

## Consciousness was a “Trouble-Maker”: On the General Maladaptiveness of Unsupported Mental Representation

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Consciousness, as a higher-order cognitive capacity allowing for the explicit representation of abstract mental states, might be the incidental byproduct of design features from other adaptive systems, such as those governing expansion of the frontal lobes in primates. Although such abilities may have occurred entirely by chance, the standardized entrenchment of this representational capacity in human cognition may have posed engineering dilemmas for natural selection in that consciousness could not be easily removed without disrupting the adaptive features of other design solutions. If so, then those organisms saddled with the burden of higher-order representation by the occurrence of these chance events were suddenly assaulted with a series of social problems previously unencountered by any other species in evolutionary history. Such consciousness-based problems constituted enormous selective pressure for generating ancestrally adaptive psychological programs (including language) designed to cope with them. Each of these design solutions was, by necessity, generated and progressively pruned over an extraordinarily short span of geological time. In addition, these programs ran into conflict with more ancient primate social adaptations — such as those underlying sexual coercion and violence — that did not evolve to be sensitive to the epistemic positions of others. These mosaic processes have likely resulted in selection for innumerable algorithmic properties driving human-specific behaviors which are both proximally *and* ultimately caused by consciousness. Consciousness by itself should be classified as maladaptive; what is adaptive are those psychological programs in place to support its incidental and problematic arrival in the human brain.

Key words: consciousness, theory of evolution, social cognition

First, a disclaimer, which for the economic reader may do a bit of good: this article is not about the *evolution of consciousness*, per se, inasmuch as it is about the *role of consciousness* in determining particular human adaptations. I myself am still awaiting a convincing, comprehensive account of why consciousness came about; my task here is much simpler than formulating something of that magnitude.

Indeed, despite volumes dedicating good portions of their pages to the contrary (e.g., Fetzer, 2002; Grossenbacher, 2001), there may in fact be no reason whatever for the initial appearance of consciousness in the species — no recurrent “problem” potentiating its earliest arrival in hominids. I shall lay my cards out early and hazard the suggestion, much like Gould’s (1991; Gould and Lewontin, 1979) general prescription on the matter, that consciousness itself may be the cleanest case of a human spandrel around. This is where I must part company with Gould, however. What will be argued in the current article is that once consciousness was perchance established, the human brain was compelled to keep pace with this novel capacity by generating fundamentally new classes of adaptive behavior that bear no homologue (or valid analogue) to the behaviors of other species. That is, consciousness may have been an inevitable byproduct of other necessary design features, such as those governing enlargement and concentration of the frontal lobes (Banyas, 1999), but rather than being neatly *exapted* (i.e., evolutionarily put to use because it coincidentally had functional elements of its own), consciousness was instead a trouble-maker the likes of which phylogeny had never seen before. It made vulnerable the organism possessing it to a sudden and sweeping array of new social problems, exerting tremendous pressure on the human species to engineer new design solutions, some of which were sloppy and jury-rigged out of older primate parts. These adaptations were constructed solely in order to fix these problems, and occurred over a very short span of geological time.

The crux of this argument is two-fold. First, consciousness, as the necessary outgrowth of a core neurological apparatus whose constituent parts were selected for and could no longer operate independently without seriously disrupting the fitness of individual organisms in possession of the organized whole, could not be directly “selected against” once it had appeared. For nature to do so would constitute something close to an engineering marvel, in which a primary adaptation — or primary adaptive system — is salvaged despite removing the spandrel(s) it generates as a function of its own design. In Gouldian terms, it would be like removing the rafters while keeping the roof intact. Second, due to these practical limitations in running consciousness through the standard sieve of natural selection, those organisms saddled with it were suddenly confronted with the intractable burden of instituting specialized psychological programs designed to handle its “unanticipated” problems. These select psychological programs are envisioned to be, therefore, both *ultimately caused* and *proximally driven* by the conscious motivations of humans — those cognitive mechanisms traditionally argued to be orthogonal to selective processes resulting in the modern human mind.

### Consciousness as an Abrupt Mental Representational Capacity Marking Human Psychological Evolution

Since the remainder of this article shall be concerned with the concept quite entirely, let me begin by offering a definition of consciousness amenable to empirical science. I define consciousness *as that naturally occurring cognitive representational capacity permitting explicit and reflective accounts of the — mostly causative — contents of mind, contents harbored by the psychological frame of the self and, as a consequence, also the psychological frames of others.* This view of consciousness is therefore not one of a solely "autothetic" nature (Tulving, 2002), nor does it *remove* the self from consciousness, but rather seeks to integrate the concept into the empirical tradition of cognitive science by holding it as a system enabling higher-order representations of abstract causes of behaviors. For example, if one says that he is "conscious of the light in the corner," what he really means is that he is conscious of the fact that he is aware of the light in the corner. Likewise, if he states that he is "conscious of the threatening stranger eyeing his wallet," what he means to say is that he is conscious of the stranger's intentions to steal his wallet. The distinction between "levels of consciousness" may be a critical one, especially for developmental and neuropsychological models, but not for the current purposes. My position here is that consciousness, as defined above, occurs at least by early childhood and is the default "level" experienced by all normal humans over the age of four years (Astington, 1994; Harris, 1990; Tardif and Wellman, 2000; Wellman, Cross, and Watson, 2001), and it is this which selective forces primarily dealt with over the course of human evolution.

