

**The robot, the party animal and the philosopher: an evolutionary
perspective on deliberation and preference**

by

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Abstract

This paper examines the evolutionary fitness of a variety of ways of reaching decisions in early hunter-gatherer societies, in order to derive insights about how economists should view modern consumers. It challenges conclusions reached by mainstream economists Robson, Rayo and Becker about why hunter-gatherers needed sensory rewards and about the kinds of preference systems that would have conferred evolutionary fitness. It argues that evolution favours those with a variety of ways of reaching decisions—programmed, deliberative, intuitive and 'go with the flow'—and that the prospect of sensory rewards serves an evolutionary role by diverting people from thinking too much about what they are doing in situations in which deliberation might interfere with survival or reproduction. The evolutionary role of a reluctance or failure to make trade-

offs is also considered along with the benefits of developing a relatively fixed identity rather than being 'all things to all men'.

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1. Introduction

This paper examines the evolutionary fitness of alternative ways of taking decisions in the context of primitive hunter-gatherers societies, in an attempts to derive insights about how today's consumers choose. It follows the approach of evolutionary psychology which emphasizes that modern humans have had relatively little time to evolve to become significantly different from hunter-gatherers compared with the time that homo sapiens spent evolving into a species fit enough to survive and spread its population far beyond its original East African environment. This approach is commonly used to analyse particular kinds of dysfunctional contemporary choices (for an excellent recent contribution, see Brooks, 2011). For example, modern humans may have an unhealthy desire for high-energy foods because they have inherited a taste for such foods that had evolutionary advantages for early hunter-gatherers: without reliable access to energy-rich foods, those who survived were the ones who took advantage of opportunities to consume energy-rich foods and thus built up calorific reserves that they could run down in times when such foods were not available. Here, by contrast, our goal is to learn some rather more general lessons from human evolution about how economists should expect modern choices to be made.

Modern humans clearly face very different sets of options from those that faced early hunter-gatherers but they generally manage to make up their minds about what to do. If the evolutionary psychology perspective is correct, they must be doing so by deploying, or building upon, whatever they inherited from hunter-gatherers. They might be able to choose via simple inherited tendencies or rules, such as a tendency to follow recommendations supplied by those who

have greater experience (cf. Earl and Potts, 2004). Alternatively, following Lancaster (1966), we may recognize that people might readily choose between modern products because they have inherited preferences regarding the *characteristics* of goods rather than goods *per se*, for although manufacturers often portray their products as offering novel characteristics, these are invariably just novel ways of producing more basic characteristics/outcomes that would have been of interest to hunter-gatherers.

The view of hunter-gatherers presented in this paper emerged as a consequence of reflecting critically on a series of papers published by Robson (2001a, 2001b, 2002) and Rayo and Becker (2007) that set out to present an evolutionary basis for hunter-gatherers developing cardinal utility functions that fit the standard von-Neumann–Morgenstern axioms. In essence, these writers see sensory rewards as having arisen to permit choices to be made by people who had limited knowledge of causal relationships in their environments, with conventional preference orderings emerging via the repeated application of simple satisficing rules to explore their environments. The present paper likewise sees a strong role for simple decision rules and accepts the limited knowledge enjoyed by primitive societies, but it ends up with a very different view from that of Robson, Rayo and Becker. The paper argues that, if we take seriously the perspective of evolutionary psychology, then we should expect to find that modern humans have inherited a pluralistic, context-dependent way of taking decisions that does not necessarily involve attempting to find optimal choices and is commonly at odds with the axiom of gross substitution. The survival of early hunter-gatherers would not have favoured the evolution of people with a one-size-fits-all way of taking decisions that always involved

attempting to engage in constrained optimization in terms of convex preference orderings.

The rest of the paper is structured as follows. Section 2 explore two contrasting views of choice that do not entail decision-makers being motivated by the prospect of sensory rewards and we consider how these ways of choosing could have been favoured by evolutionary selection processes. Section 3 considers how Robson, Rayo and Becker make their case for evolution favouring cardinal utility functions that conform to the von-Neumann–Morgenstern axioms. This is followed in section 4 by a critical appraisal of their arguments. / Section 5 introduces an alternative view based on the evolutionary advantages of having sensory systems that divert attention from thinking, towards action and acquiring experience. Section 6 brings together arguments from previous sections to offer an evolutionary view of the significance of identity that is rather different from that associated with writers such as Akerlof and Kranton (2010). Section 7 concludes, emphasizing the downsides of powerful reward incentives that get in the way of reflecting about the long-term consequences of present actions.

2. Choice without the incentive of sensory reward

There is no inherent evolutionary need for any species to inherit a way of being able to make decisions that involves anticipating the consequences of actions and weighing up the pain and pleasure prospectively associated with each feasible option. Many species manage to survive and reproduce by doing what they are programmed to do, in effect using rules to identify the kind of situation they are in and then bringing into play a rule for what they should do in that

sort of situation. In essence, they operate like robotic devices such as those that can detect and read vehicle licence plates at toll-road entrances and then decide which vehicle owner needs to be sent a bill due to not having purchased credit for using the road.

