

The Baltic International Yearbook of  
Cognition, Logic and Communication

October 2012  
pages 1-33

Volume 7: *Morality and the Cognitive Sciences*  
DOI: 10.4148/biyclc.v7i0.1780

DON ROSS  
University of Cape Town  
Georgia State University

## THE EVOLUTION OF INDIVIDUALISTIC NORMS

**ABSTRACT:** It is generally recognized that descriptive and normative individualism are logically independent theses. This paper defends the stronger view that recognition of the falsehood of descriptive individualism is crucial to understanding the evolutionary and developmental basis of normative individualism. The argument given for this is not analytic; rather, it is based on empirical generalizations about the evolution of markets with specialized labor, about the nature of information processing in large markets, and about the socialization of human children.<sup>1</sup>

### 1. DESCRIPTIVE AND NORMATIVE INDIVIDUALISM

The venerable doctrine of “individualism” comes in two tropes: descriptive and normative. Often they have been subsumed—and not infrequently confused—under the label of “methodological” individualism. This paper is about the relationships among these ideas in light of the genetic and cultural evolutionary history of humans. It argues that we best appreciate the persuasiveness of normative individualism to most modern people by understanding why their evolutionary history has made working, everyday descriptive individualism hard to achieve and maintain.

A normative individualist is someone who maintains that the justification of all values ultimately lies in the normative judgments of

individual people, and in assessments about the effects of change on the welfare of individuals. This view has polemical bite against one version or another of normative collectivism, according to which groups—clans, nations, ethnic communities, classes—may have and promote valuable objectives that transcend the preferences of their individual members. In nonsecular traditions it has sometimes been maintained that religious communities are obligated by value considerations that might, at least in dark periods, animate *none* of their members. But this is an extreme case. Politically and philosophically relevant versions of normative individualism allow that there must be some relationship between individual and collective valuations. But normative collectivists typically suppose that groups can have goals that are conceived only vaguely by most of their members. At least as importantly, collectivists typically endorse some second-order normative beliefs to the effect that members of groups *should* at least sometimes avoid pursuing their individual objectives when these conflict with the good of their teams.

Someone is persuaded by descriptive individualism to the extent that she thinks that, as a matter of fact, people are generally motivated by considerations that refer to their private welfare, or to the welfare of a restricted set of specific individuals that they value *as* individuals. Descriptive collectivists, by contrast, emphasize the capacity they attribute to at least as many people of putting aside personal interests when these conflict with what they consider best for collectives that mainly include other members with whom they are specifically unacquainted.

Framed in these terms, the conflict between the descriptive individualist and the descriptive collectivist is likely to seem to rest on a simple false dichotomy. It is widely supposed that most people are relatively self-interested across a wide range of common decision settings and problems but also recognize various duties to collectives with which they are affiliated, and often subordinate their private goals to satisfaction of these duties. Descriptive individualism and collectivism come into genuine conflict only insofar as someone seeks to prioritize one class of motives over the other in the context of promoting a general view about the best way to explain and predict broad tendencies in human action. This is why most scholarly discussions of descriptive individualism focus on it as a *methodological* thesis.

The social science tradition that has been most closely associated with methodological individualism is economics. Some important economists—though not as large a proportion of them as popular imagination, and stereotypes prevalent in other disciplines, routinely suppose—have favorably contrasted their profession with neighboring social sciences such as sociology by insisting that economists keep a clearer and more rigorous eye on the principle that actions of collectives must ultimately decompose into, and thus be explained by reference to, actions of their individual members. This basis for descriptive individualism has often been expressed as an application to human action of a more general principle of atomism, the idea that the causal capacities of composite structures should be explained by reference to interactions among the causal capacities of their parts. This is frequently given what philosophers call an ontological interpretation, according to which composites have only derivative reality as constructs out of what more basically or “really” exists, namely, the articulated constituents. Margaret Thatcher famously said that there is no such thing as society, but only individuals. The motivation for this assertion was likely her normative conviction that the *welfare* of society is nothing over and above the *welfare* of individuals added together; but like a great many normative individualists over the years, she reached straight for an ontological trope in order to seem to justify it.

More sophisticated thinkers than Thatcher have joined her in blurring the line between normative and descriptive individualism. I will concentrate on the basis of this synthesis in economics. According to many economists, the ultimate subject of their discipline is the comparative efficiency of alternative allocations of scarce resources. Unlike in thermodynamics, efficiency in economics refers necessarily to the relationship between energy expenditure and *value*; and this in turn tends naturally to prompt the question, at least in reflective moments: value to *whom*? The majority of economists have been at least vaguely utilitarian in their convictions, and this is reflected in the existence of the subdiscipline of welfare economics that studies conditions under which a society as a whole can achieve the highest value of output from different combinations of inputs. No welfare economist would regard a society as producing efficiently if individuals didn’t want to consume the products it churned out; the legendary Soviet factory that made

hundreds of thousands of unmated boots for right feet is never taken to be a model of happy industrial organization. What seems essential to saying that one economic process is more efficient than another is that it does a better job of satisfying consumers’ wants. And consumers are typically supposed to be individuals in the end, even if in practice the consumption behavior that is actually measured is more often that of households.

Noting that a commodity is consumed by somebody, or by lots of somebodies, hardly puts an end to our inquiries about its value, or about the relative value of having devoted resources to producing it. Welfare economists pressed to further justify their emphasis on satisfaction of consumer demand often invoke a doctrine known as *consumer sovereignty*. It is at this point that we find the fusion of normative and descriptive individualism: according to the consumer sovereignist, the individual person is the most *accurate* possible evaluator of what is valuable to *her*; and the ultimate source of *all* value is value to individuals.

Referring to this as a fusion will be seen to be an overstatement. The first, descriptive, clause is a logically independent proposition from the second, normative, one. Lukes (1968) is one among many philosophers who have pointed out that this applies to all conjunctions of normative and descriptive individualism that have thus far been articulated. However, this somewhat technical philosophers’ point should not stop us from recognizing that descriptive individualism would likely not have attracted the interest or support that it has were it not for the fact that most normative individualists have appealed to it in formulating their arguments.

A main linking idea that has been emphasized by more thoughtful individualists, such as von Mises (1949), is the *uniqueness* of individuals. On the normative side, it is clear enough how uniqueness relates to value; one might simply ask oneself whether most people who lost spouses would feel that their loss could be made whole by a replacement with similar preferences and looks. The relationship between descriptive individualism and uniqueness requires more development. As Miller (1978) discusses, thinkers who put descriptive individualism to work in support of normative individualism have tended to emphasize a specific constellation of properties that individuals, but not groups,

are taken to enjoy. Specifically, von Mises and his followers present individual *minds* as the essential sites of rational, self-conscious, explicit, effortful deliberation among possible actions and projects. They acknowledge, of course, that groups also work at explicit rational deliberation, but insist that this is parasitic on the occurrence of that kind of mental processing in individuals. In folk psychology, choices arrived at by such processing are generally regarded as the clearest basis for full normative responsibility—"I wasn't thinking" is regarded as a kind of excuse, even if not a fully adequate one. It seems evident that part of the basis for this cultural norm is an assumption that explicit individual ratiocination is under closer personal control than other varieties of action selection. Among its typically ascribed functions, by philosophers going at least as far back as Plato, is management of morally obtuse subconscious or "automatic" will. This most morally serious kind of thought is then connected to uniqueness by way of the assumption that it is essentially private and only imperfectly communicable. Thus another leading apologist for methodological individualism, Hayek (1949), argues that individuals should be sovereign with respect to their welfare because only they have full information about the subtle priorities and detailed relationships of mutual justification among their preferences.

Even if we grant that rational deliberation contributes to the moral and other normative weight of a choice, we may still diagnose an element of circularity in the synthesis of descriptive and normative individualism just sketched. Everyone acknowledges that although individual deliberation is a typical input to group deliberation, influence also strongly prevails in the opposite direction. There is arguably no consensus among scientific psychologists as to which direction of influence is in general more powerful, but several disciplines include rich literatures that promote the predominant influence of public reason (along, of course, with public *unreason*). Still, I would maintain that we might take the political philosopher Philip Pettit as representative of the dominant view on this question. Few writers have accorded greater moral importance than has Pettit (1997) to public deliberation. Nevertheless, in his 1993 explicit book-length treatment of the relationship between individual and collective intentionality, he argues for the traditional ontological *and* moral priority of the individual level.

