WP: 110 ISSN: 1749-361 (online)

Darwin's Ghost: Evolutionary Psychology Consumer Behaviour Analysis

Michael Nicholson & Sarah Hong Xiao

School of Economics, Finance and Business
Durham University, UK

WORKING PAPER

Address for Correspondence:

Dr Mike Nicholson
School of Economics, Finance and Business
Durham University
Mill Hill Lane
Durham
DH1 3LB
United Kingdom

Email: mike.nicholson@durham.ac.uk

Darwin's Ghost: Evolutionary Psychology and Consumer Behaviour Analysis

Abstract

The consumer behaviour analysis research programme continues to develop as both an intellectual discipline and an applied area of empirical inquiry, enriching our understanding of consumer responses to the products and services of everyday life, and to the marketing of those products and services. To date, however, the programme has functioned largely at an ontogenetic level, developing proximate-level accounts of consumer choice based upon operant learning at the expense of any meaningful engagement with the more ultimate-level accounts of such phenomena offered by adoption of a more phylogenetic perspective. In an attempt to address this potential gap in current knowledge, this paper introduces the central tenets of neo-Darwinian theory and their relevance for the consumer behaviour-analytic programme. More specifically, the paper seeks to apply adaptionist logic to the Behavioural Perspective Model, the principle explanatory framework within consumer behaviour analysis, in order to demonstrate how the hypotheses generated by that framework may gain greater conceptual clarity and empirical precision through accommodation of both ontogeny and phylogeny within its sphere of reference.

Keywords:

Evolutionary psychology; radical behaviourism; consumer choice; behavioural perspective model; operant learning

Darwin's Ghost: Evolutionary Psychology and Consumer Behaviour Analysis

"Adaptations exist as part of our nature – from the infant's Moro reflex to our fear of heights – and a psychology that denies the available evidence in favour of a wishful world where humans are formless clay waiting to be moulded by cultural practices may serve politics but not the truth."

Campbell (2002; p26)

Introduction

A process may be regarded as evolutionary if successive observations of that process, taken at intervals, display a marked trend (Dawkins, 1986). Such trends may take the form of increments, as in the mean height of humans with each successive generation, or the amount of information stored on recording media from the era of the gramophone to that of the compact disc; or else trends may be based upon progression, as in the gradated tendency toward bipedalism in human ancestry, or in the transition from horse-drawn vehicles to manned spacecraft via the humble motor car; sometimes, the trend may be both incremental and decremental depending upon the magnitude of the sampling interval, such as recorded variations in the body temperatures of certain fish species in response to habitat changes, or the fluctuating fashions in the lengths of female skirts. As Dawkins correctly observes, however, for a process to be regarded as *truly* evolutionary, there must also be some mechanism in existence to explain such changes and trends.

Evolutionary explanations in the social sciences typically take one of two forms (Pierce & Cheney, 2004). At the level of the species, evolutionary psychology seeks to construct ultimate explanations sensitive to the operation of adaptive processes within human phylogenetic history. By contrast, at the level of the organism, operant learning offers an account of human behavioural adaptation during the ontogenetic life-span of the individual. It is this latter proximate mode of explanation that has thus far been the primary focus of attention within the consumer behaviour analysis programme, operant learning theory serving as a foundation upon which to construct a viable account of consumer choice that is sensitive to its situational context (Foxall, 1999b).

Yet, the things people desire, purchase and consume are in themselves products of their evolved minds (Buss, 2004). Hamburgers and milk shakes, for instance, continue to hold great appeal to consumers, despite concerns surrounding, and knowledge of, their potentially adverse effects upon human health. They do so because their high fat and sugar contents would have been crucial to survival during our ancestral past, making their de-marketing through proximate-level interventions alone particularly challenging. Thus, for the consumer behaviour analyst, an ultimate-level dimension is essential to the construction of a more parsimonious model of consumer choice.

To date, however, the prevalence of ultimate-level theorising in consumer behaviour analysis – as in the consumer science literature in general – is perhaps best described by its paucity (Saad, 2006). Trained within the constraints of the Standard Social Science Model (Cosmides & Tooby, 1987), with its emphasis upon ontogenetic levels of explanation only and a "blank slate" view of the individual, the majority of behaviour analysts typically overlook ultimate-level influences upon learning and the potential operation of a universal "human nature". Given that all learning processes are by definition mediated by a brain that is in itself a product of human evolution, shaped by the adaptive forces of natural and sexual selection, this absence of due recognition of the phylogenetic history of individuals represents a not insubstantial gap in current understanding of consumer choice processes – a gap that the present paper thus seeks to address.

Against this backdrop, the authors argue for greater integration of evolutionary-psychological frameworks within the consumer behaviour analysis programme. By way of context, the paper therefore begins by presenting a brief overview of the central tenets of neo-Darwinist thinking, with particular emphasis upon the proposed modular nature of the mind and its implications for our understanding of human learning processes. This is then followed by a re-statement of the Behavioural Perspective Model (Foxall, 1993, 2001) at the heart of the consumer behaviour analysis programme, highlighting the ways in which the functioning of core BPM elements such as reinforcement may be in themselves subject to ultimate-level influences. Finally, by way of consolidation, the authors proceed to consider the implications of evolutionary psychology for the continued ontological development of consumer behaviour analysis, the paper concluding by identifying potential directions for future research in this area.

Beyond the Standard Social Science Model

In his recent monograph on the current state of consumer behaviour analysis, Foxall (2007) reviews evidence for the biological bases of human operant learning and, in the process, proceeds to briefly introduce evolutionary psychology as a potentially fruitful body of work suitable for integration within the current programme, noting the significance of neo-Darwinian frameworks for our understanding of the cognitive architecture involved in human learning and tentatively considering the likely evolutionary origins of key behaviourist constructs such as reward and punishment. Although broadly concurring with the sentiments expressed, however, the authors would argue that Foxall somewhat underestimates the significance of the evolutionary perspective for consumer behaviour analysis, particularly in respect of his presentation of neo-Darwinism as but a growing sub-discipline of psychology. This is to misunderstand and understate the true scale and scope of the evolutionary psychology project.

First and foremost, neo-Darwinism is not so much a sub-discipline of psychology but, rather, *a way of thinking about the whole of psychology itself*. Traditional psychologists operate within the parameters of what has become known as the Standard Social Science Model (SSSM), together with its fundamental postulate that there is no such thing as "human nature" or, if there is, that it has negligible impact upon behaviour. Within the intellectual straightjacket of the SSSM, the human neonate is conceived of as a *tableau rasa* – a "blank slate" – equipped with but a basic set of reflexes and, most crucially, a sophisticated biological computer capable of receiving informational inputs from the environment, processing those inputs, and generating a behavioural output appropriate to the current situational context (Tooby & Cosmides, 2001). There is no scope within the SSSM for innate information, motivation or a repertoire of "instincts".

As Pinker (2002) observes, however, the concept of the *tableau rasa* is fundamentally flawed because, quite simply, *blank slates cannot do anything*. No matter how sophisticated any computer might be, it is quite incapable of receiving and processing inputs from the keyboard or mouse without at very least some basic software – an operating system. So too must the human brain, some core set of rules and protocols being present from its formation to determine what environmental information this bio-computer will attend to and how that information is to be processed. Without these rules and protocols, the "blank slate" could not learn.

This is not to say that evolutionary psychologists are arguing in favour of innate knowledge, skills and values – a common misperception of the neo-Darwinian project. Far from it. Evolutionary psychologists do not suggest that the human mind – what the brain does – is in anyway endowed with an operating system. Rather, they propose that the mind simply functions *as though it had an operating system* by virtue of its evolved structure.

The notion of an evolved structure is crucial to understanding the modern neo-Darwinian synthesis for it leads to a quite different view of the human mind. Orthodox cognitive psychology proposes a "black box" view of the mind, a series of discrete general-purpose mechanisms performing key cognitive functions such as solving problems, remembering, or learning new information and skills. By contrast, evolutionary psychologists reject the notion of general-purpose processing in favour of a more "Swiss Army knife" model of the mind, a large number of domain-specific neural circuits having been shaped by natural and sexual selection pressures to address particular problems associated with survival, reproduction and perpetuation of the genetic lineage; i.e. problems such as finding food, selecting a mate, identifying kin, and so on (Boyer & Clark Barrett, 2005; Tooby & Cosmides, 2005).

