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Preferences and novelty: a multidisciplinary perspective

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The literature on technological change and economic growth is implicitly biased towards the supply side. Research is mainly concerned with the question of how productive factors are accumulated. It matters less what companies produce or how they go about selling it. As Witt puts it:

a sustained growth of *per capita* consumption is explained by a continued relaxation of the budget constraint, i.e. by rising real income, explicitly or implicitly assuming that the demand for at least some of the consumption items on which the preference ordering is defined has not yet been satiated by current consumption or is not satiable in general. (Witt, 1998a, p. 2)

In economic consumer theory, novelty is broadly neglected. Even though there are time allocation models (e.g. Linder, 1970) explaining changing patterns of consumption in the context of increasing income, their focus is not on the adoption of new goods. The consumer has to maximise total utility across time. When income increases, substitution of time-intensive activities by less time-intensive activities occurs. The goods applied in these activities, however, are not made explicit – they may have already been on the market for a long time.

In the context of economic growth, the role of novelty in consumption comes into sharper focus when, as Saviotti (1996) does, you switch the perspective from micro to macro-economics: taking market satiation seriously, rising productivity leaves more and more resources unemployed. One of two ways to avoid macro-economic satiation is a vertical extension of the production chain. Facing productivity gains in existing production segments, the number of production processes cannot be stable if resources are fully employed. In addition to this vertical extension of the production chain leading to quality change, the number of production processes can also be increased by the introduction of novelties enlarging the range of consumer goods and services. Taking these considerations as a starting point, the question of how new goods are to be adopted might be considered a worthy issue for economic research. The widespread neglect of these questions in the

economic literature does not seem to be surprising, since they present rather large challenges to standard consumption and preference theory.

However, Kelvin Lancaster (1966) managed to fit the adoption of new consumer goods within a neoclassical framework. In the next section his approach is assessed and related to recent approaches addressing the same phenomenon from a behavioural economics perspective, allowing for preference change. While preference change no longer seems to be a non-issue for economists, the question for the biological foundations enabling and constraining preference change presumably still is. Starting from Witt's (1997a) contribution, in the following section I propose a Darwinian framework in which the objective features of preferences are highlighted. Two alternative views of how such a Darwinian perspective of preferences might look like are sketched.

Alternative adoption theories

A major problem of the standard economic model in approaching the adoption of new goods is its assumption of given preferences combined with the direct assignment of preferences to goods. Since new goods by definition are unknown and a preference for something unknown is implausible, at least one of these two features has to be sacrificed if the adoption issue is to be addressed. Because there is more than one theory of adoption in the social science literature, as we shall see below, I propose an analytical distinction going back to the economist Carl Menger to classify these approaches. While attempting to explain how user value comes into being, Menger enumerated the following prerequisites:

If a thing is to become a good, or in other words, if it is to acquire goods-character, all four of the following prerequisites must be simultaneously present:

- 1 A human need.
- 2 Such properties as render the thing capable of being brought into a causal connection with the satisfaction of this need.
- 3 Human knowledge of this causal connection.
- 4 Command of the thing sufficient to direct it to the satisfaction of the need (Menger, 1950, p. 52).

Just focusing on the conditions for adoption, Menger distinguishes four elements, the first three of which we consider as constitutive for adoption: motivation, the objective properties of the good, and cognition. Since the fourth criterion in market economies is a matter of income, which is provided by supply-side processes, we can neglect it here. Taking this catalogue as a classification tool, we discuss two different approaches to modelling the adoption of novelty.

The Lancasterian production analogy

Kelvin Lancaster (1966) makes some modifications of preference theory that allow him to apply the standard rational choice framework. Consequently, in accordance with a dogma later formulated by Stigler and Becker (1977), he presumes preferences to be given. Since direct assignment of preferences to new goods is not possible, he introduces the concept of ‘characteristics’, which he calls in an earlier version ‘satisfactions’. In doing so, he applies an analogy from production theory: goods are seen as inputs to a process in which satisfactions/characteristics are the outputs. There is a given, objective relationship between consumer items and wants described by the concept ‘consumption technology’. In a developed economy, the number of goods is much higher than the number of characteristics – meaning simply that one good can serve more than one want. In Lancaster’s terminology, a consumer good produces, by means of its consumption technology, a combination of characteristics in certain amounts.

How do preferences enter the picture? Lancaster argues, ‘The consumer is assumed to have a preference ordering over the set of all possible characteristics vectors, and his aim is to attain his most desired bundle of characteristics subject to the constraints of the situation’ (Lancaster, 1966, p. 14).