There is an element of irony in the prevailing association of methodological individualism with the discipline of economics. Though both von Mises and Hayek were economists, they are associated with one specific, minority tradition in the field, the so-called Austrian school. The dominant tradition in microeconomic theory, with its most important historical highlights in the works of Walras (1874), Pareto (1927), and Samuelson (1947/1983), has been carefully agnostic on the question of whether rational, self-conscious deliberative processes have *any* causal relevance to economic behavior or are, often or even always, mere epiphenomena or post facto rationalizations. This fact is obscured by economists' overwhelming rhetorical emphasis on "choice," and often "rational choice," as the central subject matter of their discipline. However, as I argue elsewhere Ross (2011), "choice" in mainstream microeconomics does not mean what it does for the folk, psychologists, and most philosophers, namely, a process of comparison of alternatives that unfolds, consciously or unconsciously, over time in a mind or brain. In mainstream economics, a behavioral pattern is regarded as *chosen* just in case it is influenced, through any kind of channel, by incentives. It is important to emphasize the use of the word "pattern" here. Most economic choices are identified only statistically, as tendencies observed over runs of instances, usually in pooled sets of agent responses across a population, when incentivizing environmental influences change exogenously. An alternative description would be that choices for mainstream economists are equivalence classes of behaviors selected by common cost-benefit ratios. This may or may not involve any explicit representation in any consumer's computational or neural processes of the alternatives over which valuations are assigned by the economic modeler.<sup>2</sup> Thus, for example, household consumption patterns may be consistent with downward-sloping demand curves not because any consumers explicitly weigh opportunity costs in marginal terms, but simply because households with smaller budgets tend to buy less of everything in their consumption baskets.

Recently, implicit individualist themes in economics have been revived from an unexpected source: heterodox economists who reject mainstream theory and method and refer to themselves as "behavioral economists." According to promoters of this research program, such as Thaler (1992); Camerer et al. (2005); Ariely (2008) and Akerlof

& Schiller (2009), explanations and predictions in economics should advert directly to the beliefs and desires of actual individuals, which generally do not correspond to the hypothetical knowledge or preferences of the “representative agents” in which orthodox economics traffics. Because behavioral economists use game theory to model the interactions of individuals, outcomes often differ from states sought by any of the individuals in question; but individual-scale properties, as captured in the utility functions attributed to people on the basis of experiments or observation, are the foundation stones for modeling, predicting, and explaining social-scale effects.

Nonindividualism also finds its methodological proponents in contemporary experimental economics. A leading example of empirically driven anti-individualist research in contemporary microeconomics is the “ecological rationality” program championed by Vernon Smith (2008), which emphasizes influences on choice (in the economist’s sense described above) that are stored in the social and institutional environment, and that may have no representational analogues in the idiosyncratic representational spaces of typical individuals. This research program comports naturally with the “distributed social cognition” and “extended mind” perspectives that have recently been defended by some methodologists and philosophers of cognitive science (Hutchins 1995; Clark 1997; Ross et al. 2007).

A view that perches explicitly between methodological individualism and anti-individualism is defended by Hollis (1998) and Bacharach (2006). They join behavioral economists in appealing to individual representational states in explaining choice. However, they argue on theoretical and empirical grounds that people are strongly disposed to frame many of the alternatives they face in terms of the welfare of collective entities with which they identify. Such “team reasoning,” beginning from questions about “What is best for us?” rather than “What is best for me?,” reframes people’s strategic situations and typically changes the equilibria of the formal games by which analysts model the situations in question. A favorite example is of players in a team sport, such as soccer; on a cohesive and effective team, players choose actions directly by reference to maximization of the prospects of collective victory. A game-theoretic representation that ignored this, perhaps by including players’ interests in personally scoring goals in

their decision sets, would be empirically incorrect as a model of such a team.<sup>3</sup> The rhetoric of team-reasoning theorists reflects the legacy of methodological individualism insofar as they generally refer to team representations as “reframings” of representations couched in terms of individual utility functions, implying that the latter are ontologically or psychologically basic. However, this rhetoric is, from the formal point of view, strictly incidental; so far as any of the proffered evidence is concerned, we might just as naturally regard individual utility functions as reframings of more basic team utility functions. I will argue that, in light of evolutionary considerations, this inversion is the more natural perspective.

## 2. COOPERATION, COORDINATION, IMITATION, AND HUMAN EVOLUTION

Basic elements of Darwinian theory are often thought to be crucial to philosophical debates over individualism. Just as often, however, philosophers working in these precincts tend to derive overly sweeping conclusions from consideration of underspecified models.

Natural selection favors genes that have higher inclusive fitness than competitors Hamilton (1964). Individualists often try to score debating points by correctly insisting that it can favor no others. As West et al. (2010) emphasize, there is no group selection in the sense of an evolutionary pressure that is *opposed to* the statistical maximization of inclusive fitness by individuals. However, genes in all multicellular organisms maximize the inclusive fitness of their bearers by entangling their fortunes with those of other genes. Nothing restricts such gene associations to the boundaries of individual organisms, and there is no limit in principle to the complexity of networks of effects through which genes indirectly promote the inclusive fitness of organisms. In *this* sense, “group selection” should not be controversial, but it also does not have the exciting philosophical consequences often attributed to it.

Where social science is concerned, basic Darwinian theory supplies a constraint on modeling: No model should be accepted that requires genes to systematically *dispromote* the inclusive fitness of their bearers. West et al. show that this constraint gains a surprising amount

of traction against some currently popular but underformalized models of specific, speculative, dynamic effects in the evolution of human sociality, such as models that invoke “strong reciprocity” (Gintis 2000; Gintis et al. 2003) and models that appeal to “greenbeard” genes Frank (1987); Bergstrom (2002); Bowles & Gintis (2004). However, basic Darwinian theory is perfectly compatible with the idea that individuals often promote their own fitness by promoting the prospects of groups to which they belong. It therefore erects no barriers against stories of human evolution that emphasize competition between groups. Such accounts motivate taking seriously the possibility that team reasoning was the historical default frame, or even the only available frame, for early human ancestors in strategic situations. Of course, basic Darwinian theory is equally compatible with accounts based on the opposite proposal.

West et al.’s emphasis on Hamilton’s model as the complete generalization of Darwinian theory allows us to identify a feature that all of the models undermined by the inclusive fitness maximization constraint have in common: They are led to hypothesize novel evolutionary mechanisms by supposing that cooperative behavior is harder for natural selection to support than is actually the case. This is closely related to the widespread view that humans are uniquely cooperative as a species, at least among noneusocial animals. West et al. challenge this second supposition directly. Humans, they observe, are less altruistic than a number of species scattered liberally around the tree of life, are by no means special in establishing cooperative relationships with nonrelatives, and are not unique in incentivizing cooperation by punishment of noncooperators.<sup>4</sup>

This is immediately relevant to the individualism debate. Stories of human evolution that rest primary weight on overcoming obstacles to cooperation effectively presuppose individualism.<sup>5</sup> They take the problem of the origin of human sociality to be: How do basically selfish individuals evolve commitment devices against their default Darwinian dispositions to defect against one another in prisoner’s dilemmas, public goods games, and similar strategic settings that preoccupy behavioral economists? This inspires an explicit search for an evolutionary discontinuity that allowed individual human utility functions to be composed into group dynamics of a more interesting and complex character than

pure competition. Seabright (2010) explicitly elaborates the entire history of humanity around this trope.

