

# Moral Molecules, Modern Selves, and Our “Inner Tribe”

*Lenny Moss*

## *An Ethos of Ambiguity*

We are almost certainly on the threshold of a new understanding of our nature as social beings, which is being provoked and informed by developments in psychology, biology, and the social sciences. Just how we interpret and assimilate these new findings has become a topic of considerable controversy. Inasmuch as morality, however one defines it, has to do with how we treat each other, the stakes of this controversy are raised by its ostensibly moral and thereby also political implications. Less obvious, especially to the public, is the extent to which academic disciplinary statures and commitments are also hanging in the balance.

Our nature as social beings is ostensibly paradoxical. On the one hand, we are unquestionably social in nature. We are born dependent upon the care of others; we crave companionship and often go to great lengths to avoid loneliness. Short of death or physical torture, enforced solitary confinement is considered the most severe and hateful punishment that can be inflicted upon a human being. On the other hand, perceptions of individuality govern our life choices—we are seldom far from consulting our private interests when it comes to making decisions of any consequence. We find ourselves, as individuals, in an ongoing, pervasive, and often strenuous competition with the multitudes for status, recognition, and every good we seek and desire up to and including walking space on a busy urban sidewalk. We thus experience most of our fellow humans, most of the time, as potential impediments to outmaneuver and outdo in order to achieve our ends. The Enlightenment’s late-eighteenth-century “Sage of Königsburg,” Immanuel Kant, pithily referred to this seemingly contradictory state of affairs as our “unsocial sociability.”

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How we understand our unsocial sociability, even if just implicitly, is of no small consequence. Those for whom social life is nothing but some minimally constrained expression of Hobbes's "war of all against all" are prone to act accordingly. For Kant the very possibility of having rational hope for the future of humanity required a story to tell about the place of our unsocial sociability, and all of the historical sufferings and depredations wrought by it, within a framework of possible human "development." More simply stated, we need a way of understanding "human nature"

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that allows us to make sense of the evils in human history without foreclosing the possibility of seeing ourselves as moving toward improvement in general, and more specifically toward something like global peace and general human wellbeing. Kant helped himself to a providential outlook but in the form of a theoretical teleology. Kant analogized the human species with an organism that, in effect, undergoes "growing pains" on its developmental path toward maturity.

Just as the parts of an organism are always responding to the forces and factors of their immediate environment, and yet all told are contributing to the developmental ends of the organism, individual people live for the most part in their local world pursuing individual ends constitutive of a developmental trend in human history. Kant's idea was that our unsocial sociability, our individualistic will to get ahead of each other, played out at the macro-level as an impetus for the further cultivation of the species, technologically, culturally, etc. The down side of course was that our unsocial sociability also resulted in massive amounts of human cruelty and immiseration. For Kant, these events, while morally uncondonable, were, as learning experiences, unavoidable parts of human self-development. Only by force of painful experience would humanity learn the value of peaceful co-existence. Sadly, the two-plus centuries since have not easily lent themselves to confidence in a steady, progressive, human learning curve.

Two of the key elements of Kant's story—the idea that our social behavior is driven by inherent species proclivities and his providential/teleological assumption that we are invested with these proclivities for a reason—may not, on closer examination, look as foreign as one may initially have imagined. In place of talk about inherent proclivities, we now have talk about genes and chemical messengers. In place of a providential account of why (and to what end) we have the proclivities we do, we now have evolutionary arguments about why (and to what end) we have the genes and chemical messengers that we do. How to best interpret the significance of evolution, genetics, and neurochemistry for our understanding of human sociality, morality, and the implications for human conduct, however, is where present controversies first begin.

### *The Chemistry of Cooperation*

For some, the very notion that a piece of chemistry could affect our moral behavior suggests a serious blow to the presumed sanctity of human moral judgment. The dust jacket of a recent popular book by economist and neuroscientist Paul Zak does little to dispel such anxieties, indeed quite the contrary.<sup>1</sup> If the title, *The Moral Molecule*, was not sensational enough, we are further informed that it is “The New Science of What Makes Us Good or Evil.” Before even delving into the findings of the book, it might be instructive to consider under what circumstances, that is, on the basis of what kind of scientific evidence, would the integrity (or “autonomy”) of morality be undermined? Surely the mere fact that we are flesh and blood creatures; that when we feel, think, and move, chemicals in our brain and body are at play; and that one of these chemicals happens to be a nine-amino acid peptide called oxytocin, should not come as a shock nor necessarily constitute a challenge. But then what would?

