"Evolutionary Store Atmospherics" – Designing with Evolution in Mind

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Abstract Environmental psychology research shows that natural environments and natural habitat qualities are better able to positively influence human functioning (e.g., stress reduction) than most common urban environments. Such positive psychological states are often interpreted as remnants of our species' evolutionary history in natural environments. Nowadays a substantial part of the urban fabric is dedicated to commercial and business-related activities. Such environments however often lack those natural habitat qualities and elements, which have been found to promote positive psychological states. This chapter aims to demonstrate and illustrate the value of integrating such natural qualities into business-related environments, and specifically into retail environments. We coin this design strategy "Evolutionary Store Atmospherics" (ESA). The scope of this chapter is theoretical as well as practical. On the one hand, we provide an overview of the specific "ancestral" landscape elements and qualities that are found to have positive effects on human functioning. On the other hand, we discuss and illustrate how these key qualities can be integrated in store environments. Special attention is paid to situational factors that could interact with ESA design proposals, such as, for example, gender and type of shopping.

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Introduction

> *Design is a matter of survival. In the cacophony of the High Street, you need to set yourself apart to survive*
>
> (Design Council 1997)

An important and recurring challenge for ancestral humans was finding a suitable habitat, that is, a good place for living. From an evolutionary psychology perspective, one would therefore expect that the human species will have evolved a set of cognitive mechanisms ("modules") that are specialized in processing information relevant to the habitability of a setting. Importantly, the notion "habitability" is multi-dimensional, in that there are numerous factors that make a setting into a potentially good place for living (e.g., presence of food resources). Research into the factors that contribute to the perceived habitability of an environment has been coined "habitat selection theory" (Heerwagen and Orians 1993).

It is no overstatement that ancestral living conditions and environments must have differed dramatically from our modern living environments. Ancestral humans did not roam the savanna in SUV's nor were there supermarkets and shopping malls where they could pick up the resources they needed. What cannot be doubted however is that our species has evolved in *natural* environments. On an evolutionary time scale, it only recently inhabits nonnatural urban settings and, as such, is it (largely) "divorced" from the natural world which it inhabited and on which it also depended for millennia. Undoubtedly, urban life conveys many advantages when compared to the living conditions in ancestral natural environments (e.g., relative abundance of food resources). Commercial and business-related environments play an important role in providing access to these advantages.

There is, however, a sense in which the "mismatch" between urban and ancestral (natural) environments can have negative consequences. Habitat selection theory claims that many of the evolved adaptations to natural features and conditions of ancestral habitats have taken on the form of preferential responses (Orians and Heerwagen 1992). Landscapes or settings containing physical characteristics that tap into these evolved preferences (e.g., cues of fresh water) will often be experienced as beneficial, evoke positive emotions, and trigger approaching behavior. Store environments, which is the type of business environment on which we will focus in this chapter, not only often lack the physical characteristics which can trigger such preferential responses, they are also places where stress, irritation, or cognitive strain regularly take place. In this chapter we argue that consciously bringing features or characteristics into store environments that tap into evolved habitat preferences can make such environments more pleasurable and can even

dampen possible negative consequences that arise from the activity of shopping. For store-owners, this could imply a strategic benefit in terms of customer attitudes and behavior, e.g., prolonged stays and even increased purchase probabilities.

The chapter is structured as follows. In Sect. 1 we offer an extensive and critical review of research into evolved preferences for particular landscape-types, landscape configurations, and natural features/elements. In Sect. 2, we discuss why it could be beneficial to deploy such preferred characteristics and features in store environments. We coin this design strategy "Evolutionary Store Atmospherics" and we provide an extensive demonstration of the possible ways in which ESA can be practically integrated into store settings. In Sect. 3, we briefly discuss some implications and challenges related to ESA.

1 Evolved Affective Responses to Landscapes

1.1 Preferred Structural Landscape Features

Numerous environmental features could have communicated to our ancestors whether a certain environment was a suitable place for living, and whether it could provide, e.g., sufficient food resources and opportunities for protection. In the ensuing paragraphs, we will review research and models that propose that habitat quality already depends on the presence of certain *structural landscape features* (e.g., complexity) and briefly discuss how these have been linked to an evolutionary psychology framework.

1.1.1 Prospect-Refuge Theory

In the mid-1970s, geographer Jay Appleton developed *prospect-refuge theory*. This account states that particular aspects of the layout and structure of (natural) scenes influences the aesthetic perception and evaluation of landscapes (Appleton 1975, 1990). Specifically, according to prospect-refuge theory, humans' (positive) aesthetic responses to landscapes depend on whether the landscape offers the individual opportunities for both *prospect* and *refuge*, and on the relative absence of *hazards*. According to Appleton the preference for prospect and refuge is a hard-wired trait that has evolved to successfully negotiate an environment. "Prospect" refers to those landscape elements and configurations that enable the (human) individual to overview the environment in an unimpeded manner, allowing it, e.g., to anticipate possible predators and threats from out-group conspecifics or to look out for resource opportunities (e.g., a water hole). "Refuge" refers to places or landscape configurations where one can hide, rest, or find protection from meteorological conditions or predators.

