

**Patrick Vyncke**

Professor, Ph.D.

Department of Communication Sciences

Section Communication Management

Ghent University, Belgium

**Vanessa Apaolaza Ibáñez**

Associate Professor, Ph.D.

Department of Business Economics and Finance

(Economía Financiera II)

Faculty of Economics and Business Administration

University of the Basque Country, Bilbao, Spain.

**Patrick Hartmann**

Professor, Ph.D.

Department of Business Economics and Finance

(Economía Financiera II)

Faculty of Economics and Business Administration

University of the Basque Country, Bilbao, Spain.

**Contact:**

Prof. Dr. Patrick Vyncke

Dept. of Communication Sciences

Section Communication Management

Ghent University

Korte Meer 7-9-11

B-9000 Ghent

E-mail: [patrick.vyncke@ugent.be](mailto:patrick.vyncke@ugent.be)

Phone: 09 264 6891

Fax: 09 264 6992

# INSIGHTS FROM EVOLUTIONARY PSYCHOLOGY INTO PRIMARY AFFECTIVE REACTIONS AND ADVERTISEMENT EFFECTIVENESS

## ABSTRACT

Several studies in the marketing literature highlight the importance of evolutionary psychology as a scientific and pragmatic paradigm for studying unconscious aspects of advertising processing and consumer behavior (e.g. Lynn et al., 1999; Cary, 2000; Bagozzi and Natarajan, 2000; Saad, 2004, 2006; Saad and Gill, 2000, 2003; Colarelli and Dettman, 2003). In an experimental setting, we measured the primary affective reactions of 643 respondents towards 18 sets of ads. Each set consisted of a neutral ad and a manipulated ad, using insights from evolutionary psychology. Evolutionary psychological based manipulations were found to be effective in soliciting primary affective reactions, and thus to be potentially contributing to a stronger effect on advertisement effectiveness variables such as “ad attitude”, “brand attitude” and “brand purchase intention”.

## KEY WORDS

Evolutionary psychology, primary affective reactions, advertisement effectiveness

## 1. Introduction

Evolutionary psychology originates from the theories of Darwin (1859/1985), particularly concerning the process of evolution through natural selection, to the workings of the mind. Recent research shows that evolutionary psychology is a valuable paradigm when applied to the study of social behavior in general (Schmitt, 2003) and advertising and consumer research in particular (Collarelli and Dettmann, 2003; Saad and Gill, 2000, 2003). Specifically, several studies in the marketing literature highlight the importance of evolutionary psychology as a scientific and pragmatic paradigm for studying unconscious aspects of advertising processing and consumer behavior (Lynn et al., 1999; Cary, 2000; Bagozzi and Natarajan, 2000; Saad, 2004, 2006; Saad and Gill, 2000, 2003; Colarelli and Dettman, 2003). The positive impact which the implementation of evolutionary psychology can exert on the degree of ad effectiveness, can e.g. be illustrated by the power that the application of this discipline can have in evocating consumers' *primary affective reactions* (that is, basic, largely unconscious, affective evaluations of the commercial stimulus in terms of either relevance or attractiveness,

or – if one wishes – one could even think of these primary affective reactions as being instinctive reactions).

In a large scale experiment, we measured the primary affective reactions of 643 respondents towards 18 sets of ads. Each set consisted of a neutral ad and a manipulated ad, using insights from evolutionary psychology. Evolutionary psychological based manipulations were found to be effective in soliciting primary affective reactions, and thus to be potentially contributing to a stronger effect on advertisement effectiveness variables such as “ad attitude”, “brand attitude” and “brand purchase intention”.

## **2. Theoretical background**

### **2.1. Evolutionary psychology and its relevance for studying sex differences in ad preferences**

Evolutionary psychology posits that the human mind has evolved by natural and sexual selection, a point that Darwin had already alluded to. Hence, in the same way that our liver and kidneys have evolved to solve very specific survival problems, many of the affective, cognitive and conative components defining the human experience have been forged by the same selection mechanisms (Saad, 2007). Similar to the body consisting of several function-specific organs, the human mind has evolved a set of domain-specific Darwinian modules as adaptive solutions to recurrent survival and reproduction problems. Some of these problems included gathering food, avoiding predators, finding and retaining mates, protecting and investing in kin, and building and maintaining friendships, coalitions, and social networks (Saad, 2007, p. 5). According to evolutionary psychologists, adaptations then took place in the Pleistocene era, also called the Environment of Evolutionary Adaptedness or EEA (Barkow, Cosmides and Tooby, 1992; Buss, 1994, 1995; Wright, 1995; Winston, 2002; Barrett et al., 2002) to help us solve those specific problems. Hence, the corresponding cognitive and affective mechanisms that universally manifest themselves in today’s environment are in fact cognitive adaptations to survival and reproduction problems that *Homo sapiens* faced in the evolutionarily relevant past.