Also, I hesitate to call consciousness a "system" because such wordage entails the structured organization of constituent parts that added additional complexity over evolutionary time (Dawkins, 1986; Pinker and Bloom, 1992; Tooby and Cosmides, 1992). Viewing consciousness as a spandrel may obviate any need to argue for such phylogenetic changes in the capacity, while simultaneously allowing for regularly occurring ontogenetic changes in the capacity that are influenced by the maturation of the human brain and its immersion in species-typical social environments. This is not an entirely new argument, although it is not a contemporaneously popular one as judging from the ongoing pursuits of most comparative psychologists investigating the cognitive abilities of great apes and children, who seem to be committed to showing just how human other species really are (see Povinelli and Bering, 2002). Lorenz's (1977) concept of *fulguratio*, "the creative flash," also characterized this aspect of the human mind as something qualitatively unique, but by no means mysterious:

Words like development and evolution have the etymological connotation of the unfolding of something that was already there in a compressed or confined form, like the flower in the bud, or the chicken in the egg. For ontogenetic processes of this kind such words are perfectly suitable. But they are lamentably inadequate when one attempts to define the nature of an organic creative process through which something entirely new comes into existence, something that was simply not there before. (p. 29)

Although I would strongly disagree with his view of ontogeny as deterministic (see Bjorklund and Pellegrini, 2002), Lorenz sees the evolutionary pathway toward human cognition, as I do, as something greater than the sum of its parts. Notice that this is not saying that consciousness “came from nowhere.” Clearly, consciousness has its own evolutionary history and is ultimately the product of neural reorganization in the primate brain. What it is saying, however, is that consciousness may not have been discernible in any progenitor species, during either the “recent” evolutionary past or during the period when humans last shared a common ancestor with the great apes. “We know with certainty that higher systems have arisen from lower ones, absorbing them and containing them like bricks in a building. We also know, with absolute certainty, the earlier stages in development from which higher beings emerged. But each step forward has consisted of a *fulguratio*, a historically unique event in phylogeny which has always had a chance quality about it” (Lorenz, 1977, p. 35).

In what follows, therefore, I start off by assuming that consciousness, as defined above, is normatively entrenched in human psychology. Second, I ask, and then attempt to answer, “And what of it?” My main contribution in doing so is an attempt to identify some of the adaptive mechanisms that came about *because* consciousness occurred in human organisms and to explain how they may have pirated this mental representational capacity and consequently forged themselves upon the standard neurocognitive apparatus as fitness maximizing algorithms. Also, I address some important misconceptions about the cognitive leap that might have psychologically separated humans from their nearest species.

### The Abandonment of Consciousness in Evolutionary Psychology

Meaningful differences between primate species are not typically explored because consciousness is almost never viewed as an “all or nothing” phyletic phenomenon, and thus any adaptations associated with consciousness are seen to be only modifications of older, “less conscious” ones. The nonhuman primate literature, for instance, is rife with speculation about degrees of mental representational abilities in extant species closely related to humans, such as chimpanzees (e.g., Boesch and Boesch-Achermann, 2000; Fouts, Jensvold, and Fouts, 2002; Parker and Gibson, 1990; Suddendorf and

Whiten, 2001; Whiten, 1999). Although there is some fairly recent experimental support (Hare, Call, Agnetta, and Tomasello, 2000; Hare, Call, and Tomasello, 2001), such claims are based primarily on anecdotal and field research accounts, both of which have the inherent difficulty of teasing apart genuine representational skills involving mental state attribution from complex forms of association learning (Bering and Povinelli, in press; Povinelli, Bering, and Giambrone, 2000). Only in the laboratory can such issues be carefully and systematically assessed, and even here they have often suffered from a number of methodological constraints. Although this is an area brimming with debate, my own view of the experimental literature leaves me generally unconvinced that other species possess anything remotely like the mental representational capacities of humans. In fact, the bulk of the evidence makes a strong case for just the opposite, with chimpanzees not displaying any understanding of even the most basic psychological states, such as seeing or intentions (Povinelli and Bering, 2002).

With respect to at least one point, then, contemporary evolutionary psychology finds itself in something of a conceptual rut. The problem is that the field, as a whole, has failed to address — or for that matter, to even acknowledge — the following question: *Wherein lies consciousness in the unique cognitive history of the human species?* Should no answer be provided this spectral question, I believe that the health of the field is in jeopardy. It is simply inaccurate to speak of such representational skills in terms of a single module, e.g., a "theory of mind module" (Buss, 1999; Leslie, 1991; Premack and Premack, 1995), used to "predict and explain other people's behavior." The capacity is not as encapsulated as this term suggests, but is instead a generalized capacity that pervades many different and separable areas of social information processing in the human brain; in reality, theory of mind is human social cognition. Likewise, it is also insufficient to speak of the capacity's deployment in such generic categories as "imitation," "deception," "culture," "pedagogy," and so on without refining the nature of the algorithmic properties instantiated in each of these categories. These terms are artifacts of anthropology, not psychological science; nature does not select at such categorical levels. They are etic categories that have no real meaning outside of the way they are used to refer to large taxonomic families, each comprised of conceptually related, but multitudinous, forms of specific human behaviors upon which natural selection can actually operate.

Although evolutionary psychology continues to formulate testable, selection-based, hypotheses dealing with human nature at an unprecedented rate, there has been little mention of the role of mental representation in selective processes. Instead, conscious explanations are treated as causal epiphenomena — a general introspective system leading individuals to give faulty (or at least unimportant) post-hoc explanations for their behaviors (e.g., "the devil

made me do it” or “I did it because I loved her” and so on). In psychological parlance, therefore, the term *epiphenomena* applies to the mental states that attend or arise from first-order causes (i.e., unconscious adaptive heuristics) but do not, in and of themselves, serve as first-order causes.

