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**GOOD DECISIONS: RECONCILING HUMAN  
RATIONALITY, EVOLUTION, AND ETHICS\***

**BY STEVEN F. FREEMAN**

Building E52-501  
50 Memorial Drive  
Cambridge, MA 02142-1347

Phone: (617) 253-2167  
Fax: (617) 253-2660

[sfreeman@mit.edu](mailto:sfreeman@mit.edu)  
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## GOOD DECISIONS: RECONCILING HUMAN RATIONALITY, EVOLUTION, AND ETHICS

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by Steven F. Freeman

*Abstract:* The utility principles upon which decision theory is based conflict with both empirical findings and ethical thought. Evolutionary analysis cognizant of human interdependence, dependence, and death explains why we find genetic attributes and cultural values inconsistent with the tenets of rational choice. This analysis provides a rationale for deontological ethics and “logic of appropriateness” as alternative foundations for decision-making models, and suggests future research that breaks with the traditional vision of human reasoning as a defective approximation of a utility maximizing ideal.

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## 1. RECONSIDERING A UTILITY-CENTERED UNIVERSE

Utility theory – in particular, the supposition of a cardinal utility function that decision-makers should maximize (Von Neumann & Morgenstern 1944, Savage 1954) – has served as the orienting point of decision science since the inception of the field. More generally, this orientation is so unquestioned in analytical education that few of its alumni can even conceive of an alternative to its implicit consequential logic. We *know* the “right” way to make a decision: figure out what we want, consider our choices, and choose the path most likely to lead to our goal. Uncertainty and risk complicate, but do not change, this basic decision formula.

Yet this is *not* how people actually make most decisions. Contemporary counsel to reason consequentially also conflicts with nearly all ethical prescription throughout history and across cultures. In this article, I argue that these conflicts are due to an unwarranted theoretical commitment to utility theory, that we misread the heavens when we see utility as the North star and use it even to orient our moral compass. Unhitching our wagon from this star allows us to find guidance from other sources of illumination. One pair of alternative orienting lights is deontological ethics (e.g., Kant 1785) and a logic of appropriateness (March & Olsen 1989).

Based on analysis of human evolutionary process, I propose a rationale for why we might expect healthy people to behave *appropriately* rather than calculatingly and to reason *ethically* rather than consequentially. Moreover this analysis suggests that reasoning about responsibility and appropriateness aid in intergenerational survival and human fulfillment precisely because such reasoning serves to *limit* personal utility.

### 1.1. Article organization and key propositions

In the remainder of this introductory section, I provide background on utility and decision theory. I explain the origins of the common wisdom on decision-making, review the empirical research, and explain the theoretical argument and evolutionary assumption on which the utility model is based. I then detail the theoretical problem that generates this article, and introduce March & Olsen’s logic of appropriateness as a solution.

In Section 2, I challenge the evolutionary assumption on which utility theories rest. Evolutionary analysis cognizant of the importance of human interdependence, dependence, and death explains why we find genetic attributes and cultural values inconsistent with the tenets of rational choice. Both biological proclivities and adopted aspects of identity can be best understood not as a function of attributes that best support self-interest, but rather of what has been inherited or otherwise transmitted from ancestors who were able to fit in and successfully propagate as members of a tribe.

In Section 3, I attempt to close the chasm between utility-based decision prescription on one side and actual decision-making and ethics on the other. In Section 3.1, I provide the rationale for intuitive morality and non-utilitarian ethics, and use insights from Kant (1789) as a starting point for an alternative prescriptive framework. In Section 3.2, I outline elements of a descriptive model that emanate from the proposition that goals are artificial constructs rather than central motivators.

I conclude in Section 4 with implications for research – on the relation between goals and context; on what is meant by a *good* decision; and, most of all, on the study of human reasoning process not as a defective approximation of a utility maximizing ideal, but rather as a process to understand on its own terms for the keys it holds to a different, possibly better ideal.

## **1.2. The common wisdom on decision-making**

### **1.2.1. Generic utility theory (Rational Choice)**

Utility theories either advise that choices reflect values associated with expected outcomes or presume that they do. Such behavior is how adherents define “rationality.” Adherents include almost the entire field of economics (although there is sharp division within the field as to both the extent and domain of this type of rational behavior; Friedman 1964 and Becker 1979 present particularly universalist views), a large and increasing percentage of political science (see Green 1994 for a review), much of psychology (explicitly modeled in expectancy theory, e.g., Lawler 1971) and much of the other social sciences (in sociology the position is most prominently set forth by Coleman, 1993). Utility also serves as the basis for a spectrum of philosophical and policy theories ranging from utilitarianism (Bentham 1841, Mill 1859), the ethic that counsels the greatest good for

the greatest number, to self-interest, which prescribes the greatest good for oneself.<sup>1</sup>

But these positions raise some fundamental questions: First, do decision makers naturally behave in accord with the precepts of utility theory? Indeed, there would be no need for prescriptive decision theories if they did.<sup>2</sup> Second, what does it mean to choose based on value? What kind of choice could conceivably *not* be based on value? Third, if the rational way to make a decision is through goal-based reasoning, why is it that most people can't even say what their goals are, let alone use them as decision beacons? The first problem is discussed presently (1.2.2); the second in the following section (1.3); the third occupies the remainder of the article.

### 1.2.2. Choice and outcome: Herbert Simon on cognitive limits

Decision science and behavioral decision research are new fields, only a half-century old. Reasoning and decision-making processes play little role in classical economics or the behavioral psychology perspective dominant at mid-century (i.e., Watson, 1925; Skinner 1938) because it was assumed that people respond directly to incentives and disincentives. Today behavioral psychology is largely discredited (although it remains the basis of economics – see DeBond & Thaler 1994) as experiments have repeatedly demonstrated that construal plays a central mediating role between the environment and behavior, and that incentives can even be counter-motivational.<sup>3</sup>

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<sup>1</sup> Some classical economists and contemporary libertarians claim that actions motivated by self-interest result in the greatest good for the greatest number by means of the invisible hand of a free market (Smith 1776). Few contemporary scholars would back Smith's claim without important qualifications; nevertheless, many contemporary social scientists, including most economists, use descriptive models of behavior motivated by narrow individual self-interest. This is not because narrow self-interest results in the best of all possible worlds or even because it comprehensively describes human behavior, but rather "so that the theory has predictive value" (Milgrom & Roberts 1992:42-43). See also section 1.3.

<sup>2</sup> In management fields, the reader often doesn't even know if the author is proposing a descriptive or normative theory. Authors sometimes go back and forth between description and prescription, apparently without recognizing the contradiction even in otherwise impressive work. For example, Wernerfelt (1984) in the article voted "Article of the Decade" in *Strategic Management Journal*, proposes his "Resource-Based View of the Firm" as a tool to both (1) *analyze* an implicitly deterministic relationship between profitability and resources *and* (2) help *manage* the firm's resource position over time. The bulk of the article argues what firms *should* do, but the argument is made by examples of what they *do* do.

<sup>3</sup> For example, Festinger & Carlsmith (1959) show that subjects poorly paid to perform a tedious task are *more* motivated than higher paid subjects; it's postulated that the subjects assume that the task must be intrinsically interesting – otherwise they could not satisfactorily explain to themselves why they are doing it. Lepper, Greene and Nisbett (1973) show that nursery school children lose interest in play activities for which they are rewarded, presumably because they come to view the activity as a means to an end rather than attractive in its own right.

Simon's contribution to this cognitive revolution was to explain the implausibility of early economic models of behavior. Throughout his work, Simon (especially 1945, 1960) is sympathetic to the aspirations economics postulate ("outcome rationality") while noting the difficulty in practice of attaining such outcomes. Optimization requires the omniscience of a god, but we are limited by the "information processing capabilities" of the human brain. Actual behavior necessarily falls short of economic rationality on three key dimensions (1945: chapter V):

1. Rationality requires complete knowledge ... of the consequences that will follow ... each choice. In fact, knowledge of consequences is always fragmentary.
2. Since these consequences lie in the future, imagination must supply the lack of experienced feeling in attaching value to them. But values can be only imperfectly anticipated.
3. Rationality requires a choice among all possible alternatives. In actual behavior, only a very few of all these possible alternatives come to mind. (Simon 1945:81)

This formulation led to major streams of descriptive and prescriptive research, beginning with the effort of Simon and colleagues to systematically map human capabilities, deviations from rationality, and human heuristics for coping with inherent limitations.<sup>4</sup> Simon's view that people are "intendedly rational" more or less represents today's common wisdom. Simon's limitations form the basis for decision sciences (and far beyond – see Appendix A). Decision techniques, aids, and algorithms are designed to overcome or push back these limits to rationality.