Although the field of consumer behavior has amassed an impressive database of empirical findings, there is little input based on evolutionary psychology as a theoretical framework. However, a great majority of our consumption choices are manifestations of our innate human

nature, which – as we explained – has been shaped by a long evolutionary process (Saad, 2007). For instance, many of the perceptual cues that are used to achieve the advertiser’s first goal (that is, eliciting a primary affective reaction), function in universally predictable ways because they are evolutionarily relevant. The efficacy of using scantily clad young and beautiful women in drawing men’s attention to ads is one such example (Saad, 2007).

On the other hand, it is assumed that during evolution men and women faced partially different adaptive problems. Consequently, evolutionary psychology predicts that there are strong sex differences in ad preferences, which will occur when the sexes are confronted with (advertorial) cues that were – in the EEA – relevant in domains in which the sexes faced different adaptive problems (Buss, 1989). Thus, the manner by which men and women use perceptual cues to navigate through their environments seems to be linked to evolved physiological and psychological differences (Saad, 2007). Recently, Choi and Silverman (2002, p. 116) have stated, “Differing concentrations of gonadal hormones early in development feminize or masculinize the organization of the brain, resulting in *perceptual biases*, and consequently, influencing how various environmental cues are used”. Indeed, although the ultimate goal of both sexes is (gene) reproduction, the strategies to attain this goal are different. Women, compared to men, are e.g. physiologically limited in terms of the number of offspring that they can procreate, and they invest more energy in their offspring (gestation, lactation, birth, breastfeeding...) (Trivers, 1972). Consequently, women developed a proclivity towards nurturing and parenting in order to cope with this adaptive problem. Men, on the contrary, are not physiologically restricted in terms of the number of offspring they can produce. Their primary limitation is the number of healthy, fertile females that are willing to mate. To cope with this adaptive problem, men have, for instance, a disposition to look for mates giving signs or cues of youth as an indication of good genes and high fertility (Buss, 1989) or to look for mates giving signs of sexual willingness (Vyncke, 2007). These different reproductive strategies following different adaptive problems can be behavioral, attentional, and attitudinal (Schmitt, 2003). The broad influence that sex seems to have on our primary interests strongly suggests that it can be successfully applied to the study of sex differences in ad preferences (Poels et al., 2005; Malamuth, 1996).

## **2.2. The links between affective reactions and cognition**

It is still an unresolved conceptual issue whether affect should be treated as post-cognitive and part of the cognitive representational system or should be seen as an entirely separate,

primary, mental faculty (Fiedler and Forgas, 1988). Several influential theorists argued that feelings may be external to and independent of cognition and can serve as input to subsequent cognitive and behavioral processes (Damasio, 1994; De Sousa, 1987). Zajonc (1980) specifically proposed such a “separate systems” view, suggesting that affective reactions often precede and are certainly distinct from cognitive processes. Additionally, experiments by Damasio (2000) have shown that emotions are processed autonomically, i.e. independent of will and are always formed pre-cognitively. He finds that emotions and feelings are formed in what is called the ‘*proto-self*’, whereas thoughts are formed in what is known as *core consciousness*. The results of his study indicate that activity in the proto-self always precedes activity in core consciousness. He also finds that, whilst cognitive processing depends on working memory, processing of feelings and emotions is *independent* of working memory. Fitzsimons and Shiv (2001) support this, claiming that there is considerable evidence of non-conscious processes within each of these main categories of affective responses. In summary, all these authors provide evidence for the existence of precognitive affective reactions that may function as directional input to behavior management.

### **2.3. Perspectives on Unconscious Information Processing and Corresponding Affective Reactions**

As the most well-known authors who have contributed to the foregrounding of sub- or unconscious dimensions of persuasive ad processing, we must surely mention Zajonc (1980), who drew attention to primary affective reactions, occurring before cognitive processing, but nevertheless being able to influence preferences; Gorn (1982), who demonstrated in his experiments how formal cues such as music used in an ad, could create consumer product preferences on an unconscious level; Petty and Cacioppo (1986), who developed the Elaboration-Likelihood Model in which a more conscious, cognitive, content oriented, central persuasive route was to be distinguished from a more subconscious, affective, form oriented, peripheral persuasive route and Van Raaij (1989), who claimed that all ads are processed first at a more sub- or unconscious level – scanning – resulting in primary affective reactions, before they can enter a more conscious and more elaborate phase of information processing – focusing – which eventually leads to secondary affective reactions. Thus, according to this last author, cognition is preceded by a “primary affective reaction” (PAR) which functions as a gatekeeper and decides whether or not it is interesting or worthwhile to further process the

information contained in the advertisement. So, consumers should first like the ad before they are willing to process information received. The next step is a cognitive elaboration serving mainly to justify and support the PAR and as a result of which a more extensive affective reaction takes place and an attitude towards the brand is formed, which will also have a direct effect on brand purchase intention (Olney et al., 1991). On a more general level, this distinction between primary, unconscious and purely affective information processing, versus secondary, more conscious and more cognition based information processing, can be found in the work of the American neurologist LeDoux (1996). This author distinguishes a low and a high road of information processing, and detected the corresponding neurological structures studying the emotion of fear.