Thus, instead of goods, characteristics become the units of choice. In a two-dimensional characteristics space, consumers choose along an ‘efficient frontier’ which can be considered as identical for all individuals. Income changes can be conceived as scalar enlargements or reductions of this frontier. The relative distance of two goods to the origin is determined by their relative prices.

Because of the production analogy, the introduction of new goods by suppliers can now be modelled as process innovations affecting the relative prices of characteristics, that is, some characteristics have become cheaper and the efficiency frontier shifts to the outside. From the sub-set of efficient bundles of characteristics, the consumer chooses according to given preferences. The system has become fully determined.

In the Lancaster approach, adopting new goods appears as a matter of the objective criterion ‘efficiency superiority’ which is provided by the supply side. Novelty, here, refers to the connection between consumer items and needs, i.e. the second aspect in Menger’s list. In other words, consumption technologies can become more efficient. There is no cognitive problem involved in adoption. Thus a remarkable implication of Lancaster’s approach is that the concept of consumer sovereignty holds even within the context of novelty. However, since novelty by definition has to be something unknown, to constrain the perspective on efficiency changes, and to neglect the third criterion of Menger’s list, cognition seems inadequate.

Even if one accepts the existence of an objective relationship between goods and wants, the analogy between producers and consumers drawn by Lancaster appears to be a rather loose one. Lancaster does not answer the question why consumers in general can be modelled as optimisers. Within

the context of the theory of the firm, maximising behaviour is justified by the 'as if' argument (Friedman, 1953). Under the pressure of competition, any agent acting irrationally is selected out. Thus, although agents are not optimising consciously, due to the selection process, the outcomes look *ex post* as if the agents were optimisers. In the case of consumption, however, this logic certainly does not apply, since neither for natural nor for sexual selection can a plausible reason be found. So the idea of an efficiency frontier may be less adequate than in production theory.

In Lancaster's modified neoclassical approach, economics is the discipline dealing with the problem of scarcity. Such a position takes the concepts of given preferences, rational choice and the efficiency norm as its analytical centrepiece. Consumption theories following this tradition focus on the exchange activity rather than on the consumption activity itself. This feature may be explained historically by the fact that economic theory was influenced by mechanical physics (Mirowski, 1989). However, for the reasons outlined above, it is questionable whether a rational choice framework is apt to address the adoption of novelty, although rational choice theory is often assigned a constitutive meaning for economics. Witt (1996) presents an alternative perspective, in which economics is defined as a theory of social behaviour in the context of what are usually considered economic activities, e.g. consumption. This redefinition transfers the emphasis from methodological aspects to the research object itself.

Cognitive learning in consumption

To be able to address the issue of adoption, we now abandon the realm of choice theory and enter psychology. In contrast to economists, psychologists are used to dealing with changing valuations. Thus, rather than focusing on exchange processes, we now look at processes which may precede choice activities. Witt (1987b) and Woo (1992) – independently of each other – have chosen similar approaches in order to explain the adoption of novelty. Instead of sticking to rational choice theory, they allow for preference change. In so doing, they stress Menger's third aspect, i.e. cognition of the causal connection between consumption items and needs. The two approaches are in the 'behavioural economics' tradition (Earl, 1986) and are discussed simultaneously in this section because of their common features.

Their common starting point is the concept of bounded rationality developed by Simon. Because of cognitive restrictions of the human mind, attention is selectively directed. Since attention is a scarce resource, it is seen as having great economic relevance. The allocation of attention is not considered as a matter of conscious decision – this is exactly the reason why manipulation in the form of directing attention is possible and powerful: 'because it attacks the initial section of the causal chain leading to final consumer decisions, namely the deep basic source of value and preference formation' (Woo, 1992, p. 97). This implies that consumer behaviour cannot be regarded as sovereign.

The strict neoclassical separation between preferences on the one hand and knowledge or perceived behavioural opportunities on the other hand is abandoned (Witt, 1987b). The perception of opportunities itself is considered a problem: 'In forming her expectations and deciding what to do, a decision maker first faces the problem that the lists of what she might do, and of what might happen as a result of, or despite her choice, are not given but have to be constructed' (Earl, 1986, p. 9).

Consequently, Witt and Woo apply a model that stresses the co-evolution of valuations and the perceived behavioural opportunities. On the one hand, humans can value only what they perceive; on the other, they prefer to perceive what they already appreciate. In contrast to the routine concept applied by Nelson and Winter in the evolutionary theory of the firm that is equally based on bounded rationality, in this approach behavioural dynamics enters the picture.