This is precisely the individualist style of explanation identified in the previous section. It is the basis for Gintis’s (2006) tireless campaign for the hypothesis that modern humans arose through a genetic adaptation that produced a disposition for strong reciprocity. Burnham & Johnson (2005), Ross (2006a), and Guala (2012) provide direct counterarguments against this hypothesis. When West et al. (2010) identify sixteen “common misconceptions” about the evolution of human cooperation, they charge that Gintis falls into all of them; however, they do not offer a general underlying conceptual diagnosis for the attribution of so many alleged confusions. The individualist style of explanation I earlier associated with revisionist behavioral economics is a good candidate for this diagnosis. Individualism, I suggest, inflects many theorists’ entire views of human evolutionary history.

The demand for a specific explanation of how selfish, cognitively sophisticated individual hominids achieved cooperative dispositions is misplaced. All apes live in family groups.<sup>6</sup> In such groups, inclusive fitness of individuals is typically best promoted by at least some level of resource-sharing and communal protection of young. Many different degrees of cooperativeness with respect to different behavioral modalities are equilibria, depending on the subtle interplay of a limitless range of environmental factors. The most basic mechanism maintaining cooperativeness is a simple feedback loop. Animals that forage and nest in groups are likely to be more closely related to nearby conspecifics than they are to geographically distant ones. By a direct implication of Hamilton’s rule, maximization of individual fitness will then typically indicate cooperative dispositions (alongside competitive ones, of course). These dispositions in turn contribute to the maintenance of group-living patterns. Seabright (2010) is therefore right to emphasize that a major transition among some humans has been the development of institutions that promote cooperation among strangers.

It is important to distinguish between dispositions to cooperate *in general* and capacities to process information that facilitate *specific forms* of cooperation. That is to say, we must keep an eye on the difference between *cooperation* and *coordination*. If the perceptual-cognitive apparatus of a species is not designed to track and respond to the cues

from which possibilities for cooperation can be identified, then we can infer nothing about the extent of dispositions to team framing among the organisms in question, or any other aspect of their preference structures, if they miss opportunities for group projects. We do not conclude from the absence of symphony orchestras among gorillas that they are individualists when it comes to musical expression and prefer singer-songwriters.

A major theme in the literature on cooperation in intelligent social animals is untangling questions about motivations from questions about cognitive capacities. The key source of leverage has mainly been carefully sequenced experiments in which scientists first establish that members of a species understand and can be motivated to respond to an action-goal contingency, and also understand that a conspecific is in an analogous situation to themselves, with respect to this same contingency. One can then put two animals in a situation where they can only realize their goal by acting together. Only if the animals behaviorally manifest this further understanding can one infer that the capacity for the specific form of coordination being tested is present. One can then launch experimental manipulations, such as varying relative costs and benefits, intended to uncover dispositions to cooperate. Studies of this kind that have been conducted with nonhuman primates, particularly chimpanzees, have generally supported the conclusion that although chimpanzees can understand what behavior would serve the interests of a conspecific—knowing, for example, how to respond positively to directly incentivized assistance—only rare individuals show any disposition to take costless actions that would improve social welfare (Silk et al. 2005; Jensen et al. 2006; Vonk et al. 2008; Silk 2009). Other experiments have compared human and chimpanzee infants at similar stages of cognitive development and concluded that the former, but not the latter, focus on and take up opportunities to complete others' goals when they are unable to, and are disposed to supply information that would assist others in completing goals (Warneken & Tomasello 2006; Warneken et al. 2007). On these bases it is widely inferred that chimpanzees are less disposed to cooperative behavior, once capacities for coordination are controlled for, than humans.

One might press questions over whether these experiments truly separate coordination capacities from cooperative dispositions. The

fact that chimpanzees will often respond helpfully to explicit requests for assistance might be taken to suggest that opportunities to promote the social good are simply not salient to them, but that their prosocial preferences can be induced to shine through their obtuseness. However, it is important to note in this context that, in the mammalian brain areas associated with reward learning and control of reward-directed action, cognitive salience and motivation are almost inextricably linked (McClure et al. 2003); so hypothesizing morally communitarian but socially dense chimpanzees might rest on a folk psychological distinction that neuroscience undermines.

The chimpanzee results are often cited in support of the idea that modern humans' ancestors were cognitively sophisticated but selfish, like chimpanzees, and that at some point in the hominid line dispositions evolved that enhanced our socialization. Such inferences are hasty. It seems clear enough on the basis of the evidence to date that modern humans cooperate more extensively than our nearest *living* relatives. It would, however, be rash to infer from this that modern humans are therefore more disposed to team framing than our *ancestral* relatives. Chimpanzees may now coexist with *Homo sapiens*, whereas more closely related hominid species no longer do, precisely because chimpanzees' distinctive ecology has confined them to a niche in which they have not strongly competed with our line of descent, at least until recently. It is every bit as compatible with the evidence to postulate that chimpanzee sociality has atrophied in their stable and food-rich forest environment as to speculate that human cooperative dispositions are exaggerated relative to such dispositions in early hominids. Of course, it is not in doubt that the technology available to contemporary humans has vastly enhanced their coordinative capacities, which in turn allows them to achieve uniquely extended cooperative projects, in time, space, and number of cooperators. This in itself speaks neither for nor against individualism.

The underlying coordination failures that impede chimpanzee opportunities for cooperation indicate one central behavioral dispositional property that distinguishes them not only from humans, but from such other socially intelligent animals as dolphins, parrots, and corvids (Hurley & Chater 2005): Chimpanzees do not spontaneously imitate one another. This is linked to evidence about perceptual salience; even

when motivated, chimpanzees cannot pay sufficiently careful anticipatory attention to one another to perform such cognitively non-demanding tasks as jointly carrying a bucket of water without spilling it (Tomasello et al. 2004).

Merlin Donald (1991) proposes a comprehensive theory of the evolution of the modern human mind, based on interpretation of physical and cultural anthropological evidence, that promotes the central historical importance of a specific form of elaborate imitation. Donald argues that the career of *Homo erectus* involved a major transition from the *episodic*<sup>7</sup> representations of social situations on which contemporary great apes rely to *mimetically* structured representations. The latter are presented as a necessary platform for the later transition to the fully semiotic, abstract representations characteristic of the modern human mind and expressed in modern humans' distinctive use of languages with structured grammars. The core difference between an episodic and a mimetic representation is that the latter, but not the former, involves perceiving and storing memories of specific behaviors of others by reference to general stylistic features that allow them to be subsequently reenacted. Such mimesis is held to be the basis for human artistic, ritual, and religious expression; and it is by reference to these that one best inductively grasps what mimesis is in the first place. According to Donald's hypothesis, mimetic performances in turn provided the first basis for limited cross-generational learning and cultural accumulation among hominids. Donald argues that this significantly increased the selection advantage of greater memory capacity, and that the flowering of mimesis in *Homo erectus* thus predicts and partially explains the major advance in encephalization that make this species the pivotal anatomical transition figure between apelike hominids and modern humans.

Donald's theory is an exemplary instance of inference to the best unifying explanation, since all of the evidence for it is indirect and suggestive, but there is a lot of it, carefully assembled from strong sources. If the thesis is correct, it supplies a cognitive disposition by which the ecological *effectiveness* of human coordination was amplified, through exercise of new cognitive capacities that allowed humans to fuse their agency to a greater extent than is possible for chimpanzees. A disposition to imitate potentially undermines descriptive individualism, since

in the limit a group of organisms that slavishly imitated everything they remembered having seen conspecifics do would more closely resemble a single distributed organism than a collection of individuals. Of course, the forms of individualistic expression that most people most admire normatively are those that find surprising scope for novel variation on the platform of substantive imitation Elster (2000). For example, jazz group improvisations require maintenance of some shared structures as constraints in order to be interesting.<sup>8</sup> I will argue in section 3 that this pattern offers an important clue to the true relationship between descriptive and normative individualism.