Evolutionary psychology’s dismissive handling of consciousness is surprising and unfortunate, considering that there is good reason to suspect consciousness not only epiphenomenally attends many cognitive-behavioral adaptive programs in humans, but also may have played a pivotal role in building these programs. If this abandonment of consciousness was empirically — or theoretically, for that matter — justified, it would be one thing; in reality it is quite another. In reality, the field has not convincingly established these mental representations as non-causal phenomena that just “came along for the ride” with truly adaptive, unconscious heuristics. Nevertheless, evolutionary psychology seems to be embarked on a campaign characterizing people’s explicit interpretations for the causes of their own behavior as erroneous, “superstitious,” or defensively egoistic (e.g., Daly and Wilson, 1988; see also French, Kamil, and Leger, 2001). The logic is thus: it doesn’t matter what you consciously think while you do what you do (e.g., “I lent Seth my best pair of red-and-green plaid lederhosen because he needed them and that’s what men in our village wear on Sunday afternoons”); what matters is that your mind, human animal that you are, was designed to think in that particular fashion (e.g., “Distributing non-scarce or non-valuable resources to potential allies is an adaptive decision because these allies are now indebted to you and your close genetic kin and should, in the future, act retributively when you and yours need their support”). That is, people’s everyday explanations of behavior are often taken to be valueless, post-hoc behavioral descriptors, loaded with relativistic jargon, subjective biasing, and a rough and messy sloughing off of the mostly inaccessible algorithms motivating behavior.

In addition to a neglect of what are often considered unimportant “epiphenomena” — there are any number of additional reasons (e.g., definitional ambiguity, philosophical proprietariness, and perceived empirical impenetrability, to name a few) why consciousness has been largely absent at both theoretical and empirical levels of analysis in evolutionary models of human behavior. But I suspect that a good deal of the inattention paid to consciousness and, in particular, its position as a possible integrative dynamic involved in the emergence of adaptive mechanisms in humans, is something of a punitive backlash against what the field calls the “Standard Social Science Model” [SSSM] (Thornhill and Palmer, 2000; Tooby and Cosmides, 1992). For the evolutionary psychologist, advocates of this monolithic adversary are presumed to make a number of grievous errors in explaining the human condition, most notably (for the current purposes, at least) in its position that

complex behavior can only be understood within relativistic terms, because such behaviors are embedded in the "cultural context" and are "acquired" during ontogenetic processes of learning and enculturation to which the outside observer has not been privy. Thus, according to this view, there are inestimable outcomes of behavioral form because of the nearly limitless flexibility of the human potential for learning. I need not long recapitulate on what other scholars have already established for why such reasoning is inherently false: human behavior, while expressed differently under regular variations of human socioecological structures, is constrained by an underlying order that was designed to maximize the genetic success of individual organisms. Cultural differences, while they may appear to the untrained eye to reflect huge gaps between "human psychologies," are in actuality only the superficial, phenotypic expressions of the same basic genotypic plan as played out under different ecological conditions.

Although I believe there is good reason to view humans as being endowed with psychological *adaptations* in the truest sense of the word, the term is so loaded and confused that many scholars have begun to speak instead of "adaptive heuristics" (Gigerenzer and Todd, 1999), which may suggest less rigidity and fixedness in behavioral expression. The terminological use of adaptation, however, is a problem only for those who fail to acknowledge evolved traits as being sensitive — sometimes extraordinarily so — to individual developmental histories in combination with normal genetic variability. The phenotypic expression of the adaptation may be markedly different in different individuals, depending on these individuals' particular ontogenies and also their unique, heritable genetic endowments (Bjorklund, 1997; Bjorklund and Pellegrini, 2002; Carey, 2003; Gottlieb, 1991; Scarr, 1994, 1995; Wilson, 1994). This does not mean, of course, that the adaptation itself is different between such individuals; it is simply responding in different ways to the many factors confronting it. That is, since selection has a tendency to greatly reduce any variation in the evolved genotype of the species, heritability for the adaptation itself levels off close to zero (Symons, 1992), but its expression in individual members of the species can vary a good deal because of heritable differences responding in different ways to diffuse environments of development.

#### *On the "Proximal" and "Ultimate" Cause Distinction in Evolutionary Psychology*

In articulating these ideas, evolutionary psychology has done, perhaps, more than any other discipline in ending the mythic battle of "genes" versus "culture" (or "biology" vs. "environment," "organic evolution" vs. "social evolution," "learned" vs. "innate," "nature" vs. "nurture," or whatever binary expression is used to falsely dichotomize the complex epigenetic structure of

evolutionary processes associated with human behavior). But another false dichotomy, this one of evolutionary psychologists' own making, has become trademark in the literature and may presently be doing more harm than good. This is the distinction between "proximal" and "ultimate" motivators of human action, the first being credited with serving a precipitate role in getting the organism to engage in the second, which is envisioned as being the "real" factor behind selective processes (e.g., Brosnan and de Waal, 2002; Leger, Kamil, and French, 2001; Quinsey, 2002; Simpson and Gangestad, 2001). If sex was a painful enterprise, after all, the earth might presently be populated with a few strange and fantastic asexually reproducing species that managed to escape its torture. I have no qualms, in fact, with the usage of the distinction in these terms. That is, in the case of sexual reproduction there is no other clear way of looking at things. It is useful insofar as it highlights the function of the affective–interpretive component of evolutionary mechanisms from the standpoint of the organism enjoying particular adaptations — it *usefully* answers a "smaller" *why* question with a "bigger" *why* question. *Why do animals like to have sex?* Because it feels good (proximate cause). *Why does it feel good?* Because it was designed to motivate individual organisms to engage in reproduction-related adaptive behavior (ultimate cause). [Even sex may not be this simple when it comes into contact with human consciousness, however; see Burley, 1979.]