These and other aspects of sub- or unconscious processing of ads have recently enjoyed renewed interest by both social scientist in general (specially evolutionary psychologists) and consumer researchers in particular (for an excellent overview, see e.g. Hassin, Uleman and Bargh 2005, see also e.g. Gigerenzer 2000, Myers 2004, Fine 2006, Hill 2003, Bargh 1988, 1990, 1992). In line with this renewed interest in unconscious and affect laden ad information processing, our research question then is: *“Is there a higher impact on ad-attitude, brand-attitude and brand purchase intention, if primary affective reactions are generated by advertising cues developed according to insights from evolutionary psychology?”*

### **3. Research design**

#### **3.1. Sample and Stimulus Material**

In order to address the research question, personal interviews were conducted on a sample of 643 Spanish individuals (319 males and 324 females) aged 18 to 50, selected through random sampling (street interviews), and establishing age quota (50% between 18 and 35 years old, 50% between 36 and 50). In each interview, the respondent was first exposed to an ad, was then asked to evaluate both his or her degree of attitude towards the ad and the advertised brand, and finally was asked for his or her brand purchase intention after this ad exposure.

For this research project, 18 sets of print advertisements were created, using Adobe Photoshop CS 2 (see Appendix), to be shown to the respondents in our sample. Each set consisted of a neutral ad and a manipulated ad, using insights from evolutionary psychology (see for

excellent overviews e.g. Miller 2001; Buss 1989; Buss and Schmitt, 1993; Buss 1999; Workman and Reader 2004). With regard to sexual attractiveness cues, insights drawn from evolutionary psychology suggest that male sexual attractiveness for heterosexual females is enhanced by signs of physical strength and health, social-economic status, parental care and investment in offspring (among other things). Female sexual attractiveness for heterosexual males is enhanced by signs of youthfulness and health, sensuality and sexual willingness, and fertility (among other things). In 13 of the ads, these signs were enhanced in the manipulated version of the ad. To check if typical male signs did not work on female models (e.g. socio-economic status), or if typical female signs did not work on male models (e.g. youth cues), we also manipulated ads accordingly. Ads 14 and 15 show an example of this approach.

Within the subfield of evolutionary aesthetics, it has also been found that humans on average find symmetry attractive in potential mates. And in fact, even today, facial symmetry is correlated with reproductive health, and so it is plausible that rapidly detecting and being attracted to facial symmetry is an aesthetic judgment adaptation that could have led to relatively higher reproductive success (Thornhill and Gangestad, 1993; Gangestad et al., 1994; Grammer and Thornhill, 1994; Etcoff, 1999; Rhodes et al., 1999; Voland and Grammer 2003). Ads 5 and 13 show an example of this approach. Evolutionary aesthetics also explains a wide range of other responses, including a preference for landscapes that provide protection and vantage points (Dutton, 2003). Concerning this topic, it has been found, for instance, that humans as a species have developed a preference for savannah-like landscapes (since this was our natural habitat for about 2 million years and the place where our ancestors found resources like food, water and sight protection; Orians and Heerwagen, 1992; Kaplan, 1987; Ulrich, 1981; Appleton, 1975), and, on the other hand, that we also share with many other animals a clear parental instinct that extends to infants of other species (see e.g. Lorenz, 1977). Thus, we created ad sets (16, 17 and 18) too, showing images of different natural environments, where the manipulated version of the ad differentiated itself only by the alteration of some element in the scene, again drawing from arguments used by evolutionary psychologists. These last ads wanted to test non-sexual evolutionary psychological hypotheses, specially derived from the subfield of evolutionary aesthetics.

Each respondent was only exposed to one type of advertisement, so that out of a total sample of 643 individuals, 331 were exposed to the neutral versions of the ads, while 312 were exposed to the manipulated versions. Each ad was displayed only for three seconds, thus

allowing respondents no more time than necessary for primary affective reaction and minimal cognitive processing.

### **3.2. Variables measurement**

The development of measurement scales and indicators was based on the review of relevant literature. The “ad attitude” and “brand attitude” constructs were measured by a 10 point semantic differential scale with anchors of “I didn’t like it at all” and “I liked it very much”, adapted from Homer (1990) and Gardner (1983). On the other hand, the “brand purchase intention” construct was also measured by a 10 point semantic differential scale with anchors of “certainly I’ll buy it” and “certainly I will not buy it” (Mackenzie and Spreng, 1992).