It is an advantage of Donald's hypothesis that, unlike Gintis's, it does not posit an evolutionary development that promotes or requires a novel kind of behavior. Capacities for imitation are widespread in nature (Hurley & Chater 2005), and their basis in neural computation is becoming steadily clearer. The well-known literature on mirror neurons is part of this developing set of mechanistic foundations (Gallese 2003, 2007), though its significance is dogged by philosophical uncertainties over the question of whether identifying some neurons as functional mirrors amounts to anything more than suggesting neural correlates in advance of explanation. Understanding imitation as a form of coordination offers a clearer avenue to explanation, both mechanistic and adaptive, than conceiving imitation simply as basing bodily movements on another's perceived template. Neural-computational mechanisms for coordination are more powerful than mechanisms for mirroring, because the former might explain how groups of organisms find equilibria in games where there is no single dominant strategy shared by all.

The computational basis for such coordination is emerging from a research program initiated by Paul Glimcher and collaborators (summarized in Glimcher 2003), based on single-cell recordings in monkeys while they play games against computers that implement strategies the experimenters systematically vary. This work strongly suggests that, at least in primate brains, individual neurons in the circuit that estimates comparative reward values directly compute statistical variations in choice that track mixed-strategy Nash equilibria (NE), that is, optimal responses in situations in which different agents do best by doing different things, and indeed where each agent should vary

their behavior even across occurrences of strategically identical situations. Subsequent work by Lee et al. (2004) and Lee, McGreevy & Barraclough (2005) has extended the implications of this result. In general, individual groups of monkey neurons quickly learn new NE responses, and overall monkey behavior adjusts accordingly. Unlike much or all mirror neuron work, the implications of these studies go beyond identification of neural correlates. Revealingly, monkey neurons don't quite learn NE strategies when the unique best reply to the computer is pure randomization. Instead, they come as close to randomization as implementation of a classical Rescorla-Wagner conditioning rule can get. This makes evolutionary sense, because outside of some rigorously monitored asset markets and game theorists' experimental labs, it is unlikely that humans, let alone monkeys, often face opponents that can detect and exploit the difference between true NE play and NE approximation. However, the key implication here is that neurons can implement "good enough" coordination, in complex strategic settings, through long-understood processes of conditioned learning if these are supplemented by drift diffusion processes that exploit statistical relationships between stochastic behavior control mechanisms and variations in reward frequencies and rates (Lee & Wang 2009).

Coordination around NE strategy mixes based on neural conditioning and drift diffusion explains the superficially paradoxical dynamic by which learning based essentially on copying leads to distributions of variable behavior that are stochastically stable. On the basis of these considerations, we should regard human achievement of the capacity for mimesis as surprising—since nature did not replicate these capacities in nonhumans—but as not *mysterious*, since all that was needed was extra memory to amplify the power of basic mechanisms found in other primates and probably, given the ubiquity of classical conditioning responses, in nervous systems generally. This buttresses Donald's identification of the development of mimesis with the first phase of rapid encephalization in the hominid line; adding neurons and synaptic connections is the basic way, in a neural network, to increase memory capacity.

As Donald stresses, this takes us only to a first plateau on the road to modern human ecology, culture, and cognition. The game structures tracked by conditioned learning in the experiments just reviewed

are themselves stable and exogenous to the estimation task presented to the neural mechanisms. However, as economists implicitly recognize in regarding Adam Smith as their discipline's founder, the key to expanding the productivity of resources, and hence, in evolutionary terms, the capacity of the global environment to support ever larger numbers and communities of people, is specialization of labor accompanied by exchange. The economist Haim Ofek (2001) argues persuasively that specialization and exchange were a precondition rather than a consequence of the evolutionary trajectory from *Homo erectus* to modern *Homo sapiens*. Like Donald, Ofek assembles physical evidence from paleontology to build his case, but surveys it with an economist's attention to opportunity costs of alternative behavioral strategies available to our ancestors.

Opportunity costs are based on scarcity, measured as a function of budget constraints given fixed technology for resource exploitation. A constraint that faced the species as a whole concerned the metabolic demands of the larger brain. The only comparably expensive organ that could be traded off to support such increasing metabolic pressure—which selection would then tend to reduce *if* circumstances rendered such reduction compatible with Hamilton's rule—was the complex gut needed to digest raw plant food. Thus Ofek argues, in company with Wrangham et al. (1999) and Wrangham (2009), that mastery of fire was a specific precondition for at least the later and most rapid stage of human encephalization. He then marshals reasons to believe that fire-keeping was the first specialized occupation in the hominid social ecology. This involves interpretation of paleontological evidence in light of an economic analysis according to which, for *Homo erectus* and his immediate successors, it was much more efficient for specialists to maintain fires from which bands of local hunter-gatherers could draw in exchange for food and pelts than for each small band of hunter-gatherers to search for suitable kindling each day—which would have severely restricted their foraging ranges—and then endure the high-risk, failure-prone ordeal of starting a nightly fire without modern ignition technology. Caves, Ofek argues, were not primarily used as homes by early humans, as popular imagination supposes, but as fire service stations. This naturally leads one to speculate, though he does not, that cave art, exploiting early humans' mimetic dispositions,

might have had the intended function of distinguishing places of business from competing shops.<sup>9</sup> Since fire maintenance requires steady presence but not steady labor, once fire service centers were established, it would be natural for their operators to diversify into making hand axes, body ornaments, and other products that would be of value to hunter-gatherers but are not most efficiently manufactured *while* moving around to follow prey and locate fruit and vegetable patches. The pattern of human settlement of challenging environments such as ice-age Europe, Ofek argues, was constrained by considerations of economies of scale: hunter-gatherers could not begin to productively work a new territory until there were enough of them to support a local fire station. The expansion of frontiers of settlement in modern times according to this pattern—on much faster timescales, of course—is a familiar one to economic historians.

Ofek's project is not merely to explain the origins of markets. Rather, his thesis is that market exchange was the basic behavioral adaptation that allowed humans to construct a distinctive ecological niche, and the only such niche that tends by its own endogenous dynamic to expand indefinitely. Of central importance to the present argument, this adaptation is primarily one of social organization, and only secondarily one of individual cognitive and preference dispositions. Like Seabright (2010), but without any need for the hypothesis of a genetic discontinuity to support "strong reciprocity," Ofek observes that the progress of cross-band exchange in turn required the partial displacement of natural xenophobic violence by diplomacy, thus promoting the enhanced strategic competence in which social intelligence partly consists.

As noted, by their nature markets *grow* and *change*. This makes coping with their dynamics a more complex problem than that faced by groups of monkey neurons in the experiments surveyed by Lee & Wang (2009). On an evolutionary scale, the power of market participants to change the outcome spaces of games destabilizes agency itself, by making utility functions dynamic, and by embedding games within metagames.<sup>10</sup> The evolution of modern societies is characterized by dizzying acceleration in the special human capacity for niche construction; by their behavior, traders don't merely adapt to markets, but change their structures. If, as we should expect to be typical, people approach their strategic interactions with both asymmetric information

and the ability to exploit this information to dynamically influence outcome spaces, why and how should we imagine that agents converge on a shared model of outcomes? It is no gain in explanation to suggest that early people coordinated through constrained variations on imitative patterns if the patterns to be imitated were themselves unstable and relative to interpretations of available payoffs on which we cannot understand how they might have jointly converged.

Game theorists have formally studied this problem using a family of models referred to as "global games" Carlsson & van Damme (1993). In a global game, players receive slightly noisy, nonpublic signals about uncertain states of the environment. If players have correct beliefs about the sources of noise, when each one observes her own signal she can estimate the distributions of signal values received by other players. Not knowing their background beliefs, she assumes that these are randomly distributed about the unit interval, because in her ignorance this is the least arbitrary prior. On this basis, the player estimates the probable distribution of actions by others and chooses her best reply. Carlsson and van Damme show that given some plausible technical restrictions, this setup mimics the solution space of standard classical game theory while nevertheless taking into account that players choose actions in light of uncertain, conjectural beliefs about the beliefs of others.