All this is well and good, but we soon run into trouble with such thinking when dealing with adaptations that are entirely dependent on the presence of consciousness. Although there will always be an ultimate cause for every adaptive decision serving to promote actual selection, adaptive behaviors that are unique to humans will seldom have a single clear, proximate cause. For example, consider the following: in a drunken and effusive monologue, Peter has just confessed to Mary, another, more sober, patron at the barstool, that two years earlier he committed double homicide after he discovered his wife in bed with another man. Peter admits to Mary that he hid the bodies in a remote wood and, although extensively questioned about the disappearances by the authorities, was never charged with any crime because there was a lack of sufficient evidence in the case. Now Peter has stumbled into a new batch of problems, however, in that Mary knows what happened and is showing signs of going to the police. Assessing this threat, Peter deceives Mary into believing that he will accompany her to the police station the next morning and make a signed confession to the crime, but his only — seemingly innocuous — request, is that he would like to get one more "good night's sleep" at home. Somewhat hesitantly, Mary agrees to drive a suddenly very sober (but ostensibly intoxicated) Peter to his house. As they pull into the driveway, Peter dissolves his spurious stupor and sets upon Mary's throat.



In the morning, the former buries the latter in the woods next to his beloved wife and her unfortunate companion.

Although this particular example may sound a bit far-fetched (or at least extremely rare), the underlying phenomenon, which involves removing others who possess information about the self that, if exposed, would probably exact devastating consequences to one's genetic interests (e.g., castigation, exclusion, execution, imprisonment, and so on), is a common and culturally recurrent instigator of violence and homicide between interacting individuals. A more mundane case, although no less unpleasant, would be the thief who kills a convenience store clerk after the latter pulls off his mask to reveal his face. Both are cases of what Bering and Shackelford (in press) have generally labeled *information-retention homicide*, whereby, historically, "individuals who were able to employ these strategies [of removing others] under the threat of social exposure of serious transgressions or otherwise highly undesirable personal traits were more likely to pass on their genes than individuals who were not able to do so." It is therefore envisioned as a sort of extra security design feature specialized in retaining information about the socially maligned (and culturally determined) contents of self-knowledge through homicide. The mechanism should be triggered whenever others have been exposed — either incidentally or as a result of their own intentional devices — to these contents and are perceived to be likely, or willing, to disperse this information in the social community. The reader is encouraged to go to the original source in order to decide whether the case for an adaptive mechanism in this domain has been made, but let us, for the current purposes, assume that such a mechanism indeed exists in evolved human minds and then apply the proximate and ultimate distinction to this adaptive mechanism. Notice how easily we slip into disrepair in doing so.

*Why do people commit homicide under these conditions?* Because they get angry when others have knowledge of a serious social transgression or highly undesirable personal trait. *Why do they get angry that others have this knowledge?* Because others have been exposed to these sensitive facts and this may result in social exclusion. *Why have they been exposed to these sensitive facts?* Because they have acquired them through perceptual access to this strategic information. *Why have they acquired them through perceptual access to this information?* Because the individual has failed to retain these sensitive facts. *Why has? . . .* and so on. Which of these is the proximate cause? It is impossible to tell. Perhaps all of them. And what about the deceptive tactics Peter used to implant a false belief in Mary's head about his intentions? Where does this fit into the whole adaptive behavioral scheme? Indeed, there seems to be a nearly infinite regress of *why* questions, none less important than the next, before we ever get to the answer evolutionary psychologists are prone to look

for, which is that engaging in information-retention homicide occurs because failure to do so had detrimental effects on both direct and inclusive levels of fitness in the environment of evolutionary adaptedness. Shortcutting the investigative pursuit by ignoring these multiple, perhaps simultaneously occurring, forms of causation, however, will only result in an incomplete picture of causal processes in the evolution of the adaptive mechanism or, even worse, will result in an inaccurate portrayal of these processes.

For instance, we might try the following circumvention: *Why are people motivated to commit homicide under these conditions?* Because they get angry and homicidally premeditative when others possess such information. *Why do they get angry and homicidally premeditative when others possess such information?* Because failure to engage in information-retention homicide had detrimental effects on both direct and inclusive levels of fitness in the environment of evolutionary adaptedness. What this explanatory level fails to capture, however, is the fact that explicit beliefs held in the mind of the behaving individual (in this case, beliefs about beliefs) are causally entwined with the affective–interpretive component of the adaptation (i.e., what the individual has representational access to in explaining the causes of his or her own behavior). These explicit beliefs *are responsible for* gearing the organism toward engaging in the adaptive behavior, which is, in this case, to do away with another individual perceived to possess such ruinous *knowledge*, an abstract mental state that can only be represented by a human cognitive system. Peter simply *could not get angry* were it not for his ability to make a number of assumptions, even incorrect ones (e.g., perhaps Mary was all the while eyeing the fellow across the bar and didn't hear a word Peter was saying during his initial confession), about Mary's psychological states.