## **4. Research findings**

Our general finding was that all sets of ads (with the exception of one: ad A15) provided results in favor of the insights provided by evolutionary psychology. Table 1 and 2 summarize our findings. In all cases, results showed clear preferences for one or the other ad in accordance to evolutionary psychological predictions in all three of the analyzed variables (ad attitude, brand attitude and brand purchase intention). The scores for set A15 (*Perfection* brand) indicate that the socio-economic status is also an attribute valued by men in the other sex, and not something looked for solely by women, such as evolutionary psychology suggests. This may have a cultural explication, since Buss (1989), in a research study carried out on 37 cultures from all over the world about preferences for features in men and women, obtained the same result in the case of Spain, but not for the remaining countries, where women – in opposition to men – gave great importance to a solid financial expectation in potential mates. Anyway, additional research will be needed here to gain further insights in the exact interpretation respondents make of the cues added to this ad. On the other hand, set A6 (*Deep Ocean* brand) showed no preference for youth cues of the male model, such as the evolutionary psychology predicts, which posits that youth is a typical female (but not male) sexual attractive characteristic. In the same way, set A14 (*Desire* brand) showed no preference for strength cues of the female model in accordance to evolutionary psychological predictions, which suggests that physical strength is a typical male (but not female) sexual attractive characteristic.



**TABLE 1**  
**MEAN VALUE DIFFERENCES**

			A. ad			A. brand			I.p.			
			Mean	F.	Sig.	Mean	F.	Sig.	Mean	F.	Sig.	
A1 PURE	Females	0	3,25	775,097	,000	2,90	882,429	,000	2,19	1253,096	,000	
		1	8,11			7,95			7,87			
	Males	0	3,52	37,890	,000	3,28	17,705	,000	2,54	19,265	,000	
		1	5,01			4,23			3,50			
	A2 FORCE	Females	0	4,78	454,246	,000	4,20	617,854	,000	3,76	642,693	,000
			1	8,53			8,32			8,30		
Males		0	4,26	2,136	,145	4,07	6,663	,010	3,48	2,958	,086	
		1	4,62			4,70			3,94			
A3 STORM		Females	0	5,01	366,511	,000	4,70	386,542	,000	4,39	390,430	,000
			1	7,94			7,82			7,78		
	Males	0	5,45	6,848	,009	5,06	5,084	,025	4,50	7,849	,005	
		1	5,98			5,55			5,14			
	A4 AQUATHERM	Females	0	3,19	428,805	,000	3,27	391,979	,000	2,78	396,129	,000
			1	6,94			6,84			6,61		
Males		0	2,93	6,922	,009	3,78	3,896	,049	3,04	1,670	,197	
		1	3,49			4,24			3,33			
A5 FRESH-SKIN		Females	0	3,42	318,291	,000	3,33	295,976	,000	3,04	253,651	,000
			1	6,70			6,47			6,19		
	Males	0	3,42	2,199	,139	3,86	1,382	,241	3,14	2,553	,111	
		1	3,75			4,12			3,50			
	A6 DEEP OCEAN	Females	0	5,89	56,665	,000	5,55	48,004	,000	5,22	34,989	,000
			1	7,20			6,82			6,44		
Males		0	5,15	21,371	,000	5,19	21,195	,000	4,78	17,319	,000	
		1	6,11			6,09			5,71			
A7 REACTION		Females	0	5,38	57,310	,000	5,02	43,334	,000	4,67	30,540	,000
			1	6,70			6,30			5,89		
	Males	0	5,29	88,379	,000	4,78	92,583	,000	4,09	96,517	,000	
		1	6,93			6,65			6,32			
	A8 SELÚ	Females	0	4,73	62,379	,000	4,22	64,634	,000	3,95	46,737	,000
			1	6,46			5,99			5,61		
Males		0	4,87	164,417	,000	4,30	193,992	,000	3,89	161,444	,000	
		1	7,55			7,25			6,94			
A9 BIOSENSIS		Females	0	4,40	49,915	,000	4,11	36,913	,000	3,66	21,554	,000
			1	5,83			5,35			4,71		
	Males	0	4,04	175,699	,000	3,72	185,710	,000	3,12	170,967	,000	
		1	6,71			6,47			6,04			
	A10 ECSTASY	Females	0	3,81	30,659	,000	3,58	19,325	,000	3,14	14,214	,000
			1	5,01			4,55			3,96		
Males		0	3,57	172,145	,000	3,32	179,421	,000	2,83	159,857	,000	
		1	6,33			6,18			5,82			
A11 ATTRACTION		Females	0	5,38	47,268	,000	5,23	33,929	,000	4,80	20,328	,000
			1	6,75			6,42			5,83		
	Males	0	5,07	151,961	,000	4,87	127,906	,000	4,11	145,999	,000	
		1	7,37			7,08			6,77			
	A12 LOVELY	Females	0	5,21	32,303	,000	4,81	30,066	,000	4,36	26,066	,000
			1	6,54			6,08			5,64		
Males		0	5,24	64,235	,000	4,76	81,776	,000	4,05	81,355	,000	
		1	7,01			6,64			6,25			
A13 NICESKIN		Females	0	2,35	97,019	,000	2,36	80,471	,000	2,04	70,304	,000
			1	4,32			4,18			3,68		
	Males	0	2,47	162,577	,000	2,46	162,024	,000	2,01	184,406	,000	
		1	5,27			5,13			4,84			
	A14 DESIRE	Females	0	3,48	75,798	,000	3,37	61,989	,000	3,03	50,310	,000
			1	5,50			5,15			4,65		
Males		0	4,04	123,281	,000	3,77	114,027	,000	3,07	121,750	,000	
		1	6,44			6,06			5,59			
A15 PERFECTION		Females	0	6,12	6,571	,011	5,69	5,326	,022	5,34	2,155	,143
			1	6,61			6,16			5,68		
	Males	0	4,91	100,526	,000	4,52	102,672	,000	4,08	68,813	,000	
		1	6,75			6,46			5,94			
	A16 NB AUTOS	Females	0	5,33	40,112	,000	4,78	43,582	,000	4,06	47,556	,000
			1	6,54			6,15			5,65		
Males		0	5,29	57,865	,000	4,79	71,505	,000	4,26	58,264	,000	
		1	6,85			6,53			6,02			
A17 AVONTUUR AUTOS		Females	0	5,34	89,210	,000	4,75	87,127	,000	4,13	104,414	,000
			1	7,02			6,51			6,28		
	Males	0	5,57	100,117	,000	5,13	92,473	,000	4,58	101,919	,000	
		1	7,36			6,94			6,73			
	A18 BAOBAB	Females	0	6,07	136,495	,000	5,45	163,359	,000	5,14	128,108	,000
			1	8,09			7,78			7,54		
Males		0	5,95	25,416	,000	5,25	28,656	,000	4,65	38,331	,000	
		1	6,92			6,33			6,07			