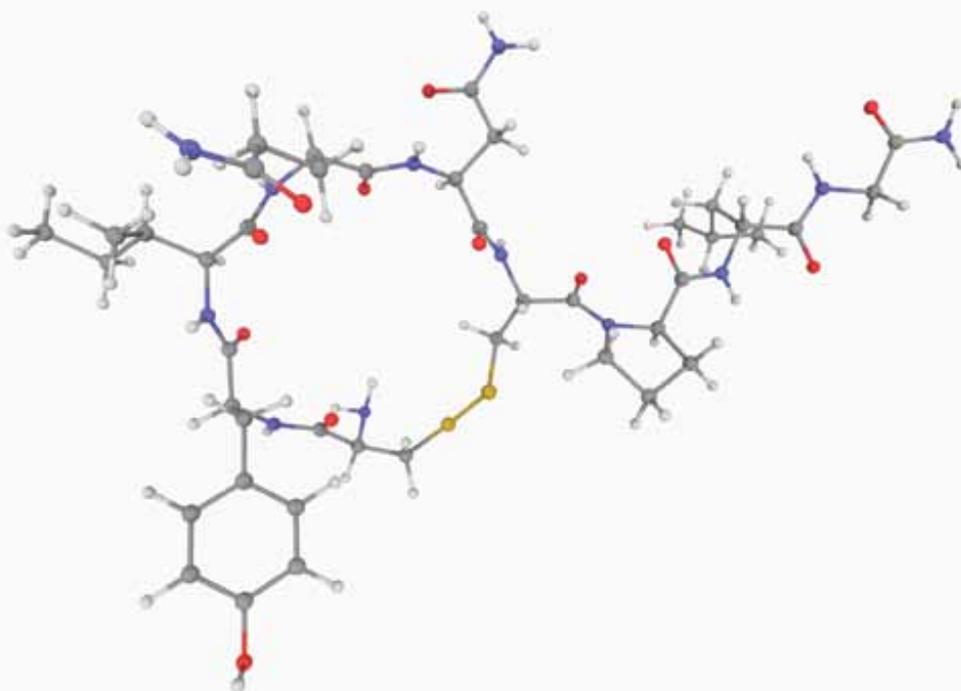
If we are to take the issue of a challenge seriously, then we first need to distinguish between a strong and a weak challenge. The strong challenge would be based upon evidence that what we have assumed to be the “logos” of moral reason is to be accounted for on the basis of the “logos” of neurochemistry. If it could be shown that moral judgment is based upon a predictable (and potentially controllable) causal chain in which the expression of oxytocin realizes and defines moral conviction, then claims to the integrity and autonomy of moral judgment would indeed be defeated. When it came to determining “what counts” as moral, oxytocin, “the moral molecule,” would have the last word; there would not, and could not, be any higher court of appeal. As we will see, there is no indication in *The Moral Molecule* that author Paul Zak ever even imagined that this strong challenge could be true.

The weak challenge is not about what determines the meaning of “moral,” and so does not question our claim to the integrity and autonomy of the very idea of moral judgment, but rather pertains to what determines our propensity to act morally. The meaning of the dust jacket boast that *The Moral Molecule* will reveal “The New Science of What Makes Us Good or Evil” can be read either way, strong or weak, and one has to wonder whether a bit of sensationalizing conflation hasn’t become stock-in-trade of the marketing (and even self-marketing) of an incipient “science of morality” industry. This is not to say, however, that the “weak challenge” is not potentially significant.

Let’s consider two extreme versions of what the weak challenge could amount to from opposite ends of the possibility spectrum. On one side, it is our entire genetic and epigenetic endowment and our entire life history that determines our propensity to act morally in any given situation. No one aspect of any of this, taken out of the whole context, is decisive in itself. All of the chemicals, synapses, and reaction patterns that our life-history has given shape to and that we are in turn shaped by are all reciprocally dependent upon each other for constituting the kind of being, moral and otherwise, that we are. In this view oxytocin may typically be one of the many chemicals of which

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Oxytocin. © Laguna Design/Science Photo Library/Getty Images.



we are composed but is neither necessary nor sufficient for moral behavior. On the other end of the spectrum, oxytocin, as the reputed “moral molecule,” could be both necessary and sufficient for moral behavior, which is to say that there is no moral behavior without oxytocin expression, and no failure to act morally in its presence. If this were the case and if, for example, any exposure to oxytocin resulted in moral behavior, and any lack of it resulted in an absence of moral behavior, then the moral relevance of one’s upbringing and life-history would be subject to question. The evidence provided by Paul Zak suggests that, as is often the case, the truth lies somewhere between these extremes.

The keynote findings for Zak’s claims about oxytocin were derived from an experiment in economic behavior that challenged “rational choice” (that is, self-interest maximization) predictions. Participants were divided into an “A” group and a “B” group. Everyone was given \$10 to begin with. Members of the A group had to decide whether to transfer some of their money to a member of the B group. Any money transferred would triple in amount for the chosen B group member. So if A transferred \$2 to B, then A would have \$8 and B would have \$16. B then had the option of showing gratitude to A by transferring some of this gain back to A. If B transferred \$3 back to A, then they both wound up better than they started. The game was played anonymously so A did not know the identity of B, and vice versa. In transferring money to B, A had to engage in an act of trust that B would transfer money back despite the lack of any self-interest B had in doing so. B had nothing to gain by returning any of the money and had nothing to lose in declining to do so. Zak took blood samples for hormone analysis at different stages of the experiment.