Using the metaphor of a photographic lens, Witt (1987b) distinguishes two ways of how attention can be directed. The first way, *shifting* the whole focus of attention, for example by advertisements, has been already mentioned. That is what Witt calls the 'agenda-setting effect'. Because retrieval works sequentially, manipulation is more effective the more often advertising messages are repeated: 'the more memory is dominated by repetitive messages, the more chances these repetitions stand of being retrieved' (Woo, 1992, p. 97).

The second way to direct attention is to *sharpen* the focus of attention – by what Witt calls the 'refinement effect'. How the refinement effect works can be illustrated by Woo's considerations about information storage within the human brain. According to him, humans do not perceive bits of information but rather whole messages. Support for the holistic character of representations can be found in Gestalt theory (see e.g. Kosslyn, 1980). For adaptational advantages in the human evolutionary development, the storage of these messages is organised in a modular way instead of within a consistent single whole. These fragmented messages, he argues, are linked by associations in broader networks:

because our mental data are distributively deposited, the more concrete encounters and instances of the same theme we deposit into our memory, the more likely these materials will be organised into a wider network, accounting thereby for the sticky conceptions we develop for certain value themes. This explains why values related to life-styles, which are invariably formed over long periods, are at once deep and influential. (Woo, 1992, p. 88)

As a consequence of this organisation, it does not seem to be very far-fetched to attribute to the concept of value a holistic dimension: '[User] value ... can be conceived to consist in a conglomeration of objects of consumption that collectively constitute or define a life theme or life-style that an individual wants to participate in' (Woo, 1992, p. 85).¹ Clearly, there is a strong semantic aspect involved in this systemic organisation.

How the behaviourist approach contrasts with Lancaster's rational choice model may best be illustrated by comparing the concepts of 'intentionality'

and ‘causality’. While Lancaster separates preferences from goods, and still assumes consumer ends to be given and explains behavioural changes as intentional reactions to shifts in restrictions or prices, Witt and Woo assume a path-dependent and co-evolutionary process of valuation and perceived behavioural opportunities. By abandoning choice theory, they apply an alternative possibility to address the adoption of new goods: preference change. Focusing explicitly on the way information is stored and retrieved not only helps to address the adoption of novelty. It may also shed some light on an issue that cannot be dealt easily with by the Lancaster model, namely the question of how the variety of goods making up an economy’s structure increases. As described above, the Lancaster approach is essentially a story about one consumption technology replacing an objectively less efficient technology without any variety increase. This is because it fails to explain how new properties and relations between goods come into being. In contrast, the co-evolution model assumes a positive feedback relation between the first and the third aspect of Menger’s list; the second aspect, objective functionality, is replaced by cognitive construction, allowing for the emergence of new properties.

Why these construction processes take place may be explained by regarding cognitive recombination activities as pleasure-generating: ‘To consume is to learn to control and to produce novelty. To consume is also to enjoy the process’ (Bianchi, 1997, p. 284; similar statements can be found in Levinsohn, 1977, and already in Gossen, 1854, p. 7). Collecting activities are telling examples of such a pleasure-generating production of novelty (Bianchi, 1997; Witt, 1998b). According to Bianchi, these activities are characterised by seriality (that is, ‘the fact that the material or immaterial objects of the collection are organised in a recognisable whole’) combined with openness of the collection set, allowing new cognitive connections to be subjectively constructed. The contrast with Menger’s objective property criterion becomes evident when Troilo (1999) describes a condition preceding all collection activities: ‘The object is generally divested of its functions and made relative to a subject.’ Or, to put it differently, ‘All the internal factors of a good, as well as its external interrelations with other goods, are decomposed, isolated and recomposed in different fashions’ (Bianchi, 1997, p. 278).

How does the consumer select and enlarge the collection set? While the agenda-setting effect may help to explain selection, the refinement effect may be related to the recomposition processes. In this process, strictly functional properties may be less important than morals, peer pressure, rules of fashion or personal history (Bianchi, 1997, p. 279). Consequently it is possible to possess, for example, twelve different sewing machines or 200 different pairs of shoes without individual satiation taking place. The refinement effect allows the issue of increasing variety to be addressed at the level of the individual, since the holistic dimension typical of complements is taken into account. It is a subjectively constructed form of complementarity, and not a complementarity caused by objective functionality (as in the case of cars and fuel).

Considering postmodern consumption patterns, Bianchi's argument for collecting as a 'paradigmatic case in consumption' does not seem too far-fetched. 'Consumers may perceive themselves as marketable items and manage their images as perceived by others, both in the job and in the social environment' (van Raaj, 1993). Thus individual consumption patterns may be used as means to gain public attention not only by politicians and celebrities, for which the semantic dimension of consumption is obvious, but by the average person as well.