There is a resonant logic in this formulation and utility theory in general: at first consideration, it seems, prescriptively, the obviously appropriate guide to intelligent action. And as a descriptive model, it provides a respectful guide to actual behavior, in that we assume a person's actions to be reasonable and proceed to search out those reasons. But as behavioral decision researchers probe utility theory, individuals often fail to meet even liberal interpretations of "intended rationality."

### 1.3. Utility axioms and violations

Just what does it mean that choice reflects value? What kind of choice could conceivably *not* reflect on value? Utility theory is agnostic with regard to ends, and this sometimes leads to tautology: "How are the things people value determined? By observing what they choose." (March

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<sup>4</sup> For summaries of research in given periods see Edwards (1954); Miller (1956); Newell & Simon (1972); Slovic & Lichtenstein (1977); Hogarth (1987); and Kleindorfer, et al. (1993). Deviations are also summarized in Appendix D.

1994:187)

To provide rigor, Von Neumann & Morgenstern (1944) analyzed the notion of expected utility axiomatically.<sup>5</sup> Behavioral decision researchers have shown, however, that four apparently modest substantive assumptions – cancellation, transitivity, dominance, and invariance – upon which the theory depends are systematically violated. For example, cancellation, the axiom that,

If A is preferred to B, then the prospect of winning A if it rains tomorrow (and nothing otherwise) should be preferred to the prospect of winning B if it rains tomorrow because the two prospects yield the same outcome (nothing) if there is no rain tomorrow,

is necessary to represent preference between prospects as the maximization of expected utility (Tversky & Kahneman, 1988:168). Allais' paradox (1953) illustrates, however, that people consistently violate this principle (see Appendix B).

Preference elicitation shows that even the most essential assumption of utility theory – invariance – is not supported. Invariance is the apparently reasonable assumption that,

different representations of the same problem should yield the same preference. That is, the preference should be independent of their description. (Tversky & Kahneman, 1988:169)

Yet in a wide variety of studies (see Dunegan, 1993) framing is shown to make a great difference. In a study of preferences between medical treatments, McNeil et al. (1982) gave patients, physicians, and students statistical information about the outcomes of two alternative treatments of lung cancer. The same statistics were presented to some respondents in terms of survival rates (“90% survive surgery ...”) and to others in terms of mortality rates (“10% die during surgery ...”). This inconsequential difference in formulation produced a marked effect. The overall percentage of respondents who favored radiation therapy rose from 18% in the survival frame to 44% in the mortality frame. Moreover, the framing effect was not smaller for experienced physicians or for statistically sophisticated business students. In replications, Tversky & Kahneman (1986:S260)

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<sup>5</sup> This influential work is a brief chapter of the magnum opus founding game theory. Von Neumann & Morgenstern thought it possible that with time and effort the fuzzy concept of utility could become measurable and mathematically operable just as the once-fuzzy concept of heat had become measurable and mathematically operable through the development of temperature scales. Interestingly, the authors' observations on the strategic nature of economic behavior – the “games” people play – actually adds to the “Herculean challenge of rationality” that Simon posed. Even assuming infinite informational processing capabilities, optimization is infinitely difficult because my action leads you to take actions which alter my environment in unforeseen ways. As a player, you know this and try to influence my actions. Etc., etc. ...

observed that, even once the inconsistency is explained, respondents persistently hold on to the two conflicting frames, maintaining an ambivalent “wish to remain risk averse in the ‘lives saved’ version and risk seeking in the ‘lives lost’ version.” (Although they also do want to be consistent.)

#### **1.4. Flawed decision makers, studies, or theory?**

This striking discrepancy between empirical studies of choice behavior and predictions from utility-based theory means there is something wrong with either the decision makers, the studies, and/or the theory. The common wisdom is that human beings are seriously flawed decision makers, but there are two other possible explanations: Studies may not reflect real choices made under real circumstances or utility theory may be inappropriate as a general normative basis for choice. I consider each explanation in turn.

##### **1.4.1. Human, all-too-Human?**

When students first hear of framing experiments and a long list of other “heuristics and biases” uncovered by behavioral decision researchers (see Appendix D) they are surprised, but they quickly recover and readily acknowledge that people are foolish. It seems incontrovertible that people (especially other people whose decisions affect us) sometimes (often? usually?) make bad decisions. In general, Simon’s explanation carries the day: people are limited information processors who rely on relatively simple rules to make manageable the complexities of the optimization problem. So accepted is this explanation that in this day of reliable machines that “human” as an adjective often means “flawed” (e.g., “human factors”).

In some ways, however, most behavioral decision research seems to greatly *overstate* human rationality. Simon’s examples of limited cognition come from the most extreme of rational activities – chess players and technical experts. Behavioral decision researchers most often use test taking students from elite universities. In common experience, we see around us people driving to gambling casinos in overinsured cars, running up credit card debt often with money in savings accounts, succumbing to temptation and regretting it at the same time, treating loved ones cruelly and then desperately mourning them when they’re gone....

On the other hand, there is reason to suspect “flawed decision maker” as an explanation for these



phenomena. Human evolution has produced a powerful thirty-trillion synapse mind with abilities that far exceed those of science to understand or replicate. Living things evolve remarkable solutions to important problems they face. If maximizing utility really were of central import to humans, we would have built in functions for linear programming. This assertion may at first sound ludicrous, but consider that birds possess algorithms that allow them to navigate by the stars and even ants and bees track location. The kinds of utility optimizing problems done in decision analysis are infinitely easier to solve than others that humans face, such as bipedal locomotion, speech recognition, visual perception, or, as I discuss in Section 2, empathy.

In a parallel question of human intuitive statistical abilities, evolutionary psychologists Cosmides and Tooby (1996) provide compelling evidence that supposed human inability to reason probabilistically is due to the inapplicability of probabilistic reasoning to single events, a concern raised by statisticians in internal technical debates. When problems are expressed in frequentist terms, a more generally accepted ‘technical’ position, people’s intuitive estimates are highly accurate. Likewise, supposed inability to maximize utility may be due to the inappropriateness of utility-based reasoning as an all purpose problem-solving strategy, a concern raised in internal ‘technical’ debates of the discipline which has grappled for centuries over normative frameworks for choice. For reasons I discuss in Section 3.1, few ethicists accept far-reaching application of utility theory.

#### **1.4.2. Utility theory in light of Kahneman & Tversky**

Despite the now widespread belief that people are not-so-good decision makers, utility-based theories of behavior (a.k.a. Rational Choice Theory) have never been more prominent; Green (1994) found, for example, that the percentage of articles using a rational choice perspective in the leading journal of political science steadily increased from 0% in 1957 to 38% in 1992.<sup>6</sup>

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<sup>6</sup> This increasing volume of articles in *Political Science Review* might be taken as evidence of superior scholarship, but Green (1994:6) argues that it is unwarranted fanfare: “... theoretical models of immense and increasing sophistication have been produced by practitioners of rational choice theory, but ... the case has yet to be made that these models have advanced our understanding of how politics works in the real world. To date, a large proportion of the theoretical conjectures ... have not been tested empirically. Those tests that have been undertaken have either failed on their own terms or garnered theoretical support for propositions that, on reflection can only be characterized as banal: they do little more than restate existing knowledge in rational choice terminology.”

Some utility-based theorists have challenged conclusions of behavioral decision research, claiming that experimental results may not reflect real choices made under real conditions. Lopes (1996) argues that subjects in McNeil et. al. (1982) did not consider their choices as fully as they would have in reality. She claims that the different framings represent arguments: on the one hand, we'll be more likely to survive if... on the other hand, we'll be more likely to die if.... The discrepancies represent responses to arguments, rather than a choice made in natural conditions. Other scholars suggest that the laboratory subjects are *too* conscious. Indeed, in the midst of the cognitive revolution, psychology may have come to *overstate* the mediating effect of cognition between stimulus and choice. Lost has been psychoanalytic appreciation of the power of the unconscious, which recent work in the study of emotions has highlighted (e.g., Lazarus 1991, Goleman 1995). Recent findings in neuroscience show that some actions are directed from noncognitive centers such as the hypothalamus and a second "brain" located in the gut (Blakelee 1996). It is possible that these other mechanisms serve to attain optimal outcomes in the absence of conscious reasoning.