As one of his controls, Zak also compared findings from a parallel experiment but one in which the transfer of money from A to B was determined not by A’s trust that B would reciprocate, but randomly by the blind selection of balls from “the Walmart Bucket” with numbers on them. What Zak found was that the experience of being trusted (to reciprocate) by members of group B, resulted in a spike in their oxytocin levels, which in turn correlated with a propensity to return some of the money to the A member. Zak writes,

when participants received transfers of money based on someone’s decision to trust them, their oxytocin levels were 50 percent higher than the levels of those who received money based on the Walmart bucket and the random luck of the draw. Those who knew their windfall was based on another player’s faith in them also returned almost twice as much—41 percent of their new total—compared to 25 percent—by those whose good fortune was random.<sup>2</sup>

What these findings suggest is that there is a biologically based propensity for responding to the experience of being trusted with generosity and that this dynamic is mediated by the chemical messenger oxytocin. Much of the penumbra (especially the commercial penumbra, including dust jackets) of recent neurochemistry has traded on the inference that the new sciences will undermine assumptions about our humanity in some way, such as by challenging the idea that we are moral agents. The use of the two extreme cases (of the “weak challenge”) discussed above was meant to help facilitate our assessment of this possibility. So what is the verdict? The first implication of Zak’s work is that, if anything, we are constitutionally more humane—so surely not less human—than economists and others have imagined inasmuch as repaying trust with good will and generosity appears to be part of our “biological nature.”

But does the fact that our acts of human decency (or at least some of them) are mediated by a key chemical messenger reduce the locus of moral agency from that of the complex individuals we take ourselves to be, down to some form of unconscious chemical mechanism? If

the latter of the two extreme cases above was supported by the evidence, then the answer would be “yes” because it would suggest that what is distinctive about each of us as individuals, and our life histories, would be irrelevant. Further findings reported by Zak indicate that this is not the case. A spike in oxytocin is not necessarily a sufficient basis for acting morally, nor is the capacity to respond to an oxytocin spike in an empathetic fashion independent of one’s life history. A working oxytocin-empathy system is a contingent outcome of a life-history that supports it. Studies have shown that women who have been subject to protracted abuse can lose the capacity to respond empathetically to an oxytocin spike (indeed in some cases trustworthiness even becomes inversely

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proportional to the amplitude of the oxytocin spike). Children deprived as infants of a loving environment (such as in an under-staffed orphanage) fail to develop a working oxytocin system for some time even after being taken into a caring home.

Experimental findings about the role of oxytocin in eliciting empathetic, ostensibly moral behavior, and the conditions which nourish it, are not at all contrary to our best intuitions about what it means to live a “good life” and may in fact help us better realize what we already knew. A chronic cortisol-releasing stress response, for example, will

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knock out the oxytocin system. Those who are at greatest risk of this are not the classic overachievers but rather those, like the high-responsibility, low-influence, middle managers described in the classic Whitehall study (which inversely correlated the mortality rates of over 18,000 male civil servants over a ten-year period with their grade levels), who live their lives with chronic frustration and bottled-up anger. Testosterone elicits a combative response and so has something like the opposite effect as that of oxytocin. It has been shown that

even as spectators at an athletic competition, both men and women undergo a testosterone surge when their team wins. One may well wonder whether children whose principal daily experience is centered on the pursuit of testosterone spikes from video-game combat may be at risk of failing to developmentally acquire the full capacity for empathic relationships.

What inspired Paul Zak, and others, to associate the influence of oxytocin with “morality” as opposed to something less provocative like “good feelings” is its correlation with actions that are not in one’s own ostensible self-interest. To the extent that such correlations continue to be supported by the evidence, they do present a challenge to those who would hold that moral action can occur only on the basis of adherence to a principle (or a commandment) and only by force of explicit intent, that is, never through mere inclination guided by feeling. That our affective, pre-theoretic, perhaps even pre-linguistic natures include propensities for acting selflessly, does not mean, however, that moral reflection can be declared redundant and tossed out the window. Indeed, learning how to overcome the outdated and simplistic binaries of mind versus body, reason versus emotion, etc., may prove to be the most important lesson of our encounters with new “sciences of the social.”

The evolutionary antecedents to the oxytocin molecule were molecules associated with promoting receptivity to copulation in marine vertebrates. For oxytocin to come to promote selfless, that is, ostensibly moral behavior in ancestral humans to make any evolutionary sense, one has to imagine that a) our human ancestors were members of tightly knit groups, and b) evolutionary success over long periods of time had at least as much to do with competition among groups as it did among individuals within a group. Selfless behavior within a group competing with other groups could well contribute to evolutionary success but only so long as the selflessness was limited to fellow members of one’s group. Reflections such as these led to experiments carried out by