Normally it is the role of the consumer to detect and to expand the collection set. But the pleasure-generating features of collecting can be exploited by suppliers as well. The example of Swatch watches demonstrates that the collection sets do not necessarily have to consist of old items. Here the marketing executives have obviously understood both features constituting collection activities: openness is taken account of as well as seriality, since twice a year the range of models is slightly varied (Bianchi, 1997, p. 280). Though, in this case, the detection of the collection set is vicariously conducted by the supplier.

Objective features of preferences: a Darwinian perspective

In the neoclassical model we have a fixed preference ordering described by formal axioms. The material content of these preferences is not only unspecified, the relevance of such knowledge is even denied. Max Weber (1909, p. 388), for instance, completely denies the necessity of a psychological foundation of marginal utility theory, arguing that these axioms do not intend to give a realistic representation of human nature. According to him and others, the aim of economics is rather prediction by what, in Popperian terms, might be called 'situation analysis'. In a similar vein, we may understand the statement of one major representative of ordinal utility theory: 'Let others concern themselves with the nature, the essence of "value". I am interested only in seeing whether I can discover which regularities are presented by prices' (Pareto, cited in Lewin, 1996).

The unquestionable strength of the rational choice approach in situational analysis has to be balanced against a certain weakness: There are claims that neoclassical economics cannot fail to explain reality (e.g. Witt, 1987a), as it has a tendency to explain everything without excluding anything.

However, it is not only ordinal utility theory that lacks material hypotheses about the contents of preferences. It is equally true of the cognitive learning processes sketched above. This leads us to the issue of interaction between supply and demand in innovative consumption activities. The perspective that '*tabula rasa* consumers' are victims of manipulative suppliers pushing whatever products they wish is most prominently represented by Galbraith (1958). Other authors such as Callon (1987) stress the role of social power relations inhibiting technological developments. Smart advertisers, at least in principle, can gain influence through agenda setting.² Thus,

if agenda setting is taken into account, preference change seems to be a process which can be directed by external influences in an arbitrary way. However, if we allow for changing preferences it seems quite legitimate to ask whether there are limits to this preference change. If unlimited preference change were possible, and manipulation of preferences were to take place, the dynamics of technological knowledge could drive history in an arbitrary way.

Witt (1997a, 2000) takes a Darwinian perspective on this, considering biology to be the ‘anti-discipline’ of economics. Following Tietzel (1983), an anti-discipline explains the problems of another discipline equally well or even better than the discipline it refers to. However, there exists more than one way to relate biology to economics. In order to clarify the way in which a Darwinian perspective refers to biology, I briefly compare it with the analogical application of biology. For illustration purposes I take an example from the context of patterned evolution. Schlicht (1997) and Kubon-Gilke and Schlicht (1998) distinguish two sorts of evolution:³

The notion of *blind evolution* describes a combination of random variation and selection whereas the concept of *patterned variation* presumes regularities in the variation process as features inherent to evolutionary processes.

Schlicht mentions path dependence as the main cause of patterned variation in biology. Present genetic endowments are the base for future developments, i.e. the latter do not start from scratch. The phenomenon of path dependence can be observed in the evolution of artefacts as well. Some authors even strongly emphasise the analogy with biology by constructing a genealogy of artefacts (e.g. Fischer, 1998; Saviotti, 1996), suggesting that ‘descent’ also takes place. However, the underlying causes responsible for path dependence in the design of artefacts are different from those prevailing in biology. Firstly, in biology, the biparental principle of reproduction constrains change, whereas, in technology, conservative associative patterns can – but do not have to – provide path dependence. This allows the range of possibilities of variation to be much larger, at least in principle. Secondly, in contrast to genes, due to different storage possibilities, technological and design knowledge is less likely to become extinct: when a specific design does not sell any more, it can re-emerge 100 years later by imitation in a shape whose physical properties do not differ from those of the original. Therefore, path dependence can be interrupted at some stage and continue at another stage in history.