#### *Why Higher-Order Beliefs Matter: Consciousness and the Complexity of Causation*

Consider the nature of the information that Peter was exposed to prior to his behavior in the foregoing example. His adaptive decision was made not solely in response to anything in the environment that bears, by virtue of its physicality, chemical properties or an actual perceptual referent occurring in real space. Such sources of information may serve a vital function in allowing the individual to make a number of functional *inferences* about, for instance, the intent of the other person (e.g., Mary's uncomfortable shifting in her seat probably has something to do with the fact that she will not "rest easily" with this new information.). However, these cues are only part of a complicated causal loop that feed directly and continuously into the conscious mind until adaptive decisions are made and behaviorally deployed. Their rapid input serves, among other things, to construct inferences about mental states (e.g., Mary's knowledge of Peter's antisocial behavior and her intentions to go to

the police station), to invoke the affective–interpretive component (e.g., Peter’s becoming angry because of these intentions and viewing Mary as a dangerous adversary), and to manufacture new beliefs (e.g., Peter’s belief that Mary’s knowledge of his murderous past will ruin him), until this complex and semi-articulated network comes to yield a tangible behavioral outcome (or the absence of one) that natural selection can actually work upon (i.e., environmental cue  $\rightarrow$  inference  $\leftrightarrow$  belief  $\leftrightarrow$  affect = behavior). But note that if we take away any one of these “proximate causes” the system would collapse because it could no longer support the behavior. For example, in the case of information-retention homicide, it is only once the belief is in place that the behavior can occur; among other things, it is the individual’s belief of the epistemic and intentional status of the other — a belief which occurs under the full glare of his consciousness — that leads Peter to raise his hands to poor Mary, the “knower.” In other words, he is conscious of (i.e., can reflect upon) the belief that “x,” with “x” being the supposition that Mary *knows* what he *knows* about himself and she *intends* to do something about it. This general class of belief is not simply added on as a post-hoc descriptor of his murderous actions, nor does it merely attend these adaptive behaviors as an epiphenomenon, but rather *it is a necessary condition* for the adaptive behavior to occur.

### On the Possibility of Misinterpretation: Teleology, Continuity, and the “Why Should They” Argument

Several critical points demand clarification here, namely distinguishing between (1) being conscious of the adaptive algorithms operating within the human brain, and (2) the necessity of having the capacity for consciousness in generating these adaptations. I would be hard-pressed to convincingly argue that individuals engage in adaptive behavior because they are explicitly aware of the adaptive nature of this behavior. That is, it is unnecessary (and perhaps preposterous) to argue that Peter did away with Mary because he was aware of, and subsequently concerned by, the fact that his genetic fitness was at stake by not engaging in the behavior of information-retention homicide. Organisms did not evolve with a textbook knowledge of natural selection enabling them to engage in deliberate calculations of cost–benefit behavioral analysis leading to “successful” (i.e., fitness maximizing) outcomes. Such thinking is teleological and should be excised from all evolutionary models of human behavior. Rather, these calculations occur implicitly and have driven emergent processes that only seem to reflect these types of underlying “intelligent” analyses. Humans are certainly not special in this regard. This is an altogether different matter, however, from the issue of *how* organisms think — that is, how their brains are organized as information pro-

cessors suited to specific environmental situations and how this functional organization goes about translating such information in order to produce adaptive behavioral responses.

My position in this paper is that certain human psychological adaptations, such as information-retention homicide, were dependent on the standardization of consciousness, as a generalized capacity, for their selection to occur. Inasmuch as this is the case, and the capacity to represent mental states is indeed a relatively novel evolutionary innovation appearing not until recently in hominid evolution, then the assemblage of behaviors driven by these psychological adaptations will find neither precursor nor homologue in the behaviors of closely related extant species. For each of these broad adaptive programs enabled by consciousness, there is nothing "like" it in other primates. We do not, for example, see some "implicit level" of shame-based suicide in chimpanzees, nor some "rudimentary form" of information-retention homicide in gorillas and orangutans. Rather, they are entirely absent in these species because the generalized capacity supporting them as adaptations is entirely absent.

One of the central misconceptions about this (and related) positions comes in the form of the following argument: "Of course chimpanzees don't naturally display these types of behavior — they don't have any reason to." In other words, advocates of this "*why should they?*" argument claim that the absence of specific classes of behavior in a species is a function of the absence of those selective pressures in the socioecological history of the organism that might have hammered out the emergent properties that eventually became expressed as actual adaptive behaviors. As a general theoretical postulate, such thinking is in close agreement with core principles of natural selection; specific adaptations are usually undertaken by emergent properties which become increasingly specified to accommodate environmental contingencies presenting recurrent problems for members of a given species. Thus, an advocate of the "*why should they?*" argument might, for instance, reason that chimpanzees do not engage in protodeclarative referencing (i.e., referential communication, such as pointing, designed to share something of interest in the environment with another individual), because, in contradistinction to humans, chimpanzee sociality was selected for competitive interests rather than cooperative ones. Such reasoning is okay if we are dealing with highly specific adaptive programs, or cognitive-behavioral heuristics that take the form of propositional algorithms activated in select contexts *that are supported by the same underlying system*. Again, this is the level (i.e., the level of individuated behavioral output) at which selection operates. Protodeclarative referencing might have evolved in order to recruit the attentional focus of conspecifics only after humans faced selective pressures to cooperate in order to obtain scarce resources, and therefore the behavior

might be deployed under conditions where, among other things, cooperation is necessary in order to complete a goal-oriented task.

The "why should they?" argument egregiously fails, however, as soon as it is used to provide justification for the experimental absence of the underlying mental representational capacity serving to host these more specific adaptive mechanisms. *It is not correct* to say, for example, that expression of the mental representational capacity itself was driven by an increased selective pressure for protodeclarative referencing. Again, consciousness is a generalized system responsible for creating, and subsequently fostering and engaging, numerous propositional algorithms, none of which should be seen as "the" psychological adaptation serving to initially flesh it out. Rather, protodeclarative referencing (and other such consciousness-dependent psychological adaptations) simply could never have occurred — whether there was selection for it or not — were consciousness not already a standardized product of human cognition. The emergence of protodeclarative referencing as a behavioral strategy designed to allow the individual to intentionally communicate information to naïve others was dependent on the capacity to first represent these others as mental agents capable of harboring information. In other words, consciousness came first.