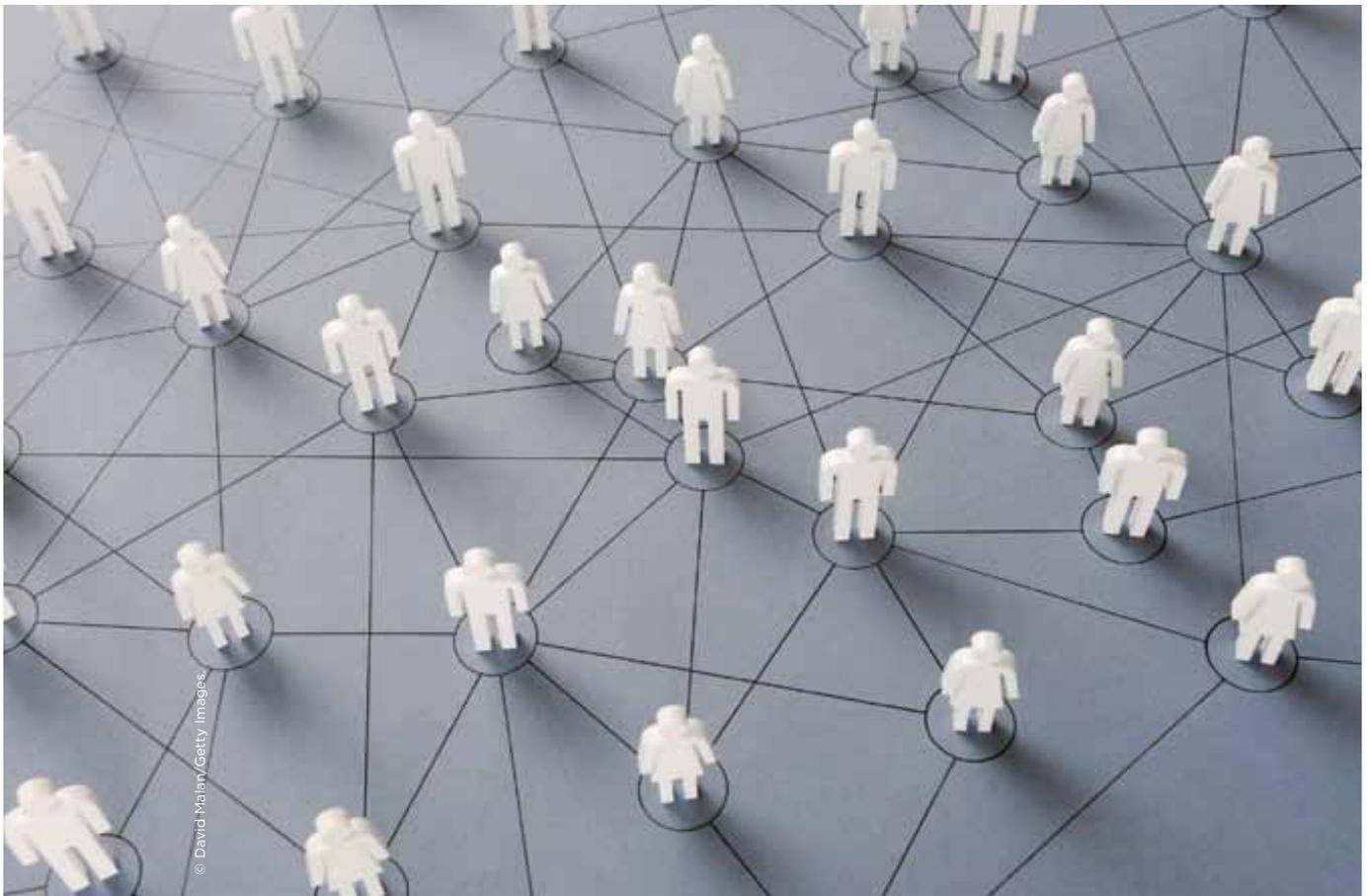
a psychologist at the University of Amsterdam to discover evidence for what has also been referred to as “the dark side of oxytocin” or more technically as “parochial altruism.” Dutch students tested on the standard moral dilemma of having to sacrifice one person in order to save five, when dosed with oxytocin, were “far more likely to sacrifice the Muhammads than the Maartens.”<sup>3</sup> Other experiments likewise associated oxytocin exposure with favoring members of the “in-group.”<sup>4</sup>

At the end of the day, “the lesson” of “the moral molecule” appears to be that we are the hybrid descendants of an ancestry that has bequeathed to us a visceral proclivity for empathic feelings and selfless actions on behalf of those others we tacitly perceive as members of our in-group, a more individuated capacity for privileging our private interests, and the ability to cognitively reach beyond both the in-group and private interest in holding ourselves accountable to the force of moral argument, when such becomes explicit. *Clearly, our ability to judge when oxytocin is and is not inducing moral behavior illustrates that we are not ultimately beholden to oxytocin-induced feeling to distinguish between the two; we have independent criteria for what counts as “moral.”* But this by no means is meant to exclude the possibility that it was, in evolutionary terms, exactly the kind of deeply empathic feeling for a fellow member of one’s group that was the feedstock from which *ideas* of morality could have been abstracted and generalized. It is exactly this idea of the antecedence of moral emotion to cognitive moral judgment that ethologist Frans de Waal has claimed in arguing that chimps, bonobos, and gorillas can be seen to display the pre-theoretic rudiments of morality in some of their social interactions.<sup>5</sup>