Evidence in support of domain-specific processing can be found in the cognitive neuroscience literature. For example, as a consequence of very localised damage to the cortex, patients suffering from the clinical condition of prosopagnosia retain normative memory functioning, but experience severe impairment of their ability to recall and identify human faces (Carlson, 1994). Conditions such as this seriously undermine the notion of a single "black box" module performing all memory functions and, given the profound implications for survival were all memory faculties to be disrupted by, say, a single blow to the head, lend support to the proposal that natural selection would instead have favoured the emergence of a whole series of neural circuits dedicated to quite specific memory activities of adaptive significance; the massive modularity hypothesis (Fodor, 1983).

Evolutionary psychologists, then, propose that the human mind is an evolved cognitive architecture comprised of a vast number of domain-specific neural circuits, shaped by natural and sexual selection to address particular adaptive problems. These circuits lead to information being prioritised and processed in quite particular ways in order to generate a behavioural response appropriate to prevailing environmental conditions, giving the appearance of an innate operating system guiding that processing as a result of the efficiency with which the circuits function. Not so much a "ghost in the machine" as "Darwin's ghost" explaining their development.

The idea that this circuitry is a product of evolution is important to the discussion which follows. Stable human settlements and agricultural activities are comparatively recent phenomena; less than 100,000 years old, in fact. For the bulk of human evolutionary history, our Pleistocene ancestors enjoyed a nomadic foraging lifestyle in an environment akin to the African Savannah region of today. Moreover, it is within this Environment of Evolutionary Adaptation (EEA) that the neural circuitry evolved, rendering it appropriate to, and calibrated for, effective functioning within a quite different environment to the modern world of cities and warfare and commerce and marketing (Buss, 2004). Thus, when behavioural economists bemoan the "irrationality" of human actors and the ways in which it confounds their sophisticated consumer choice equations, they are somewhat missing the point. The human mind is not "irrational", it is *better than rational*, for just as the human passion for fast-foods persists despite health concerns due to the adaptive saliency of their core ingredients, so *all* aspects of consumer choice are being mediated by a cognitive architecture that would have been extremely efficient to meet the challenges faced by our hunter-gatherer ancestors.

Evolutionary Bases of Consumer Learning

Evolutionary psychologists, then, view the mind as a series of specialised adaptations, neural circuits forged by natural and sexual selection pressures to solve particular problems in the Environment of Evolutionary Adaptation. They also reject any notion of innate behaviours, the apparent appearance of which is merely an artefact of the ways in which the cognitive architecture of the mind has evolved to prioritise and process particular information in particular ways. Moreover, rather than a comparatively small number of general-purpose modules, they posit the existence of an entire "tool kit" of domain-specific neural adaptations.

The implications of this position for the study of learning are important in two key respects. Firstly, if neo-Darwinism rejects innate behaviours, then it follows that all behaviours must be learned, even if they do not appear so. Secondly, if mental faculties such as memory are conceptualised as a whole series of neural circuits performing different "remembering" functions, then learning too must be conceptualised not as a single general-purpose "black box", but as a repertoire of evolved facultative adaptations whose functions are to track the environment and adjust the organism's behavioural responses accordingly (Gaulin & McBurney, 2004).

On a basic level, evidence for an evolutionary influence upon what is learned and what is not learned can be found in the classical conditioning literature. In the early 1960s, for instance, Garcia famously ate a particularly unpleasant paella and was violently sick, an event that led him to experience persistent feelings of nausea whenever he subsequently encountered paella again in the future. On the basis of this observation, Garcia and Koelling (1966) conducted a series of experiments to investigate the conditions under which classical conditioning of taste aversions may occur in laboratory rats. As a species, rats are notoriously difficult to poison because they have a tendency to consume a very small quantity of food, wait a considerable period of time to see if they are sick, and only then consume the remainder of the food once they are "sure" it is safe. In one stage of their experiment, Garcia and Koelling observed that although it is possible to condition an aversion to any food by means of a neutral stimulus (e.g. a loud sound, an electrical shock), as would be predicted by the Pavlovian paradigm and was evident in Watson's infamous "Little Albert" study (Watson & Rayner, 1920), this conditioned reflex is nevertheless far weaker than the learned association acquired between a particular taste (e.g. saccharin solution) and subsequent nausea (actually induced via an injection up to twelve hours later). Furthermore, in a subsequent series of studies, Garcia and Ervin (1968) demonstrated that conditioned nauseous responses increase in saliency with the novelty of the vomit-inducing stimulus, providing further evidence supportive of the evolutionary bases of learning – if one were to design an animal best equipped to survive in a hostile environment with a paucity of food, then one would indeed "hardwire" a learning mechanism biased toward rapid detection of the potentially toxic effects of novel foodstuffs. Thus, rather than being a uniform process, classical conditioning is perhaps better regarded as a series of neural circuits shaped by natural selection to differentially collect information about causation (Bolles, 1979).

Operant learning too can similarly be regarded as a series of adaptations, rather than a single multi-purpose mechanism. Since the 1950s, biological psychologists have conducted numerous experiments in an attempt to identify a single site within the brain in which operant learning might occur. The results, however, have been inconclusive and contradictory, regions of the brain as diverse as the nucleus accumbens, ventral tegmental area, amygdala and prefrontal cortex having being prone to synaptic change in response to rewarding and punishing stimuli (for review, see: Carlson, 1994). Again, as in the case of prosopagnosia, evidence such as this suggests the existence of a number of different neural circuits, each representing a particular adaptation capable of handling a specific environmentally-cued behaviour modification (Gallistel, 1990, 1995). It is a view further supported by the literature on human language acquisition, where different brain regions – functioning in quite different ways – have been implicated in the development of skills as diverse as differential attention to auditory stimuli, production of phonemes and the acquisition of grammatical rules (Pinker, 1991, 1994).

Rather than boasting a mechanism for classical conditioning, then, and a parallel one for operant learning, the mind is equipped with a potentially enormous array of adaptive specialisations that perform a series of diverse functions of significance to survival and reproduction in the Environment of Evolutionary Adaptation. Some of these adaptations require repeated trials for learning to occur. Others, particularly where a stimulus-outcome pairing is ecologically extremely salient – as witnessed by the Garcia Effect – function on a one-trial basis. Learning may thus most usefully conceptualised as a network of circuits bound by their own particular facultative rules, forged by evolution to optimise functioning to match the ecological opportunities and constraints of the prevailing environment (Gaulin & McBurney, 2004).

This multi-circuit learning repertoire is especially important for the field of behaviour analysis – including for consumer behaviour analysis. If different circuits function within different ecological contexts, and this differentiation is further compounded by the evolutionary-salient goals the individual is pursuing at any given moment in time, then the challenge associated with understanding how consumer learning actually occurs is far more complex an endeavour than might have previously been recognised.

To illustrate this potential complexity, consider the example of a normal healthy female consumer, shopping in the supermarket for vegetables to accompany dinner that evening. During the course of her life-span, the consumer has tasted many different vegetables, some of which she enjoys and others which she does not. This particular consumer has a fondness for cabbage and so she makes her selection from those varieties available. A perfectly normal act of consumer choice, explicable by operant learning at an ontogenetic level.

Now imagine that the exact same consumer, with an identical learning history of previous encounters with vegetables, has recently conceived a child and is within the first trimester of her pregnancy. On encountering the varieties of cabbage available – her favourite vegetable – she immediately experiences a spontaneous extreme nauseous response. According to the embryo-protection hypothesis (Profet, 1992), this response, typically attributed to "morning sickness", is the product of a learned adaptation and will be experienced by around 86% of pregnant women. Vegetables such as cabbage, along with many fresh meats, are high in teratogens, toxins that are extremely harmful to the developing embryo. Natural selection has thus favoured the emergence of an adaptation that overrides her preference for cabbage and generates a nauseous response that prevents our pregnant consumer from ingesting such a substance. It is a phyologenetic adaptation, but it holds a capacity to attenuate an ontogenetic one. Of course, if the consumer persists with cabbage exposure despite her nausea, then classical conditioning may well lead to the acquisition of a Garcia-type aversion to the vegetable that persists long beyond pregnancy.