0: Neutral Version; 1: Manipulated Version

**TABLE 2**  
TEST OF DIFFERENCES IN MALE/FEMALE RATINGS OF THE MANIPULATED ADS

	A. AD		A. BRAND		I.P.	
	F.	Sig.	F.	Sig.	F.	Sig.
<b>A1 PURE</b>	253,219	,000	364,598	,000	455,142	,000
<b>A2 FORCE</b>	340,958	,000	286,087	,000	366,201	,000
<b>A3 STORM</b>	139,511	,000	158,068	,000	180,949	,000
<b>A4 AQUATHERM</b>	287,970	,000	163,106	,000	215,751	,000
<b>A5 FRESH-SKIN</b>	205,032	,000	124,066	,000	134,474	,000
<b>A6 DEEP OCEAN</b>	31,390	,000	14,958	,000	10,540	,001
<b>A7 REACTION</b>	1,920	,167	3,171	,076	3,410	,066
<b>A8 SELÚ</b>	28,730	,000	33,300	,000	28,729	,000
<b>A9 BIOSENSIS</b>	19,685	,000	28,630	,000	29,861	,000
<b>A10 ECSTASY</b>	36,421	,000	51,053	,000	55,188	,000
<b>A11 ATTRACTION</b>	11,773	,001	12,234	,001	17,917	,000
<b>A12 LOVELY</b>	4,413	,036	6,139	,014	5,614	,018
<b>A13 NICESKIN</b>	16,414	,000	16,616	,000	23,254	,000
<b>A14 DESIRE</b>	18,170	,000	16,363	,000	14,772	,000
<b>A15 PERFECTION</b>	,610	,435	2,155	,143	1,222	,270
<b>A16 NB AUTOS</b>	2,464	,117	3,378	,067	2,551	,111
<b>A17 AVONTUUR AUTOS</b>	4,414	,036	5,243	,023	4,839	,029
<b>A18 BAOBAB</b>	45,704	,000	57,070	,000	46,936	,000

## 5. Conclusion and discussion

In this paper we have presented the results of an experimental study which clearly shows the fruitfulness of applying evolutionary psychological insights for eliciting primary affective reactions that have substantial impact on “ad attitude”, “brand attitude” and “brand purchase intention”. Thus, our results demonstrate how an evolutionary-informed perspective can yield benefits to both the practitioners as well as theoreticians of advertising. In the same way, these findings are also relevant for the brand communication managers, who must consider the benefits that the use of and the appropriate emphasis on different types of stimuli (e.g. cues of sexual attractiveness) on advertisement will have on the brand. With reference to both sex-specific mating preferences and evolutionary aesthetical cues, the hypotheses formulated on the basis of the evolutionary psychological perspective received qualified support.