Recognising these differences, analogy-thinking does not seem to be a promising way to gain new insights into the directedness of human behaviour. As an alternative, a more direct application of biological thought is chosen by means of the homeomorphic approach coming from sociobiology. In recent years, sociobiology has triggered the idea of founding theories of social behaviour on natural sciences. To put it in Wilson’s (1998) words: there is a pursuit of ‘consilience’. A common starting point of sociobiological theorising is the

simple idea that the human species can be considered as a result of evolution. With this background, sociobiologists are convinced that the nature and content of preferences are scientifically analysable (Hirshleifer, 1977). This essentialist view, of course, challenges standard economics' position, according to which preferences are entirely subjective entities. In contrast to the notion of a subjective perspective on preference change, a Darwinian perspective focuses on super-individual features which may result from innate fixed properties of human behaviour. To put it differently: we want to avoid subjectivity and pursue hypotheses about the internal structure of humans which guide and constrain technological change.

A Darwinian perspective on consumption theory implies the application of the concept of natural selection. Thus it has to be chosen among the several potential units of selection. Neither the consumer himself/herself (as Miller, 1999, suggests) nor artefacts (as proposed by Fischer, 1998, or Eldredge, 1998) are seen as the unit of selection. As Witt (1997a, 2000) emphasises, it is *wants* which have evolved and been selected for during human phylogeny. Thus selection operates in a more indirect way on economic development:

The starting point for social evolution is ... provided by those patterned features of human behaviour, thinking and feeling that remain unaffected by processes of social evolution. The theory of social evolution, unlike the theory of biological evolution, can start with these givens. (Schlicht, 1997, p. 731)

In contrast to neoclassical theory, such an approach cannot be classified as having any *a priori* assumptions; biology explains the emergence of preferences. Therefore the consilience approach to evolutionary theorising shows features of self-referentiality: the preference apparatus generating or constraining economic change is itself a product of evolution.

Although we have sketched some general features characterising a Darwinian approach, it should be noticed that, so far, no fully fledged Darwinian theory has been developed. In the following section we compare two Darwinian approaches. The criteria of comparison are the following questions, which are strongly related to each other:

- 1 How does the selection mechanism affect economic development?
- 2 To what extent are preferences objective givens and to what extent a product of idiosyncratic learning processes? How do these approaches connect nature and nurture?
- 3 What may be the implications of such an objective perspective on preferences for empirical research? Can we expect to detect regularities and directions within long-term consumption patterns reflecting these objective features?

Innate wants and innate learning mechanisms

The way Witt (1997a) approaches the problem is connected with Menger's first category: wants and needs. It starts from a list of innate needs common to

human and non-human mammals: hunger, thirst, the need for sleep and maintenance of body temperature, etc. From nutrition science it is well known that information about certain food items (e.g. their sugar and fat content) is genetically coded (see Diedrichsen, 1990; Schneider and Schmalt, 1994; Pudel and Westenhöfer, 1998). Such items satisfying innate wants and needs motivate and reinforce behaviour. They can be called *unconditioned reinforcers*. Starting from these genetic endowments, additional wants can be learned by innate mechanisms. Items which appear regularly with unconditioned reinforcers can, after some time, get a positive valuation. However, when the pairing is interrupted, this valuation fades. Cognition is not considered at all – basically it is a behaviouristic model of operant conditioning that is supported by many laboratory experiments with mammals and non-mammals.

As a result, we have to distinguish between two different classes of wants: on the one hand, there are wants which are products of biological evolution and as such are part of the shared genetic heritage; on the other there are others which have been learned individually. There is no knowledge problem concerning the items' properties involved in this kind of learning process. From its theoretical outline, operant conditioning is compatible with the 'equipotentiality hypotheses of learning'. Since 'want learning' consists in an arbitrary pairing of a reinforcer with a neutral stimulus which is independent of the latter's quality, there are no contents more likely to be learned than others. Want learning follows individual conditioning history. However, by social reinforcement mechanisms working within families and small groups, a certain convergence in preferences among individuals may be achieved and transferred between generations. This mechanism is responsible for the emergence of culture, here understood as commonly shared preferences which are socially acquired.

The framework presented here offers an additional way to approach the novelty issue. Witt's sociobiological approach has the advantage of providing an essentialist explanation of what the contents of preferences are and how they come into being. Moreover, as with Lancaster, it is possible that an item can achieve several stimulus qualities in several dimensions, becoming paired with more than one reinforcer. To look at novelty as a new combination of stimuli unified in one consumption item is certainly different from conceiving novelty as an efficiency gain in consumption technology or as a result of cognitive refinement as discussed above.