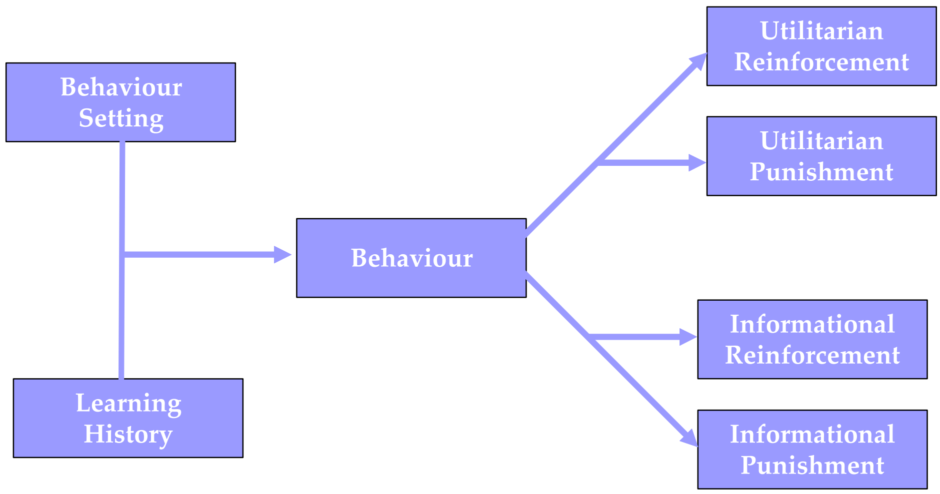
Examples such as this illustrate the false dichotomy between ontogeny and phylogeny. If consumer behaviour analysts construct proximate-level accounts of consumer choice only, two unforeseen consequences may become evident: (1) the explanations of choice constructed are undermined in their validity by the operation of phylogenetic effects distorting what is learned and what is not learned; and (2) the emphasis will remain firmly fixated upon learning-moderated differences between consumers, at the expense of any meaningful engagement in those universals in consumer choice that may stem from the phyologenetic history of the species. In other words, without due consideration of the central tenets of evolutionary psychology, the consumer behaviour analysis programme – especially a programme that now accommodates intentional behaviourism within its conceptual sphere – cannot hope to generate a comprehensive explanation of consumer choice.

Phylogeny and Ontogeny – The Behavioural Perspective Model Revisited

Within the consumer behaviour analysis literature, the Behavioural Perspective Model (BPM) has become firmly established as the principal radical behaviourist explanatory framework used to construct an interpretation of consumer choice. Depicted in **Figure 1**, below, the BPM locates consumer behaviour firmly within the situational context within which it occurs.

Figure 1: The Behavioural Perspective Model

(after: Foxall, Oliveira-Castro, James, Yani-de-Soriano, & Sigurdsson, 2006)



Derived from Skinner's (1981) own three-term contingency, the BPM can be regarded as a operant model of consumer choice. Consumer choice behaviours are deemed to be directed toward maximisation of positively-reinforcing consequences and/or minimisation of punishing aversive outcomes. After Schwartz (1989), however, these reinforcing consequences are subject to bifurification; utilitarian reinforcement denotes the direct consequences of a choice outcome, as experienced by the consumer (e.g. enjoying the taste of a particular brand of coffee), whilst informational reinforcement is more indirect in character and represents the third-party feedback received on the individual's performance of the role of consumer (e.g. a statement received from a retailer detailing the number of points accrued on a loyalty card). Most consumption situations will, to varying degrees, be characterised by both utilitarian and informational reinforcement, as when a fashion consumer is both satisfied with her new *Guess* handbag and receives admiring comments from her friends. Moreover, all purchase episodes will have reinforcing and punishing dimensions, the pleasure of acquiring the *Guess* handbag being accompanied by the pain of having to pay for it.

Given that the objective of any purchase situation is maximisation of positively-reinforcing outcomes and/or minimisation of aversive consequences, it follows that the consumer requires some process via which (s)he may seek to estimate the likely consequences of performing a particular behavioural response in the current consumption situation. Within the BPM explanatory framework, this information is yielded by stimuli present within the proximal behaviour setting within which purchase will occur, certain stimuli within that setting, by virtue of the operation of the individual's unique learning history of past experiences of identical or similar situations, being transformed into discriminatory stimuli that serve as "clues" to the likely consequences which will follow selection of available choice options.

The BPM represents a dynamic, evolutionary model of consumer behaviour, a model that has been applied in order to construct operant interpretations of a plethora of consumer choice scenarios, including: the interpretation of consumer choice scope (Foxall, 1999a); in-store behaviour within the retail fashion sector (Newman & Foxall, 2003); consumer emotional responses to aspects of the service encounter (Foxall & Greenley, 1999); situational influences on consumer attitudes (Foxall & Yani-de-Soriano, 2004); brand loyalty (Foxall, 2003); determinants of fish purchase and consumption (Leek, Maddock, & Foxall, 2000); the affective responses of Latin American consumers to the shopping environment (Soriano, Foxall, & Pearson, 2002); the operant interpretation of marketers' behaviour (Foxall, 1998); consumer satisfaction levels in the Birmingham International Convention Centre (Foxall & Hackett, 1994); multichannel consumer behaviour (Nicholson, 2005); and the effectiveness of specific social marketing mix variables within an energy conservation context (Foxall et al., 2006).

Despite its broad sphere of application, however, the BPM remains first and foremost an ontogenetic explanatory device, generating proximate-level accounts of consumer choice episodes sensitive to the individual's own repertoire of past experiences of similar choice episodes and discriminatory stimuli within the current behaviour setting. But, what of the phyologenetic history of the consumer as a member of the human species? How might the broader ultimate-level effects highlighted previously be accommodated within the BPM interpretive framework?

As noted earlier, there has been something of a paucity of evolutionary perspectives evident in the consumer behaviour literature which, at first glance, might make the task of mapping extant neo-Darwinian research onto the BPM's core elements appear somewhat problematic. This is emphatically not the case, however, for consumption has been a common theme within the "mainstream" evolutionary psychology literature almost from its inception. There are a number of possible reasons for the widespread interest in consumption-related phenomena among evolutionary psychologists, but perhaps the most important lies in the ubiquity of the act of shopping across human societies, the comparative ease with which it might be investigated empirically, at least relative to other potential target behaviours, and the associated opportunities afforded for the form of cross-cultural comparison needed in order to establish the existence or otherwise of universal behavioural tendencies operating at a species level. Whatever the reasons underlying this interest in consumption, however, the fact remains that a vast body of evidence has accumulated within this research domain, as witnessed by the recent synthesis offered by Saad (2007). The task of reconciling the phylogenetic evidence with the BPM framework is, therefore, perhaps less challenging than might otherwise be anticipated. Indeed, sufficient literature is available upon which to draw to construct a whole book on how neo-Darwinian evidence might be employed in order to shed light upon the operation of the operant processes depicted within the BPM's schematic framework, and vice-versa. Space precludes presentation of such a detailed exercise here, however.

For the purposes of the present paper, the authors thus confine discussion to one key operant concept only; the concept of reinforcement. There are two main reasons for this: first, reward and punishment are perhaps the most important of all learning constructs within the behaviour analytical programme, integral to understanding the operant nature of consumer choice; and second, Foxall (2007) himself has already made tentative suggestions as to the likely evolutionary bases of reinforcement that are worthy of expansion and clarification.

Reinforcement as an Evolutionary Process

The orthodox view of learning, it will be recalled, was to hypothesise the existence of one or two general-purpose cognitive modules performing functions such as classical conditioning and operant learning in a relatively uniform manner and within a variety of environmental-situational contexts. Within the modern neo-Darwinian synthesis, however, this "black box" conceptualisation of the learning process has been superseded by a multi-circuit model in which a complex "Spider's web" of evolved facultative adaptations, each performing particular domain-specific learning operations and both interacting with and influencing each other in a differential manner according to their fitness-maximising saliency and/or prevailing ecology.

Whatever the particular circuit(s) in operation, however, the behavioural perspective model proposes that reinforcement is the primary objective of consumer choice. Within the BPM interpretive device, this reinforcement is characterised by its bifurification into utilitarian and informational varieties, each subject to rewarding or punishing outcomes.

Utilitarian reinforcement reflects the positive consequences of performing a particular behavioural response. It may take the form of attainment of functional utility in its most literal economic sense, such as where a soap powder succeeds in making clothes cleaner or an investment yields the anticipated rate of return, or else it may be more hedonic in form, such as when a consumer enjoys a new DVD she has purchased or experiences the pleasurable intoxication resulting from consumption of his favourite wine. As Foxall (2007) correctly observes, this form of reinforcement is perhaps the least problematic to accommodate within a neo-Darwinian framework for it clearly represents the primary reinforcement essential to survival and attainment of inclusive fitness.