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### *Our Difference*

Is it, then, only language that clearly distinguishes human-level sociality from that of our closest primate relatives? In what could well be the most revolutionary work on the subject, coming out of the laboratory and studies of Michael Tomasello, the answer is a resounding “No!” The critical transition for Tomasello is the emergence of a capacity for “shared intentionality,” also known as “we-intentionality.” Crucially this is a capacity that is developmentally established in humans (and no other species) prior to language. Consider the following experiment. Twelve-month-old, pre-linguistic children were set up to observe an adult stapling papers and then leaving the room, after which another adult moved the stapler. The first adult returned and appeared to be flummoxed as to what happened to the stapler. Most of the children tested proceeded to try to help the adult by pointing to the new location of the stapler. In this simple act, the twelve-month-old children, according to Tomasello, revealed a kind of social cognition that no other higher primate has ever achieved. The help-oriented pointing required an implicit understanding on the part of the infant that the adult understands that the infant understands the adult’s objectives and that the adult understands that the infant



is pointing to help. What even the pre-linguistic human can understand, and no other creature, so far as we know, can understand, is that “we” understand so and so, “we” have our attention directed to such and such object, “we” are engaged in pursuing a common goal, and normatively “we” know that we are accountable to each other when it comes to exiting from a shared “we” relationship. The distinctiveness of the capacity for “we-intentionality” reveals itself in practices of “informing,” as above, where only on the basis of a capacity for we-intentionality can pointing play the role that it does.

Another kind of activity transformed by we-intentionality is that of sharing. In a revealing series of experiments, investigators compared the propensity of chimpanzees and young children to collaborate in pulling in a board containing either pre-divided parcels of food or an undivided parcel of food. In the latter case, the chimpanzees or the children would have to divide the food themselves. The chimpanzees but not the children showed a very strong preference for pulling in the boards with the food pre-divided, where the young children did not exhibit any such preferences at all. For the chimps, one can surmise, the undivided pool was a conflict waiting to happen. We-intentionality brings with it implicit norms of sharing, in the absence of which there can only be anticipation of conflict. “It is not that the children always divide the food equally. Sometimes one individual will take more than her share, but then the partner challenges her to square things up, which she almost always does.”<sup>6</sup>

Language involves an implicit agreement to let an arbitrary signifier stand for something. Language involves convention, and convention requires shared-intentionality. Language and culture require a socio-cognitive infrastructure of shared-intentionality and a socio-affective infrastructure of shared feeling and mutual trust. Studies on the

neurochemistry and on the cognitive psychology of human (and primate) cooperation have come to point inexorably toward the primacy, specificity, and significance of the early hominid/human group. It has not been very long since sociobiologists and evolutionary psychologists took the social group as a background given that did not require any explanation and strove to characterize human psychology as the sum total of domain-specific functional “cognitive modules” (such as cheat detectors and high fertility-promising female 0.7 waist-to-hip ratios), naturally selected exclusively to advantage some individuals over other individuals within the group. Even within the world of evolutionary biology, the lock-hold of the paradigm of selfishness as the one-and-only deep truth of evolution by natural selection has been giving way to renewed appreciation for the primacy of “the group” as a level of evolutionary selection...but not without a fight.

### *Public Trust and Research Agendas*

In his 1987 book, *The Last Intellectuals: American Culture in the Age of Academe*, Russell Jacoby argued that Americans were seeing the last generation of thinkers who were oriented toward addressing the good of the general public, as opposed to an orientation shaped and mediated by the vicissitudes of disciplinary success. The public stature and visibility of a number of scientifically trained writers over the last few decades has been elevated by publicity given to challenges to the authority of evolutionary theory by biblical literalists and Christian conservatives. This has resulted in an increasing presence in the literary public sphere of books written by people from the natural sciences addressing the larger questions of human self-understanding and right thinking. It might not even be too much of a stretch to suggest that book jacket endorsements from Richard Dawkins, on one side of the pond, and Steven Pinker, on the other, have become for many a new *Good Housekeeping* seal of approval. On closer examination, however, some of Jacoby’s concerns might well merit revisiting.

### *Hanging in the Balance*

Although Darwin himself was a pluralist about the levels in the hierarchies of nature at which natural selection could take place, that is, individuals, groups, species, etc., the last four decades saw a widespread agreement amongst neo-Darwinists that group selection was not likely to be a strong factor in evolution. Much of this discussion had to do with the challenge of accounting, in Darwinian terms, for the presence of members of so-called “eusocial” insect colonies who do not reproduce but whose efforts are good for the reproduction of the group. A solution was proposed by the English mathematician Richard Hamilton, who, rather than moving up to the level of the group, moved down to the level of individual genes. His idea was that a gene expressed in a nonreproductive member of a group could still be favored by

natural selection if it was also present in closely related reproducing members of the group and that altruism of the former would support the enhanced fecundity of the latter. In this view, the nonreproducing individuals are seen as mere functionaries, directed by their genes, to serve the reproductive interests of their reproducing kin. Hamilton's model was expressed as a mathematical inequality, whereby the gene is favored by natural selection if " $r$ ," which is a measure of the relatedness of the reproductive and nonreproductive individuals, is greater than its cost-to-benefit ratio. This model of evolution has been known as both "kin selection" and "inclusive fitness theory." Hamilton was a young unknown at the time, and his big breakthrough was the at-first-reluctant acceptance of his work by the world's leading expert on the biology of the social insects, Harvard's E. O. Wilson. Wilson not only embraced his work but was inspired by it to attempt to extrapolate some of its lessons to the understanding of human sociobiology as well.