Our findings confirm the results obtained in an earlier similar Belgian study (Vyncke, 2007) as well. Thus, it corroborates what evolutionary psychology predicts relating to human behavior, which arises to a large extent from psychobiological predispositions and which is shared, in a high degree, by all men and women in spite of the cultural differences which can differentiate them. As a result, findings lead to the suggestion that many of the advertising cues, e.g. depictions of masculinity and femininity, are not due to socialization forces. Rather sex-specific semiotics and images are rooted in universal sex-specific mating preferences. Whereas many advertising images are influenced by societal changes (e.g., the depiction of women in a wider range of roles, the use of specific colors and/or type of humor), others are impervious to temporal or cultural context (e.g., facial and body symmetry of attractive endorsers). Hence, an evolutionary perspective recognizes that the advertising and entertainment industries are not involved in any conspiratorial agenda (Saad, 2007). They provide images that conform to the evolved preferences of both men and women (e.g., young women and tall men). In the same way, we can also conclude that the importance of beauty – either in terms of sexual attractiveness or general aesthetics – does not seem to depend solely on socialization. Concerning this point, for instance, Langlois et al. (1990) demonstrated that human infants (as young as six months old) gazed longer at facial images that were more beautiful (i.e., more symmetric). Ontogenetically speaking, the infants were too young to have been socialized into preferring more beautiful faces, thus pointing to an innate aesthetic response.

Our experiment must be broadened to include other product categories, other evolutionary psychologically relevant cues, and a greater diversity of (preferably also non-Western) cultures. Nevertheless, we hope that our experiment will stimulate further exploration of the insights and findings of evolutionary psychology as a new paradigm for studying ad processing and consumer behavior. As has been argued by Saad (2007), our behaviors including our consumption habits will probably be best understood as manifestations of the interaction between our biological heritage and our unique environmental circumstances.

## 6. References













- Aharon, I., N. Etcoff, D. Ariely, C.F. Chabris, E. O'Connor, and H.C. Breiter (2001), "Beautiful Faces Have Variable Reward Value: fMRI and Behavioural Evidence", *Neuron*, 32 (8), 537-551.
- Appleton, J. (1975), *The experience of landscape*, London: Wiley & Sons.
- Bagozzi, R.P. and R. Natarajan (2000), "The year 2000: Looking forward", *Psychology & Marketing*, 17, 1-11.
- Bargh, J.A. (1988), "Automatic information processing: Implications for communication and affect", in *Communication, social cognition and affect*, ed. Donohew, L., H.E. Syper and E.T. Higgins, Hillsdale, NJ: Lawrence Erlbaum Associates, 9-32.
- Bargh, J.A. (1990), "Auto-motives: preconscious determinants of social interaction", in *Handbook of motivation and cognition*, ed. Higgins, T. and R.M. Sorrentino, New York: Guilford, 93-130.
- Bargh, J.A. (1992), "Being unaware of the stimulus vs. unaware of its interpretation: Why subliminality per se does matter to social psychology", in *Perception without awareness*, ed. Bornstein, R. and T. Pittman, New York: Guilford.
- Barkow, J.H., L. Cosmides, and J. Tooby (1992), *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*, New York: Oxford University Press.
- Barret, L., R. Dunbar, and J. Lycett (2002), *Human Evolutionary psychology*, Princeton, NJ: Princeton University Press.
- Bornstein, R.F. (1989), "Exposure and affect: Overview and meta-analysis of research, 1968-1987", *Psychological Bulletin*, 106, 265-289.
- 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. (1994), *The evolution of desire: Strategies of human mating*, New York: Basic Books.
- Buss, D.M. (1995), "Evolutionary Psychology: A new paradigm for psychological science", *Psychological Inquiry*, 6, 1-30.
- Buss, D.M. (1999), *Evolutionary Psychology: The New Science of the Mind*, Needham Heights, MA: Allyn & Bacon.
- Buss, D.M., and D.P. Schmitt (1993), "Sexual strategies theory: An evolutionary perspective on human mating", *Psychological Review*, 100, 204-232.
- Cary, M.S. (2000), "Ad strategy and the stone age brain", *Journal of Advertising Research*, 40, 103-106.