What are the implications of this for empirical research? Witt (1997a) proposes an empirical research programme that focuses on the Darwinian innateness of wants and needs:

An inspection of long-term economic development can, however, help identify certain regularities which can be explained by evolutionary concepts as long as these are defined in a broader sense...The question that remains is whether, in spite of all the variance resulting from the individual influences, it can be argued that a general tendency can arise in the grand total of human choices in a way that is significant for characterising economic evolution and, if so, whether

such a tendency has something to do with the basic innate preferences of man.
(Witt, 1997a)

Does this theory give any clue for empirical research on whether – besides the immediate genetic level – we can expect some regularities of want learning? Are there any hints of a hierarchical relationship between reinforcers, as, for example, the famous Maslowian pyramid or Georgescu-Roegen's (1954) 'principle of subordination of wants' suggest?⁴

In operant conditioning theory the genetic level is limited to primary reinforcers and the random pairing procedure following the 'equipotentiality hypothesis of learning'. From these features, path dependence can be concluded but not any inter-culturally observable direction of preference learning. The order in which wants are acquired according to conditioning theory is entirely individual. Thus the question whether this synthesis of operant conditioning and a recombination approach could provide a case for patterned evolution seems to be an empirical one. A historical investigation of consumption attitudes applying catalogue series or inventories as sources which starts with the objective reinforcers common to all humans could reflect typical patterns of wants and want learning. This kind of investigation can show whether some recombinations may have higher frequencies than others over time. We conclude that conditioning theory as presented here may offer a starting point for empirical research designed to detect super-individual and inter-cultural tendencies in the evolution of wants. In principle, a phenomenological approach using the history of artefacts as a source seems to be a viable approach, though serious methodological questions would have to be solved.

Evolutionary psychology

Now we can abandon the narrow framework of operant conditioning. While, on the supply side, specific cognitive allowances of humans enable them to develop tools and to achieve technological progress, it seems strange that it should be entirely missing on the demand side. Otherwise, human consumption behaviour would be entirely equivalent to the consumption behaviour of other mammals. Conditioning theory, for this reason, should be supplemented by considerations of cognitively influenced behaviour. Thus we are back to Menger's third category. However, in contrast to the hypotheses of Witt and Woo presented above, in this section a Darwinian perspective on cognition is applied. Its basic idea, the overcoming of the equipotentiality of learning, allowing for any content, may be best understood when compared with the approaches of Witt and Woo presented above.

Although Woo has a modular idea about the architecture of the human mind, he does not consider content-specific storage of information. He rather applies what Tooby and Cosmides (1992) call the 'standard social science model'. In such a model the role of the architecture of the human mind is limited to embodying 'the capacity for culture. Human nature is

merely the indeterminate material that the social factor moulds and transforms' (Tooby and Cosmides, 1992, p. 28). Within the standard social science framework, unconstrained preference change as well as arbitrary manipulation of mental contents – resembling strongly Galbraith's critique of the concept of consumer sovereignty – are viable. Thus material hypotheses are not possible because material contents vary between the cultures according to their different socialisation.

Therefore I propose as an alternative the evolutionary psychologist's view of the human mind developed by Leda Cosmides and James Tooby, which is equally genetically based like the primary reinforcer concept presented in the previous section. The research object in evolutionary psychology is the human mind, which is considered to be the result of human phylogeny.⁵ Thus the cognitive modules are adaptations of the organism to its past environment. By means of genetic information, mental mechanisms are still connected with the shape and the problems of an earlier world.

Tooby and Cosmides consider the human mind not as a general-purpose mechanism of adaptation; it is assembled, made of many domain-specific mechanisms for specific problems like the search for food, social exchange, etc.⁶ This means that humans share some innate '*a priori* categories', such as capabilities for language acquisition. From their perspective, the mind is not a *tabula rasa* like in the Woo model; its modular architecture already contains pre-existing contents, the fundamental on which social learning can be built. Thus the focus of attention is neither exclusively on the genetic level, propagating a primitive determinism, nor on the cultural level. The power of this approach consists in the particular way nature and nurture are connected. It helps to deal with the 'subjectivity problem' (see e.g. Witt, 1989) by offering a causal explanation for mental representations of the world, which shape the expectations of economic agents.

This feature seems to be crucial to the design of an empirical research strategy. Tooby and Cosmides start from a statement about observed human behaviour which can be assumed to be broadly accepted among social scientists: 'observations of patterns of similarities and differences do not establish that the substance of human life is created by social learning' (Tooby and Cosmides, 1992, p. 117).

In place of the usual dichotomy of nature and nurture, they place three different notions of culture (1992, p. 121):

- 1 *Meta-culture*. Mechanisms are functionally organised to use cross-cultural regularities in the social and non-social environment; these give rise to pan-human mental contents and organisation.
- 2 *Evoked culture*. Alternatively, functionally organised, domain-specific mechanisms are triggered by local circumstances, leading to within-group similarities and between-group differences.
- 3 *Epidemiological culture*. Observers' inferential mechanisms construct representations similar to those present in others; domain-specific mechanisms

influence which representations spread through a population easily and which do not.