There is little doubt that the preference for prospect and refuge – if hardwired – will have evolved in natural settings. Still, it is relevant to note that Appleton saw that prospect and refuge can also be effective in non-natural environments, that is, in *architecture* and *city planning* (Appleton 1990). Like in natural settings, prospect and refuge can be evoked by a number of scene organizations or configurations, and later in this chapter (Sect. 2.2.1) we readdress this issue and offer an overview of the different ways in which it can be integrated in retail environments. It should, however, be noted that to this day prospect-refuge theory has remained largely theoretical, and – although fairly often cited – research that has *directly* attempted to test the theory is quite limited. In particular, Stamps' (2006) review of articles citing Appleton's prospect refuge-theory shows that only a small percentage actually inquires about the viability of the specific claims made by the theory (e.g., Fischer and Shrout 2006).

1.1.2 Preference Matrix

From the 1980s onward, there has been a proliferation of empirical research in the field of environmental psychology, investigating which structural landscape qualities are preferred by human individuals. Perhaps the most influential explanatory model that has ensued is the "preference matrix", which has been advanced by Kaplan and Kaplan (1989). According to the Kaplans, humans are an information gathering species, and landscape configurations that facilitate the process of both negotiating and understanding the information conveyed by, and present in a landscape are preferred. In particular, the Kaplans contend that the aesthetic perception of a (natural) environment is influenced by the presence of the following four structural landscape features or "predictors".[1]

1. *Complexity*: this quality is defined as a measure for '... how much is "going on" in a particular scene, how much there is to look at' (Kaplan 1988: 48). A tropical forest often is highly complex, because it contains – on a limited spatial scale – many different (natural) elements, with different forms, textures, and colors. A desert, on the other hand, scores low on complexity because it does not contain many distinct objects/elements.
2. *Coherence*: this quality refers to the presence of visual features that contribute to the organization, understanding, and structuring of the scene, such as symmetries, repeating elements, or unifying textures. For example, an environment with trees is more coherent when those trees are grouped into separate clusters than when all the individual trees are scattered randomly over the landscape. Such grouping entails that the number of units of information is reduced and the scene becomes easier to grasp.

[1]Roger Ulrich has developed a similar model, coined the *psycho-evolutionary framework* (Ulrich, 1983, 1993). The "preferenda" that are part of this framework mostly overlap with the predictors of the Kaplans' model.

Fig. 1 Mystery evoked by a path curving out of sight

3. *Mystery*: this characteristic refers to landscape features or organizations where, from the perspective of the observer, a part of the scene is hidden or occluded, but more information can be acquired if the individual enters the scene more deeply. A clear example is a path curving out of sight. The fact that it is unclear where the path is leading to, can lead to curiosity and explorative behaviour (Fig. 1).
4. *Legibility*: this relates to the interpretation of spaces, and refers to the capacity to predict and maintain orientation in the landscape as one further explores it. For example, a conspicuous landscape element (e.g., a rock formation) that is visible from far away and from different locations in the landscape can serve as a point of orientation, and can thereby facilitate exploration and travel throughout the environment.[2]

According to the Kaplans, preferences for these structural landscape features are evolved adaptations: "... the nature of the [preferred] predictor variables and the nature of the preference response itself ... [tend] to support the existence of an evolved bias toward certain landscape configurations" (Kaplan 1992: 590). For example, when innately predisposed to prefer – say – mysterious landscape configurations, a human individual will probably have had higher survival changes than

[2]Bell et al. (2005: 45) note that the relation between the four predictors and preference remains somewhat ambiguous: "Although the relative importance of each element is not clear, coherence and complexity may require only moderate levels in order to facilitate information processing, whereas the more legibility and mystery in a scene, the better in terms of preference judgements".

an individual who remained aesthetically unaffected. The former will have been more inclined to further penetrate and explore the setting, and hence, he/she will thereby have had increased chances for finding new resources, shelter, and for opportunities to overview the landscape. Of course, there is the difficulty that mysterious settings can sometimes contain hidden dangers, so a tendency to explore them will only have been successful if it worked in tandem with evaluative mechanisms assessing the potential risk associated with entering a mysterious scene. However, as far as we know, such evolutionary claims have never been empirically tested.