- Choi, J., and I. Silverman (2002), "The relationship between testosterone and route-learning strategies in human", *Brain and Cognition*, 50, 116-120.
- Colarelli, S.M., and J.R. Dettmann (2003), "Intuitive Evolutionary Perspectives in Marketing Practices", *Psychology and Marketing*, 20 (September), 837-65.
- Cosmides, L., and J. Tooby (1994), "Beyond intuition and instinct blindness: toward an evolutionarily rigorous cognitive science", *Cognition*, 50, 41-77.
- Crawford, C., and D.L. Krebs (1998), *Handbook of Evolutionary Psychology*, Mahwah, New Jersey: Lawrence Erlbaum.
- Damasio, A.R. (1994), *Descartes' Error: Emotion, Reason, and the Human Brain*, New York: Avon Books.
- Damasio, A.R. (2000), *The feeling of what happens*, Harvest Books, Harcourt, Inc. New York.
- Darwin, C. (1985), *The origin of species*, New York: Penguin (Original work published 1859).
- De Sousa, R. (1987), *The Rationality of Emotion*, MIT Press, Cambridge.
- Dutton, D. (2003), "Aesthetics and Evolutionary Psychology", in *The Oxford Handbook for Aesthetics*, ed. Levinson, J., New York: Oxford University Press.
- Etcoff, N.L. (1999), *Survival of the Prettiest*, New York: Doubleday.
- Fiedler, K., and J.P. Forgas (1988), *Affect, Cognition and Social Behavior*, Toronto: Hogrefe.
- Fine, C. (2006), *A Mind of its own. How your Brain Distorts and Deceives*, Cambridge: Icon Books.
- Fitzsimons, G.J., and B. Shiv (2001), "Non-conscious and Contaminative Effects of Hypothetical Questions on Decision Making", *Journal of Consumer Research*, 28 (2), 224-238.
- Gangestad, S.W., R. Thornhill, and R.A. Yeo (1994), "Facial attractiveness, developmental stability, and fluctuating asymmetry", *Ethology and Sociobiology*, 15, 73-85.
- Gardner, M.P. (1983), "Advertising Effects on Attributes Recalled and Criteria Used for Brand Evaluations", *Journal of Consumer Research*, 10 (December), 310-318.
- Gigerenzer, G. (2000), *Adaptive Thinking. Rationality in the Real World*, New York: Oxford University Press.
- Gorn, G.J. (1982), "The effects of music in advertising on choice behavior: A classical conditioning approach", *Journal of Marketing*, 46 (1), 94-101
- Grammer, K. and R. Thornhill (1994), "Human (Homo sapiens) facial attractiveness and sexual selection: The role of symmetry and averageness", *Journal of Comparative Psychology*, 108, 233-242.
- Hassin, R.R., J.S. Uleman, and J.A. Bargh (2005), *The New Unconscious*, New York: Oxford University Press.
- Hill, D. (2003), *Body of Truth. Leveraging What Consumers Can't or Won't Say*, Hoboken, NJ: John Wiley & Sons.
- Homer, P.M. (1990), "The Mediating Role of Attitude toward the Ad: Some Additional Evidence", *Journal of Marketing Research*, 27 (February), 78-86.
- Kaplan, S. (1987), "Aesthetics, affect and cognition: environmental preference from an evolutionary perspective", *Environment and Behavior*, 19, 3-22.
- Langlois, J.H., L.A. Roggman, and L.A. Reiser-Danner (1990), "Infants' differential social responses to attractive and unattractive faces", *Developmental Psychology*, 26, 153-159.
- LeDoux, J.E. (1996), *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*, New York: Phoenix.

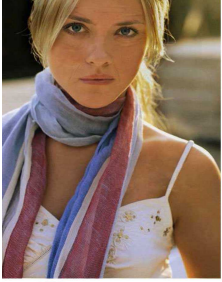













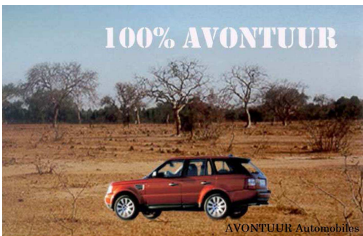
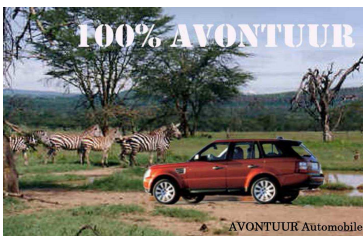


- Lorenz, K. (1977), *Behind the mirror: A Search for a Natural History of Human Knowledge*, New York: Harcourt Brace Jovanovich.
- Lynn, M., K. Kampschroeder, and A. Pereira (1999), "Evolutionary Perspectives on Consumer Behavior: An Introduction", *Advances in Consumer Research*, 26, 226-230.
- Mackenzie, S.B., and R.A. Spreng (1992), "How Does Motivation Moderate the Impact of Central and Peripheral Processing on Brand Attitudes and Intentions?", *Journal of Consumer Research*, 18 (March), 519-529.
- Malamuth, N.M. (1996), "Sexually explicit media, gender differences, and evolutionary theory", *Journal of Communication*, 46, 8-31.
- Miller, G. (2001), *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature*, London: Heinemann.
- Myers, D.G. (2004), *Intuition. Its Powers and Perils*, New Haven & London: Yale University Press.
- Olney, T.J., M.B. Holbrook, and R. Batra (1991), "Consumer responses to advertising: the effect of ad content, emotions, and attitude toward the ad on viewing time", *Journal of Consumer Research*, 17 (March), 440-453.
- Orians, G.H., and J.H. Heerwagen (1992), "Evolved responses to landscapes", in *The Adapted mind: evolutionary psychology and the generation of culture*, ed. Barkow, J.H., Cosmides, L. and Tooby, J., Oxford University Press, 555-579.
- Petty, R.E., and J.T. Cacioppo (1986), "The elaboration likelihood model of persuasion", *Advances in Experimental and Social Psychology*, 19, 123-205.
- Pinker, S. (1997), *How the mind Works*, New York: Norton.
- Poels, K., S. Dewitte, and P. Vyncke (2005), "Changing Roles, Changing Preferences? The Dual Impact of Gender Identity on Preferences for Sex Specific Advertising Stimuli", [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=870388](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=870388), 26 February 2008.
- Rhodes, G., J. Roberts, and L.W. Simmons (1999), "Reflections on symmetry and attractiveness", *Psychology, Evolution & Gender*, 1, 279-295.
- Saad, G. (2004), "Applying evolutionary psychology in understanding the representation of women in advertisements", *Psychology & Marketing*, 21, 593-612.
- 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*, Lawrence Erlbaum Associates, London.
- Saad, G., and T. Gill (2000), "Applications of Evolutionary Psychology in Marketing", *Psychology & Marketing*, 17 (December), 1005-1034.
- Saad, G., and T. Gill (2001), "Sex differences in the ultimatum game: An evolutionary psychology perspective", *Journal of Bioeconomics*, 3, 171-193.
- Saad, G., and T. Gill (2003), "An Evolutionary Psychology Perspective on Gift Giving among Young Adults", *Psychology & Marketing*, 20 (December), 765-784.
- Schmitt, D.P. (2003), "Universal Sex Differences in the Desire for Sexual Variety: Tests from 52 Nations, 6 Continents, and 13 Islands", *Journal of Personality and Social Psychology*, 85 (1), 85-104.
- Simpson, J.A., and D.T. Kenrick (1997), *Evolutionary Social Psychology*, Mahwah, New Jersey: Erlbaum.