These decision rules can take the form of inherited instincts. For example, young geese will run for cover if a hawk-like silhouette is moved across the sky above them but they keep foraging if the silhouette is moved in the opposite direction so that it resembles a long-necked bird such as an adult goose rather than a long-tailed bird such as a hawk (Tinbergen, 1951). However, inherited systems of rules may also enable organisms to identify and store further rules, much in the way that a computer can be programmed to recognize a need for a new piece of software, such as a plug-in, or search for an upgrade that it will then download and install. The decision rules incorporated into the organism's repertoire after birth may be constructed unconsciously (for example, via the brain's pattern detection processes functioning according to the frequency with which sets of neural connections have been activated previously—see Hayek, 1952) or via an experimental processes of forming and testing hypothesis (Kelly, 1955) or may be obtained socially.

If Nature mainly provides an operating system that determines which new rules are allowed to be trialled as bases for action, evolutionary processes are likely to have favoured people whose inherited operating systems were to some degree permeable, allowing them to be partially open-minded. This would have facilitate their adaptation to changes in their environment: they would not have been like the giant pandas or koalas that have become endangered due to being unable to consider switching from specific varieties of bamboo or eucalypt

leaves in the face of habitat loss. However, as we shall see in section 6 when discussing the evolutionary economics of identity, there are limits to how permeable a rule system should be if it is to offer an evolutionary advantage.

The creative capacities of hunter-gatherers gave them the ability to change how they dealt with their existing environment and to overcome population pressure by moving into new environments. However, despite being unmatched by other species, their creative capacities were nonetheless finite. To get the widest possible access to potentially useful new decision rules, they needed to inherit an openness to picking up rules from other people who had come up with different creative ideas and made different mental connections—those who suffered from the ‘Not Invented Here’ syndrome that sometimes afflicts modern firms would have been needlessly hampering their chances of surviving and reproducing.

In order to get access to other people’s rules it might be necessary for them to be open to acting in ways that conformed with some of the rules employed by these people. Social groups themselves will threaten their long-run survival prospects if their entry rules require forms of behaviour that are ruled out by those with the potential to make valuable contributions towards coping with insecure environments. Survivors will therefore tend to inherit operating systems that do not so rigidly define their behaviour as to preclude some willingness to compromise. Hunter-gatherers equipped with somewhat permeable rule systems could thereby have engaged in what Spread (2011) calls a process of ‘support bargaining’ that helped them deal with the insecurities of everyday life without referring their choices to any form of utility function.

Decision rules that permit choices to be made without comparing alternatives in terms of prospective sensory rewards can be very simple, as with 'When in Rome, do as the Romans do.' But they can also be formed of complex interconnecting principles and involve the consideration of alternative possible courses of action. As an example of the latter we might consider the ordinal preference systems suggested by Slutsky (1915) and Hicks and Allen (1934). Here, the consumer seeks get as far as possible up what Hicks (1939, p. 18) called a 'scale of preference' rather than having utility functions and seeking to maximize some quantifiable notion of utility. Such a preference ordering allows the consumer to consider alternatives, in contrast to extreme 'cultural or social dopes' who simply conform with social norms (see further, Koppl and Whitman, 2004). However, it too can be seen as if it involves programmed behaviour: if we know the preference ordering and the set of constraints the optimal choice emerges in a predetermined manner; there is no room in the Slutsky/Hicks/Allen framework for the agonizing and hesitation that is frequently observed in everyday life. Moreover, certain kinds of behaviour are ruled out by the assumptions used in specifying such preference orderings.

3. The Robson, Rayo and Becker perspective

Although it is possible to construct analyses of choice that do not entail consumers being motivated by sensory rewards, many economists have not felt comfortable about removing the psychological side of motivation from their models (see Hands, 2010). Decision-making that simply involves following systems of rules seems to lack the reflective deliberating aspect of what being

human often seems to involve. From the standpoint of Loasby (1976, p. 5), choices made in this way are not genuine choices at all.

As well as being predetermined, such choices have no emotional side, yet, as humans, we know that choice can involve entertain thoughts such as fear and excitement about consequences of alternative courses of action. We also know that some prospects make us ‘hot under the collar’, whereas others ‘leave us cold’—in Laaksonen’s (1994) terms, some choices are more ‘involving’ than others. Moreover, Joan Robinson’s (1964, p. 48) view that utility is ‘a metaphysical concept of impregnable circularity’ no longer holds:

neuropsychologists have been able to study the physiological side of sensory experiences and there is now a growing body of knowledge of how sensory inputs associated with particular kinds of activities trigger chemical secretions (for example, dopamine or endorphins) in the brain that then affect of people feel.