A few behavioral economists continue to provide utility-based explanations for even the most apparently inutil actions – for example, Becker & Murphy (1988) explain addiction as the best choice made at any given point during a downward spiral of options – but most contemporary rational choice theorists accept that individuals do not necessarily behave as predicted by the expected utility model. Rather, the theory now rests on an evolutionary imperative: In a competitive world, behavior in accord with the model will aid, if not determine, survival. Moreover, when real-world behavior deviates too far from the equilibrium behavior suggested by the model, at least a few rational individuals will exploit aberrant behavior to their own advantage, and through either learning and adaptation or selection and retention processes, a pattern of rational behavior **MUST** eventually predominate (Bell, Raiffa & Tversky 1988). It's the so-called "hard reality" of this argument, rather than ethical principles or empirical evidence, that's at the heart of economic theory, utility theory, and rational choice – and tends to marginalize those working outside this paradigm, regardless of any other argument or evidence, however insightful or well documented. This evolutionary imperative underlies both descriptive and prescriptive theory, and therefore almost the entire curricula of

management science and strategy, as well as the theory and applications of rational choice in academic disciplines.

In Section 2, I argue that this goal-oriented view of evolutionary process is incomplete and that, by implication, the utility model of decision-making is, at best, overextended. Careful analysis of the actual selection and retention processes that shape what and who we are leads to very different descriptive and normative models of decision-making.

### 1.4.3. An alternative: Logic of appropriateness

The analysis points to a rationale for March & Olsen's (1989) "logic of appropriateness." In contrast to the familiar logic of consequence – reasoning based on preferences, alternatives, and expectations – logic of appropriateness requires reasoning based on identity, recognition, and rules. The decision maker, implicitly or explicitly, must answer these three questions:

- \* Who I am?
- \* What is the situation?
- \* What does a person such as myself do in a situation such as this?

Although this logic is unfamiliar to decision theory, March notes that it is immediately recognizable both in common experience and in other theories of behavior. Individuals learn from parents, schools, peers, and TV what it means to be a mother, a manager, a college student, or a man

... political scientists talk about the importance of institutions, anthropologists about culture and norms, sociologists about roles, and psychologists about identities, production systems, and schema. (March 1994:58)

That people often follow rules rather than reason consequentially is not a new observation. Economists explain this as a function of information and experimentation costs, making the point that cheap imitation is often more efficient than costly optimizing (Conslisk 1980, Nelson & Winter 1982). March (1994:79-95) himself suggests that rules and identities may be useful because they capture with at least some degree of success the wisdom and experience of the past. True enough, but in this essay I propose a more direct rationale: that we use alternatives to consequential reasoning primarily because reproduction is often enhanced by adopting roles that *limit* personal utility.

## 2. EVOLUTIONARY CONSIDERATIONS ON DECISION-MAKING

Rational choice theory makes much of “selection” process, but finesses the role of reproduction and helping of progeny, and addresses only superficially the role of the group. Here I argue that an economic “evolutionary” foundation based on the favorable effects of self-interested behavior ignores more prominent features of the human condition: interdependence, dependence, and death.

Throughout this section, I consider evolution both of genetic proclivities as it is commonly used in biology and psychology (Darwin 1859, Wilson 1978, Dawkins 1989, Buss 1995) and evolution as it is used within the social sciences to examine the change over time of rules (e.g., Axelrod 1984), routines (e.g., Nelson & Winter 1982), values (e.g., Wiener 1988), and other aspects of culture (e.g., Harrison & Carroll 1991) or identity (e.g., Atkinson 1989). Whatever position one takes in the nature vs. nurture debate, evolutionary analysis yields the same conclusion: neither genes nor values need necessarily benefit (as we normally understand the term) their human carriers; they must simply be successful in *propagation*. Biologists observe that the key to genetic survival, and therefore biological proclivity, is not individual success or even survival, but rather genetic reproduction; for a human gene or genetic trait to survive, its carrier must mate and guide progeny toward successful reproduction. Likewise, those studying rules, routines, values, culture, and identity also come to emphasize various factors of *transmission* (Cavalli-Sforza & Feldman 1981, Cavalli-Sforza 1988) rather than their instrumental value (utility).

### Assumptions of Evolutionary Reasoning

Evolutionary psychologists understand the human brain and mind as an integrated bundle of complex mechanisms (adaptations), each “designed by natural selection in past environments to promote the survival of the genes that directed its construction by serving some specific function.” (Symons 1992:138). A rigorous evolutionary approach to understanding behavior (Symons 1992; Cosmides, Tooby & Barkow 1992) is based on adaptations that occurred in response to selection pressures of the Pleistocene era, the period in which these researchers believe most attributes of the mind and body were formed, and in which people lived in tribes as hunter-gatherers.<sup>7</sup>

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<sup>7</sup> Even allowing for uncertainty about how much of our evolution occurred in the Pleistocene era and the nature of life and conditions in the period, this approach has demonstrated success in generating hypotheses that are often

Findings in decision research can be understood from such evolutionary considerations. For example, Klein (1995) finds few “decisions” *per se* among firefighters and others in life and death situations, but rather that a particular pattern leads directly to a particular response (see Appendix C). His respondents claim that “intuitive” responses have at times saved their lives. Such a capability would have had similar survival value in the Pleistocene era, where pattern changes often signaled danger. Concretely, Pleistocene survival would depend much more on intuitive responses to avoiding catastrophe than calculative reasoning.

## 2.1. Interdependence

### 2.1.1. Importance of the Group

It seems reasonable to imagine that Pleistocene survival also depended more concretely upon the success of the tribe and one’s relationship within their tribe than maximizing personal utility. It’s ironic that in the public mind evolutionary processes tend to be exclusively concerned with competition; in both biological and social science, researchers are more likely to study and emphasize the importance of *cooperative* phenomena (Barkow, et al. 1992:22; Axelrod 1984). Pleistocene life, as we understand it, required that one work with others as part of a hunting party, homemaking unit, and other such groups – depending concretely on others for sustenance and shelter. Presumably it was very difficult to leave the group to join a “better” one or to go it alone. A proper appreciation of the importance of the tribe and one’s place in it leads to viewing the role of reason in a new light – any practical value in intellectual capabilities is contingent on the trust of the group. The ability to outsmart one’s tribesmen is a dangerous gift. Aristotle (338 BC/1958:153) relates the unspoken advice

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substantiated by further research. Using this approach Profet (1992) explains why women get morning sickness – to deter ingestion of a material that was potentially hazardous to embryos. Cosmides & Tooby’s (1992) hypotheses of cooperation as implicit social contract leads to mapping of mental capabilities and experimental tests used to produce the findings cited earlier on probabilistic reasoning (Cosmides & Tooby 1996).

Important academic work in this area includes special journal issues of *Journal of Social Issues* v.47(3) (ed. Caporael & Brewer 1991), *Psychological Inquiry* v.6(1) (target article: Buss 1995), *Behavioral and Brain Sciences* v.17(4) (target article: Wilson & Sober 1994; continuing commentary in v.19(4)); two volumes of commissioned articles originally presented at Stanford conferences (Barkow, et al. 1992; DuPré 1987), and many books such as Buss 1994 and Pinker 1997.

What I have proposed is broadly consistent with ‘hierarchical evolutionary theory,’ (Buss 1987; Eldriedge & Grene 1992; Wilson & Sober 1994, 1996; Caporael & Brewer 1991, 1995) according to which “interdependence at the group level serves as the primary strategy for survival – the group providing a critical buffer between the individual and the physical habitat.” (Caporael & Brewer 1995:32).

given by an ancient king when asked how to deal with potential rivals: the king took his student out to a field of corn and proceeded to level the tops, lopping off all the outstanding tassles. On the other hand, there would have been – and continues to be – great value in fitting in gracefully, and making others like and want to help you. Trust is easier to win when one poses less of a threat. Enfeebled ability, however, is fortunately not the only way to be less of a threat.

Endeavor in artificial intelligence has shown that logical-mathematical tasks which people find difficult (e.g., differential equations) are remarkably easy for machines, whereas tasks which people find effortless (e.g., language recognition) prove incredibly challenging, almost intractable (Pinker 1994). People are amazingly good at understanding others, even when few or no words are spoken. We have a further gift of empathy, an ability as yet unthinkable for computers. People often know how others will feel about their actions without verbal communication or direct contact. Such understanding allows individuals to fit in and work with others. These remarkable human attributes and their evolutionary importance suggest a human proclivity for reasoning using a logic of appropriateness rather than a logic of consequence.