1.2 Positive Effects of Unthreatening Nature on Affective and Cognitive Functioning

Habitat quality is not solely determined by structural landscape features, but also by the presence or absence of certain natural elements (e.g., animals, edible fruits). On a general level, a crucial difference between business and ancestral environments is that the former are natural, whereas the latter are mostly made up of (non-natural) manufactured objects and materials. In the following sections we will discuss research that contends that adaptive mechanisms have evolved for a number of evolutionarily relevant natural elements: specifically, vegetative elements, water-features and animals. In Sect. 2.2.2, we will then further point out which specific perceptual features are conspicuous to these elements, and how they can be deployed in retail design.

1.2.1 Vegetation

Within the field of environmental psychology a significant amount of research has been dedicated to the impact of unthreatening "naturalness" – or the lack thereof – on human emotional and cognitive functioning. In these contexts the concept "natural" is given a common sense interpretation, and applies to any scene containing predominantly natural objects and elements, as opposed to *artefactual* objects (e.g., buildings). Still, a review of this research literature learns that the type of natural element that is invariably present in the stimuli used in these experiments is vegetation (e.g., plants, trees, flowers).

A number of positive effects are associated with viewing natural/vegetated settings. It is found that such type of scenes are consistently (aesthetically) preferred over nonnatural, urban environments, or environments predominantly containing artefacts (for a review, see Ulrich 1993). A closely related finding is that such settings have so-called "restorative" effects on humans, both affectively and cognitively. The "affective" interpretation of restoration is clear from the fact that when individuals have experienced a stressful episode, exposure to vegetated scenery seems capable of undoing that stress better than nonnatural (urban)

environments (e.g., Ulrich et al. 1991). "Cognitive" restoration has been demonstrated in experiments which show that contact with vegetation can restore an individual's capacity to concentrate, that is, to direct attention (Hartig et al. 1991; Hartig et al. 2003). As preferential and restorative responses toward natural scenes have been observed in both western and non-western populations they are sometimes believed to be a human universal (Ulrich 1993; but see Lewis 2005).

The evolutionary account states that quick, automatic affective responses toward vegetation are evolved adaptive traits (Ulrich 1993; Heerwagen and Orians 1993; Falk and Balling 2009; Hartmann and Apaolaza-Ibáñez 2009). Vegetative elements, like trees, could offer, say, protection against sun and rain, and when blooming they could bear flowers and sometimes also edible fruits (Orians and Heerwagen 1992; Heerwagen and Orians 1993; Ulrich 1993). Individuals with hardwired positive affective reactions toward such vegetative elements will have been more inclined to approach them, and hence, were probably more successful in obtaining resources than those individuals who remained emotionally unaffected. Restorative responses are claimed to be the result of the moderating effect of positive emotions (triggered by vegetative elements) on states of heightened arousal (Ulrich, 1993).

One problem with the evolutionary views underlying the environmental psychology experiments is that almost *any* kind of greenery leads to preferential reactions and restoration. *If* a hardwired aesthetic response to vegetative life would have evolved, then one would expect that such response would be more specific, that is, directed to features that indicate resource availability – not directed to greenery *in general*. In agreement with this assumption, some evolutionary psychologists have proposed that flowers are likely candidates for leading to positive affective reactions: they were a source of food, and they were a cue that fruits could be available in the near future (Orians and Heerwagen 1992; Heerwagen and Orians 1993).

A few empirical studies have been conducted to explore the aesthetic impact of flowers and they are consistent with the foregoing view. Todorova et al. (2004), for example, found that flowers are not only appreciated for their aesthetic value, but also for their positive influence on psychological wellbeing. Consistent with this, research by Yamane et al. (2004) shows that working with flowering plants has a more positive impact on emotions than their non-flowering counterparts. Haviland-Jones et al. (2005) found that receiving flowers induced positive moods in individuals and triggered genuine positive emotional expressions (determined by the frequency of non-fake smiles). A study by Park et al. (2004) examining the effects of exposure to vegetation on pain shows that female subjects have a higher pain tolerance, report less intense pain, and experience less pain distress when they watch flowering plants than when they are exposed to non-flowering plants.

1.2.2 Water Features

Failing to find drinking water, and thereby running the risk of becoming dehydrated, probably was a major source of selection throughout human and pre-human

evolution (Coss 2003). In this regard Roger Ulrich contends that "[a] functional-evolutionary perspective ... implies that people should respond positively to natural settings having water ... The survival-related advantages would have included immediate availability of drinking water, ... attraction of animals that could be hunted, and in some locations (seacoast, estuary, salmon river) extremely high food productivity associated with fish, shellfish and crustaceans" (Ulrich 1993: 90). A piece of circumstantial evidence, supporting these evolutionary hypotheses, speaks from the fact that housing prices are oftentimes the highest when on a waterfront (cf., Luttik 2000).