Robson (2001a, 2001b, 2002) and Rayo and Becker (2007) draw on some of this research in attempting to provide an account of how cardinal utility functions could have emerged as early humans confronted the challenges posed by their environments. In particular, they employ Damasio’s (1994) ‘somatic marker hypothesis’. This holds that the sensory inputs that people experience from undertaking particular actions will trigger physiological changes in their brains that in turn change their emotional state. It is these expected changes in how one will feel that provide incentives to make particular kinds of choices. For example, nowadays the prospect of being able to experience feelings of euphoria may tempt some people to attend a party at which supplies of the drug Ecstasy are likely to be available, while others may opt for the less risky ‘feel good’

experience associated with consuming a bar of chocolate or a romantic Hollywood movie. Rather superficial approaches to choice may be triggers in modern society by options that evoke somatic markers inherited from early humans: for example, a man may lust after a Ferrari sports car because its styling makes its body somewhat resemble that of a voluptuous female, whereas a young woman may be drawn to a Fiat 500 because its baby-like cuteness stirs her inherited maternal instincts.

Robson, Rayo and Becker do not use the somatic marker hypothesis to discuss preferences for particular kinds of products or activities. Rather, they focus on the possible implications of research findings that suggest sensory processes work by detecting changes in incoming flows of sensory information. Moreover, whereas Damasio sees human decision-making as typically involves both thoughts and emotions, Robson, Rayo and Becker only use the emotional side of his analysis. They try to show how von Neumann–Morgenstern cardinal utility functions could have emerged in hunter-gatherer societies via decision-making processes that combined very simple decision rules with sensory rewards that are supplied according to the deviation of attainments from a point of reference.

Their work also draws on ideas from the economics of organization, with Robson employing intermediation theory and Rayo and Becker applying statistical insights from agency theory. Though their models start out with satisficing behaviour (explicitly so in the case of Rayo and Becker, who use the term on eleven pages of their article, often on multiple occasions per page), they make no reference to the seminal work of Simon (1955, 1957) on satisficing. Similarly, despite going on to show that the satisficing process eventually results

in optimal choices, they make no reference to the classic paper by Day (1967) that attempts to show the same result in the context of firms. Once merged, their lines of thought can be sketched as follows.

Hunter-gatherers were in an agency relationship with the selection environment in which they lived. They did not know for sure how to win the best rewards from their environmental principal. As well as facing risks in reproducing and nurturing their offspring, they had to deal with risks as they chose between different parts of their environment and different techniques for procuring food, along with risks that they would choose food that was not particularly good for helping them survive and pass on their genes. However, they had opportunities to add to their experience by experimenting and they could increase their sample set by studying the outcomes of choices made by their peers. By sampling their choice environments they could acquire knowledge of the probability distributions they faced. Once they developed von Neumann-Morgenstern utility functions, they would be able to assign expected utilities as a basis for choosing. Before they reached that stage, however, they needed a different means of choosing, one that would also lead them to acquire knowledge of the kinds of probability distributions they faced. A simple satisficing decision rule that involved no prior probability beliefs and used past experience to define a reference point to aim for would have been sufficient for this if they adjusted the reference point in the light of the sensory reward they received each time they found a way of doing better. Because the amount of utility they got depended on the outcome of each bet they placed, relative to their updated reference point, their happiness would have fluctuated around a steady mean level. Eventually they would have discovered how to choose optimally

between any initially unknown distributions. They would therefore gradually have become able to cope with each kind of event that appeared in their environment.

What Robson sees hunter-gatherers as doing is akin to what happens when modern consumers purchases products via intermediaries such as supermarkets or mortgage brokers, trusting the intermediaries' expertise and thereby reducing the amount of knowledge they need to be able to acquire and process. The hunter-gatherers trusted the sensory signals associated with particular things or activities and chooses on the basis of these sensory incentives, thereby receiving sensory rewards as intermediate goods en route to achieving environmental fitness. The rival prospect of sensory rewards associated with rival bundles of goods thus gave hunter-gatherers incentives to behave in particular ways even if they did not know how their behaviour would contribute to their success in passing on their genes. For example, being able to enjoy high calories food in unexpectedly large quantities gave them large sensory rewards en route to helping them remain active and keep on finding food and hence survive, but they were attracted to such food by its sweet taste without necessarily knowing how it helped their biological fitness. Similarly, associating pleasure with sex may have resulted in them engaging in sexual activity even in harsh desert environments where conception was rare and it was therefore difficult to make the connection between having sex and having babies.

Choosing on the basis of anticipated sensory rewards also eliminates much of the cognitive load that would arise if people were trying to choose on the basis of ordinal preferences. A hunter-gatherer with ordinal preferences

might easily be able to rate one bundle as equal to, better than or worse than another bundle that was virtually identical. In this case, it would be a matter of establishing whether one bundle had more of something but was otherwise equal to the other, or examining marginal trade-offs in terms of a rule specifying the diminishing marginal rate of substitution in that vicinity. For non-adjacent bundles, however, a very complex process of successive mental pair-wise comparisons with other bundles would be necessary before it would be possible to pronounce which was the best bundle.