### 2.1.2. Importance of “Ethical” action

Even utility studies cognizant of interpersonal interactions find a surprising benefit for non-opportunistic, *ethical* action. Axelrod (1984) invited decision theorists from a variety of fields to enter programs to compete in a round-robin iterated Prisoner’s Dilemma tournament along with a program of random cooperation and defection. The winner of both this tournament, and a subsequent more heavily publicized one, was TIT-for-TAT, a program that simply rewards cooperation with cooperation and punishes defection with defection. This surprising result<sup>8</sup> was achieved despite its being the simplest program – only four lines – and the fact that it cannot possibly win any given game.<sup>9</sup> TIT-for-TAT won the tournaments by eliciting behavior that allowed both it

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<sup>8</sup> Although TIT-for-TAT’s superiority may seem obvious in retrospect, in each of the two tournaments only a single entrant submitted the program. The entries of the first tournament were submitted by 14 eminent scholars who had studied and written on the Prisoner’s Dilemma; the entries in the second tournament included submissions from 62 scholars who had seen the results of the first.

<sup>9</sup> The best TIT-for-TAT can do is tie. If there are no defections it’s a tie; otherwise TIT-for-TAT is always a defection behind. The wins were also achieved despite contest considerations that seemed predisposed *against* TIT-for-TAT: it is a known poor-performer against the random program and total payoff for a single defection was close to mutual

and its “opponent” to do well.<sup>10</sup>

Outside of such stylized simulations, TIT-for-TAT implementation is far more complicated than in a lab experiment. It’s often difficult to know when one’s associates are cooperating or defecting, and even more difficult to determine and execute the appropriate TIT to reward or punish the relevant TAT behavior. But that’s largely what ethical reasoning and appropriateness is all about, and it’s primarily to deal with this challenge rather than maximization functions that we need our sophisticated brains and complex reasoning abilities.

## 2.2. The rest of the evolutionary story: Dependence, Reproduction, and Death

As important as this point is about interdependence, the argument I want to make goes far beyond. I propose something that, as I say it, appears trivially obvious, but is neglected in current theory – that adult survival is of limited importance in human evolution. Equally essential is the need to reach adulthood, mate, and successfully direct progeny, and for all of these processes the value of utility-maximizing is even more suspect; pure utility-maximization would probably lead to reproductive failure. The exigencies of human reproduction, even more than survival, require reasoning about appropriateness and morality. They also require the flexibility to change goals and

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cooperation but much higher than for mutual defection. Additionally, the first contest was fixed length, allowing other programs to defect on the last move without fear of retribution.

<sup>10</sup> This was just one of many fascinating observations and lessons Axelrod drew from these tournaments. Other findings of particular relevance to themes discussed in this article include:

Nice programs – those that never defect first – almost always did better overall than other programs because they do so well with each other. Moreover iterated tournaments, in which successful programs multiply and poor performers die, illustrate an additional problem of sophisticated defection: One opportunistic program that managed to score well against low ranked entries faced fewer and fewer strategies it could exploit as these exploitable entries were weeded out. A not nice strategy may look promising but in the long run it can destroy the very environment it needs for its own success. (p. 117)

Maximization programs did poorly. Despite sophisticated attempts to make inferences about the other player, these inferences were often wrong. Worse, their *own* behavior lead to counter-productive reactions. Probabilistic strategies too complex were sometimes perceived as random and yielded total defections. In a zero sum game it’s good to keep the opponent guessing. In a non zero-sum game, cooperation is encouraged by clarity.

“Forgiving” strategies also do well under some circumstances, such as under noisy conditions or with bellicose opponents determined to punish even justified retribution. Indeed, economic analysis generally concludes that revenge is irrational because past opportunism is a sunk cost (recall the ancient Chinese aphorism, “He who plots revenge should dig two graves.”) In contrast, TIT-for-TAT seems the ethical, if sometimes irrational response to unprovoked defection. But in the long run, forgiving strategies are exploitable by defectors and TIT-for-TAT is not. TIT-for-TAT does well because it is a balance between punishing and forgiving. Extracting more than one defection for each defection risks escalation; extracting less than one-for-one invites opportunism.

priorities as the situation demands.

### 2.2.1. The Biological Life Cycle

To reach the age of reproduction requires not wits but love. Human babies enter the world completely dependent, and live only because someone feeds and cares for them. To continue to receive care and survive, children must learn the rules of the providers.

Reproductive factors differ for men and women, but two general requirements hold:

- ability to attract/seduce/impregnate a mate
- willingness to have and nurture children.

One might imagine that effective consequential reasoning would aid in the mating game, but even the prototypical calculator, Machiavelli, emphatically rejected this idea in his famous metaphor:

... it is better to be impetuous than cautious, because fortune is a woman ... We see that she allows herself to be taken over more by [bold] men than by those who make cold advances; and then, being a woman, she is always the young man's friend, because they are less cautious, more reckless, and with greater audacity command ... . (1513/1964:215)

Virtually everyone who has ever written on such matters believes that nothing is so contrary to romance, the prelude to procreation, as cold logic. Frank (1988) hypothesizes that calculated logic leaves a spouse vulnerable to changing fortunes and wary of making the sacrifices child-bearing entails. To provide at least a possibility of a lasting union and family in a world where commitment is important and fortune changes, people must behave on some basis other than calculated logic.

The whole relation between children and utility is problematic. Although most people want to have children, a desire that could in principle be included in one's utility curve, it's questionable how rational a desire it is. The average parent-to-be probably underestimates the costs and sacrifices involved in child-rearing by a factor of ten.<sup>11</sup> This doesn't mean people shouldn't have children, just that it's a non-rational genetic impulse rather than an accurately assessed consequential decision, and that, in becoming a parent, we sacrifice our own utility for something else. Moreover it begins a lifetime of choices especially infused by obligation. Willingness to have and nurture children is almost in contradiction to strict self-interest – imagine what one could do with all the time, money,

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<sup>11</sup> To say nothing of the pain of *child-bearing*. The Parent's Dictionary (Spear 1997) defines "impregnable" as "A woman whose memory of labour is still vivid."



and energy! At very least, an economically rational woman would not decide to have many. The first thing that family planning agencies do to encourage smaller families is appeal to utility. Commercials in Mexico contrast the well groomed family of four living an orderly middle class life in a nice home, with the overweight, underdressed, overwhelmed mother of six screaming kids living in unruly poverty. Here in America, we have the ad campaign appealing to children not to destroy their options by having a baby.

Having lots of babies or having them young is demonstrably *not* economically rational in terms of lost income and life opportunities (Maynard 1997), but whether behavior is passed on through genes or culture, people are likely to be less economically rational: the offspring of someone who found love and nurturing or unprotected sex more appealing than other, utility enhancing, life options. Some refer to this reality as *de-evolution*. Call it what you wish, but it is the operant selection process. Economic well-being is strongly *negatively* correlated with fertility both within nations (Herrera & Kiser 1951) and between them. In a cross-national sample of 54 countries, Heerink (1994:94, table 3.3.1) finds that the correlation between fertility rate and per capita real income, life expectancy at birth, and literacy are  $r=-.87$ ,  $-.88$ , and  $-.85$  respectively.<sup>12</sup>

To marry and raise a family one must normally assume a role both in a family unit and a larger supporting social structure – both of which demand understanding and empathy, the alternative abilities linked to the logic of appropriateness. The willingness to further guide one's children and grandchildren to successful maturity is almost in contradiction to utility theories. Raising children well requires selfless devotion to particular others – little ones that are most dependent on us and most like us. It conflicts with both *self-interest* and the utilitarian's professed concern for the greatest good for the greatest number, wherever and whomever they might be.

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<sup>12</sup> Although I'm speaking here of current times rather than Pleistocene conditions, the point is important because evolution is an ongoing process. The population mix is always changing as a function of propagation.

The term *de-evolution*, incidentally, betrays not only bigotry but a fundamental misunderstanding of evolutionary process. It implies evolution as a progression or march toward some inexorable end (i.e., greater intelligence) rather than a dialectic – an increased probability of replication in a given environment, which in turn is also changed as a result of population change and activity.