This is a specific example of a more general point that is sorely missed in the writings of many comparative researchers. There is an "argument" in the comparative literature, for instance, used with increasing frequency in discussions of the mental representational skills (or lack thereof) of nonhuman primates. It comes in something like the following variant: "The absence of evidence is not evidence of absence." That is, just because the bulk of the empirical work has found little to no convincing evidence of higher-order representation in other species, this does not mean that other species (especially closely related ones) lack such skills. Perhaps they simply are not expressed under experimental conditions because such conditions do not adequately simulate the evolved ecological conditions of the species being tested. Or perhaps it may just be that no experimental methodology can ever demonstrate the presence of such a system in other species, because it is not amenable to empirical testing and operates in ways that we are unable to gauge with the crude resource we are accustomed to calling "human intelligence."

The trouble with this view is that support for the null hypothesis, vast as it may ever be, becomes useless; there simply is nothing experimenters can ever hope to accomplish — no matter how well done or ecologically valid their experimental designs — to show that other species do not possess the general capacity. But scholars who voice this opinion must, by virtue of their own reasoning, also believe in the possible existence of all sorts of things (little green men included) for which we have been provided no empirical evidence. Although any good philosopher of science reminds us that a hypothe-

sis can never be proven correct, it is also the case that any good practitioner of science can get us pretty damn close to the truth. The point is that if a generalized capacity, such as consciousness, indeed spawned an entire suite of adaptive mechanisms which is entirely dependent on the capacity's standardized placement in human cognition, then the absence of all those behaviors serviced by these psychological adaptations *really does* reflect the absence of the generalized capacity.

In other words, if a species lacks these behaviors, that probably means it lacked the challenges in its evolutionary history selecting for these behaviors, which in turn means that it lacks the underlying system causing these problems. Close species, such as chimpanzees, may have no "reason" to engage in particular behaviors because of the unique conditions under which they evolved, but there is circularity here in that the behaviors themselves can only appear once the generalized capacity occurs. In other words, the unique problems encountered by our human ancestors were unique *because* they were manufactured by this new capacity, such as (to name just a few) the trouble of having knowledge of others' epistemic status with regard to one's own social transgressions and becoming susceptible to blackmail or social exclusion; being subservient to others who possess specialized and valuable knowledge (e.g., how to go about obscure tasks; how to procure resources in novel environments; how to cure a physical ailment; how to engage in ritualistic activities, and so on); representing others' emotional and physical discomfort and experiencing empathy in response to their being insulted or assaulted; becoming psychologically vulnerable to socially unsavory information about the self (e.g., sexual attraction to adolescent stepchildren; infanticidal ideation; fantasies about sexual coercion or rape, and so on); having to vigilantly attend to what other's believe about one's own intentions and thus frequently engaging in or inhibiting behavior that runs counter to one's true intentions; becoming vulnerable to other people's deceptive tactics in their strategic guarding against public exposure of their true intentions; becoming forced to effectively monitor and control the dispersal of information concerning the self; being compelled to obtain valid information about significant others who may impinge upon one's fitness; and, having to attend to others' perceptual representations of the self's sexual displays (e.g., penile erection in the presence of females proprietarily controlled by dominant males; signs of aging in females signaling waning sexual viability). Likewise, any design solutions to such "problems of consciousness" were therefore done for no other reason than to solve such problems while simultaneously meeting the engineering requirements of the neurocognitive apparatus already in place. A chimpanzee reared in a human household could no sooner engage in the adaptive behaviors comprising such design solutions than a shrew raised

by bats could begin emitting sonar in order to locate insects in the dark. Natural behavior is diagnostic of natural systems.

In their important discussion of natural language as a complex adaptation, Pinker and Bloom (1992) similarly eschew contentions that chimpanzees and other nonhuman primates must — by some formal decree of evolutionary theorizing which states that unending strands of continuity and natural selection are intrinsically braided — display some weak or truncated form of the system:

Of course human language, like other complex adaptations, could not have evolved overnight. But then there is no law of biology that says that scientists are blessed with the good fortune of being able to find evolutionary antecedents to any modern structure in some other living species. The first recognizably distinct mental system that constituted an antecedent to modern human language may have appeared in a species that diverged from the chimp-human common ancestor, such as *Australopithecus afarensis* or any of the subsequent hominid groups that led to our species. We must be prepared for the possible bad news that there just aren't any living creatures with homologues of human language, and let the chimp signing debate come down as it will. (pp. 484-485)

Interestingly, language is one of those complex adaptations that was almost certainly fleshed out by the presence of consciousness, so dependent is it upon an awareness of the speaker's own and others' mental states (Bloom, 1998; Pinker, 1997; Tomasello, 1999). At perhaps one of its highest tiers of complexity, the conceptual-intentional subsystem, language consists of shifting and premeditated intentional nuances, anaphoric statements, tonal and frequency mediated punctuations and restraint, and declarative utterances, all of which convey or retain information for perceived receptive audiences. The evolutionary scaffolding of the natural language system can be viewed in both the developing speech of young children and also in the sheer complexity of its design; this can best be seen as reflecting *very* recent phyletic improvements, adumbrations, and restructurings of a system born of simple necessity. Once consciousness occurred, the old limbically driven, imperative primate vocal system would no longer do. It had to be fundamentally reentered and tailored to the new requirements of mental state representation. Thus the reorganization of neural circuitry leading to articulation and grammatical structuring should be seen, as Pinker and Bloom (1992) note, as recent in origin, as it seems largely based on humans taking the "intentional stance" in regards to (in general) causal reasoning and (in particular) other agents. Again, the impact of consciousness on the evolution of human cognition should not be underestimated; it was an intrusive, sweeping tide whose ebb and flow reworked the foundations of more ancient primate adaptations and also brought new material ashore in order to construct entirely novel — entirely human — adaptations.