4. Critical appraisal of the Robson, Rayo and Becker approach

The models offered by Robson, Rayo and Becker not only acknowledges the limited cognitive capacities of early hunter-gathers. They also allows for evolutionary selection mechanisms to work on far less than would be involved if Hicks-style ordinal preferences were programmed into human genes and passed from one generation to another. If people had Hicks-style preferences there could, of course, be competitive advantages to behaving in a transitive manner, and convexity of preferences would prevent the kind of indecisiveness that proved fatal for Buridan's ass (as noted by Hicks, 1939, p. 22), so genes that generated such preferences during the formation of the brain might indeed get passed on. However, the Robson, Rayo and Becker hunter-gatherers merely inherit a simple decision rule and a tendency to experience utility on the basis of the difference between what they achieve and the reference point they have so far established. The preference ordering is then generated from the interaction between these two building blocks, with the process occurring particularly rapidly if agents can use information about the experience of others when

updating their reference points and assessments of the probability distributions underlying the various environments in which they choose. The implication seems to be that, if von Neumann–Morgenstern utility functions were efficient in evolutionary terms then modern humans would have inherited the same two building blocks and would sooner or later develop their own cardinal preference systems that obeyed the von Neumann–Morgenstern axioms. However, though their thinking is ingenious, it is flawed as a device for justifying the kinds of utility functions that economists commonly assume as foundations for choice.

As previously indicated, the process at the heart of their approach is conceptually rather similar to Day's (1967) analysis of how managers who were using simple satisficing decision rules might, via a process of iteration, eventually end up maximizing profits. Day's point was that economists would still be justified in assuming profits were maximized even if, as Winter (1964) had argued, firms that took their decisions via quick and simple rules could drive out those who took time trying to figure out the best thing to do. However, it needs to be considered whether Winter's (1971) critique of Day's analysis applies in this context. In his reply to Day, Winter pointed out that in Schumpeterian environments of rapid technological innovation and associated surprises, firms may not get the chance to discover optimal policies by trial and error. Instead, what they needed to be able to do in order to survive was to keep innovating and thereby ensure that their rivals never achieved more than a temporary competitive advantage.

At first sight, it may seem as though hunter-gatherers did not have to contend with a Schumpeterian environment: climate change was not rapid, new species of predators did not suddenly appear and sudden catastrophic events

such as earthquakes and volcanic eruptions would only have had localized impacts on an increasingly geographically spreading population of humans. This being the case, early humans would have had the chance to develop preference orderings by using simple satisficing processes to find better and better ways of employing their environments. For humans as a species, survival merely required the capacity to adapt optimally to environmental shocks even if the latter wiped out some individuals: for example, if an earthquake caused landslips and diverted rivers this would change the set of lotteries that survivors faced but they would eventually adapt optimally via the processes that generated their preference orderings.

Further reflection leads, however, to the view that Winter's perspective does apply in this context because humans compete with each other for resources and mates. Indeed, it is this rivalry that may help explain the apparent tendency people have for judging their well-being in terms of their consumption relative to others rather than on the basis of their absolute levels of consumption (on the dysfunctional 'arms-race' behaviour this produces in modern society, see Frank, 2007)—a rather different way of using the reference point-based view of utility from that of Robson.

Early humans, like those of today, could try to secure a competitive edge by innovating. With inter- and intra-tribal struggles going on, and with protagonists thinking creatively to devise surprising new strategies, it would have been difficult to enjoy a quiet life that was conducive to optimal adaptation to the natural world. In the face of strong social competition for resources, tribes led by people with repertoires of 'fast and frugal decision rules' (cf. Gigerenzer and Goldstein, 1996; Gigerenzer and Selten, (eds), 2001) that permitted rapid

adaptation to new constraints and opportunities would have had bigger chances of surviving than those who were methodically applying a single technique to get a detailed appreciation of the opportunities of their natural locale. Those engaging in the latter kind of behaviour would tend to get wiped out by those who focused instead on being able to move rapidly from one environment to another as hit and run raiders.

Even within a tribe that did not have to deal with threats from other tribes, innovations would have continually changed the sets of probability distributions they were exploring. This could include not only the development of hunting equipment that worked particularly well in certain contexts but also personal skills (for example, of performance or presentation) that increased the chances of winning a mate and whose productivity would then be eroded as they were emulated or bettered by rivals, thereby providing incentives to come up with something different. So, even if (probably a perfectly reasonable 'if') happiness were determined by the difference between attainments and a reference point that was continually being adjusted, it is unlikely that biological selection processes would favour those who focused on getting to know the set of lotteries they faced rather than on creatively disrupting the environments of their peers. Then, as now, fashion and equilibrium do not go together, and though modern consumers mostly outsource their fashion inputs rather than self-supplying them, the essence of being a fashion leader has always been to have a capacity to combine things in surprising new combinations to produce socially visible outputs (Chai, Earl and Potts, 2007).

Secondly, there is the issue of whether a process that led to hunter-gatherers having preferences consistent with each of the axioms required for a

von Neumann–Morgenstern utility function would have been conducive to their evolutionary success. Early humans would have enjoyed increased chances of reproductive success if they appreciated that some choices are much more important than others and may benefit from being resolved in ways that are different from those used where the outcome is not, in Shackle's (1972) terms, 'crucial'. Those who were worried about the potentially catastrophic downsides of taking risks might have increased their survival chances by developing a 'safety first' decision rules in line with the critique of expected utility theory offered by Roy (1952) and Blatt (1979–80). In trying to be 'safe rather than sorry' regardless of the size of the potential upside of taking a risk, their preferences would be at odds with the continuity requirements of a von Neumann–Morgenstern utility function.