### 2.3. A parallel process for identity evolution

Biology provides important clues for what to expect in terms of cognitive proclivity, but human beings are not simply, or primarily, arrangements of genes. When we think of ourselves, we are more likely to think of values, beliefs, and other aspects of our identity. This spiritual side also undergoes an evolutionary process in which utility considerations are less central than those of transmission.

One could look at human identity and human organism as a symbiotic relationship. Values, rules, beliefs and routines are in this sense like bacteria that live within bodies. Such bacteria can adopt “strategies” along a continuum from exploitative to beneficial. Beneficial bacteria improve their survival chances by improving those of their host. Harmful bacteria can suck the life out of their hosts to their temporary advantage, but must then find new hosts to exploit. Particularly pathogenic bacteria and viruses probably produce public fear out of proportion to the true risks because virulence almost always decreases over time; bacterial and viral survival is a direct function of *amenability to a host*. Aspects of identity can be viewed on similar terms. Just as individuals and organizations seek identities, identities are out there in legend, books, movies, and (human) models seeking host bodies, organizations, and most preferably, institutions in which they can reside and propagate. Bizarre new identities arise periodically (e.g., at time of this writing the latest trend in fashion advertising and magazine covers is a style referred to as “heroin chic”) but these virulent identities usually burn themselves out. Those that are the most supportive of the beings that house them and that facilitate reproduction have an evolutionary advantage. But, as with genetic proclivity, survival advantage is not the only evolutionary consideration.

The existence and extent of a given cultural trait or aspect of identity (e.g., religious identification) – is based less on the utility it provides to individual adherents than on the motivation of these adherents to try to instill it within others. Particularly important is the effectiveness of a dictum to “go forth and multiply.” Two points relevant to the general argument emanate from this observation: first, to the degree that reasoning practices are learned rather than genetic, people are more likely to think ethically than consequentially simply because ethically-minded parents and teachers normally are more motivated to instill their style than consequentially-minded parents and

teachers; second, the particular values that are incorporated as part of the identity are passed along on the basis of ethical actions rather than calculated reason. We are who we are because someone took the time and trouble to make us as we are. Our values will be passed along to the next generation partly on the basis of what these values can provide, but also in part based on the time and trouble we take to pass them along.

Studies of collective action, for example, show that people are recruited to social movements on the basis of personal relations. Marx (1851) argued that worker readiness to arms is a function of “class consciousness,” which arises through concrete relations with other workers, and network researchers have demonstrated that this is the key explanatory factor in a variety of social action and social identification studies. Through meta-analysis, questionnaire, and participant-observation, Snow, Zurcher & Ekland-Olson (1980) conclude that participation in political and religious movements is due more to proximity, availability, and interactions than psychological /dispositional factors.

#### **2.4. Summary of evolutionary argument and findings from behavioral decision research**

Ability to reason pragmatically toward achieving a goal may have evolutionary benefit, but not so much as is usually assumed. More important and usually overlooked is the ability to fit into the social support system and the inter-generational continuum – to get support, to work with others, and to be supportive. This ability requires reasoning based not on consequence, but rather appropriateness (rules) and ethics (responsibility). From an evolutionary perspective, we would expect behavior that permits one to get along, to seduce and be seduced, and to love and give to others – especially those others for whom we feel responsible (children and kin; students and kindred spirits). If possible, it would be even better if we could shift roles to do all of these things as appropriate.

From this perspective, the fact that different frames elicit different preferences as per Tversky & Kahneman (1981, 1986) makes good sense. As we move in and out of different roles, we change not only our behavior but also our *goals*. My goal as warrior or hunter may be to kill; as a father it is to bring life forth. Inconsistency in goals, behavior, or thinking patterns, is, I propose, *not* a

cognitive limitation, but rather a cognitive adaptation that allows us not only to play the different roles life demands of us, but also to understand others and their positions.<sup>13</sup>

### 3. ALTERNATIVE DECISION-MAKING MODELS

Part of the lure of rational choice theory is the lack of alternative accessible worldviews. One fairly *inaccessible* alternative is Kantian moral reasoning. The reader probably would expect a descriptive model to precede a prescriptive one both in the organization of this article and in our common epistemology, but I begin with prescriptive framework because that is where the only well-developed alternatives exist. If today there are one hundred scholars ready to tell us how to make a decision for each observer of the process, over history the comparative ratio has been probably more like 10,000:1. The decision-advice business has always enjoyed strong demand across the entire human spectrum. How we actually make decisions has never had the same exigency. So it's not so surprising that we find a usable alternative prescriptive model off the shelf (3.1), whereas we will have to cobble together a descriptive model from more basic elements (3.2).

#### 3.1. A prescriptive alternative to rational choice: Kantian moral reasoning

Utility theory seems to offer a prescriptive model that's hard to argue with – a path to achieve our ends better – but the best minds from the past three millennia have worked out quite different prescriptive models. The traditional field of prescriptive decision-making has been ethics – as a field it has far more and far longer collective experience than decision science at prescribing what choices we should make.

##### 3.1.1. Ethics, utility, and influence

Ethicists, however, have little influence in strategy or management theory. Ethics do not seem to help us get what we want; sometimes they get in the way. The only apparent way one can derive utility from ethics is if *other* people follow certain rules. An individual seeking to maximize his utility would say, “Perhaps if everybody followed Kant’s categorical imperative or the Golden Rule, the

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<sup>13</sup> I believe it is to facilitate this shift that hunting parties, war parties, and sports teams have elaborate pre-hunt/ battle/ game rituals. Prescriptively, this theory implies that the perpetual incidents of violent criminal conduct by professional and school athletes might be ameliorated if those engaged in sanctioned violence were to hold *post-event* rituals as well to smooth the transition back to normal life.

world would be a better place, but why should *I* follow it?" The same is true even for utilitarian prescription. We see ourselves as trapped in an unending series of prisoners' dilemmas dependent on the behavior of others. But perhaps this bondage is an unfortunate illusion of utility preeminence. An individual has ethical intuitions about what he *himself* should do. Presumably these served some survival/ reproductive function; otherwise it's unlikely we would have them – they almost certainly add to the complexity of the human brain.

### 3.1.2. What ethicists and ethics do

One problem with ethical intuitions as a guide is that they are often hazy, conflicting, and highly contextual. Part of what ethicists do is collect and refine intuition. Ethicists have been thinking for millennia about identities, rules, roles, and situations: what functions they serve, what to do when they conflict, and what to do when they conflict with utility. To the degree people do follow prescriptive models, it is far more likely to be an ethical code than a utility-based decision aid. Perhaps the central proposition of this essay is that *normal ethical intuition and ethical reasoning allow individual human beings to function as part of a community and continuum, which is the most essential condition of individual survival and propagation.*

Relatively few ethicists subscribe to utility theories, and of these most are utilitarians; virtually no philosopher argues for self-interest as an ethical basis for life.<sup>14</sup> Many more are deontologists – prescribing that one should act in accord with *duty* regardless of consequences. Probably the most highly regarded deontologist, and perhaps the most highly regarded figure in western ethical thought is Immanuel Kant (1724-1804). It is not my intention to argue for the truth of Kantian ethics or its superiority to other systems, deontological, utilitarian or otherwise but merely to show that viable alternatives to utility theory can and do exist. In particular, I propose that, as a prescriptive decision-making model, *deontological ethics may aid in intergenerational survival and human fulfillment and that Kantian thoughts on human reasoning propensities are consistent both with evolutionary analysis and “anomalous” findings of behavioral decision research.*

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<sup>14</sup> This is a position held by Ayn Rand who has a remarkable almost cult-like following, but Rand is not considered a serious philosopher. Even her best works, *Atlas shrugged* and *The fountainhead*, although arguably compelling fiction, seem riddled with critical contradiction: Why, for example, do her heroes endure such sacrifice and pain to save the world for self-interest? The whole notion of such heroes contradicts her narrow self-interest argument.

### 3.1.3. Kant on the purpose of reason

In *Grounding for the Metaphysics of Morals*, Kant (1795) asks, “What purpose does reason serve?” He concludes that rather than acting in the service of self-interest, reason must serve to *overcome* self-interest:<sup>15</sup>

- 1a. Happiness, “by which we mean self-preservation and welfare,” cannot be the goal of reason because if that were the case, “nature would have hit upon a very poor purpose for reason ... this purpose could be attained much more certainly by instinct.” People are most happy doing what comes naturally. In fact, this is almost what we mean by happiness.
- 1b. Yet reason rather than instinct controls the will.
- 1c. The true purpose of reason must be to overcome instinctual inclinations for happiness, i.e., to perform one’s duty.
2. Moral worth (duty) is based on intent, not result. People are extremely limited both in ability to achieve effects and capacity to divine them, but we do possess a reasoning faculty capable of understanding duty. To act morally is to act on the basis of law or principle; moral worth, therefore, is based on these principles and our adherence to them, not on results, which are often the product of chance and beyond our capacity to control.
3. Duty is the necessity of action done out of respect for moral law.
4. From these three propositions, we can derive the law that identifies duty. There is only one principle that satisfies the condition of universality demanded by pure reason: Before choosing a course of action in any circumstance, we may ask ourselves, “What would happen if this action were formulated as a general rule?”