A leading domain of application for global game theory has been to speculative crises in financial markets (e.g., Morris & Shin 1998). Global game theory is, among other things, a tool for formally exploring circumstances under which coordinators can converge on inferior equilibria, or traps—for example, in the Morris and Shin model, bank runs that can only be stopped by exogenous interventions. It is interesting to reflect on this against the background of the history of the individualism debates in economic methodology. The neoclassical tradition began with Walras's problem of trying to determine the circumstances under which atomic individuals with uncorrelated utility functions could efficiently coordinate on prices and trades in a market. The global game theorist turns this venerable question on its head: Given coordination that is as efficient as possible in light of background uncertainties among players, under what circumstances might players "overcoordinate"—that is, converge on inefficient game structures and

eliminate strategic variance within the population that might otherwise have provided the basis for discovery of paths to sets of equilibria containing superior outcomes? Note the close relationship between these contrasting modeling approaches and our main topic: The Walrasian tradition assumes distinct individuals and must explain how they converge on a shared information structure, whereas the global game theorist makes players' identities strategically endogenous to the structures of their games but then faces the problem of market instability due to insufficient interindividual strategic variation.

A specific version of overcoordination has been studied experimentally, under the label of the "herding" problem. Suppose that an agent,  $i$ , who is unsure about the distribution of private information in a market observes a number of other agents all choosing strategies that would be explained by the hypothesis that those agents share belief  $\beta$ . Suppose that  $i$  has private information,  $\tau$ , that contradicts  $\beta$ . Under certain plausible conditions, it can be expected-utility-maximizing for  $i$  to choose to imitate the other participants'  $\beta$ -based strategies and ignore her own private information. But in that case  $\tau$  is lost to the market. This must, in general, decrease the expected efficiency of the market. Furthermore, initial observers in the chain might happen to be unlucky, and falsely attribute  $\beta$ . The result can be a "reverse cascade" in which everyone converges on an incorrect model that throws away *all* private information.

Experimental tests of herding have generated equivocal but interesting results. Anderson & Holt (1997) found significant cascading and reverse cascading even when participants knew that their own ability to estimate the market, based on their private information, was at least as good as anyone else's. SgROI (2003) replicated this result in situations where subjects could decide to wait to choose until they had observed the choices of others. SgROI also tested the effect of correcting errors incorporated in reverse cascades. In these instances, participants tended to move further away from Bayesian rationality than recognition of the identified errors warranted, suggesting failure by participants to fully recognize that rational choice can produce suboptimal outcomes. On the other hand, Huck & Oechssler (2000); Nöth & Weber (2003); Spiwoks et al. (2008) found general failures of Bayesian rationality and overweighting of private signals, and therefore fewer cascades. That

is, in these experiments people departed from individual rationality by taking their own private information too seriously—and thereby behaved in a way that, given some plausible informational structures, could increase expected market efficiency.

Two experimental reports are especially interesting in the context of our present main topic. Hung & Plott (2001) found prevailing near-rational behavior (from the individual's point of view), and broad confirmation of Anderson and Holt's findings, when subjects were encouraged to frame their decisions as individuals. ("Near" rationality refers to the fact that subjects produced somewhat fewer cascades than fully rational agents would be predicted to do.) However, when subjects understood that the majority decision would bind all participants, and were thus given incentive to reframe the choice problem as one confronting a team, subjects paid more attention to their private signals. This "contrarian behavior" will tend to improve social efficiency in a very noisy environment, while lowering it in a highly transparent one. However, as a further complication, when Corazzini & Greiner (2007) encouraged subjects to frame their choices in the familiar context of independent choices over lotteries, herding collapsed and individually irrational but socially efficient contrarian behavior abounded.

The Hung and Plott finding carries a nice warning about reliance on intuitions in thinking about the relationship between descriptive and normative individualism. We might describe their setting in philosophical terms as follows: subjects were incentivized to adopt nonindividualistic norms, in a context where these were best served by cultivating idiosyncratic individual strategies, such that an individualistic frame is essential for adequately describing behavior. Page (2007) provides evidence for the efficiency of this pattern of framing, and its tendency to self-stabilizing dynamics, in contemporary firms, schools, and other complex organizations.

Let us summarize. In an early human environment where most groups of relatives hunted and gathered, but some formed households that maintained fire services and general merchandise shops in caves, simple imitation could not tell a family what to do. If it sought to optimize, the family should in the first place have focused not on the special properties of its individual members, but on a social property: What were the local marginal costs and benefits of being, respectively,

the next foraging group in one's area, the next foraging group in a new area, and going into retail? If the family opted for business, it *then* needed a basis for stable specialization among its members; who will cultivate the craft of hand-axe manufacture, who will concentrate on cave art, who will gather kindling for the fire? Basic principles of organizational psychology tell us that stability within the production unit is best served if people imaginatively identify themselves with their assigned roles. This gives all household members incentive to collaborate in reinforcing one another's professional identifications. We might not be surprised to discover, though of course we never can, that cave artists, as possessors of the most rare skill among those of value, and who required emotional creativity to anticipate the tastes of hypothetical customers from among nonkin, were encouraged to think it natural for artists to be relatively narcissistic and temperamental, while the personality of a fire-maintenance officer should be the opposite.

Specialization of labor thus promotes shared normative framing of individual differences. Such differences may sometimes have their basis in genetically produced variations in talent or temperament, but where they do, the members of a corporate entity have incentive to exaggerate these, and where they do not, to create them. We now turn to consider processes by which these incentives are channeled into stable patterns of behavior.

### 3. THE SOCIAL SCULPTING OF INDIVIDUALS AND NORMS OF INDIVIDUALITY

There is at least one body of scholarly literature that seems clearly committed to the conjunction of descriptive anti-individualism and normative individualism. This is work by historians of social and cultural organization. It is a familiar theme in such history that "the individual" emerged gradually, and very recently, as an idea that governed people's normative expectations about one another and about themselves. Of course, historians have many different opinions as to when and how quickly this happened in various parts of the world. It is also widely disputed as to whether "the individual" was a bit of social technology invented in Europe, which then spread from there to other continents. Although some versions of such stories connote ethnocentric

triumphalism that could be thought to imply racism, plausible mechanisms for them are available. If capitalism is promoted by individualistic norms, as stressed in a venerable tradition going back to [Weber \(1905/2002\)](#), then one might expect that capitalism and individualism would generally coevolve, and that individualism would have spread, geographically and temporally, along with the other member of the dyad. (For a recent account that is explicitly coevolutionary in just this way, see [Clark 2007](#).)

A representative historian's text that takes the gradual emergence of the individual for granted as a phenomenon that needs explanation and contextualizing is that by [Morris \(1972\)](#). Joining a controversy already in progress over whether individualism arose with the Renaissance or during the medieval period, Morris mounts a monograph-length defense of a critical 150-year episode between 1050 and 1200. He opens by sketching his target explanandum:

We think of ourselves as people with frontiers, our personalities divided from each other as our bodies visibly are. Whatever ties of love or loyalty may bind us to other people, we are aware that there is an inner being of our own; that we are individuals. To the Western reader it may come as a surprise that there is anything unusual in this experience. It is to us a matter of common sense that we stand apart from the natural order in which we are set, subjects over against its objectivity, and that we have our own distinct personality, beliefs, and attitude to life. . . . [I]t is true that Western culture, and the Western type of education, has developed this sense of individuality to an extent exceptional among the civilizations of the world. . . .