Related to the safety-first issue is the question of whether selection processes would have favoured those who saw certain kinds of goods as having benefits that were not substitutable. As Witt (2005) reminds us, the idea that different kinds of utilities associated with different kinds of goods should be seen as being aggregated during the process of choice was introduced by Jevons and was not part of the original Benthamite view or the version of marginal utility theory proposed by Menger (1871). The latter involved a priority ranking of alternative uses of a given resource and was much more focused on people trying to ensure their survival. As such, it can be seen as anticipating Maslow's (1954) famous proposition that people have a hierarchy of needs. In Damasio's terms, the somatic marker attached to thirst will divert attention from anything else if a lack of water is so acute as to threaten survival, whereas if the person is not thirsty but is starving, their attention will be captured by the problem of

finding their next meal. Moreover, while hunter-gatherers may not have had the cognitively overwhelming diversity of options that modern consumers face, their need sometimes to be quick with their choices, combined with their limited computational capacities, may also have favoured those whose decisions did not involve computing overall values for rival courses of action and who instead opted to 'take the best' in a single dimension, or employed some kind of checklist. (For classic experimental work that shows how people switch into non-compensatory decision-making strategies under cognitive pressure, see Payne, Bettmand and Johnson, 1993.)

Thirdly, questions need to be raised about Robson's view of the evolutionary role of consumers having sensory rewards as incentives. His use of the theory of intermediation to explain the emergence of utility functions is certainly ingenious. However, Robson's approach overlooks the possibility, considered at the start of section 2 of this paper, that species can enjoy reproductive success by behaving purely in a programmed manner with no anticipation of receiving a sensory reward. This could entail, for example, engaging in sexual activity on the basis of instinct without receiving any pleasure as a consequence of doing so. To a degree, we can see humans as being programmed in this way: not merely is there the interest in pairing up consequent on hormonal changes experienced by teenagers, there is also the 'biological clock' phenomenon whereby women who have not produced children by their late thirties often tend to get obsessed with doing so.

Given the possibility of behaviour being instinctive, there is no need for a lack of knowledge about means-ends relationships to have resulted in increased biological fitness of those who responded to the incentives provided by

anticipated sensory rewards. A very different reason may therefore explain Shlain's (2004, p. 17) observation that humans have evolved to be able to breed all year round, treating sex as a recreational activity rather than primarily for breeding purposes, and as the only species in which males increase their chances of reproductive success by taking steps to ensure that female partners is well prepared to enjoy sexual penetration

5. Sensory experiences as an antidote to thinking

While humans are boundedly rational due to their finite attentive and processing capacities, their cognitive capabilities run way ahead of other species. This difference may be summed up as a capacity for deliberation and it opens up a role for utility in choice that is very different from that which Robson derives from the theory of intermediation. Being able to reason and question established behaviour is the key to the success of the human race, as it has led to creativity, experimentation, and the ability to switch between environments or actively change them. However, this ability to reflect on alternative possibilities carries a potential threat to human survival: thinking may get in the way of actions that are necessary for reproductive success. This being the case, those who can be diverted from thinking by being programmed to pursue sensory pleasures may have a better chance of reproductive success than those who spend their time reflecting. The pursuit of sensory pleasures, particularly in social settings, plays an evolutionary role by attenuating the biologically dysfunctional side of being able to think. But having a strong preference 'to party' rather than think may not be conducive to reproductive success if it results in one's behavioural routines getting out of line with a changing environment or creating circumstances that

are difficult to manage. Hence reproductive success depends on being both philosopher and party animal.

To show how this idea works, let us initially return to the topic of sex and reproduction and reflect on an oft-quoted comment that Evelyn Waugh made in a letter to Nancy Mitford on 5 May 1954 (see Amory, ed., 1982, p. 423): ‘Of children as of procreation—the pleasure momentary, *the* posture ridiculous, the expense damnable.’ Waugh could also have mentioned the messiness, the risks of transmitting disease, the opportunity cost in sleep and other activities, the potential for offspring to inherit disastrous sets of genes and the fact that birth is one of the most life-threatening activities in which a woman can engage. The intended implication of Waugh’s comment seems to be that it is amazing that thinking beings bother to have sex and produce offspring. In the absence of the prospect of very high levels of sexual pleasure, reason could have been sufficient to get in the way of any instinct to breed that was shared with other species.

Though Waugh implies that the ‘momentary’ nature of sexual pleasure is unsatisfactory, it actually makes evolutionary sense for sexual pleasure to be a very intense but fleeting experience that completely gets in the way of a person’s reflective capacities. Experiences that involve sensory overload will be difficult to commit to memory, reflect upon and replay in the imagination. The only way to revisit an experience that cannot be captured in the memory for savouring is by doing it again. Hence the explosive but fleeting nature of sexual pleasure increases the probability that people will engage in sexual activity and hence end up producing children, despite all the downsides that this might entail.