Fast-forward three decades, and Wilson no longer feels that inclusive fitness theory has made good on its promises. Subsequent findings of the correlation between the close genetic relationships of members of a group and the presence of a eusocial structure, for example, did not pan out. A eusocial group is one in which multiple

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generations remain together and a division of labor exists such that the members of the group perform functions for each other. As a functionally interconnected whole, a eusocial group can be thought of as a kind of "super-organism" that competes with other super-organisms and benefits from traits that promote intra-group cooperation and cohesion. Group selection, for Wilson, was back on the table for understanding the evolution of eusociality in insects and also for being far and away the best account of hominid/human evolution. From the point of view of Wilson and others who now countenance the power of group selection in evolution, competition among individuals in a group is still a factor

in evolution; it just depends on how stringent the pressure on the group is to function as a tightly integrated super-organism. As natural selection can variably take place at either the individual or the group level, this alternative to inclusive fitness theory is called "multilevel selection theory." By Wilson's lights, there was an inevitable balance between the influence of the two. Where Darwinism predicts that selfish individuals will reproductively win out over altruistic individuals, it also predicts that groups of nonselfish, cooperative individuals will outcompete groups of selfish, untrustworthy individuals. Once again, what begins to take shape is a hybrid legacy. Perhaps a new vision of the basis of Kant's unsocial sociability is coming into view?

### *From the Hearth*

Wilson’s latest book, *The Social Conquest of Earth*, culminates in an attempt at offering an up-to-date account of the origins and meaning of human nature.<sup>7</sup> He has now taken on-board much of the recent work on phenotypic plasticity,<sup>8</sup> epigenetics,<sup>9</sup> and a postgenomic appreciation for the evolutionary importance and complexity of gene regulation. Eusociality in insects begins with a shared nest that must be defended. Experiments have shown that a capacity for beginning to differentiate tasks within a nest can be “spring-loaded,” that is, already present as a potential response pattern latent in the pre-eusocial phenotype. The most likely early mutation that plays a significant role in the initiation of eusociality is not one that confers some kind of new information but rather a mutation that knocks out the gene that is critical for causing the queen to leave her nest and found a new one.

In the case of early humans, the parallel vision is one that locates a likely transition in eusociality with the initiation of permanent encampments built around a controlled campfire by *Homo erectus* over a million years ago. The common need to share and protect the campsite and to cooperate in the procurement of meat for cooking would have provided a context favoring an advanced level of sociality. Just as with insects, but far more so, the *Homo erectus* genome would have already had a significant capacity for adaptive phenotypic adjustment prior even to any genetic changes. Following the lead of Tomasello, Wilson now sees the attainment of the capacity for shared intentionality as the *sine qua non* of the human line of evolution up to and including being the precondition for the possibility of spoken language. The capacity of group members to share objects of mental attention, hold goals in common, and to hold themselves (and each other) accountable to implicitly shared norms are surely the kind of skills and attributes that could enhance the survival of a hominid/human group.

### *Dissent or Descent?*

While there is a growing consensus amongst evolutionary theorists that both inclusive fitness theory and multilevel selection theory can effectively mathematically model the same range of phenomena,<sup>10</sup> many who have worked with the former have taken exception to Wilson now giving inclusive fitness theory very short shrift.<sup>11</sup> For Dawkins and Pinker, however, one will have to surmise that much more than a failure to be ecumenical is at stake. In a lengthy review of *The Social Conquest of Earth* entitled “The Descent of Edward Wilson,” Dawkins actually goes so far as to discourage his readers from reading the book.<sup>12</sup> Paraphrasing Dorothy Parker, he closes by exhorting his reader that “this is not a book to be tossed lightly aside. It should be thrown with great force.”<sup>13</sup> Earlier he had opined that Wilson’s former collaborator Bert Hölldobler was “yet another world expert who will have no truck with group selection,”<sup>14</sup> apparently without ever asking Hölldobler, whose own response to this was that “almost everyone agrees that selection can also operate on the level of the colony. Indeed a colony can serve as a vehicle of genes, and one can model this by employing inclusive fitness theory

or multilevel selection theory.”<sup>15</sup> Pinker, who refers to group selection as a “scientific dust bunny, a hairy blob in which anything having to do with ‘groups’ clings to anything to do with ‘selection’” is hardly any more civil. But why such vitriol against a fellow scientist?