[The] relative weakness of the sense of individuality is not confined to those societies which we normally call primitive. The student of the Greek Fathers or of Hellenistic philosophy is likely to be made painfully aware of the difference between their starting-point and ours. Our difficulty in understanding them is largely due to the fact that they have no equivalent to our concept "person," while their vocabulary was rich in words which express community of being. ([Morris 1972](#), p. 1–2)

Of particular interest in the context of the present essay is Morris's effort to distinguish individualism as a contested political ideology from a deeper sense of individualism that he takes to be a normative construct, though one that now constitutes an objective description of modern "Western" people:

This book will [be concerned with] . . . that respect for individual human beings, their character and opinion, which has been instilled into us by our cultural tradition, and with its implications for personal relationships and beliefs. The hard core of this individualism lies in the psychological experience with which we began; the sense of a clear distinction between my being and that of other people. The significance of this experience is greatly increased by our belief in the *value* of human beings in themselves. (Ibid., 3)

Very interestingly, Morris takes as a key indicator of the presence of the "new" sense of individuality in the cognitive formation of a person the ability to write biography and—especially—inwardly reflective autobiography:

What cannot be verbalized can scarcely be thought, and before 1050 the capacity of most writers to express themselves lucidly was poor. When, in the ninth century, Einhardt attempted to describe Charlemagne's personal appearance—a bold undertaking, for there were few recent precedents to guide him—he built up a pastiche of quotations from Suetonius, to such an extent that some commentators have suspected that the passage is not a description of Charlemagne from the life, but a merely literary construction. . . . If we seek for genuinely individual description from the life, we must look to men who were able to write down fluently and naturally what they saw. . . . The same is true of the art of self-expression. The meditations of Anselm or Aelred of Rievaulx, who were able to express their affections and longings in a practiced way, moving easily from one idea to another, would have been literally unthinkable a century before. (Ibid., 7–8)

I have no side to take in the historians' controversy over when individualistic norms and literary expressions arose in Europe. The interest of Morris's discussion for present purposes lies in two aspects: first, the confidence on both sides of the argument that individualistic *norms* were culturally constructed at an identifiable, recent time and place; and, second, the explicit link that Morris makes, on which the whole method of argument in his book depends, between individualism and autobiographical narrative.

The significance of autobiographical narrative in both historical-cultural and individual development has been extensively discussed by psychologists and cognitive scientists. Donald (1991) follows Bruner (1986) in defending the view that narrative structure as the basis for logical organization and explanation of events arose with human language and "develops early and naturally in children" (Donald 1991, p. 256), whereas "analytic" or "theoretical" reasoning, based on postulated timeless and abstract principles, arose with the ancient Greeks, sometime between Homer and Herodotus. However, the disposition to produce narratives can in principle predate a disposition to produce narratives centered on the narrator and taken to express a partial and distinctive subjective point of view. Jaynes (1976) proposed the radical thesis that Greeks in the time of Homer did not engage in autobiographical narrative and in consequence lacked self-awareness. As we saw above, this seems to be Morris's assumption, expressed a few years before Jaynes's book appeared.<sup>11</sup> Dennett (1991), though he is agnostic with respect to Jaynes's dating of the development of self-awareness, argues on the basis of considerations from the neuroscience of consciousness that Jaynes is correct to tie self-awareness to the production of reflective autobiographical narrative and to see this capacity as essentially relying on cultural scaffolding. Dennett doubts that narrative arises "naturally" in children, if "natural" is taken to mean "without cultural exemplification and reinforcement"; and his account of consciousness depends on the idea that, at least, autobiographical narrative does not so arise. Similarly, Hutto (2008) argues that folk psychology is essentially a learned facility with the narrative construction of others, which adepts reflexively apply to themselves.

Based on game-theoretic logic, Ross (2004; 2005; 2006b; 2007; 2008a; 2008b) has extensively characterized the processes by which

people learn, over the course of childhood and adolescent development, to construct narrative selves that have the following properties:

- (1) They are adapted to local cultural expectations, so that they facilitate location of equilibria in global games with others who share a similar cultural background.
- (2) The dimensions along which their variance is culturally salient form the basis for a prevailing typology of personalities and linked aptitude sets that are normatively and statistically associated with types of economic occupations and social roles.
- (3) They are attractive to others, and so encourage cooperative activities that exploit specialized, complementary roles, to the extent that they display creative uniqueness within the boundaries of local normative conventions.
- (4) They develop inconsistency, which tends in the limit to incoherence, if they are not reinforced by a person's recurrent interactants; and inconsistent or incoherent narrative selves are regarded by others as diagnostic of unreliability at best and insanity at worst.
- (5) Their relative inconsistency or incomprehensibility to others will be associated with ostracism and exclusion from collaborative projects, including opportunities for mutually advantageous exchange.
- (6) Their general comprehensibility to at least a subset of the community sufficient for maintenance of the person's economic niche is a precondition for material flourishing in a society based on division of labor.
- (7) They are more closely controlled and influenced, at least from adolescence, by cohort peers than by living ancestors (Harris 2006).
- (8) They may be drastically revised in the course of a lifetime by appeal to the occurrence of milestone events recognized as such by culturally stable metanarratives. Examples of such milestones

in contemporary Western societies are college graduation, marriage, first parenthood, religious conversion, and acknowledged recovery from addiction.

Properties (1) through (3) explain the economic function of narrative selves as structures that facilitate the organization of specialized perspectives and capacities so as to avoid overcoordination and the resulting inefficient loss of information. Of course, the economic efficiency of a structure does not predict its existence unless it is supported by equilibrium dynamics. Properties (4) through (6) indicate the incentive structures that lead all cognitively and conatively competent people to devote significant resources to narrative self construction and maintenance, and indeed to defend these constructions tenaciously, not infrequently choosing biological death as preferable to self-undermining actions such as shaming one's family, treason to country, or abandonment of religious commitments. Properties (7) and (8) indicate how cultural conventions on allowed self-narratives may avoid locking into conservative traps that cannot keep pace with environmental or technological change. These properties do not *guarantee* avoidance of conservative traps, and of course many communities and subcommunities fall into such traps to varying degrees.

One of the core capacities that human parents must nurture in potentially successful offspring is that of self-narration. This skill mainly consists in the ability to engage in recurrent generate-and-test cycles in social interactions, and to track shifting local norms that define the range within which distinctive styles of behavior pass from being celebrated, to barely tolerated, to resented. As described by McGeer (2001) and others, parents reward their children's adoption of consistent focused interests and forms of expertise, and encourage them to explicitly identify with "signature" clusters of activities and domains of knowledge. However, as property (7) indicates, and as recounted in detail by Harris (2006), while parents nurture the capacity for self-narration, peers play a larger role in suggesting and constraining content, at least from early adolescence. This is popularly appreciated as the child's drive to establish "independence," and social institutions express strong normative interest in the extent to which it is legitimate for parents to resist it.

#### 4. CONCLUSION

At three scales—that of the evolution of the modern human species, that of the cultural emergence of values adapted to giant industrial communities, and that of the etiology of distinctive personal characters—I have identified arcs of development from behavioral spaces with little individual variation to spaces characterized by emphasis on special capacities and characteristics of individuals. All of these developmental arcs are both driven and constrained by largely implicit and nondeliberative normative considerations. Specialization of labor was culturally promoted because it made people richer, and the promotion of such specialization in turn made people smarter. The tendency of team reasoners to inefficiently overcoordinate was resisted by the cultural evolution of pressures to use the new resource of language for individual differentiation. But since the point of this differentiation was ultimately high-order coordination, we should expect to find, as we do, that it is controlled by cultural norms about which people care a lot. In most historical human societies, people who are less than ideally unique are merely regarded as boring and shuffled a few steps backward in the mate selection sweepstakes, whereas people who carry their self-making art to avant garde lengths, where general comprehensibility and predictability to others break down, are often savagely persecuted.<sup>12</sup>

In light of this developmental vector, normatively sculpted human individuals tend to celebrate individuality as a principle, up to a point. At the scale of cultural development, this is manifest as cultural pride that often tips into aggressive ethnocentrism, but is generally regarded as a good thing when it is channeled into peoples' fascination with their own history and forms of art. At the scale of individual development, people regard their narrated selves as among their most precious assets; in general, only the persons of very close kin, especially offspring, are assigned competing levels of value. Contrary to parochial but widespread perspectives such as that of Morris reviewed above, these dynamics are universal among human communities and not restricted to Western cultures. At the same time, since pressure for specialization of labor, in communities extending beyond family groups, is the primary exogenous pressure that drives the evolutionary dynamics, the *extent* to which individuals are encouraged to differentiate them-

selves is indeed correlated with the growth of complexity in economic production.

Thus, from the perspective of evolution and development, Bacharach's rhetorical presentation of individual utility maximization as default strategic framing, and team utility maximization as "reframing," reverses figure and ground. Atomism is an upside-down explanatory stance in all social sciences, including historical anthropology and economics. The history of attempts to base normative individualism on descriptive individualism, such as can be attributed to the Lockean tradition in political philosophy, appear profoundly confused from Darwinian and historicist perspectives.