We might similarly expect evolutionary processes to have favoured early humans whose brains allowed their attentions to be diverted from thinking by

somatic markers attached to survival-enhancing activities. Being programmed to feel hungry or salivate at the prospect of certain taste sensations may have dysfunctional consequences in modern affluent societies where food is abundance, but without such programming a philosophical hunter-gatherer might have failed to find food due to being unduly obsessed with alternative ways of getting food, and meanwhile could have been failing to eat such food as was available.

In the context of modern society, the phenomenon of the 'absent-minded professor' provides a ready means for seeing the hazards of being insufficiently motivated by sensory rewards and the desire to avoid pain or discomfort. What happened to George Shackle in 1951, shortly after he took up the Brunner Chair of Economic Science at the University of Liverpool, provides an extreme example of this. Shackle initially lived alone in rented accommodation, while the rest of his family stayed in Leeds pending the sale of their house. Left to his own devices, Shackle's workaholic tendencies ran wild. As his biographer Ford (1994, p. 9) notes,

[H]e became so engross in his work that he used to forget to leave the department, spending the night there working away oblivious of the fact that he had missed out on mealtimes, with the consequence that one day his junior lecturers arrived to find him in a state of complete exhaustion, collapsed on the main staircase.

Shackle was clearly abnormal in the extent to which he was capable of giving attention to his work and not let his mind wander. To rein in his tendency to get

engrossed in thought he needed either cues from social interaction or a strong personal feeling of hunger. The importance of a minder for this great economic philosopher again became evident in the late 1970s whilst his first wife was dying of cancer and in the months after her death. This great sadness in his life diverted his attention from the toll that undiagnosed Coeliac disease was taking on his own health. He was very lucky to meet his second wife as soon as he did, for it was Catherine Shackle who ensured that his health problems were diagnosed and brought under control. His mind was brilliant but it was lacking in the extent to which it was programmed for self-preservation.

People who have inherited a tendency to derive pleasure from socializing do not merely increase their prospects of reproductive success and survival by increasing their prospects of finding a mate or a minder who will ensure they achieve a functional balance between thinking and sensory experiences. Being programmed to feel comfortable in a social setting also provides:

- Access a wider pool of ideas for coping with life and achieving control over their environments. This can range from the ability to obtain knowledge of means/ends relationships and outsource their preferences for goods and services (Earl and Potts, 2004) to alternative strategies for achieving happiness and evidence of their relative efficacy (i.e., what Potts, 2010, calls 'happiness signalling'). It should be emphasized that here we are talking about social sourcing of decision rules and expertise, in addition to the possibility of decisions being affected by information cascades (see Earl, Peng and Potts, 2007): mainstream economists tend only to focus on the last of these.

- Scope for overcoming to some degree the limitations of one's memory.
- The opportunity to acquire a group identity as a means of framing oneself and hence of acting and overcoming the problem of constructing meaning for one's life and working out what to do with it.
- Enhanced gumption to keep acting as if a particular outcome can be achieved, thereby facilitating overall progress in the face of adversity (for a recent empirical study of the impact of group membership on personal resilience in the modern setting, see Jones and Jetten, 2011). As with the previous point, being sociable helps reduce the risk of ending up depressed and suicidal that might be increased by too much thinking about the point of bothering with anything.
- The advantages of teamwork (for example, in hunting large animals) and economies of scale arising from the division of labour in production

In the light of all this, it is not surprising that selection processes would have favoured people who were genetically programmed to derive pleasure from social activities and who were attracted to those who were likewise somewhat hedonistic and able to let go and live for the moment rather than shy, nerdy, or prone to be lost in their thoughts about future possibilities. In the modern world, survival opportunities may be enhanced by being in the company of people closer to the latter end of the spectrum, but selection processes are far from catching up with this: indeed, it is the less thoughtful who are more likely to breed, with their offspring being supported by welfare payments made possible by those who were more willing to sacrifice pleasure to realize their cognitive potential.

The evolutionary role of pleasurable diversions from reflective thought arises for two ontological reasons. The first is that the relative values to attach to decision dimensions/product characteristics are not self-evident, so arguments about alternatives will tend to go on indefinitely unless our brains have been programmed to help us assign values. This programming seems to reside in a person's ventromedial prefrontal cortex, for Damasio's work with head-injury patients showed how some with severe frontal lobe damage remained capable of describing in detail the characteristics of, say, many different restaurants but completely unable to choose between them due to the injury having left them unable to attach values to different characteristics. This means that although Damasio's somatic marker hypothesis is commonly presented (as in its Wikipedia entry) as being about how emotions guide or bias behaviour to help people avoid becoming cognitively overloaded, the role of somatic markers is more fundamental: rather than making it *easier* to weigh up different aspects of rival options, they are a *prerequisite* for being able to take a decision in this way. They function in the same way that a satisficing rule serves to prevent people from getting locked in the infinite regress that awaits them if they try to optimize. As Elster (1984, p. 135) observes when discussing the cases presented by Simon (1955) and Winter (1964) for focusing on satisficing rather than optimization, 'at some point this infinite regress must be cut short by intuition, unsupported by formal reasoning, and why not then make the cut-off point as close to the action itself as possible?'