There are a number of ways in which evolutionary psychology may serve to illuminate our understanding of utilitarian reinforcement. Different people find different experiences reinforcing, and at different stages in their life-span, an effect that is quite reasonably often assumed simply to be a product of ontogenetic learning. But, as the example of the pregnant consumer introduced earlier clearly illustrates, the actual situation is not quite that simple. What is normally positively reinforcing (e.g. exposure to cabbage) may suddenly become punishing (triggering nausea) through a one-trial learning process that is of particular adaptive salience (protecting the embryo). Moreover, when one extends the scope of analysis to utilitarian reinforcement to encompass its more hedonic manifestation too, then the determination of what experiences are pleasurable or aversive develop even more overt evolutionary origins.

The example of evolved food preferences discussed previously is indicative of the influence exerted by adaptive mechanisms upon utilitarian reinforcement. It will be recalled that, despite current health concerns, fast foods are differentially more reinforcing by virtue of their high fat and sugar contents; substances of fundamental importance to effective functioning in the hostile environment of the EEA. In fact, even in countries as yet untouched by a *McDonalds* or a *Starbucks*, the preference for foods high in such substances has been observed to be near universal, lending further support to the notion that our evolutionary heritage plays a crucial role in determining what is reinforcing and to what extent; a not insignificant observation for social marketers seeking to modify eating behaviour in pursuit of public health goals (Burnham & Phelan, 2000).

Even where strong cultural variations in food preferences can be identified, it would be an over-simplification to conclude that this is purely an artefact of ontogenetic learning. For instance, if aggregate consumption patterns are taken as an indirect metric of the extent to which members of a society finds a particular substance reinforcing, then it might reasonably be concluded that this is an example of a learned preference, the socio-cultural context determining the desirability of that substance and – idiosyncratic taste aversions apart – ensuring acquisition of a culture-bound taste preference via frequent reinforcement.

Yet, the possibility exists that even the socially or culturally specific value placed upon the substance in question is in part determined by phylogenetic factors. Aggregate levels of coffee and alcohol consumption, for instance, have been found to strongly correlate with ecological factors such as ambient temperature and hours of exposure to sunlight (Parker & Tavassoli, 2000). Given that variations in consumption of these two substances under different climatic conditions would be crucial to the maintenance of physiological homeostasis, then in is not difficult to conceive of circumstances under which the differential utilitarian reinforcement needed to ensure appropriate calibration to the local environment might have been favoured by natural selection and, over time, become embedded within the society's eating culture. It is a view supported by Sherman and Hash (2001) who, in a large-scale cross-cultural study spanning some six continents and 36 countries, observed that apparent universalities in the use of particular spices with anti-microbial properties were moderated by local climatic conditions, use of the said spices varying from cuisine to cuisine according to the likely risk of meat contamination within a country's ecology. In other words, when it comes to human taste preferences, evolutionary psychology allows more specific predictions to be made in respect of what product or ingredient might be more reinforcing than another and the extent to which that differential may or may not be moderated from one context to another – a not insignificant phenomenon, particularly when viewed from the standpoint of the international food marketing manager.

Similarities and differences in what is reinforcing and under what ecological circumstances are not confined to the domain of consumer food preferences, of course. Utilitarian reinforcement may be related to utility attainment in its most literal economic sense, or else it may be more hedonic in its manifestation. In respect of the latter, the substantial body of literature on the neo-Darwinian origins of cultural products may prove especially enlightening.

Take the example of human tastes in music, a consumption phenomenon that is prone to multiple causation at an ontogenetic level. Quite why a particular song or piece of music is hedonically reinforcing to a consumer is complex, but nevertheless readily amenable to proximate-level explanation (Baum, 2004). In some circumstances, for instance, a new recording by an artist may hold appeal merely as a consequence of prior experience of that artist's work; on other occasions, the source of the reinforcement may derive initially from verbal behaviour, the recommendation of a significant other leading to subsequent acquisition of a preference through mere exposure. Both scenarios quite clearly lend themselves to operant interpretation. Under other circumstances, classical conditioning may play a more prominent role, processes such as stimulus generalisation directing a consumer toward previously unknown artists within a particular music genre.

Despite the apparent validity of extant proximate-level accounts of musical tastes, however, adoption of an evolutionary perspective holds a capacity to further illuminate this particular facet of consumer aesthetics (Tooby & Cosmides, 1992). A common finding among music psychologists, for example, is that although consumers desire a degree of novelty, they also typically crave familiarity. Within the hazardous context of the EEA, this tendency makes adaptive sense. Unfamiliar sounds would be regarded with suspicion, representing potential signals of impending novel sources of danger; an adaptation still prevalent today and manifest in a clear preference for songs and musical scores that are not too inconsistent with prior positively-reinforcing musical experiences (Huron, 2004). On a more specific level, certain degrees of bass sounds evident within a composition have been found to elicit unpleasant autonomic responses in individuals, an effect again perhaps stemming from an adaptive mechanism orienting the organism toward potentially hazardous sounds, whilst other softer sounds appear endowed with a capacity to almost instantaneously become associated with food and serve as conditional stimuli for subsequent salivatory reflexes, possibly reflecting yet another adaptation specialised for learning auditory signals associated with the presence of safe food (Bergman, 1990; Huron, 2003; Meyer, 1903; Raffman, 1993; Thompson, Balkwill, & Vernescu, 2000).

From music to art and from motion pictures to television soap operas, the evolutionary psychology literature on cultural products is resplendent with similar examples of the extent to which differences in aesthetic taste may be associated with particular adaptive specialisations (e.g. Cooper, 1999; Grinde, 1996; Grodal, 2004; Riegel, 1996). Although no one would deny that these differences are equally amenable to interpretation at an ontogenetic level only, engagement with this not insubstantial body of literature may reveal the precise origins of the differential levels of reinforcement such products typically elicit and, in the process, enable the behaviour analyst to formulate more precise hypotheses in respect of predicted reinforcing effects.

Utilitarian reinforcement, then, be it related directly to the utility function of the target purchase or its more hedonistic dimensions, owes its origins to our evolutionary heritage. It is direct primary reinforcement in its most literal sense, defined primarily by the extent to which it satisfies adaptive needs – needs calibrated not to the world of today, but to the demands of the Environment of Evolutionary Adaptation. But, what of informational reinforcement, the indirect feedback received on one's performance in the role of consumer?

According to Foxall (2007), the roots of informational reinforcement lie in the notion of secondary reinforcement through status. In the environment of our Pleistocene ancestors, competition between individuals was rife, particularly among the males of the species (Campbell, 1995). The male who gained access to the most fertile female was the one with the greatest potential for protecting his mate and providing the resources necessary to ensure that both she and any resultant offspring survived, reproduced and passed these "fit" genes on to a new generation.

Conversely, the female most capable of attracting such a mate was the one with the attributes most signalling reproductive potential; cues of health, intelligence, nurturing potential, and so on. Thus, to both males and females, status display was a crucial component of inclusive fitness, with prestige as the most overt signal of that fitness. It therefore follows that a learning adaptation capable of performing status tracking functions would have been favoured by selection pressures. From a behavioural perspective, this means that a mechanism for detecting and responding to informational reinforcement would have considerable adaptive value.

Of all of the consumption phenomenon associated with informational reinforcement, perhaps the most overt is the behaviour typically labelled as conspicuous consumption, defined by Veblen (1899) as encompassing all of those purchase activities that publicly display one's membership of a privileged social grouping. In the competitive world of the EEA, conspicuous consumption signalled fitness potential through the public display of status symbols; today, status is still signalled in this way through the consumption of designer fashions, prestige motor cars and the latest technological innovations.

The literature on conspicuous consumption has historically focused upon the concept of costly signalling; acceptance of a price premium to display status, sometimes referred to as a "Veblen Effect". Thus, just as the peacock pays a high price for the capacity of its tail feathers to attract a mate, so modern consumers will increase expenditure where the public consumption of a good confers a high degree of status among significant groups; i.e. where it delivers a high level of informational reinforcement. Moreover, dependent upon a person's situational and/or life circumstances, conspicuous consumption as a route to informational reinforcement can become so important that consumers are willing to accept a number of potentially undesirable risks. They may purchase according to the handicap principle, for instance, sacrificing even product quality for brand status, or else they may engage in deceptive signalling, whereby consumers may even risk public exposure and subsequent loss of face by false display of conspicuous consumption activities.