*"Coping" with Old Primate Adaptations: A Mind Troubled By Its Past*

Although many scholars have in fact been swayed by Pinker's doggedly convincing arguments for language as an adaptation, there exist far more contentious claims of human psychological adaptations that, from the very first, left many critics with a bitter taste in their mouths (for discussions, see Conway and Schaller, 2002; Siegert and Ward, 2002). As is so often the case with controversial claims of human nature, especially those which may have a real impact on social reform once they inevitably spill out into the popular media and are dangerously misinterpreted, arguments showing that rape (e.g., Shackelford, 2002; Thornhill and Palmer, 2000), child abuse (Bjorklund, Yunger, and Pellegrini, 2002; Daly, 1989), and homicide (Daly and Wilson, 1988) are adaptations that were met with a predictably vituperative scholarly audience. Mainstream social psychology, unaccustomed to viewing the human organism as a *human organism*, has been especially rejecting of such claims, largely because it misunderstands them to mean that these adaptations were "instincts" devoid of the effects of social learning. In reality, evolutionary psychologists advocating such claims have repeatedly stressed the importance of social learning (and the environment more generally) in the expression of such behaviors, and even in the underlying mechanisms promoting them (see Belsky, Steinberg, and Draper, 1991; Buunk, Angleitner, Oubaid, and Buss, 1996; Daly and Wilson, 2001; Ellis, McFayden-Ketchum, Dodge, Pettit, and Bates, 1999).

In the face of growing bodies of evidence and theoretical improvements, many critics have begun to acknowledge the value of evolutionary thinking in psychology while remaining greatly troubled by the core issues. The more constructive adversaries of the field hope to wipe away the adaptationist framework of modern day evolutionary psychology which, in the critic's opinion, is Panglossian and full of "just-so" stories, in favor of a more deliberate, systematic investigation of evolved psychological mechanisms (de Waal, 2002; Panksepp and Panksepp, 2000). de Waal (2002, p. 187) aptly calls this effort separating "the wheat and the chaff." I agree that such a reform is generally in order, but evolutionary psychology is no more susceptible to bad research and theory than any other empirically based, theory driven scientific discipline. Many of the charges against the current standing in the field are exaggerated, and some (such as those addressed in the current article) are simply false accusations that demonstrate an impoverished understanding of central concepts. Evolutionary psychologists must begin taking into consideration not only a blasé, faceless "environment of evolutionary adaptedness" filled with our "hunter-gatherer ancestors," but also the rich epigenetic tapestry of speciation, ontogeny and genetic heritability composing the modern mind.



Such an approach could go a long way, for example, in addressing the misconception that relatively rare human behaviors, such as child abuse, homicide, and rape, cannot possibly be adaptations because they occur so infrequently, and likely did so in the distant past as well. How could these behaviors be human adaptations when — in virtually all human societies — they are the exceptions and their absence is the norm? Take, for instance, de Waal's (2002, p. 189) recent remarks on this topic:

A major problem with the strategy of singling out rape for evolutionary explanation is that the behavior is shown by only a small minority. The same criticism applies to Daly and Wilson's (1988) well-known work on infanticide by stepparents. If child abuse by stepfathers is evolutionarily explained, why do so many *more* stepfathers lovingly care for their children than abuse them? And if rape is such an advantageous reproductive strategy, why are there so many *more* men who do not rape than who do?

Ironically, it is where de Waal has made his impact in the behavioral sciences — the field of primatology — where many of the answers to his questions can be found. There is in fact good reason to believe that a whole nation of friendly stepfathers could do little to overturn Daly and Wilson's (1988) landmark biological analysis of human violence, or that a world brimming with chivalric male suitors could not make a dent in Thornhill and Palmer's (2000) explanation of rape as an adaptation. The trouble is that adaptive processes underlying human sociality do not begin at some vague point of "hominization," but have a much richer, complicated, and *longer* history than evolutionary psychologists tend to acknowledge. After all, we are primates first, humans second, and primate evolution has been characterized by intense selective pressure for precisely those types of behavioral strategies that de Waal (1982) correctly points out are rarities in the decision-making of modern humans (Goodall, 1986; Kummer, 1971). Sexual coercion, infanticide, selfish motives, and physical violence are the name of the game in the social lives of most species of nonhuman primates. This suggests that the psychological programs instantiating these behaviors, while undergoing adjustments and reallocations to accommodate different species' recurrent socioecological environments and distinct problems, have been so biologically useful to individual organisms that they have been all but cemented into the primate brain. This does not imply, of course, that more socially palatable behaviors, such as reconciliation (de Waal, 1996), are not ancient themselves, but because such behaviors are not observed across the primate order, they are likely not as ancient as primate adaptations subserving sex and violence. Given their payoffs throughout the course of primate evolution, such old adaptive social programs are far too deeply engrained in the neurocognition of modern day primates to be at any significant risk of disappearing from any given species, much less one as new on the scene as *Homo sapiens*.

Having said this, however, it is perfectly plausible, and in fact predictable, that the relative rate of their actual behavioral occurrence would drop off substantially once encroached upon by a representational system capable of tracking the self's intentions and also the intentions of others. In other primate species, behaviors such as forced copulation and infanticide may lead to retaliatory attacks, sometimes lethal, by offended higher-status parties who have direct perceptual access to such incidents (de Waal, 1982; Goodall, 1986; Kummer, 1971). However, (a) the inability of potential "victims" to perceive the hidden, aggressive intentions of potential "perpetrators," (b) the inability of perpetrators to track others' knowledge of their behaviors, and (c) the inability of observers to intentionally communicate the occurrence of these transgressions to naïve others who did not witness the event, fosters a high level of frequency of such behaviors in nonhuman primates. Indeed, by all accounts, such behaviors almost certainly *will* occur whenever the conditions are "right" — that is, when dominant animals, or those with connections to dominant animals who may recruit others to the event through various alarm displays, are absent, making retaliation unlikely to occur.