The second ontological factor is that, even in the absence of the need for something to get in the way of the impossibility of resolving values purely on the basis of reason, humans need a mechanism to stop them spending time on

thinking as a result of their brains having finite processing speeds. Although, in certain contexts people sometimes can produce instantaneous expert judgments subconsciously, followed much later by articulated reasons for them, when they try not to act on intuition they run the risk emphasized by Winter (1964 and Gigerenzer and Goldstein (1996), namely, of being outsmarted by those who use 'fast and frugal' decision rules.

Stopping to deliberate rather than engaging in action to seek pleasure and/or avoid pain can be catastrophic: there is no point in trying to figure out the best way to fight a fire or reflect on what would have been the most fire-proof structure if in the meantime one is consumed by flames. A desire to avoid pain that causes people have their attention tempted away from deliberation puts them under pressure to find a satisfactory solution quickly, so they are more likely to survive when threatened. Similarly, people whose deliberative tendencies can be curbed by pleasurable opportunities may enhance their biological fitness by being able to 'seize the moment' or 'go with the flow' rather than limiting their choices to what they are sure they can control.

Social interaction can be wrecked if some members of a party take an inordinate amount of time to reach a decision. Consider again Damasio's restaurant choice problem, this time in a social context where a group has is working out where to go for an impromptu meal.. Langer (1991, pp. 203–4) considers this situation at the end of her book *Mindfulness* and, implicitly echoes Elster, she urges her readers to recognize that mindfulness has a second-order aspect, that of being able to identify situations in which it is better to make an arbitrary 'gut' decision and then focus on the process of making the decision come right, instead of obsessively trying to take the right decision by asking

more and more questions despite there being no logical stopping point. If one of the would-be diners lacks this capacity and insists on thoroughly considering all the options, the evening will mostly be lost. By contrast, those who succumb to the sensory allure of something that looks OK and are aware of the costs their hesitation may impose on others (and the punishment that could ensue for being a ‘party pooper’) may achieve much more fulfilment and valuable social payoffs.

These arguments do not take us back to Robson’s position that utility functions emerge because people are not smart enough to appreciate means-ends relationships and to reduce cognitive processing loads. Our position is that sensory rewards contribute to evolutionary fitness by getting in the way of potentially dysfunctional attempts to resolve questions about means-ends relationship. Our view is somewhat redolent of Keynes’s (1936) thinking about the role of ‘animal spirits’ in investment decisions. If people do not have an emotional impetus to act they may let opportunities slip away while they deliberate or talk themselves out of potentially successful ventures by seeing more and more potential for things to go wrong.

6. **The evolutionary role of identity**

Before concluding, it is worth considering how the evolutionary benefits of people having identities caused by their brains being wired so that they each develop a set of organizing principles and heuristics for running their lives and defining the kind of person that they are—rather in the way that Lakatos (1970) sees scientists operating according to particular sets of hard core axioms and ‘do’ and ‘don’t’ rules. What emerges is quite different from the analysis proposed by Akerlof and Kranton (2010) even though we share their view that a person’s

identity is a way of thinking about the kind of person they are that constrains how that responds to incentives. Akerlof and Kranton see identity as malleable and hence they argue that organizations may be wise invest in getting their members to identify with organizational goals as a cheaper means than financial incentives for increasing productivity. From our evolutionary perspective, identity is something that may have payoffs for the person in question, rather than merely being something organizations can twist and exploit.

We noted in section 2 that there are evolutionary advantages from having a somewhat permeable operating system and hence being willing to make some compromises in the process of support bargaining. However, people who lacked core principles that limited their willingness to consider particular forms of behaviour would be disadvantaged in social competition. For one thing, trying to be 'all things to all people' requires a person to incur the cognitive costs of uploading and installing the rules of each social group into which they try to fit. In the interim, they would be at risk of making socially embarrassing errors that revealed them as pretenders, rather like failed undercover agents.

Secondly, having a set of principles and sticking to them reduces cognitive costs by limiting the set of options that one considers. Identity thus provides route to 'fast and frugal' decision-making. This is evident in the following self-reflection on identity by Parsons (2000, p. 143):

[T]here are certain possibilities I will entertain for spending tomorrow night doing, and some I will not entertain, simply because of the person I am. I would not, for example, imagine watching a football match. Likewise, I would not imagine stealing a car to go to my chosen place, because

'someone who steals cars' does not constitute part of my self-understanding. It is not that I have entertained the idea of 'stealing cars', only to disregard it after weighing up relevant costs and benefits... . It simply does not arise as possible, given my self-understanding.

If Parsons did not have his identity to constrain his thoughts, the sensory allure of a wide menu of possibilities might not be enough to prevent the choice problem from seeming overwhelming unless he invoked some kind of satisficing rule. Identity thus plays a vital role in making deliberation possible in a manner that involves making tradeoffs: it restricts the personally-feasible set much in the way that a short-listing process does in a labour hiring decision, and sometimes so much is ruled out that the characteristics of what is left can be traded off in terms of their sensory appeal.