A number of authors have focused upon these alternatives to the Veblen Effect, providing indirect and direct evidence that informational reinforcement is a primary factor involved in conspicuous consumption activities under circumstances where an ability to engage in behaviours where price and status will correlate positively are impaired. For instance, in respect of the handicap principle, a series of studies by Chao and Schor (1998) suggest that consumers are more willing to accept smaller weights for perfume and cosmetic products as brand status rises, tend to decorate their (public) living rooms and neglect their (private) bedrooms as budgetary constraints increase, and will even sacrifice food quantity and/or quality in order to obtain a prestige car or designer clothing.

In one major study of deceptive signalling in Chile, Van Kempen (2003) reported that young adults striving for upward mobility would often pack groceries from a cut-price food store in carrier bags from a more upmarket competitor, purely for public display to neighbours when returning home from shopping. Some consumers even went to the lengths of being seen selecting items in a high-status food store at a peak time of day, only to surreptitiously abandon the shopping cart before reaching the checkout and make a subsequent journey to a remote low-cost supermarket. Such individuals also tended to drive around town with all windows closed in order to suggest they owned a car with air conditioning and, perhaps most bizarrely of all, several reported having received motoring fines for driving whilst using a mobile telephone even though the phone they were "using" itself was nothing more than a wooden replica! Deceptive signalling is a clear example of a consumption phenomenon where the public display of goods – i.e. the attainment of informational reinforcement – quite clearly overrides notions of price, quality, value, etc.

In one particularly innovative and relevant study, Xiao (2006) applied the BPM explanatory framework itself in order to examine consumer behaviour toward counterfeit goods; perhaps the most overt example of deceptive signalling today, accounting for over 4% of all world trade and, in three-quarters of all cases, involving "fakes" knowingly purchased by the consumer. Applying both survey-based methodologies and a novel purchase situation simulation, Xiao observed powerful effects of two distinct forms driving counterfeit buying: first, the number of counterfeit goods acquired increased proportional to the degree of status the genuine versions could deliver (e.g. designer fashions and jewellery), with consumers apparently being willing to accept a price premium for the most convincing fakes; and second, even where the goods purchased were counterfeits of everyday low-cost items (basic toiletries, condoms, etc.), a key motivation tended to be in order to "free up cash" for the purchasing of larger quantities of genuine status-conferring goods. Moreover, the circumstances in which a good-quality imitation product would most often be purchased for public consumption tended to involve situations with clear evolutionary-significant themes; i.e. impressing a member of the opposite sex or a potential employer/client, shadowing the consumption behaviours of members of aspirational groups, and so on.

As with its utilitarian counterpart, then, informational reinforcement as a process is amenable to neo-Darwinian interpretation. Given the significance of status to our ancestors in the competitive environment of the EEA, selection will have favoured the emergence of an adaptive mechanism capable of status tracking functions, as manifest in conspicuous consumption activities today. Although readily explainable in purely ontogenetic terms, understanding of informational reinforcement can be enhanced via the adoption of an evolutionary lens, the literature on prestige and status yielding important insights into the precise circumstances under which reinforcement of this nature is most likely to gain primacy.

One final area in which evolutionary psychology may inform and enhance the behaviour-analytical perspective on reinforcement, however, concerns the adoption of innovations; an area of consumption in which research suggests that both utilitarian and informational reinforcement play a pivotal role.

According to Foxall (1993), four distinct forms of consumer behaviour, termed operant classes, can be defined according to their relative high-low capacity to yield utilitarian and informational reinforcement:

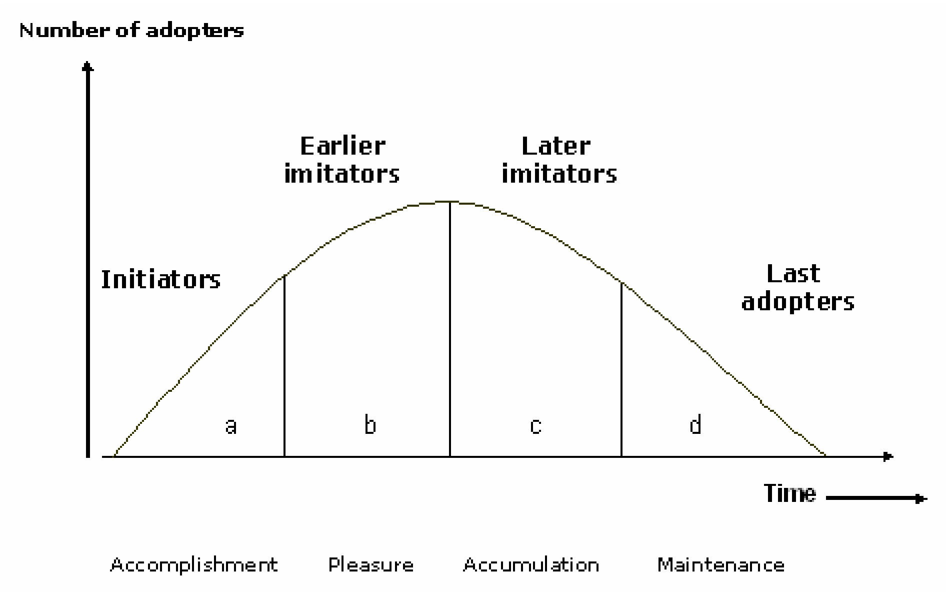
> *Maintenance Shopping:* Low in both utilitarian and informational reinforcement, behaviours in this category are associated with routine purchasing only, such as the weekly trip to the supermarket to purchase general groceries or the regular payment of local taxes.
>
> *Accumulation Shopping:* Low in utilitarian reinforcement, but with informational reinforcement acquiring greater importance, this class of behaviour is generally associated with saving and collecting, as manifest in the accumulation of supermarket "loyalty card" points or the satisfaction derived from seeing interest accrue on a savings account.
>
> *Pleasure Shopping:* Low in informational reinforcement, but high in utilitarian reinforcement, this is shopping in its most selfish and hedonistic sense, typically evident

in the purchase of entertainment products for private consumption, clothing items as a personal "treat", and so on.

Accomplishment Shopping: High in both forms of reinforcement, this mode of shopping is consumption in both its hedonistic and public senses; i.e. enjoying purchasing *and* being seen to be making the "right" product/brand choices, the most overt example being engagement in conspicuous consumption activities as highlighted above.

Foxall (1997) has argued that these patterns of reinforcement both determine and predict the extent to which an individual consumer will become an adopter of a new product innovation, mapping the four operant classes onto the classic diffusion of innovations curve (**Figure 2**).

Figure 2: Adoption of Innovations by Operant Class of Behaviour



As can be seen from the above, individuals seeking both utilitarian and informational reinforcement (accomplishment behaviour) are the earliest adopters of new innovations, followed by those prioritising utilitarian reinforcement (pleasure) or informational reinforcement (accumulation), with consumers for whom neither are a priority representing the "laggards" in the innovation curve. From a behavioural perspective, the category of adopter to which a person belongs is assumed to be a product of his or her own unique learning history of past adoption of innovations and their reinforcing outcomes. However, evolutionary psychologists have also studied adoption of innovations and, once again, the insights gained from that literature may further inform our understanding.

For instance, one particularly fruitful line of research concerns the neo-Darwinian origins of innovation, thought to lie not just in the extent to which status display per se is important to the individual's current circumstances, but also as a consequence of so-called birth-order effects.

In a hostile environment, offspring face competition not only from members of the same species, but also from members of the same family. Countless mammalian species display evidence that newborn offspring adopt often sophisticated strategies to encourage parental investment, thus maximising their chances of survival and reproduction. Furthermore, in particularly impoverished environments, such species also display high levels of siblingcide, offspring being prepared to kill one another during the course of rivalry for parental attention (Daly & Wilson, 1988; Daly & Wilson, 1999).

Within the modern consumer society, this competition among offspring is thought to be a key factor in within-family variations in adoption of innovations (Saad, 2007). First-borns, for instance, have been found to be the most innovative in terms of educational products and the acquisition of new product innovations as gifts to their parents; an observation thought to indicate a "Look at me, I'm a good boy/girl" effect whereby parental investment is forthcoming in response to conformity to social and familial expectations of striving for resources. Later-borns, who are at a disadvantage relative to their well-behaved and stronger older siblings, must therefore strive for parental investment by carving out a distinct familial niche, and to signal intelligence and environmental awareness, as reflected in a tendency to be more innovative as manifest in the far greater propensity to be "early adopters" of products, ideas and social movements. Moreover, in very large families, the youngest-born is most likely to take this niche-creating to extremes, being the most rebellious and non-conformist of all the siblings; an effect most pronounced in consumption of new youth movements and their associated fashions and emblems.