The general definition of culture connecting these three terms starts from the phenomenon instead of from the cause: ‘culture refers ... to any mental, behavioural, or material commonalties shared across individuals, from those that are shared across the entire species down to the limiting case of those shared only by a dyad, regardless of why these commonalties exist’ (Tooby and Cosmides, 1992, p. 117).

In order to design a research strategy to detect universal features restricting and underlying all human behaviour, this threefold concept of culture seems to be quite important. However, while it is intuitively plausible that commonalties between groups could be caused by either cultural or genetic factors, because of the evoked culture’s context-dependence observed differences can be caused by both factors as well. Cosmides and Tooby exemplify these context-dependent decision rules in their explanation of empirical evidence on food-sharing practices in hunter–gatherer societies:⁷ under circumstances of high variance for individual foragers, a cognitive programme of wide food sharing is activated. This is individually functional, since it helps to avoid feast-or-famine cycles. Under low-variance conditions a switch to alternative sharing programmes takes place. In this light, an empirical research strategy based on the observation of inter-cultural commonalties and differences is doomed to failure.

A thorough understanding of how the selection mechanism affects economic development can improve the situation. Both metaculture and evoked culture have a genetic base which may constrain behavioural variation. This holds also for the approach presented in the last section. However, there it was unclear how learned wants might superpose the genetic ones in a direction-generating way. ‘Epidemiological culture’ may be a clearer case of patterned evolution, since it starts not from the variation process but from the diffusion process. In fact this perspective does not rule out that, in general, any kind of cognitive recombination is possible. But diffusion by social learning mechanisms seems to be more likely if it takes place along the lines of what can be cognitively reconstructed. A precondition for these reconstruction processes involved in social learning is something *a priori*, shared by the observer and the observed: ‘if two individuals have not shared assumptions about the world, communication between them is impossible. If human minds truly were initially *tabula rasa* ... then no anthropologist or immigrant to a culture could learn about it’ (Tooby and Cosmides, 1992, p. 208).

For this reason, it is more appropriate to talk about diffusion constraints than about constraints on variations. These prevent a new representation from raising its share within a population:

If a representation is easy to successfully reconstruct and is evaluated positively, then it will tend to spread through interindividual chains of inference, becoming widely shared. If it is difficult to reconstruct or evaluated as not valuable, it

will have only a restricted distribution or will disappear. (Tooby and Cosmides, 1992, p. 120)

Unlike institutional constraints or selection criteria in perception which are founded on individual learning and are variable, the reconstruction mechanisms Tooby and Cosmides have in mind are genetically fixed. Thus the way natural selection influences economic development is by affecting the reconstruction capabilities through enabling the reconstruction of certain contents while preventing the reconstruction of others.

Tooby and Cosmides consider these innate criteria to be the solution to the problem of adapting to the social environment. Without being endowed with these innate criteria, humans would not be able to predict their other humans' friendly or hostile behaviour:

this task of reconstruction would be unsolvable if the child did not come equipped with a rich battery of domain-specific inferential mechanisms, a faculty of social cognition, a large set of frames about humans and the world drawn from the common stock of human metaculture, and other specialised psychological adaptations designed to solve the problems involved in this task. (Tooby and Cosmides, 1992, p. 119)

In order to get an idea of these innate diffusion constraints, identification of the reconstruction criteria is necessary. At present, evolutionary psychology is a research programme rather than any sort of fully fledged stock of knowledge. To the author's knowledge, very little research has yet been conducted in this field. Thus, instead of results, evolutionary psychology's general empirical research strategy is sketched here. It can best be described by what Tooby and Cosmides call 'design experiments': 'If one knows what adaptive functions the human mind was designed to accomplish, one can make many educated guesses about what design features it should have, and can then design experiments to test for them.' The ambitious pursuit is a 'list of human universal preferences, and of the procedures by which additional preferences are acquired or reordered' (Cosmides and Tooby, 1994, p. 331).