To the extent that people use their identities as building blocks for their views of the world, we should expect their identities to be far less malleable than Akerlof and Kranton seem to expect, for changing their self-concepts would require them to undergo a major rethink about how they see the world more generally (cf. Hinkle, 1965). If identities have limited plasticity, several implications arise that have evolutionary significance in relation to the productivity of hunter-gatherers (and modern humans).

First, being known as a particular kind of person who will and won't do particular things and has a particular modus operandi facilitates social coordination by making it easier to assemble effective teams, assign roles, and rely upon team members to act in particular ways, and by increasing trust and thereby reducing monitoring costs where the team members have demonstrated

that they are people with high integrity. Consider, too, the consequences of a person feeling guilty about potentially violating a principle that they see as part of their identity in order to reach another goal. If the person compromises, the implication is that they are not the person they thought they were. That prospect may provide a powerful motivation to search for ways of meeting both goals rather than compromising and making a trade off, This may lead to higher long-run attainments all round than if they turns a blind eye to a failing to stick to their principles and then seek to removed the cognitive dissonance by telling themselves that what they got in exchange for not standing firm was worth the sacrifice. In other words, if the menu of possibilities is not fixed, a refusal to make tradeoffs may be dynamically efficient even though it may look irrational in terms of standard economic thinking.

7. Conclusion

Decisions can be made in a variety of ways and do not inherently involve trading off alternative prospects of pain and pleasure to work out overall values for rival courses of action. Programmed decisions can be based on inherited instincts or rules that people acquire as they develop and mingle socially. Behaviour may be unconsciously automatic or involve awareness that a rule is being used. Decision rules can be very simple but they can also consist of nested sets of contingent rules, which may include rules that preclude making tradeoffs in particular situations, either on principle or to facilitate computation. Decisions can also be the product of deliberation, something for which humans possess a unique capacity and which may involve suspending existing rules and thinking creatively about ways of reframing situations, which courses of action might be

feasible and which of their characteristics really matter in the context in question. Decisions may also be driven by emotions, such that the decision-maker chooses on the basis of intuition or 'gut feeling' and is unable to invoke a rule or chain of reasoning as being the basis of the choice. Alternatively, emotional factors may completely get in the way of using rules or deliberation. Where people make deliberative decisions they need to employ rules and/or their emotions in order to be able to close the problem of choice.

These different ways of taking decisions would all have had conferred evolutionary advantages for hunter-gatherers depending on which contexts they faced, and they all continue to do so in the diverse decision contexts of today. In some contexts it pays to think long and hard about what to do and/or be prepared to trade off different values. In other contexts fortune favours those who act quickly on the basis of simple rules or trusting their instincts, or who have particular requirements in mind and are not willing to make tradeoffs.

Although one can construct models in which simple rule-based processes eventually result in von Neumann–Morgenstern functions, selection processes seem unlikely to have favoured those who, via successive decisions, programmed themselves to be able to flip into trying to take all of their decisions on the basis of such a utility function. A one-size-fits-all decision-making method of the von Neumann–Morgenstern kind would not have given evolutionary advantage in a world of social competition where some decisions could have catastrophic consequences rather than merely being low probability downside outcomes of learnable probability distributions. Moreover, such a way of choosing would not have involved genuine deliberation for this is the antithesis of choosing on the basis of a given value system and pre-specified set of alternatives and a single,

given objective. Human progress has depended on a powerful capacity to deliberate creatively rather than taking the environment and set of possibilities as given. However, because thinking has an opportunity cost in attention, selection processes have favoured those whose brain functioning had an emotional side that prevented them from being locked in thought and enables them to attend to their immediate self-preservation and/or seize fleeting opportunities. But an undue focus on prospects for sensory reward may also prove dysfunctional by inhibiting creative reflection prior to action. It is possible that the attention-arresting capacity of sensory rewards that contributed to the evolutionary success of early humans is dysfunctional in modern society if sensory temptations are ubiquitous and budget constraints are fuzzy..

The arguments in this paper may have implications beyond consumer theory. For example consider the differences in time horizons stereotypically associated with Japanese and Western corporations. In the past one might have explained these largely with reference to the extent to which top managers had to focus on immediate payoffs due to differences in the role of debt finance and interlocking shareholdings versus equity finance with potential for external takeover raids. However, we should also be mindful of the far greater differences between top-level remuneration and that of line workers in Western firms than in the much flatter organizational hierarchies of Japanese businesses. If executive remuneration packages are the means to obtaining sensory rewards (for example, from playing with 'big boy's toys' such as yachts, or the kudos from winning a 'trophy wife'), then a focus on doing what it takes in the short term to win these prizes is more likely if the prospective sensory rewards are spectacularly bigger. Japanese executives would have their attention diverted

less from long-term, process-oriented thinking by a result-oriented obsession with how much they could earn (cf. Langer, 1991, pp. 87–9). Similarly, an undue tendency amongst bankers to concentrate on winning bonuses that permit profligate consumption would get in the way of reflective thinking about where their present-focused lending behaviour might lead, as with the Global Financial Crisis.

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