- Symons, D. (1995), "Beauty is in the adaptations of the beholder: the evolutionary psychology of human female sexual attractiveness", in *Sexual Nature/Sexual Culture*, ed. P.R. Abramson and S.D. Pinkerton, Chicago: University of Chicago Press, 80-118.
- Thornhill, R., and S.W. Gangestad (1993), "Human facial beauty: Averageness, symmetry and parasite resistance", *Human Nature*, 4, 237-269.
- Tooby, J., and L. Cosmides (1992), "The psychological foundations of culture", in *The Adapted Mind: Evolutionary psychology and the generation of culture*, ed. J.H. Barkow, L. Cosmides and J. Tooby, New York: Oxford University Press, 19-136.
- Tooby, J., and L. Cosmides (1995), "Mapping the evolved functional organization of mind and brain", in *The cognitive neurosciences*, ed. M.S. Gazzaniga, Cambridge, MA: MIT Press, 1185-1997.
- Trivers, R.L. (1972), "Parental investment and sexual selection", in *Sexual Selection and the Descent of Man, 1871-1971*, ed. B. Campbell, Chicago: Aldine, 136-179.
- Ulrich, R.S. (1981), "Natural versus urban scenes. Some psychophysiological effects", *Environment and Behavior*, 13 (5), 523-556.
- Van Raaij, F. (1989), "How consumers react to advertising", *International Journal of Advertising*, 8, 261-273.
- Voland, E., and K. Grammer (2003), *Evolutionary Aesthetics*, Springer: Heidelberg, Berlin, New York.
- Vyncke, P. (2007), "Hidden persuaders revisited. New Insights from evolutionary psychology into primary affective reactions on advertisements", *6th International Conference on Research in Advertising (ICORIA)*, Lisbon, Portugal, June 2007.
- Winston, R. (2002), *Human Instinct. How our primeval impulses shape our modern lives*, London: Bantam Press.
- Workman, L., and W. Reader (2004), *Evolutionary Psychology. An Introduction*, Cambridge: Cambridge University Press.
- Wright, R. (1995), *The moral animal – Why we are the way we are: The new science of evolutionary psychology*, New York: Vintage.
- Zajonc, R.B. (1980), "Feeling and thinking: preferences need no inferences", *American Psychologist*, 35, 151-175.

APPENDIX: SELECTION OF EXPERIMENTAL ADS

		<p>Ad 1</p>
		<p>Ad 2</p>
		<p>Ad 3</p>
		<p>Ad 4</p>
		<p>Ad 5</p>
		<p>Ad 6</p>



 	 	<p>Ad 7</p>
 	 	<p>Ad 9</p>
 	 	<p>Ad 15</p>
 <p><b>Born to Beetle.</b></p> <p>NewBorn automobiles NB</p> <p>For the love of automobiles.</p>	 <p><b>Born to Beetle.</b></p> <p>NewBorn automobiles NB</p> <p>For the love of automobiles.</p>	<p>Ad 16</p>
 <p><b>100% AVONTUUR</b></p> <p>AVONTUUR Automobiles</p>	 <p><b>100% AVONTUUR</b></p> <p>AVONTUUR Automobiles</p>	<p>Ad 17</p>
 <p>Baobab Café PURO SABOR AFRICANO</p>	 <p>Baobab Café PURO SABOR AFRICANO</p>	<p>Ad 18</p>