For many members of the public for whom Dawkins and Pinker have come to serve as arbiters of (nonfiction) literary good taste, the battle lines were understood as that of scientifically informed reason versus anti-scientific myth or prejudice. What may be less obvious to readers is the extent to which their professional careers, *and public standpoints*, have been very closely tied to a very specific *and increasingly insecure* concept of “the gene.” Dawkins’s very name is virtually synonymous with the concept of “the selfish gene” and all that can be derived from that concept. But when Dawkins wrote his career-making manifesto, molecular biologists believed that a large part of the genome was “junk” or “selfish” DNA that served no purpose in the cell other than its own perennial replication. In the wake of the revelations of the human genome project, it has become increasingly clear that the noncoding parts of the genome are critical for regulation as well as being the source of much evolutionary innovation through reshuffling. Molecular biologists no longer speak of junk DNA. Multilevel selection theory now threatens to put the nails in the coffin of the selfish gene concept.

When DNA sequences associated in some way with increased cooperation within a successful group increase in frequency in the next generation, are they still selfish genes? Can the ascription “selfish” even retain any non-trivial meaning if its putative phenotypic contributions are not in any straightforward way “selfish”? Wilson has suggested that the assessment of a gene’s relative selfishness or generosity should come after, *not before*, one knows for what it has been graced by natural selection. For Dawkins (as well as for Pinker), such talk is heresy. They hold as a first and inalienable principle that natural selection means “gene-level selection” and that gene-level selection is “selfish.” Once upon a time, Dawkins looked at evolution heuristically “from the gene’s eye view,” but at some point soon thereafter every other “eye view” somehow became condemned as an act of un-Darwinian apostasy.

Pinker, a psychologist, has built a career on hypostatizing mental traits on the basis of the logic of gene-level selection. The genes-for this and genes-for that account that Pinker proposes bears no relationship to the actual findings of molecular biology, offers few if any empirical examples of “real” genes to draw upon, and shows no awareness of new developments with respect to the findings of comparative genomics, “facilitated variation,”<sup>16</sup> adaptive phenotypic plasticity, “evo-devo,”<sup>17</sup> and so on. Pinker sums up his objection to group level selection (and thus multilevel selection) as follows:

I have argued that the concept of Group Selection has no useful role to play in psychology or social science. It refers to too many things, most of which are not alternatives to the theory of gene-level selection but loose allusions to the importance of groups in human evolution. And when the concept is made more precise, it is torn by a dilemma. If it is meant to explain the cultural traits of successful groups, it adds nothing to conventional history and makes no precise use of the actual mechanism of natural selection. But if it is meant to explain

the psychology of individuals, particularly an inclination for unconditional self-sacrifice to benefit a group of nonrelatives, it is dubious both in theory (since it is hard to see how it could evolve given the built-in advantage of protecting the self and one’s kin) and in practice (since there is no evidence that humans have such a trait).<sup>18</sup>

Pinker dismisses the theory of group selection because it is not doing the kind of work he wants done. But in assuming he knows what kind of work should be done in advance, he is begging all of the relevant questions. The new promise of group selection is not about being able to distinguish between cultures genetically but rather about being able to finally properly understand the basis of human culture as such.

Like it or not, the basis of human culture, we increasingly see, has a great deal to do with the evolution of a socio-affective/socio-cognitive infrastructure that opens up an enormous arc of possibility. Getting our best grasp on the needs, biases, and constraints of this open-ended, context-sensitive domain of bio-socio-cultural epigenesis is best served by an expansive and synthetic co-mingling of many sources of real data and insight, not by a narrowing censorious pre-screening in the name of “The Mechanism” of gene-level selection. With respect to the psychology of individuals, Pinker helps himself to the idea that the mark of group level selection would be something like a spontaneous propensity for individuals to blow themselves up on behalf of the group (and he insists that suicide bombers have been persuaded in the name of their kin, not dictated by a gene for altruism). But this stark characterization of what the fruits of group selection would look like is a canard of its opponents.

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As Wilson has suggested, what group selection predicts and helps to account for is not “altruism” as it has been defined by selfish-gene theorists but “groupishness.” The ongoing findings about the role of oxytocin in the promulgation of community trust and good will, but also of the possibility of ethnocentric bias, should provide an excellent venue for exploring the evolution of human groupishness, but let us consider another. In a 2008 study, Jessica Nolan and others found that, unbeknownst to 810 participants from California, what most influenced their behavior with respect to energy conservation was not (as they believed) all the good reasons for conserving energy, but rather unconscious knowledge of what their neighbors were doing (which they rated as their least important consideration).<sup>19</sup> Studies like these are rife in the social psychology literature, and while they do not have the pizzazz of the discovery of, say, a gene for self-immolation, they are crucial for understanding much of the reality of how we humans go about our daily lives, in most places, most of the time.<sup>20</sup>

## Coda

Multilevel selection may be able to account for the paradox of our “unsocial sociability.” Or, it could be that as we became even more skilled as members of a group with the capacity, built on shared intentionality, to see ourselves from the point of view of the general other, and thereby not only to be normatively accountable *but critically and reflectively accountable*, that a self-ego emerged and with it the epigenetic possibility for radical individuation. In any event, it seems likely that we are at once creatures of the ancestral group and yet individuals whose detachment from enclosure within the group is irreversible. Nor have we yet been able to jump out of our ancestral skins and into the full realization of the universal autonomy that we project in our regulative idealizations of moral and legal justice. The social sciences and normative social theory may be able to glean from the new sciences of human nature the need to countenance the modern human as a hybrid creature...and a work in progress.