The Categorical Imperative: *I should never act except in such a way that I can also will that my maxim would become a Universal Law.*

Example: Consider the case of breaking a promise under duress: Were we to claim it is acceptable that one break a promise under duress, then what does “promise” mean? We could no longer count on anyone for anything. Thus it becomes clear that there is no way that we may break our promise while still acting morally.

This is a test ideally suited to human reasoning ability: To be morally good requires no far reaching acuteness to comprehend all the variables in a given situation and divine future consequences. As human beings, however, we *can* readily understand and apply this principle. The difficulty lies in accepting it, when it is more pleasant to ignore.

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<sup>15</sup> I’ve taken considerable liberties in simplifying and paraphrasing key points from a long, dense, very complex argument (from Kant standard reference pages 387-405).

Relevant to this article, it’s interesting to note that well before Darwin there was a working theory of functionality: that God created everything for a purpose.

To summarize Kant's view, reason is not in the service of self interest, but rather *serves to overcome self-interest*. This faculty allows one to function as part of a social system by providing the ability to understand and fulfill various roles (duty). Reason also permits a person to understand and fulfill the responsibilities demanded to bring forth progeny, guide them to maturity, and, if necessary, help *lead* the group.

#### **3.1.4. Empirical research on how good decisions are made**

A prescriptive model of decision-making requires that one distinguish between good and less-good decisions, but how to define "good" is precisely what's at issue in most debates. I have put it forth as an empirical question, but aside from an unpublished study by Jones & Frisch (1992) no one has yet analyzed it as such (see Section 4.2).

Anderson (1983) studied the Kennedy administration's decision-making during the Cuban Missile Crisis in part because of the unusual degree of consensus among historians that these decisions were exemplary both in outcome and process. In his analysis, Anderson found several deviations from the standard prescriptive model. First, there was no attempt to optimize: Rather than attempting to choose the one best alternative from a set of competing courses of action, the decision makers considered a series of yes-no choices. Second, they were loss averse: Rather than try to solve a problem, their first priority at each decision point was to *not make matters worse*. Finally, *goals*, rather than being identified from the beginning, *emerged* as participants discussed the issues. Consistent with the demands of a logic of appropriateness, their discussion presumably helped them to better understand the nature of the crisis, as well as their own roles and responsibilities in its resolution.

### **3.2. Toward a (propagative) descriptive model of decision-making**

The considerations of Sections 2 and 3.1 lead to a search for characteristics quite different from the classical perspective. Over the past forty years, behavioral decision theorists (e.g., March & Simon 1958; Cyert & March 1965; Tversky & Kahneman 1974; Nelson & Winter 1982; Kahneman, Slovic & Tversky 1982; ) have searched for heuristics that allow decision makers to roughly approximate optimal utility in the face of cognitive limits. While this has been an important and

fruitful endeavor, it is only part of the story. Entities and ideas must not only survive, but also propagate. The search I propose is for characteristics that (1) would have supported propagation in the settings in which we evolved, and (2) are conducive to the maintenance and propagation of modern identities. These include motivations that correlate with propagative success, behavior removed from the domain of reason, special competencies in working together, and – most contrary to received wisdom – *malleable* goals.

### 3.2.1. Malleable goals (Goals as artificial)

I have argued that people are not motivated primarily to maximize utility – however vaguely the term is defined. Earlier I claimed that if maximizing utility really were of central import, we'd have built-in calculators. Indeed, nature periodically runs an experiment producing people with fantastic calculating abilities, but no ability to empathize or consider others' feelings – they are the idiot savants made famous by Oliver Sacks (1985, 1995) and the movie *Rain Man*. In natural settings it's unlikely such individuals would survive or reproduce; conversely, people who can barely count and commit every one of the decision defects listed in Appendix D manage to survive (often quite happily) and reproduce. Sometimes they even become rich, famous, and idolized.

The expectation of Von Neumann & Morgenstern that utility would become measurable and mathematically operable has not come to pass and never will. Nor will any other first principle of motivation ever be discovered. Rather, we are motivated by a wide variety of ends that correlated with reproductive success in our ancestors,<sup>16</sup> and especially important among these sources of motivation is need for group belonging. As such we necessarily have what Bion (1952, 1975) referred to as a social valence: we adopt certain goals that allow us to fit into a group.

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<sup>16</sup> Indeed, utility theory has probably remained an unnecessarily abstract and empty concept. For all the work of economics, it does not really explain much: mostly that people prefer more than less of unambiguous goods such as money – but *even then* psychologists find many cases where they voluntarily accept less. Utility is potentially much more concrete. An evolutionary approach can posit goods and values that should be reasonably consistent even across cultures because they correlate with reproduction in the environment in which humanity evolved: security, survival goods (food, shelter, clothing), spouse(s), children, knowledge, friends, goods that make one more sexually attractive, status-providing goods, etc....



### 3.2.2. The role of reason

Until now, I have primarily considered a theory of behavior rather than decision-making *per se*. Here I consider the implications of this theory for decision-making proper. One need not agree with all of Kant's views to accept that happiness and pleasure, the ends most commonly associated with utility, tend to obtain more readily from instinctual behavior than from reason.<sup>17</sup> Likewise, important survival and reproductive mechanisms such as fear, anger, hunger, and sexual desire are largely decoupled from the reasoning process.

Reason, in contrast, seems to be a tool uniquely suited to understanding, in particular understanding people. It provides us with insight into motivations (both our own and others') and a sense of justice and propriety. If the calculus of optimization seems unnatural, a calculus of fairness and reciprocity seems almost *too* natural. Jackall (1988) observes that managers who systematically try to ignore and push down all the details of operations in their business can never get enough details about other people with whom they interact. My guess is that other people – what they think and how they might react – play a big part in most reasoning processes.

### 3.2.3. Why this section is unsatisfying

This section (3.2) is both the most important and the least satisfying part of this article. It's most important because we can hardly explain a process, let alone prescribe how to do it better, if we don't have an adequate description of it. Yet that is the situation as it stands. It's the least satisfying because it is little more than speculation – the work which is prelude to writing it well has yet to be done. In the final section (especially 4.4) I consider what some of the work might be.

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<sup>17</sup> This is not to say that reason is *never* used in the service of self interest. For example, the more reasonable among us occasionally refrain from sugar consumption, despite a proclivity to indulge. My point is that reason is also used, indeed *more* likely to be used, in the service of duty and appropriateness. Even in the case of reason as used to resist temptation, self interest alone seems an insufficient motivator; for example, it's often only when it's clear that others are dependent on them, that addicts give up their addictions – Xxx (199x) documents that impending motherhood is one of the few successful motivators that help young women overcome drug and alcohol addictions.

## 4. SUMMARY AND IMPLICATIONS FOR RESEARCH

### 4.1. Summary

In this essay, I explain the utility basis of decision-making, noting a serious gap between theory and findings. I ascribe this gap to an overextension of utility theory and show that it rests upon an evolutionary argument that is seriously incomplete. A more complete analysis of evolutionary process mitigates an expectation that people should have well developed consequential reasoning abilities and proclivities. Rather, we would expect important advantage in being able to reason about roles, interpersonal rules, and situations – the kind of logic of appropriateness that is consistent with empirical findings in decision-making. I propose also that this evolutionary process applies to our identities as well as our biological proclivities. In Section 3, I offer Kantian moral reasoning as an alternative to utility-based consequential reasoning for consideration as the basis of a prescriptive decision-making model, and lay out some characteristics of what we would expect to find in a descriptive decision-making model cognizant of the fundamental importance of propagation. I conclude with implications for research.