However, normative individualism is not entirely independent of the relation of explanatory priority as between individual and collective scales of description. Strong normative individualism makes sense precisely *because* maintenance of distinctive individuality is a kind of *achievement*. If strong individual distinctiveness were the human biological default, it would be gratuitous to normatively celebrate and defend it. Protective and promotional norms do not generally arise around assets that require no effort to acquire or maintain.

These considerations do not license a metaphysical argument in favor of caring about the welfare of collective entities only as derivative of the welfare of individual people, of the kind sought by the Austrian economists. I am persuaded by such naturalistic metaethicists as Hume (1748/1977) and Joyce (2001) that no justified metaphysical arguments are in principle available for either side of this enervating dispute. The best we can do is explain why most people find normative individualism attractive and indeed emotionally irresistible. If nothing is made "ultimately good" by the nature of the universe, then it is sound procedure to appeal, in policy disagreements, to values that shape the majority of human judgments, as contingent consequences of history. It is reasonable to expect proposers of policies to indicate the individuals whose welfare the policies in question will promote, and to tell us how those who suffer welfare losses will be compensated.

#### Notes

<sup>1</sup>This paper is forthcoming in *Cooperation and its Evolution*, ed. by K. Sterelny, R. Joyce, B. Calcott, and B. Fraser, MIT Press, 2013

<sup>2</sup>See Ross (2011). Macroeconomists confuse the relevant associations in a special way by assigning high methodological importance to “microfoundations.” The general validity of this concern is controversial; see Hoover (1988) for the clearest treatment, and Hartley (1997) for a sustained criticism. For present purposes it suffices to say that what is “foundational” about the sought-after microfoundations of macroeconomics is not ontological or normative; the demand for them arises from macroeconomists’ understandable unease with any model that posits statistically extractable data that markets fail to extract. So the concern is ultimately about social structures and processes, not individuals. See Janssen (1993) for a detailed workout of this argument, by an author who seems to hope, in exact opposition to my own attitude, that economists will eventually succeed in taking ontological individualism more seriously.

<sup>3</sup>The model of more selfish players will of course sometimes be correct—team cohesion not infrequently unravels, as in the case of the French national side in the 2010 World Cup. But the game theorist would not be able to correctly model the difference between the French team and, for example, the superb Spanish winning side, without resort to Bacharach’s innovation.

<sup>4</sup>West et al. (2010) acknowledge that humans use special proximate mechanisms to coordinate their cooperation—particularly language. This is important to issues raised later in the chapter.

<sup>5</sup>This point is forcefully made by Thalos & Andreou (2009).

<sup>6</sup>Orangutans were once thought to be solitary. This has turned out to be inaccurate as a generalization, and such solitude as is observed in some orangutans now appears to be a recent adaptation to habitat changes. See Dunbar (1988).

<sup>7</sup>Psychologists sometimes understand episodic memory as necessarily involving narrative memory, which would confine it to humans. Donald’s use of the term is more general, but still in the standard conceptual ballpark; he presents evidence that modern apes remember particular social situations involving specific individuals.

<sup>8</sup>This is even true of so-called free jazz. Furthermore, it is not evident that the freest jazz would have value to any listeners except by way of contrasts with less free jazz.

<sup>9</sup>Given the inaccessibility of much cave art, we can rule out a billboard function. But many modern businesses regard stylish and expensive customer service areas as essential.

<sup>10</sup>This complexity explains why economists did not know how to model markets with imperfect competition—as opposed to markets in which all agents are price takers—until a few decades ago, and why economists have become increasingly interested in evolutionary game theory as an important part of the analytical toolkit in addition to classical game theory.

<sup>11</sup>Jaynes’s thesis had been suggested by him in articles that predate Jaynes (1976) by decades. However, Morris does not cite Jaynes, or indeed anyone, as authorities for his remarks about the ancient Greeks.

<sup>12</sup>Happy are societies that, like England, evolved second-order norms favoring amused appreciation of eccentricity.

## References

Akerlof, G. & Schiller, R. 2009. *Animal Spirits*. Princeton: Princeton University Press.

- Anderson, L. & Holt, C. 1997. ‘Information cascades in the laboratory’. *American Economic Review* 87: 847–862.
- Ariely, D. 2008. *Predictably Irrational*. New York: Harper.
- Bacharach, M. 2006. *Beyond Individual Choice*. Princeton: Princeton University Press.
- Bergstrom, T. 2002. ‘Evolution of social behavior: Individual and group selection’. *Journal of Economic Perspectives* 16: 67–88.
- Bowles, S. & Gintis, H. 2004. ‘The evolution of strong reciprocity: Cooperation in heterogeneous populations’. *Theoretical Population Biology* 65: 17–28.
- Bruner, J. 1986. *Actual Minds, Possible Worlds*. Cambridge, MA: Harvard University Press.
- Burnham, T. & Johnson, D. 2005. ‘The biological and evolutionary logic of human cooperation’. *Analyse & Kritik* 27: 113–135.
- Camerer, C., Loewenstein, G. & Prelec, D. 2005. ‘Neuroeconomics: How neuroscience can inform economics’. *Journal of Economic Literature* 43: 9–64.
- Carlsson, H. & van Damme, E. 1993. ‘Global games and equilibrium selection’. *Econometrica: Journal of the Econometric Society* 61: 989–1018.
- Clark, A. 1997. *Being There*. Cambridge, MA: MIT Press.
- Clark, G. 2007. *A Farewell to Alms*. Princeton: Princeton University Press.
- Corazzini, L. & Greiner, B. 2007. ‘Herding, social preferences, and (non)conformity’. *Economics Letters* 97: 74–80.
- Dennett, D. 1991. *Consciousness Explained*. Boston: Little, Brown.
- Donald, M. 1991. *Origins of the Modern Mind*. Cambridge, MA: Harvard University Press.
- Dunbar, R. 1988. *Primate Social Systems*. London: Croom Helm.
- Elster, J. 2000. *Ulysses Unbound*. Cambridge: Cambridge University Press.
- Frank, R. 1987. ‘If *Homo economicus* could choose his own utility function, would he want one with a conscience?’ *American Economic Review* 77: 593–604.
- Gallese, V. 2003. ‘The roots of empathy: The shared manifold hypothesis and the neural basis of intersubjectivity’. *Psychopathology* 36: 171–180.
- . 2007. ‘Before and below “theory of mind”: Simulation and the neural correlates of social cognition’. In N. Clayton N. Emery & C. Frith (eds.) ‘Social Intelligence’, 179–196. Oxford: Oxford University Press.
- Gintis, H. 2000. ‘Strong reciprocity and human sociality’. *Journal of Theoretical Biology* 206: 169–179.
- . 2006. ‘Behavioral ethics meets natural justice’. *Politics, Philosophy & Economics* 5: 5–32.
- Gintis, H., Bowles, S., Boyd, R. & Fehr, E. 2003. ‘Explaining altruistic behavior in humans’. *Evolution and Human Behavior* 24: 153–172.
- Gintis, H., Henrich, J., Bowles, S., Boyd, R. & Fehr, E. 2008. ‘Strong reciprocity and the roots of human morality’. *Social Justice Research* 21: 241–253.
- Glimcher, P. 2003. *Decisions, Uncertainty, and the Brain*. Cambridge, MA: MIT Press.
- Guala, F. 2012. ‘Reciprocity: weak or strong? What punishment experiments do (and do not) demonstrate’. *Behavioral and Brain Sciences* 35: 1–59.
- Hamilton, W. 1964. ‘The genetical evolution of social behavior I & II’. *Journal of Theoretical Biology* 7: 1–52.
- Harris, J. 2006. *No Two Alike*. New York: Norton.
- Hartley, J. 1997. *The Representative Agent in Macroeconomics*. London: Routledge.
- Hayek, F. 1949. *Individualism and Economic Order*. Chicago: University of Chicago Press.
- Hollis, M. 1998. *Trust within Reason*. Cambridge: Cambridge University Press.