Starting from adaptive problems in a Pleistocene environment which are assumed to be known, an engineering-like reconstruction process allows possible architectures to be designed. For their evaluation Tooby and Cosmides propose a two-step procedure:

- 1 The *solvability* analysis, in which 'the researcher asks whether a proposed architecture is capable of generating a behaviour that we know humans regularly engage in, whether adaptive or not ... (Tooby and Cosmides, 1992, p. 108). In the solvability analysis one asks what range of outcomes is actually produced by a specific design. The better the outcomes hit an adaptive target the more likely it is that a real adaptation has been identified.
- 2 In order to avoid pure functionalism it is supplemented by the *evolvability* analysis. 'Because non-human and human minds ... were produced by the evolutionary process operating over vast expanses of time, tenable

hypotheses about their design must be drawn from the class of designs that evolution could plausibly – or at least possibly – have produced’ (Tooby and Cosmides, 1992, p. 108). An evolvability analysis contains qualifying principles as the aptitude to solve problems related to reproduction, the avoidance of unnecessary complexity, etc.

Endowed with this toolbox, and assuming that the human mind’s design constraints do not prevent the detection of how itself it was shaped, the task remains to design and to conduct a design experiment capable of detecting the innate diffusion constraints.

Evolutionary psychology could be of considerable use for evolutionary economics if the identification of specific cognitive mechanisms holding independently of situations becomes possible. However, what about the implications for predicting behaviour? When only the prediction of a behaviour’s direction is possible but the result can be superposed by other influences the causality is, of course, rather weak. This feature, which Tietzel (1983) complains of as a disadvantage, can be transformed into a virtue as soon as situational analysis is abandoned. Within the framework of an evolutionary theory addressing innovation and change, situational analysis could be replaced by pre-revelation analysis. This concept is described by Witt:

Unfortunately, novelty is an amorphous concept. By definition, the informational content, the meaning and the properties of what newly emerges, cannot be anticipated. It is therefore sometimes thought that theoretical constraints cannot be imposed on the infinite realm of possible novelty, which thus implies that novelty must be treated as exogenous. Yet this view is unnecessarily restrictive. It is true that theory cannot positively anticipate the results of evolution. On the other hand, hypotheses can always be developed that exclude certain kinds of novelty from occurring. This implies empirically meaningful, testable predictions even though they may be rather weak ones. Theoretical considerations of the latter inquiry will be called here prerevelation analysis. (Witt, 1993, p. 92)

Once design experiments have been conducted successfully, evolutionary psychology may produce *ex ante* hypotheses about the functioning and constraints of social learning which should be interesting for diffusion research. In a long-term historical perspective a ‘possibility corridor’ channelling technological change may become visible.

Conclusion

In this chapter the role of preferences in economic change has been highlighted. Based on criteria going back to Carl Menger, a classification of concepts dealing with novelty in consumption has been proposed. It seems that novelty can be conceived in different ways: either as the efficiency increase of a consumption technology, or with reference to changes in the subjective cognition of consumers or to new wants learned by operant conditioning.

The second part of the chapter was concerned with the objective part of preferences, implicit traces of which can be detected already in Lancaster's concept of characteristics. In order to strengthen this perspective on preferences, a Darwinian view was sketched, emphasising the evolved biological foundations of human behaviour, simultaneously enabling and constraining preference change. Two different versions of a Darwinian perspective were presented: reinforcement learning presupposing some basic wants, and evolutionary psychology presuming the adaptedness of cognitive mechanisms.

Moreover, it has been argued that looking at preferences from a biological and psychological perspective can give rise to new research questions. Taking the concept of 'patterned variation' from evolutionary biology as a heuristic metaphor, one can speculate whether the Darwinian approaches give any clue to something equivalent in consumption. Before empirical investigations into long-term regularities in consumption can be conducted, however, clarification is needed on whether and how the three aspects of the Menger scheme – wants, technology and cognition – are interrelated.

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Notes

- 1 The systemic character of this lifestyle concept resembles Dosi's (1982) concept of technological paradigms, though the rules governing its evolution and its constraints on possible expansion are less clear.
- 2 How marketing campaigns can even overcome technological lock-ins is shown by Witt (1997b).
- 3 Their aim is to show parallels between biological evolution and institutional evolution.
- 4 This principle is what psychologists call a 'structured motivation theory', i.e. a theory dealing with the relationship between different motivations (Lea *et al.*, 1993, p. 496). In this concept there is an implicit idea of a hierarchical pattern of wants resulting from the fact that only after the satisfaction of the more basic want is the next want revealed.
- 5 The declared aim of evolutionary psychologists is the integration of psychology and the social sciences into evolutionary biology (Tooby and Cosmides, 1992) and it can therefore be considered to be within the sociobiological tradition.
- 6 This modular view of the human mind is supported by the literature on framing, which emphasises the context dependence of behaviour, e.g. Ortmann and Gigerenzer (1997).
- 7 These context-dependent decision rules are related to the concept of 'ecological rationality' (Gigerenzer *et al.*, 1999).

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