### 4.2. Context and goals

The purpose of this article is not to reject utility theory, but to point out that goals – and therefore utility – are artificial, that goals are necessarily vague and malleable and part of a larger social context and process. There is nothing new about the idea that context shapes goals – much of anthropology and sociology is about *how* context shapes goals, but this insight has not been incorporated into most psychological and economic theories of behavior. This article helps lay the micro-foundations for a wide range of social theory which documents the importance of social relations and influence, but has seemed inconsistent with economic reality and individual competitive exigencies. A proposition that emanates from this analysis is that the various roles a person takes on shape choice *and goals* as different standards of appropriateness come to the fore.

One way to begin to empirically research the relationship between frames, roles, and goals would be to explore “implicit” frames. This theory suggests that setting (e.g., home, office, vacation) and the people one is with will affect goals and decisions.

### 4.3. Good decisions

What most people want to know from research on decision-making is how to make good decisions. Consistent with the two strategies put forward in this article, there are two ways to approach this question: If we look first at consequences, we ask, “What decision processes produce good outcomes?” (4.3.1) If we look first at appropriateness, we ask, “What are the processes that good decision-makers employ?” (4.3.2)

#### 4.3.1. What is (empirically) a good decision?

Prevailing wisdom is that good decisions are either those which emanate from a goal-based decision-making process such as decision analysis (e.g., Keeney 1982, Hogarth 1987) or which best meet pre-defined goals. Here I have proposed otherwise: that good decisions may flow from a deontological decision process such as that proposed by Kant. The question has largely remained in the realm of philosophy as both utilitarians and deontologists claim that their assumptions flow from philosophical principles, but the question can also be approached empirically: What do people mean when they say something was a good decision? Even a subjective ex-post evaluation of different decisions and decision-making processes would be valuable.<sup>18</sup> What’s behind the everpresent notions of "good" and "bad" decisions? Everyone wants to know how to make better decisions. Isn't there anything experience or science can tell us? If not, why do these notions of "good" and "bad" persist? Why do we try to learn?

One possibility might be to study decisions of consequence and conflict – e.g., who and whether to marry; or choice of jobs, careers, homes, and schools – and see which decisions, when we look back with experience, we judge to have been wise versus those we feel were foolish. Is there any pattern or process that prevails? In this essay, I suggest that decisions emanating from a logic of appropriateness may be viewed subsequently as favorable to those based on expected consequences.

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<sup>18</sup> I’m aware of no such work in the literature, but in a yet-unpublished study, Jones & Frisch (1992) asked subjects to describe good or bad outcomes that occurred in their lives and to describe the thinking that led to the outcome. They found good outcomes were associated with rational deliberation, but didn’t tease out the different kinds of rationality that I have considered here.

### 4.3.2. Comparing good and not-so-good decision makers

The question of who is a good decision maker is as problematic as the question of what is a good decision, but there are people we look to as models – e.g., mature professionals whom we go to for advice (physicians, consultants), elected representatives whom we entrust with power (at least we trust them more than we do the losing candidates), and those whom we seek to emulate. We also have anti-models, individuals from whom we learn by example what *not* to do– e.g., villains and failures. Within given domains, we can often consensually identify models and anti-models. One could then compare either the process or “defect” level. In this essay I have suggested that, contrary to intuition, some framing effects, loss aversion, and other presumed decision flaws may be *more pronounced* for people we consider good decision makers.

In Section 2, I argued that it is useful to frame matters differently under different contexts, that it is “valuable” to change one’s values as necessary and practicable. Goleman (1995) observes that cognitive reframing is also the *only* consistently successful method for pulling oneself out of sadness, depression, or regret. Weick (1993) and Stone (1997) note that an ability to see from different frames is almost what we mean by “wisdom.”

### 4.4. Decision process analysis: Humanities and science

Since the earliest preserved writings, the learned have been telling us how to make decisions, but I have emphasized in this essay the importance of understanding actual decision processes. Owing in part to the methodological difficulty of documenting thought (even one’s own), few rigorous studies have been conducted on how decisions are actually made. Rather, such endeavor has been left in the speculative realms of psychiatry, literature, and existential philosophy. At the opposite pole of the methodological spectrum, the scientific enterprise of judgment/decision-making research has generally consisted of narrow laboratory studies. Starting with the presumption that the purpose of decision-making is to maximize utility, social scientists have tested how subjects estimate expected outcomes of alternatives. Studies often consist of undergraduates making probabilistic guesses or hypothetical choices in laboratories.

#### **4.4.1. A middle way methodologically**

Both approaches are somewhat less than satisfying. Humanistic accounts can hardly be taken as more than speculation. How can one make inferences from single, often fictitious, case studies? On the other hand, social science seems to be missing the essence of decision and judgment – the sense of conflict, weightiness, responsibility, and even pain that accompanies important choices. Interview and observation processes that draw out subjects' thoughts and emotions, but are conducted with rigorously qualitative methods, could serve as a middle way methodologically to begin to answer important descriptive questions.

#### **4.4.2. What causes a decision?**

For all the presumed importance of decisions, we have little systematic understanding of the function deliberation serves. As Kant asked, wouldn't instinct serve us just as well were welfare our goal? Certainly some choices central to life such as breathing and circulating blood are removed from the realm of decision-making. Over others such as hunger and thirst, we have but little control. Maximizing utility seems a reasonable hypothesis, but evidence indicates a sharp asymmetry. Archival (Freeman 1997) and questionnaire (Jackson & Dutton 1988) studies have shown that managers attend more to threats than opportunities, just as Kahneman & Tversky (1979) showed we more actively seek to avoid losses than win gains. Perhaps this is not a bias, but rather evidence that decision-making is not about maximizing utility. A systematic study of the causes or sources of decision may provide insight into motivation, behavior, and the role of deliberation. My argument of a deontological function of reason suggests that decision processes will often, if not usually, arise from ambiguity or ambivalence concerning responsibilities rather than involve strategies to better realize desires.

#### **4.4.3. What do we mean (empirically) by decision?**

By "decision," I mean the process and product of deliberation, but the term is often used as reflecting any choice even when choice alternatives are never made explicit. A current trend among some decision-making scholars (Langley, et. al. 1994; Klein 1995; Zsombok 1996) takes the deliberation presumption as problematic, suggesting that choices are usually made without deliberation, at least without present deliberation by the supposed decision maker. One way to get a

better definition is to find out empirically how the term is used – what kinds of processes people describe when they describe a decision.

#### 4.4.4. What kind of mental process occurs?

In following March (1994), I have posited two types of decision-making processes – a logic of consequence and a logic of appropriateness. Does one or the other better represent actual mental processes? Do we have goals in mind that we are trying to attain or do we have an identity we are trying to fulfill? It's also possible that both or neither fit. Perhaps there are yet other decision processes and other “logics,” each with a dominant domain, and original adaptive function. Perhaps each of these reasoning processes even has separate, potentially identifiable modules in the brain.

#### 4.5. Liberation from utility and what decision process might tell us

Simon wrote on the weak relation between choice and outcome, but by limiting his empirical domain to chess games and technical experts, he almost certainly *overstates* this relation. I suspect the Arabian night's tale *Appointment in Samarra* (O'Hara 1934) expresses the relation more faithfully (or fatefully). The story goes of a servant who cried that Death had threatened him and beseeched his master a fast horse upon which he could flee to Samarra. The master consented; later that evening when he met Death he asked, “Why did you terrify my servant?” Death replied, “I did not mean to frighten him. I was just surprised to see him here, when I planned to meet him tonight in Samarra.” Even the relation between desired outcomes and underlying interests is problematic. In *The Ideal Husband*, playwright Oscar Wilde (1895) observed, “When the Gods want to punish us, they answer our prayers.” Such warnings are ubiquitous across literary and religious traditions from Seneca to Pogo. (Ainslie, 1994:xi, begins his book on intra-personal economics with a list of such quotations.)

In the face of such tenuous links, human beings may find forever unsatisfying and disappointing the quest for achieving goals that are beyond their ability to control or adequately anticipate. Rather the choices we *do* have are those of particular actions. Sartre (1943) said “One is what one does,” and Frankl (1946) illustrated this compellingly in his remembrances of life in a concentration camp. He recalls how, while what was to become of him was not in his hands, “... every day, every

hour offered the opportunity to make a decision ...” Some inmates were co-opted into service by their oppressors, and many renounced dignity and values in the struggle of personal survival, but Frankl felt the most important aspect of each decision was,

whether you would or would not submit to those powers which threatened to rob you of your ... inner freedom; which determined whether or not you would become the plaything of circumstance (Frankl 1946/1984:86-87).