- Hoover, K. 1988. *The New Classical Macroeconomics*. Oxford: Blackwell.
- Huck, S. & Oechssler, J. 2000. 'Informational cascades in the laboratory: Do they occur for the right reasons?' *Journal of Economic Psychology* 21: 661–671.
- Hume, D. 1748/1977. *An Enquiry Concerning Human Understanding*. Indianapolis: Hackett.
- Hung, A. & Plott, C. 2001. 'Information cascades: Replication and an extension to majority rule and conformity-rewarding institutions'. *American Economic Review* 91: 1508–1520.
- Hurley, S. & Chater, N. (eds.). 2005. *Perspectives on Imitation*. MIT Press.
- Hutchins, E. 1995. *Cognition in the Wild*. Cambridge, MA: MIT Press.
- Hutto, D. 2008. *Folk Psychological Narratives*. Cambridge, MA: MIT Press.
- Janssen, M. 1993. *Microfoundations: A Critical Inquiry*. London: Routledge.
- Jaynes, J. 1976. *The Origin of Consciousness in the Breakdown of the Bicameral Mind*. Boston: Houghton Mifflin.
- Jensen, K., Call, J. & Tomasello, M. 2006. 'What's in it for me? Self-regard precludes altruism and spite in chimpanzees'. *Proceedings: Biological Sciences* 273: 1013–1021.
- Joyce, R. 2001. *The Myth of Morality*. Cambridge: Cambridge University Press.
- Lee, D. & Wang, X.-J. 2009. 'Mechanisms for stochastic decision making in the primate frontal cortex: Single-neuron recording and circuit modeling'. In P. Glimcher, C. Camerer, E. Fehr & R. Poldrack (eds.) 'Neuroeconomics: Decision Making and the Brain', 481–501. London: Elsevier.
- Lee, D., Conroy, M., McGreevy, B. & Barraclough, D. 2004. 'Reinforcement learning and decision making in monkeys during a competitive game'. *Brain Research: Cognitive Brain Research* 22: 45–48.
- Lee, D., McGreevy, B. & Barraclough, D. 2005. 'Learning and decision-making in monkeys during a rock-paper-scissors game'. *Brain Research: Cognitive Brain Research* 25: 416–430.
- Lukes, S. 1968. 'Methodological individualism reconsidered'. *British Journal of Sociology* 19: 119–129.
- McClure, S., Draw, N. & Montague, R. 2003. 'A computational substrate for incentive salience'. *Trends in Neurosciences* 26: 423–428.
- McGeer, V. 2001. 'Psycho-practice, psycho-theory, and the contrastive case of autism'. *Journal of Consciousness Studies* 8: 109–132.
- Miller, R. 1978. 'Methodological individualism and social explanation'. *Philosophy of Science* 45: 387–414.
- Morris, C. 1972. *The Discovery of the Individual: 1050–1200*. New York: Harper & Row.
- Morris, S. & Shin, H.-S. 1998. 'A theory of the onset of currency attacks'. Economics Group, Nuffield College, University of Oxford *Economics Papers* working paper series no. 149.
- Nöth, M. & Weber, M. 2003. 'Informational aggregation with random ordering: Cascades and overconfidence'. *Economic Journal* 113: 166–189.
- Ofek, H. 2001. *Second Nature*. Cambridge: Cambridge University Press.
- Page, S. 2007. *The Difference*. Princeton: Princeton University Press.
- Pareto, V. 1927. *Manuel d'économie politique*. Paris: Marcel Giard.
- Pettit, P. 1993. *The Common Mind*. Oxford: Oxford University Press.
- . 1997. *Republicanism*. Oxford: Oxford University Press.
- Ross, D. 2004. 'Meta-linguistic signalling for coordination amongst social agents'. *Language Sciences* 26: 621–642.

- . 2005. *Economic Theory and Cognitive Science, vol. 1: Microexplanation*. Cambridge, MA: MIT Press.
- . 2006a. 'Evolutionary game theory and the normative theory of institutional design: Binmore and behavioral economics'. *Philosophy, Politics & Economics* 5: 51–79.
- . 2006b. 'The economics and evolution of selves'. *Cognitive Systems Research* 7: 246–258.
- . 2007. 'H. sapiens as ecologically special: What does language contribute?' *Language Sciences* 29: 710–731.
- . 2008a. 'Economics, cognitive science and social cognition'. *Cognitive Systems Research* 9: 125–135.
- . 2008b. 'Classical game theory, socialization, and the rationalization of conventions'. *Topoi* 27: 57–72.
- . 2011. 'The economic agent: Not human, but important'. In U. Maki (Ed.), *Handbook of the Philosophy of Science, vol. 13: Economics*. London: Elsevier.
- . 2011b. 'Estranged parents and a schizophrenic child: Choice in economics, psychology and neuroeconomics.' *Journal of Economic Methodology* 18: 217–231.
- Ross, D., Spurrett, D., Kincaid, H. & Stephens, G. L. (eds.). 2007. *Distributed Cognition and the Will*. Cambridge, MA: MIT Press.
- Samuelson, P. 1947/1983. *Foundations of Economic Analysis*. Cambridge, MA: Harvard University Press. Enlarged ed.
- Seabright, P. 2010. *The Company of Strangers*. Princeton: Princeton University Press. Revised ed.
- Sgroi, D. 2003. 'The right choice at the right time: A herding experiment in endogenous time'. *Experimental Economics* 6: 159–180.
- Silk, J. 2009. 'Social preferences in primates'. In E. Fehr P. Glimcher, C. Camerer & R. Poldrack (eds.) 'Neuroeconomics: Decision Making and the Brain', 269–284. London: Elsevier.
- Silk, J., Brosnan, S., Vonk, J., Henrich, J., Povinelli, D. & et al., A. Richardson. 2005. 'Chimpanzees are indifferent to the welfare of other group members'. *Nature* 435: 1357–1359.
- Smith, V. 2008. *Rationality in Economics*. Cambridge: Cambridge University Press.
- Spiwoks, M., Bizer, K. & Hein, O. 2008. 'Informational cascades: A mirage?' *Journal of Economic Behavior & Organization* 67: 193–199.
- Thaler, R. 1992. *The Winner's Curse*. New York: Free Press.
- Thalos, M. & Andreou, C. 2009. 'Of human bonding: An essay on the natural history of agency'. *Public Reason* 1: 46–73.
- Tomasello, M., Carpenter, M., Call, J. & T. Behne, H. Moll. 2004. 'Understanding and sharing intentions: The origins of cultural cognition'. *Behavioral and Brain Sciences* 28: 691–735.
- von Mises, L. 1949. *Human Action*. New Haven: Yale University Press.
- Vonk, J., Brosnan, S., Silk, J., Henrich, J., Richardson, A. & et al., S. Lambeth. 2008. 'Chimpanzees do not take advantage of very low cost opportunities to deliver food to unrelated group members'. *Animal Behaviour* 75: 1757–1770.
- Walras, L. 1874. *Éléments d'économie politique pure ou théorie de la richesse sociale*. Lausanne: L. Corbaz.
- Warneken, F. & Tomasello, M. 2006. 'Altruistic helping in human infants and young

- chimpanzees'. *Science* 311: 1301–1303.
- Warneken, F., Hare, B., Melis, A., Hanus, D. & Tomasello, M. 2007. 'Spontaneous altruism by chimpanzees and young children'. *PLoS Biology* 5, no. e184. Doi:10.1371/journal.pbio.0050184.
- Weber, M. 1905/2002. *The Protestant Ethic and the Spirit of Capitalism*. (Baehr, P., & Wells, G., Trans.). Harmondsworth: Penguin.
- West, S., El Mouden, C. & Gardner, A. 2010. 'Sixteen common misconceptions about the evolution of cooperation in humans'. *Evolution and Human Behavior* 32: 231–262.
- Wrangham, R. 2009. *Catching Fire*. New York: Basic Books.
- Wrangham, R., Jones, J., Laden, G., Pilbeam, D. & Conklin-Brittain, N. L. 1999. 'The raw and the stolen: Cooking and the ecology of human origins'. *Current Anthropology* 40: 567–594.