All of these effects of birth order and position in the innovation curve have been verified empirically in both industrial and pre-industrial societies, and in relation to products and consumption experiences in many different classes, suggesting a powerful role for familial position in adoption of innovations (Claxton, 1995, 1999; Saad & Gill, 2001; Saad, Gill, &

Nataraajan, 2005; Sulloway, 1996, 2001a, 2001b; Zemanek, Claxton, & Zemanek, 2000). Thus, although patterns of reinforcement and past experiences of them play a key role in an individual's position in the innovation cycle, biosocial factors such as birth order may well exert a moderating influence, determining the saliency of the patterns of reinforcement yielded by innovations for the individual.

In sum, reinforcement is just one element of the BPM interpretive framework in which adoption of a neo-Darwinian perspective may prove instructive. In both its utilitarian and informational forms, reinforcement has quite clear evolutionary bases, particularly when viewed in terms of learning as a multi-circuit series of adaptive specialisations. These two reinforcement forms would have served primary and secondary functions within the Environment of Evolutionary Adaptation and understanding of those roles holds a capacity to shed light upon why consumers respond in differential ways to prevailing patterns of reinforcement, the precise circumstances under which such differences may or may not be manifest, and the likely moderating influences that may be exerted by biological, social and cultural variables. Not only does adoption of a neo-Darwinian lens thus inform our understanding of the reinforcement process, it also allows us to formulate new and more precise research hypotheses that may serve to advance the behaviour-analytical programme further through integration of ontogeny and phylogeny within our conceptual frameworks.

Learning Histories?

Throughout this paper, we have sought to establish a connection between evolutionary psychology and consumer behaviour analysis as a means of encouraging a more unified view of what are often seen as competing, rather than complimentary, paradigms. Historically, there has been an unfortunate tendency to separate the phylogenetic and ontogenetic levels of explanation as though acceptance of one *de facto* implied rejection of the other. This is emphatically not the case.

Imagine the scenario in which a mother, standing in line at the supermarket checkout, responds to her crying child by giving him a bar of chocolate. An ontogenetic interpretation of this event might be that the mother has previous experience of the child crying as a signal that he is hungry, so she administers the chocolate bar to pacify him. A perfect normal everyday act of behaviour, easily explainable in operant terms.

Now consider the same scenario again from the standpoint of evolutionary psychology. A phylogenetic interpretation of the exact same event might be that the mother is aware that crying is a signal that her child is hungry and thus, in order to maximise his chances of survival and subsequent reproduction, she engages in a subconscious parental investment behaviour and administers food to satiate his needs. Again, a very reasonable ultimate-level explanation, conforming firmly to the central tenets of neo-Darwinism.

The key point about these two interpretations, however, is that *both* may simultaneously be true. The mother is indeed responding to prior learning (ontogeny), but this learning has only occurred because she is endowed with an adaptive learning circuit designed by natural and sexual selection precisely to handle situations of this form (phylogeny). In other words, the proximate-level account offers us an interpretation of *what* is happening and the ultimate-level account informs us as to *why* it is happening. The two are not mutually exclusive but, rather, they "dove-tail" succinctly to provide a more comprehensive understanding of the mother's behaviour toward her child.

Evolutionary psychologists have often been accused of engaging in a grand intellectual pursuit, generating a series of "just so" stories that are near impossible to verify. In part, this is an inevitable consequence of the strategies typically adopted by scholars in this discipline. Typically, they will adopt either a "top-down" approach, seeking to predict the behaviour of our Pleistocene ancestors under particular conditions and then seeking evidence of replication of that behaviour in a contemporary form, or else they will favour a "bottom-up" strategy, interpreting a modern behaviour by inferring its likely origins in a particular set of ecological circumstances in the Environment of Evolutionary Adaptation. Whatever the strategy adopted, however, we can never *really* know what happened in the EEA and so the account generated is purely speculative, albeit endorsed indirectly at times by, say, cross-cultural research that indicates predicted patterns of behaviour universal across a range of different contemporary societies.

Behaviourism, on the other hand, offers a very convincing explanation of environment-behaviour relationships via operant learning. It portrays behaviour as a function of reinforcement, with discriminative stimuli serving as predictors of that reinforcement that help to shape a behavioural response. Depending on one's point of view, this is thus either an elegantly simple model of behaviour or, alternatively, an over-simplified account of human action that relies on an impoverished pseudo-equation; the three-term contingency. Indeed, it is this latter view that critics of behaviourism often seek to perpetuate, suggesting that this "redundant" paradigm portrays humans merely as automata that passively respond to environmental stimuli.

Yet, by their integration, both schools of thought can benefit from one another. Evolutionary psychologists, rather than speaking of universal "instincts" and making grand claims on the basis of very macro-level survey-based and geodemographic data, have an opportunity to engage with the behaviour-analytic literature and instead generate more empirically testable hypotheses that predict the forms of learning one would expect natural and sexual selection to have equipped the individual with and how these facultative adaptations may function under particular circumstances. Conversely, instead of simply constructing speculative propositions of likely human action under certain conditions, primarily on the basis of assumptions about reinforcement salience, prior experience of such reinforcement and the likely environmental stimuli that may signal it, behaviourists may gain much from viewing the behaviour under investigation through a neo-Darwinian lens, particularly in respect of the opportunity afforded for developing more precise hypotheses in respect of what will be reinforcing, when and why. Put another way, rather than competing with one another, evolutionary psychologists and behaviour analysts can actually assist one another and, in the process, advance understanding of human action through a more scientific approach to its investigation (Ludwig, 2003).

In respect of the consumer behaviour analysis programme itself, the example of reinforcement and its likely evolutionary bases illustrates the potential engagement with neo-Darwinism has for future research endeavours. By drawing upon the not insubstantial consumption literature generated by evolutionary psychologists, it becomes possible to formulate hypotheses that move the programme in to potentially very important new areas of research activity. In particular, such a marriage of thinking allows us to predict more accurately what products, services and experiences will prove more or less reinforcing, to whom, and under what ecological circumstances; a not insignificant development in respect of international and cross-cultural work in particular. Furthermore, as demonstrated by the example of birth-order effects and the adoption of innovations, even engagement with biologically-defined parameters holds considerable promise in respect of the capacity to refine our models to accommodate deeper understanding of the type of learning history an individual consumer may develop and why. Put another way, behaviour analysts can draw upon evolutionary thinking to formulate research activities that are characterised by greater precision, thus improving the predictive power of key frameworks and concepts such as the BPM – a development with a symbiotic effect for evolutionary psychology which, in the process, acquires an opportunity to generate ontogenetic-level hypotheses to test its central concepts, rather than relying purely upon the more macro-level work so despised by critics.

Of course, reinforcement is but one element of the BPM explanatory framework, yet there is no reason to presuppose that other elements may not equally benefit from accommodation of an evolutionary perspective. The behaviour setting, for instance, may prove a fruitful ground for future research in this area. The Garcia Effect taught us decades ago that individuals, both animal and human, respond differentially to environmental stimuli. However, by drawing upon the vast body of literature accumulated by evolutionary psychologists on the adaptive value or significance of particular proximal cues, behaviour analysis may gain a capacity to inform understanding as to what situational factors may be most/least likely to be transformed into discriminatory stimuli in the current consumption setting, to whom and under what conditions, irrespective of prior experience. Again, this would greatly advance past work by authors such as Belk (1975), Magnusson (1981) and Stokols (1987) and, on a more practical level, enable retail organisations to gain more effective "control" over consumer choice through environmental management.

Finally, in respect of the more precise formulation of research propositions, evolutionary psychology directs attention to one substantial yet under-researched independent variable in the behaviour-analytical literature; the variable of sex. Human beings, like many other species, come in two distinct morphs – male and female – each characterised by differences in their optimal reproductive strategy. Because of concealed ovulation, females and males are distinguished by a single crucial knowledge disparity; the paternity conundrum. That is, whereas females are always 100% certain that they are the mother of the offspring they are carrying, males can never be entirely sure that they are the father. Therefore, in the harsh world of the EEA, the most effective means of maximising reproduction for the male was to "spread the seed wide" and copulate with as many fertile females as possible. For the female, on the other hand, due to the potential risks of ova pollution, the optimal reproductive strategy was one based upon monogamy, the goal being to pair-bond with the single male with the resource capacity to protect and provide for the female and any offspring (Boaz & Almquist, 1999; Buss, 1989; Ford & Beach, 1951; Hrdy, 1999; Kruger, 2001; Symons, 1979).