Social science and philosophy have long distinguished between instrumental goods associated with instrumental acts and goods-in-themselves associated with expressive acts, but in practice, the distinction is less clear: even the most apparently instrumental of acts is unavoidably expressive. Goffman (1974:9) observes that when hanging out the wash we are not merely drying it, but hanging it out for others to see. In the end, Frankl suggests that concern with dignity and meaning is precisely what allowed many to survive the camps.

... most men in a concentration camp believed that the real opportunities of life had passed. Yet, in reality there was an opportunity and a challenge. One could make a victory of those experiences turning life into an inner triumph ...(Frankl 1946/1984:93)

This is an ambitious essay, taking on a large domain and linking many disparate topics, but at its core, I make a modest point: Utility is not the only star in the sky; there are other points of light which illuminate human behavior and which we use as navigational beacons our journeys through life. But this modest point has huge implications. If we accept it, we no longer see human reasoning process as a defective approximation of a utility maximizing ideal, but rather a process to understand for the keys it holds to a different, possibly more satisfying ideal. Unhitching our theoretical wagon from this star will allow us to find guidance from other sources of illumination, and to begin to chart these underexplored sectors of the human firmament.

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## APPENDICES

### Appendix A. Simon's legacy

The Simon challenge to rationality has had an enormous impact throughout social science. Simon created the field of organization theory with his claim that organizations are a solution to psychological limitations: by bounding responsibility, directing goals, coordinating choices, and providing resources and specialized training, the organization makes rational choice possible within a limited context. This theory remains the foundation for much of organization theory today.

Decision techniques, aids, and algorithms are designed to overcome or push back Simon's limits to rationality. But this vision reaches far beyond decision aids; the major thrust of applied social science over the past half-century has been to attempt to reduce inefficiencies attributable to human limitations. Much if not most of the work in the business school and applied psychology is about pushing back the limits of knowledge and consequence, Simon's first limitation. More far reaching yet, the entire enterprise of science and education is widely understood and even more widely justified in terms of this challenge to rationality: Scientists endeavor to push back the frontiers of collective knowledge; educators endeavor to push back the frontiers of individuals' knowledge. Together, scientists and educators endeavor to more parsimoniously express knowledge, that is make it more comprehensible to human beings limited by time and ability. Economists, mathematicians, and philosophers endeavor to push back the frontiers of analytical reasoning. Statisticians endeavor to better estimate consequences of given actions based on empirical methods. Most scientists endeavor to develop models with the explicit aim to predict or project consequences. A whole industry of computing technology endeavors to supplement inherently weak human computational abilities.

More recently, we have also come to focus on Simon's third limitation. Tremendous investment is being made in trying to expand awareness of choices and alternatives. Communications, networks, information and database technologies largely serve to expand awareness of possibilities. Innovation research and ideas such as skunk works (Peters 1983) are designed to further expand our choices.

Interestingly, much less has been done toward better predicting future preferences (Simon's second limitation). If Simon's analysis is sound, this area may represent an important research opportunity. On the other hand, the lack of findings in this area may provide evidence of a problem with Simon's premise of intended rationality.

## Appendix B. Allais' Paradox and the Cancellation Principle

Imagine the following two decision situations – each involving a pair of gambles:

<b>Situation X</b>	Probability of winning	Amount to win	<b>Situation Y</b>	Probability of winning	Amount to win
Gamble 1	100%	\$1,000,000	Gamble 3	11%	\$1,000,000
Gamble 2	10%	\$5,000,000		89%	\$0
	89%	\$1,000,000	Gamble 4	10%	\$5,000,000
	1%	\$0		90%	\$0

Results of Allais' experiments reveal that although nearly everyone chooses gamble 4 to gamble 3 in Situation Y, most people would prefer gamble 1 to gamble 2 in Situation X. This violates the cancellation principle because 89% of the probability in both cases can be canceled out; focusing on the remaining 11% results in a parallel situation. Slovic & Tversky (1974:370) provide a utility argument to try to convince subjects of the logical inconsistency of this pair of choices:

Suppose we had 100 numbered tickets in bowl where one ticket would be selected at random to determine the outcome. The four gambles can thus be represented as in the table below. The payoffs are the amounts that would be won if a ticket whose number appears at the top of the column is drawn.

		Ticket number		
		1	2-11	12-100
<b>Situation X</b>	Gamble 1	\$1,000,000	\$1,000,000	\$1,000,000
	Gamble 2	\$0	\$5,000,000	\$1,000,000
<b>Situation Y</b>	Gamble 3	\$1,000,000	\$1,000,000	\$0
	Gamble 4	\$0	\$5,000,000	\$0

Now if one of the tickets numbered from 12 to 100 is drawn, it will not matter, in either situation, which Gamble I choose. I therefore focus on the possibility that one of the tickets numbered 1-11 will be drawn in which case situations X and Y are exactly parallel. My decision in both situations depends on whether I would rather have an outright gift of \$1M or gamble to win \$5M.

- (a) If I prefer the gift of \$1M I should choose Gamble 1 over Gamble 2 and Gamble 3 over Gamble 4.
- (b) If I prefer the gamble for \$5M I should choose Gamble 2 over Gamble 1 and Gamble 4 over Gamble 3. No other pairs of choices are logical.

But results from Slovic & Tversky's (1974) experimental tests show that subjects' choices are not swayed by even the clearest and most compelling arguments utility advocates can muster. In fact, they are far more likely to be swayed away in the other direction – away from the utility-based position – by Allais' simple argument (from Slovic & Tversky 1974:370):

In Situation X, I have a choice between \$1M for certain and a gamble where I might end up with nothing. Why gamble? The small probability of missing the chance of a lifetime to become rich seems very unattractive to me.

In Situation Y, there is a good chance that I will end with nothing no matter what I do. The chance of getting \$5M is almost as good as getting \$1M so I might as well go for the \$5M and choose Gamble 4 over Gamble 3.

## Appendix C. Klein's Recognition-Primed Decision Model (1995)

Klein asked firefighting commanders to describe their "hardest cases," Classifying 156 decision points they faced in these cases, Klein found the following frequencies:

<u>Type of Strategy</u>	<u>Frequency</u>
Choosing from Preselected Options	0
Concurrent evaluation	18
Novel option	11
Recognitional decision	127

The recognitional strategy is exemplified by the following incident of a laundry chute fire:

... [He] sees that there are flames spreading up the laundry chute. That's simple, a vertical fire that's going to spread straight up. Since there are no external signs of smoke it must just be starting.

The way to fight a vertical fire is to get above it and spray water down. He sends one crew up to the first floor and another to the second. Both report that the fire has gotten past them. The commander goes outside and walks around to the front of the building. He can see smoke coming out from under the eaves of the roof. It is obvious what has happened. The fire has gone straight up to the top floor, and is pushing smoke down the hall. Since there was no smoke when he arrived just a minute earlier, this must have just happened.

It is obvious to him how to proceed... (40-41)

## Appendix D. A partial list of human decision-making "biases."\*

Conservatism: underestimation of extreme probabilities (Edwards 1968)

Gambler's fallacy: belief in streaks of good and bad luck (Tversky & Kahneman 1971)

Small numbers fallacy: overconfidence in inferences made from small samples (Tversky & Kahneman 1971)

Availability: probability estimates based on the ease with which instances can be brought to mind (Tversky & Kahneman 1973)

Hindsight: overestimating the predictability of an event after it has occurred (Fischhoff 1975)

Overconfidence: overestimation of test results and associated probabilities (Einhorn & Hogarth, 1978)

Loss aversion: losses treated differently from gains even when the reference point is arbitrary (Tversky & Kahneman 1979, 1984)

Base-rate neglect: prior probability ignored in making probabilistic inference (Tversky & Kahneman 1980)

Endowment effect: price people demand to give up an object is more than they would be willing to pay to acquire it (Thaler 1980)

Framing effects: equivalent representations of a decision problem evaluated differently (Tversky & Kahneman 1981; McNeil et al, 1982; a wide variety of others summarized in Dunnegan 1993)

Conjunction fallacy: the probability of a conjunction judged more likely than either of its constituents. (Tversky & Kahneman 1983)

"Hot hands" fallacy: belief that basketball players get "hot" and "cold" – unsupported by statistical data analysis (Gilovich, et al 1985)

Sunk-cost effect: current investment based on irrelevant past investments (Arkes & Blumer 1985)

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\* For a more extensive list of 100 articles documenting 20 "human information-processing biases" see Hogarth (1987: Appendix E).