## Endnotes

- <sup>1</sup> Paul J. Zak, *The Moral Molecule* (London: Bantam, 2012).
- <sup>2</sup> Zak 15.
- <sup>3</sup> Carsten K. W. De Dreu, et al., “Oxytocin Promotes Human Ethnocentrism,” *Proceedings of the National Academy of Science of the United States of America* 108 (2011): 1,262–66.
- <sup>4</sup> Carsten K. W. De Dreu, et al., “The Neuropeptide Oxytocin Regulates Parochial Altruism in Intergroup Conflict Among Humans,” *Science* 328 (2010): 1,408–11.
- <sup>5</sup> Frans de Waal, *Primate and Philosophers: How Morality Evolved* (Princeton: Princeton University Press, 2009).
- <sup>6</sup> Michael Tomasello, *Why We Cooperate* (Cambridge, MA: MIT Press, 2009) 25.
- <sup>7</sup> Edward O. Wilson, *The Social Conquest of Earth* (New York: Norton, 2012).
- <sup>8</sup> In an authoritative and path-breaking work, Smithsonian scientist Mary Jane West-Eberhard made the case for the ability of organisms, up and down the phylogenetic spectrum, to adaptively adjust their phenotype to environment conditions and for these adjustments to often lead the way in evolutionary change. If an altered phenotype spreads through a population, it can then become progressively stabilized through natural selection of genetic variants best suited for the new phenotype. See Mary Jane West-Eberhard, *Developmental Plasticity and Evolution* (Oxford: Oxford University Press, 2003).
- <sup>9</sup> Epigenetics refers to the stable turning on and off of genes during the course of a lifetime through chemical modification of both DNA and other components of the chromosome. Epigenetic “imprinting” has also been seen to be passed on from one generation to the next. The same genome can be the basis for many different kinds of phenotypes depending upon how it is epigenetically structured, which in turn can be influenced by many environmental factors.
- <sup>10</sup> For an excellent discussion of the controversy and the case for a complementary view of the two theories, see David Sloan Wilson, “The Clash of Paradigms,” *The Huffington Post* (15 July 2012): <[http://www.huffingtonpost.com/david-sloan-wilson/clash-of-paradigms\\_b\\_1672775.html](http://www.huffingtonpost.com/david-sloan-wilson/clash-of-paradigms_b_1672775.html)>.
- <sup>11</sup> A multi-authored defense of the utility of inclusive fitness theory was published in *Nature*. See Patrick Abbott, et al., “Inclusive Fitness Theory and Eusociality,” *Nature* 471 (March 2011): E1–E4.
- <sup>12</sup> Richard Dawkins, “The Descent of Edward Wilson,” *Prospect* (24 May 2012): <<http://www.prospect-magazine.co.uk/magazine/edward-wilson-social-conquest-earth-evolutionary-errors-origin-species/>>.
- <sup>13</sup> Dawkins.

- <sup>14</sup> Dawkins.
- <sup>15</sup> Quoted in David Sloan Wilson, “Richard Dawkins, Edward O. Wilson and the Consensus of the Many,” ETVOL: <<http://www.thisviewoflife.com/index.php/magazine/articles/richard-dawkins-edward-o-wilson-and-the-consensus-of-the-many>>.
- <sup>16</sup> For an outstanding, authoritative, up-to-date, and layman-accessible account of the biology of variation and innovation, written by Harvard molecular biologist and “Inaugural Chair of Systems Biology” Marc Kirschner and Berkeley cell and developmental biologist John Gerhart, see *The Plausibility of Life* (New Haven: Yale University Press, 2005).
- <sup>17</sup> Amongst other things, investigators in the burgeoning field of evolutionary developmental biology, or “evo-devo,” have redefined the meaning of evolution from that of a change in gene frequency over generational time to a change in patterns of development over generational time.
- <sup>18</sup> Steven Pinker, “The False Allure of Group Selection,” An Edge Original Essay (18 June 2012): <<http://edge.org/conversation/the-false-allure-of-group-selection>>.
- <sup>19</sup> Jessica M. Nolan, et al., “Normative Social Influence Is Underdetected,” *Personality and Social Psychology Bulletin* 34 (2008): 913–23.
- <sup>20</sup> For an outstanding recent review of the wealth of work in social psychology that points toward the early evolution of human groupishness, see Selin Kesebir, “The Superorganism Account of Human Sociality: How and When Human Groups are Like Beehives,” *Personality and Social Psychology Review* 16.3 (2012): 233–61.