject of consciousness has become fashionable. Amazon lists 3865 books under "consciousness," a number of them new releases of the last year or two. What exactly is the problem of consciousness, and why exactly is it so difficult, if not impossible, for us to agree on a solution to it? … The hard problem of consciousness is to account for how it can exist and function in a way that is private, subjective, and qualitative, in a world that consists of public, objective, physical phenomena."[xvi] In other words, how is it that the brain represents the world, not as a purely objective image from an objective instrument such as a video camera, but rather as a scene that signals what the current environment moment means to the viewer in a private, qualitative, and subjective manner.

I believe that the renewed Darwinian theory directly addresses this key problem. Building on Damasio, the Darwinian theory posits that all the signals from our sense organs are evaluated by our drive modules in terms of personal criteria—their relevance to self-survival and reproduction—and signals found to be relevant are so marked. It is the marking process that converts these signals from objective information (a view through a camera) into qualitative, private, and subjective information (consciousness). Only those signals that are marked for relevance are then sent on to the prefrontal cortex for further conscious processing, decision-making, and action, as well as to other parts of the brain such as the long-term memory of the neocortex. All other signals quickly fade out and are superseded by the changing scene, as suggested above by Crick.

Readers can judge for themselves the quality of all of these explanations, including that of high-level human consciousness.

Does the Theory Promote Consilience, The Unity of Knowledge?,

The renewed Darwinian theory explicitly forges a connection between the social sciences and the natural sciences, especially biology. Starting with the biological building blocks, the theory can cut across disciplinary lines (see Figure 1 in the Introduction) and enable multi-disciplinary analysis. It helps us recognize the relevance of both emotion and cognition in understanding human behavior. In this regard, I would comment on the assertion made by some scholars that rational behavior is only reflected in people's efforts to meet their economic needs and that other behaviors are non-rational or even irrational. With the new Darwinian theory, this issue is moot, since people can accurately be described as employing their rational cognitive powers, not only to address their individual economic needs, but also to address their drives for social bonding, for comprehension, and for defense.

As the scientific community moves toward a unified theory of human behavior, there must be movement beyond the narrow specializations of the human sciences as they are presently constituted. Scientists will need to study each other's fields carefully enough to engage in respectful dialogue, even as they continue to pursue their own specializations. Each of the major disciplines seems to have a characteristic bias that will need to be adjusted in some way if that discipline is to make its potential contribution toward consilience:

- Biologists seem to have a bias toward understating the significant differences between humans and other primates, such as their sexual and family behavior. This bias might well reflect their desire to overcome the public's continuing doubt about the evolution of humans from earlier primates. Biologists have also been slow to use any of Darwin's evolutionary selection mechanisms other than natural selection in their theorizing.
- Sociologists seem to have an aversion to "reductionism," to working their analysis back and forth between the societal and the individual levels. They also have an aversion to recognizing any genetic influence on behavior.
- Psychologists have a strong attraction to controlled laboratory experiments that are not always the most useful method for testing developmental, path-

dependent theories. They also seem to be resisting the study of non-cognitive elements of the brain and, like sociologists, have been slow to recognize genetic influences on behavior.

- Cultural anthropologists tend to be heavily committed to an exclusively culture-driven theory of human behavior that will need to be broadened.
- Economists will, perhaps, need to make the greatest adjustment because they are so wedded to a theory that axiomatically treats human beings as rational maximizers of self-interest. This will need to be changed if economists are to move toward consilience with biology and with the other social sciences. As we will see more of in Chapter 12, a new group of economists—behavioral economists—are already leading the way in this direction.

For well over a century, each branch of the natural and social sciences has focused on a limited part of the puzzle of human behavior, its practitioners talking almost exclusively to each other while treating the other behavioral disciplines more as competitors than as collaborators. This has served to stimulate a great deal of creative effort but at the cost of an unacceptable risk—the risk of the significant unintended negative side effects of seriously applying such incomplete theories. Scientific ideas, like ideological fashions, are no longer local phenomena. They tend to go global very quickly. New social, economic, and psychological theories are being rapidly applied on too large a scale to tolerate significant errors. For the safety of the species, scholars and scientists need to adopt the medical dictum of "least harm" and to subject any new theory of human behavior to painstaking testing before advocating its general use. In this regard, I would add that, if the aspect of renewed Darwinian theory that surprised me the most—the existence of free-riders—is disproved by subsequent research, I will be relieved, since any remedy for this issue almost certainly will involve significant constraints on the freedom of choice of these individuals. On the other hand, if the free-rider hypothesis is supported, humankind will have opened up not only a set of hard choices but also a pathway toward a more promising future.

In the face of the great unknown, all scientists need to cultivate humility, avoid hubris, and strive for the consilience of knowledge. In this regard Darwin is a

wonderful role model and the record of the human sciences during the past decade is encouraging. In this book, I have cited the work of scientists from all the major relevant disciplines who are striving toward consilience in our understanding of human behavior. They represent the best of multidisciplinary work. Or, perhaps, they are the pioneers of an emerging interdisciplinary science of human behavior, with no specialist modifiers. The "least harm" rule applies more to the renewed Darwinian theory than to most, not only because the theory claims to be more general and complete than others, but also because its subject—human behavior—is of ultimate importance to us all. I am very much aware that, in spite of significant supporting evidence, the theory is still incomplete and largely untested. It is inevitably incomplete because, like all theories, it is a set of mental representations, an approximation of reality. The relevant test is not the unattainable goal of perfect accuracy in representing reality but rather the goal of relative accuracy in comparison with other available theories. However, we should have no doubt that reality is out there, waiting to put any theory to the ultimate test. As Winston Churchill is credited with saying, in answer to the familiar philosophic question about whether there is any reality beyond perception: "I can't answer the philosophic question but I do know for sure that, whether you perceive the sun or do not, if you fly too close to it, you will be burned to a crisp." I fervently hope that others who are qualified will undertake broad and rigorous testing of the renewed Darwinian theory, readily accepting the risk it will be burned to a crisp in the process.

So what I most hope is that this work will stimulate many more scholars from all the relevant scientific disciplines to address once again the big question of the universals of human behavior. And I hope that scholars from the humanities will join the effort. The renewed Darwinian theory needs to be tested by scholars of history, religion, literature, philosophy, and contemporary culture. The results of such work would be much more important than whether or not the particular theory proposed in this book is accepted as the currently most useful approximation of the true nature of humans.

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