This changes dramatically, however, with a species such as *Homo sapiens*, for whom social information is capable of being transmitted rapidly between parties far removed from the actual behavioral incident (Dunbar, 1993), and individuals (any one of whom is a potential perpetrator) are knowledgeable to this extent. In such cases, retaliation for social transgressions is likely to ensue as a direct consequence to others gaining knowledge of the proscribed behavior. What is defined as a transgression is going to be determined by the various socioecologies of different groups, but in general such judgments will be made for those behaviors that pose a clear and present danger to the fitness interests of individual members of a community such that group functioning is adversely affected and may not adequately sustain the needs of individuals within the group as long as the behavior is allowed to occur. It is difficult to imagine any human socioecology where rape, homicide, and child abuse would not meet this criterion. But the real confound is the fact that, for humans, the possibility of retaliation is no longer just a matter of who was physically present at the time of the transgression, but also who *else* knows what *x* did to *z*; what these others believe *x*'s intentions were in doing so; whether others know about or what they believe about *x* engaging in similar behavior in the past; whether others believe *z* "deserved" such treatment; whether others believe *z* experienced physical or psychological pain from *x*'s behavior; whether others believe *x*'s behavior is diagnostic of a stable personality characteristic and is thus likely to occur again; whether *x* knows something of relevance about those who know about the behavior and can use this information strategically; whether others believe *x*'s behavior was caused by his own intrinsic traits or was governed by the circumstances surrounding

the event; whether others believe  $x$ 's claims about the causes of his own behavior; whether others believe  $x$ 's displays of remorse over or regret about his behavior are sincere; whether others believe  $x$  possesses specialized knowledge that makes him valuable; and, whether  $z$  might have possessed such knowledge.

In addition, due to the strategic value of acquiring negative information about social others, individuals who have engaged in such proscribed actions must seriously contend with the communal appetite for any such information and develop effective strategies in their own right which are designed to monitor and influence others' epistemic status (e.g., persuasion, threat, information-retention homicide, etc.). It is new psychology meeting old psychology, or rather consciousness introducing fundamentally new evolutionary problems for the human species to grapple with.

Individual members of nonhuman primate species may have "witnesses" to their social transgressions in the technical sense of the term, but such witnesses might as well be deaf and blind, given their naïveté as to the epistemic positions of others with regard to the transgression. Again, if there is a dominant individual physically present, or an individual with dominant allies that might be recruited to the scene, then certain behaviors are less likely to occur. If there is only an audience of clear subordinates, however, then nonhuman primates are impelled to engage in these behaviors because of their clear fitness advantages. It is commensurate to a human thief refraining from his thieving because there is a Doberman Pinscher in the room, but paying no mind to the cat on the sofa.

For humans, however, the conspecific witness presents a dangerous threat to genetic fitness in the witness's ability to rapidly disperse information to significant social others. Therefore the advantages of simply *not engaging in* such behaviors seems to go without saying; if one possesses the inhibitory skills (Bjorklund and Kipp, 2002), the deceptive aptitude (Allen and Gilbert, 2000; Simpson and Kenrick, 1997), the empathic abilities (Kagan, 2000), and the self-deceptive defense mechanisms (Moomal and Henzi, 2001; Nesse and Lloyd, 2002; Trivers, 2000) designed to deal with such nefarious intentions, then such an individual should be able to quell the actual behavioral expression of these intentions and avoid retaliatory actions. Of course, the adaptations comprising these underlying intentions are as solidly in place as ever, and seem at little risk of soon becoming denuded by the moral outcries of a species that would prefer they go away. The sins of the "fathers" are also the sins of the "sons"; they only *appear* to have fled under a wide banner of "sin." To see this, one need only look at the multibillion-dollar-a-year industry of modern psychotherapy, or at findings from the social psychological and forensic literatures showing that criminal activity and social transgressions increase dramatically under the cloak of perceived anonymity (Durant,

Carey, and Schroder, 2002; Ellison–Potter, Bell, and Deffenbacher, 2001; Jackson, 1984). It is the new consciousness-based adaptations, highly sensitive to reputation and social information monitoring and control, coming into conflict with old primate social adaptations. For the most part, these new adaptations are coming out on top, just as de Waal points out — but not, apparently, without a fight.

### Concluding Remarks

Consciousness was a harsh master that rose to the throne by some incidental stroke of fortune or flaw, bringing about more problems than it did solutions. Given this, it seems unlikely that an assemblage of prepackaged domain-specific adaptive algorithms would have come readily bootstrapped with the capacity. Rather, human psychology was put to hard labor in order to generate such algorithms over a very short span of geological time.

The topic of consciousness as a selective force has been all but exiled from current versions of evolutionary psychology. Often conflated, wrongly, with evolutionary foresight, consciousness is considered an obscurant, an illusion, or an epiphenomenon, but in all cases a psychological product completely orthogonal to selective forces. I have attempted to argue quite the opposite in the current article — that consciousness has been so central in selective processes since the advent of human evolution that nearly every social adaptation separating humans from the African apes occurred altogether *because* of it.

Nonetheless, consciousness was not, *prima facie*, “adaptive.” On the contrary, consciousness was maladaptive for those organisms that did not — or were not able to — engage in or inhibit the behaviors demanded of it. What was adaptive for our early human ancestors were instead the domain-specific psychological programs designed to solve those problems introduced by this new mental representational capacity, programs ultimately instantiating behaviors promoting genetic fitness in individual organisms.

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