This fundamental difference between the two sexes has become a central focus of the neo-Darwinian project. It has informed a vast body of research into likely sex differences in behaviour of evolutionary significance, from office gossip and the so-called promotion "glass ceiling", through to differentials in the characteristics each sex finds attractive and the type of clothing worn under varying ecological circumstances. Moreover, in the specific field of consumer research, this underlying adaptive logic has been used as a basis for exploring a broad spectrum of consumption phenomenon, including: sex differences in computer gaming; responses to advertising models; children's toy preferences; musical aesthetics; consumption of pornography and romantic novels; the design of teddy bears; and response rates to personal advertisements. Useful syntheses of these respective bodies of literature on sex differences are offered by Campbell (2002) and Saad (2007).

Historically, behaviour analysts have tended to overlook the variable of sex. In many respects, this is unsurprising – after all, the cornerstone of behaviourism is the notion that behaviour is learned, so sex differences tend just to be equated with gender differences and explored merely as social roles that are acquired during the lifespan. This neglect is unfortunate because sex differences in learning abilities would be expected for quite practical adaptive reasons. If natural selection constructs learning circuits for particular adaptive problems, then the problems faced by males and females in the EEA were at times quite different. Women needed to be equipped with superior verbal learning skills, for instance, in order that they may survive in a social group whilst men were foraging; an activity which in itself would necessitate a male advantage in respect of spatial learning. Both of these exemplar specialisations have been demonstrated empirically, and both have quite clear neurological and/or hormonal bases verifiable by clinical evidence (Halpern, 2000; Kimura & Hampson, 1993; Sherry, Jacobs, & Gaulin, 1992). More importantly still, they have very obvious implications for the study of sex differences in a range of different consumer choice situations. Therefore, by engaging with the evolutionary psychology work in this area, a potential exists for behaviour analysts to refine current thinking in respect of this important learning variable and, in turn, to provide a means for evolutionary psychologists to develop proximate-level hypotheses of circumstances in which sex differences might be anticipated to be manifest at a micro-level, augmenting the more macro-level research that is frequently unable to distinguish between learned gender roles and actual manifest biologically-mediated effects.

In sum, the present paper has sought to offer a neo-Darwinian contribution to the consumer behaviour analysis programme. The central argument posited here has been that learning is by definition a series of adaptations and that a body of literature founded upon adaptive logic thus offers an opportunity to inform our understanding of consumer choice. The paper does not claim to be comprehensive, nor to offer a definitive account of how a synergy between the proximate and ultimate levels might be achieved. It has merely sought to raise awareness of some of the central tenets of evolutionary psychology and to encourage greater exploration of this literature in pursuit of a more comprehensive and parsimonious account of consumer behaviour. It has also endeavoured to question the traditional dichotomy between ontogeny and phylogeny and to suggest that *both* perspectives have much to gain through greater engagement with one another. Put another way, it is perhaps time to stop thinking about one ontogenetic learning history and, instead, to accommodate a phyologenetic one in our schema also. Some rules may be learned by consumers, others may simply have the appearance of being learned because the hardwired circuits generating particular behaviours function so effectively. This is not just a rhetorical question; it has important implications for our knowledge of consumer behaviour.

In conclusion, explanations of consumer choice that are founded upon adaptation in the life of the species *or* in the life of the individual are simply no longer tenable. Phylogenetic perspectives offer insight into what learning mechanisms natural and sexual selection pressures might have favoured and the precise circumstances under which they may, or may not, be activated. Ontogenetic perspectives, in turn, yield insight into how those specialist mechanisms operate and their iterative impact across the lifespan. Via integration of these two perspectives, therefore, a much richer understanding of human action in general – and consumer choice in particular – thus emerges. In the context of the consumer behaviour analysis research programme, this is too potentially rich an opportunity to miss for, through accommodation of neo-Darwinian logic within our programme, we may come to develop greater precision in our hypothesising, greater clarity in our conceptualising, and greater credibility for our discipline. Darwin may be long gone, but his ghost is only just beginning to intrude upon our domain – we should welcome its presence and accept that learning histories may be both proximate and ultimate conceptualisations.

References

Baum, W. M. (2004). *Understanding Behaviorism: Behavior, Culture and Evolution* (2nd ed.). Oxford: Blackwell.

Belk, R. W. (1975). Situational variables and consumer behavior. *Journal of Consumer Research, 2*, 157-164.

Bergman, A. S. (1990). *Auditory Scene Analysis: The Perceptual Organization of Sound*. Cambridge, MA: MIT Press.

Boaz, N. T., & Almquist, A. J. (1999). *Essentials of Biological Anthropology*. New Jersey: Prentice-Hall.

Bolles, R. C. (1979). *Learning Theory*. New York: Holt, Rinehart and Winston.

Boyer, P., & Clark Barrett, H. (2005). Domain Specificity and Intuitive Ontology. In D. M. Buss (Ed.), *Handbook of Evolutionary Psychology*. Hoboken, NJ: Wiley.

Burnham, T., & Phelan, J. (2000). *Mean Genes - From Sex to Money to Food: Taming our Primal Instincts*. Cambridge, MA: Perseus.

Buss, D. M. (1989). Sex differences in human mate preferences: evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences, 12*, 1-49.

Buss, D. M. (2004). *Evolutionary Psychology: The New Science of the Mind*. Boston, MA: Pearson.

Campbell, A. (1995). A Few Good Men: Evolutionary Psychology and Female Adolescent Aggression. *Ethology and Sociobioiogy, 16*, 9-123.

Campbell, A. C. (2002). *A Mind of Her Own: The Evolutionary Psychology of Women*. Oxford: Oxford University Press.

Carlson, N. R. (1994). *The Physiology of Behaviour*. New York: Allyn and Bacon.

Chao, A., & Schor, J. (1998). Empirical tests of status consumption. *Journal of Economic Psychology, 19*, 107-131.

Claxton, R. P. (1995). Birth order as a market segmentation variable. *Journal of Consumer Marketing, 12*, 22-39.

Claxton, R. P. (1999). Birth order and two marketing-related measures of aggression. *Psychological Reports, 84*, 236-238.

Cooper, B. L. (1999). Images of women in popular song lyrics: A bibliography. *Popular Music and Society, 22*, 79-89.

Cosmides, L., & Tooby, J. (1987). From Evolution to Behaviour: Evolutionary Psychology as the Missing Link. In J. Dupre (Ed.), *The Latest on the Best: Essays on Evolution and Optimality*. Cambridge, MA: MIT Press.

Daly, M., & Wilson, M. (1988). *Homicide*. New York: Aldine de Gruyter.

Daly, M., & Wilson, M. I. (1999). Human evolutionary psychology and animal behaviour. *Animal Behaviour, 57*, 509-519.
Dawkins, R. (1986). *The Blind Watchmaker*. London: Longman.
Fodor, J. (1983). *The modularity of the mind: an essay on faculty psychology*. Cambridge, MA: MIT Press.
Ford, C. S., & Beach, F. A. (1951). *Patterns of Sexual Behavior*. New York: Harper.
Foxall, G. R. (1993). A Behaviourist Perspective on Purchase and Consumption. *European Journal of Marketing, 27*(8), 7-16.
Foxall, G. R. (1997). *Marketing Psychology: The Paradigm in the Wings*. Wiltshire: Antony Rowe.
Foxall, G. R. (1998). The marketing firm. *Journal of Strategic Marketing, 6*, 131-150.
Foxall, G. R. (1999a). The Behavioural Perspective Model: Consensibility and Consensuality. *European Journal of Marketing, 33*(5/6), 570-596.
Foxall, G. R. (1999b). Putting Consumer Behaviour In Its Place: The Behavioural Perspective Model Research Programme. *International Journal of Management Reviews*(June), 133-158.
Foxall, G. R. (2001). Foundations of consumer behaviour analysis. *Marketing Theory, 1*(2), 165-199.
Foxall, G. R. (2007). *Explaining Consumer Choice*. London: Palgrave.
Foxall, G. R., & Greenley, G. E. (1999). Consumers' emotional responses to service environments. *Journal of Business Research, 46*, 149-158.
Foxall, G. R., & Hackett, P. M. W. (1994). Consumer Satisfaction with Birmingham's International Convention Centre. *Services Industry Journal, 14*(3), 369-380.
Foxall, G. R., Oliveira-Castro, J. M., James, V. K., Yani-de-Soriano, M. M., & Sigurdsson, V. (2006). Consumer Behavior Analysis and Social Marketing. *Behavior and Social Issues, 15*, 101-124.
Foxall, G. R., & Yani-de-Soriano, M. Y. (2004). Situational influences on consumers' attitudes and behaviour. *Journal of Business Research, in press*.
Gallistel, C. R. (1990). *The Organization of Learning*. Cambridge, MA: MIT Press.
Gallistel, C. R. (1995). The Replacement of General-Purpose Theories with Adaptive Specializations. In M. Gazzaniga (Ed.), *The Cognitive Neurosciences*. Cambridge, MA: MIT Press.
Garcia, J., & Ervin, F. (1968). Gustatory-visceral and telreceptor-cutaneous conditioning: Adaptation in internal and external milieus. *Communications in Behavioral Biology, 1*, 389-415.
Garcia, J., & Koelling, R. A. (1966). Relation of cue to consequence in avoidance learning. *Psychonomic Science, 4*, 123-124.
Gaulin, S. J. C., & McBurney, D. H. (2004). *Evolutionary Psychology* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.
Grinde, B. (1996). The biology of visual aesthetics. *Journal of Social and Evolutionary Systems, 19*, 31-40.
Grodal, T. (2004). Love and desire in the cinema. *Cinema Journal, 43*, 26-46.
Halpern, D. F. (2000). *Sex Differences in Cognitive Abilities*. Mahwah, NJ: Erlbaum.

Hrdy, S. B. (1999). *Mother Nature: natural selection and the female of the species*. London: Chatto and Windus.
Huron, D. (2003). Is music an evolutionary adaptation? In I. Peretz & Z. R. (Eds.), *The Cognitive Neuroscience of Music* (pp. 55-75). Oxford: OUP.
Huron, D. (2004). *The Plural Pleasures of Music.* Paper presented at the Music and Music Science Conference, Royal Institute of Technology, Stockholm.
Kimura, D., & Hampson, E. (1993). Neural and Hormal Mechanisms Mediating Sex Differences in Cognition. In P. Vernon (Ed.), *Biological Approaches to the Study of Intelligence*. New Jersey: Ablex.
Kruger, D. J. (2001). *What is Evolutionary Psychology?* Available: http://homepages.luc.edu/~dkruger/ep1.html [2002, 14/10/02].
Leek, S., Maddock, S., & Foxall, G. R. (2000). Situational determinants of fish consumption. *British Food Journal, 102*, 18-39.
Ludwig, E. A. (2003). Why Pinker Needs Behaviorism: A Critique of the Blank Slate. *Behavior and Philosophy, 31*, 139-143.
Magnusson, D. (1981). Wanted: A psychology of situations. In D. Magnusson (Ed.), *Toward a Psychology of Situations: An Interactional Perspective* (pp. 9-32). Hillsdale: Lawrence Erlbaum.
Meyer, M. (1903). Experimental studies in the psychology of music. *American Journal of Psychology, 14*, 456-475.
Newman, A. J., & Foxall, G. R. (2003). In-store customer behaviour in the fashion sector: some emerging methodological and theoretical directions. *International Journal of Retail & Distribution Management, 31*(11), 591-600.
Nicholson, M. (2005). *Consumer Psychology as the Behaviourist Views It: An Operant Analysis of Consumer Channel Choice.* Unpublished PhD thesis, University of Durham.
Parker, P. M., & Tavassoli, N. T. (2000). Homeostasis and consumer behavior across cultures. *International Journal of Research in Marketing, 17*, 33-53.
Pierce, W. D., & Cheney, C. D. (2004). *Behavior Analysis and Learning*. London: LEA.
Pinker, S. (1991). Rules of language. *Science, 253*, 530-535.
Pinker, S. (1994). *The Language Instinct*. New York: Morrow.
Pinker, S. (2002). *The Blank Slate: The Modern Denial of Human Nature*. London: Allen Lane / Penguin.
Profet, M. (1992). Pregnancy sickness as an adaptation: A deterrent to maternal ingestion of teratogens. In J. Barkow & L. Cosmides & J. Tooby (Eds.), *The Adapted Mind* (pp. 327-366). New York: Oxford University Press.
Raffman, D. (1993). *Language, Music and Mind*. Cambridge, MA: MIT Press.
Riegel, H. (1996). Soap operas and gossip. *Journal of Popular Culture, 29*, 201-209.
Saad, G. (2006). Applying Evolutionary Psychology in Understanding the Darwinian Roots of Consumption Phenomena. *Managerial and Decision Economics, 27*, 189-201.
Saad, G. (2007). *The Evolutionary Bases of Consumption*. Mahwah, NJ: LEA.

Saad, G., & Gill, T. (2001). Sex differences in the ultimatum game: An evolutionary psychology perspective. *Journal of Bioeconomics, 3*, 171-193.

Saad, G., Gill, T., & Nataraajan, R. (2005). Are laterborns more innovative and non-conforming consumers than firstborns? A Darwinian perspective. *Journal of Business Research, 58*, 902-909.

Schwartz, B. (1989). *The Psychology of Learning and Behavior*. New York: Norton.

Sherman, P. W., & Hash, G. A. (2001). Why vegetable recipes are not very spicy. *Evolution and Human Behavior, 22*, 147-163.

Sherry, D., Jacobs, L., & Gaulin, S. (1992). Spatial memory and adaptive specialization of the hippocampus. *Trends in Neuroscience, 15*, 298-303.

Skinner, B. F. (1981). Selection by consequences. *Science, 213*, 501-504.

Soriano, M. Y., Foxall, G. R., & Pearson, G. J. (2002). Emotion and environment: A test of the behavioural perspective model in a Latin American context. *Journal of Consumer Behaviour, 2*(2), 138-154.

Stokols, D. (1987). Conceptual strategies of environmental psychology. In D. Stokols & I. Altman (Eds.), *The Handbook of Environmental Psycology* (Vol. 1, pp. 41-70). New York: Wiley.

Sulloway, F. J. (1996). *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives*. New York: Pantheon.

Sulloway, F. J. (2001a). Birth order and evolutionary psychology: A meta-analytic overview. *Psychological Inquiry, 6*, 75-80.

Sulloway, F. J. (2001b). Birth Order, Sibling Competition, and Human Behavior. In R. H. Holcombe (Ed.), *Conceptual Challenges in Evolutionary Psychology: Innovative Research Strategies* (pp. 39-83). Dordrecht, NL: Kluwer Academic.

Symons, D. (1979). *The Evolution of Human Sexuality*. Oxford: Oxford University Press.

Thompson, W. F., Balkwill, L. L., & Vernescu, R. (2000). Expectancies generated by recent exposure to music. *Memory and Cognition, 28*(4), 547-555.

Tooby, J., & Cosmides, L. (1992). The psychological foundations of culture. In L. Barkow & L. Cosmides & J. Tooby (Eds.), *The Adapted Mind: Evolutionary Psychology and the Generation of Culture* (pp. 19-136). New York: Oxford University Press.

Tooby, J., & Cosmides, L. (2001). *Evolutionary Psychology: A Primer*. Center for Evolutionary Psychology, University of California, Santa Barbara. Available: http://www.psych.ucsb.edu/research/cep/primer.html14/12/02].

Tooby, J., & Cosmides, L. (2005). Conceptual Foundations of Evolutionary Psychology. In D. M. Buss (Ed.), *Handbook of Evolutionary Psychology* (pp. 5-67). Hoboken, NJ: Wiley.

Van Kempen, L. (2003). Fooling the eye of the beholder: Deceptive status signalling among the poor in developing countries. *Journal of International Development, 15*, 157-177.

Veblen, T. (1899). *The Theory of the Leisure Class*. New York: Macmillan.

Watson, J. B., & Rayner, R. (1920). Conditioned emotional reactions. *Journal of Experimental Psychology, 3*, 1-14.

Xiao, S. H. (2006). *Intellectual Property Theft and Illicit Consumer Behaviour: A Psychology of Counterfeit Products Purchasing.* Unpublished PhD Thesis, University of Durham.

Zemanek, J. E., Claxton, R. P., & Zemanek, W. H. G. (2000). Relationship of birth order and the marketing-related variable of materialism. *Psychological Reports, 86*, 429-434.