Environmental psychology research also shows that the presence of water-features in (natural) landscapes is highly preferred by humans and has de-arousing properties. In an experiment probing the differential effects of urban versus natural scenes, Ulrich (1981) found that nature, and also water-features, positively influenced subjects' mood and feelings. Among others, it was found that the amplitude of alpha waves[3] was higher in individuals when they viewed vegetation and water-features than urban scenes, which suggests that subjects felt more wakefully relaxed in the former condition. The heart rate of subjects exposed to water or vegetation pictures was also higher than when they were watching urban environments, indicating that nature scenes are more successful in eliciting interest and attention. More recently, similar results have been obtained by Fredrickson and Levenson (1998). In this experiment, subjects were initially exposed to a fear-inducing film. After this, they watched different movies that were chosen to trigger different emotions in them (i.e., contentment, amusement, neutrality, sadness). A movie of ocean waves led to feelings of contentment, which in turn led to more rapid return to the baseline levels of cardiovascular activation when compared to the neutral movie. Although more research on this topic is needed, these few studies already suggest that exposure to water can have both relaxing and fascinating effects.

1.2.3 Animals

It cannot be doubted that failing to keep track of an ambushing predator could have had severe, if not life-threatening consequences for our human ancestors. An evolutionary psychology perspective would therefore expect that a number of hardwired cognitive "programs" will have evolved to solve predator- and prey-specific challenges. These adaptations could include mechanisms for the recognition, detection, and monitoring of animals (cf., New et al. 2007a), appropriate emotional responding to predator and prey (cf., Mineka and Öhman 2002), and information storing about animate categories (e.g., plants, animals) (cf., Atran 1995).

What might the *proper* (visual) input of these mechanisms be? Early humans evolved in a changing biotic environment and "fixed" mechanisms dedicated to

[3]This type of brain wave is associated with wakeful relaxation and is commonly measured by an Electroencephalograph (EEG).

specific animals would quickly have become maladaptive. To date only fixed templates have been observed for *perennial* threats, like snakes and spiders (e.g., Barrett 2005; Rakison and Derringer 2008). A plausible view is that the proper input of those specialist mechanisms handling predator and prey are probably a number of *constant* or *invariable* (perceptual) features that are characteristic to (interactions with) predator and prey, or to their behavior. Barrett (2005) has investigated this issue in-depth and proposes that such features could include – among others – specific movement cues or patterns (e.g., sneaking), morphological features (e.g., eyes), and contingency (i.e., the fact that an organism can suddenly react to a far-away occurrence, element or animal). In Sect. 2.2.2. we will illustrate how such features might be integrated in the design of store environments.

1.2.4 Savanna Hypothesis

Within the field of evolutionary environmental aesthetics it is often assumed that a substantial part of hominin and *Homo* evolution took place in East-African savannas. As a result, it is argued that (early) humans evolved a hardwired preference for landscapes that share (visual) qualities with savannas, or park-like landscapes (Ulrich 1983, 1993; Orians and Heerwagen 1992; Heerwagen and Orians 1993; Appleton 1975, 1990; Orians 1980, 2001). The implicit assumption is that some kind of phylogenetic "imprinting" of this ideal habitat has taken place in the human species (Ruso et al. 2003).[4]

One line of support for the savanna hypothesis is that aesthetic enhancements to artwork (e.g., landscape paintings) or landscapes (e.g., park designs) often entail an increase of features or configurations that are typical to savannas (e.g., openness) (Orians and Heerwagen 1992; Heerwagen and Orians 1993). Some empirical studies have also *directly* tested preference reactions toward different landscape types. For example, Balling and Falk (1982) showed that young children (aged 8) – as opposed to older individuals – prefer savannas over other biomes, despite the fact that the children are unacquainted with this type of environment. The researchers speculate that this could point to an innate preference for savannas (see Falk and Balling (2009) for a replication of the Balling and Falk (1982) study with non-western individuals).

Although the savanna hypothesis is frequently adopted as a given in the field of (evolutionary) environmental aesthetics, other experiments have failed to replicate Balling and Falk's (1982) initial results and consequently do not provide further support for an innate preferential bias toward savannas (cf., Han 2007; Lyons 1983; Hartmann and Apaolaza-Ibáñez 2009). Finally, it must be noted that the claim that savannas are the unique type of biome in which our species has evolved is still far

[4]This version of the savanna hypothesis should not be confused with Satoshi Kanazawa's savanna principle (Kanazawa 2004), or with Dennis and McCall's (2005) savannah hypothesis.

from settled (Potts 1998). *If* there would be a universal preference for savanna-type environments then the most probable explanation is that such settings contain an ideal "mix" of preferred structural landscape features and preferred natural contents, which were discussed in Sect. 1.1 and 1.2.

1.3 Commenting upon the Inborn Nature of Evolved Landscape Preferences

As can be surmised from our previous discussion, many hypotheses and speculations about evolved landscape preferences are based on environmental psychology research. Characteristic to this research is the interest in probing and charting aesthetic reactions and possible restorative effects, *not* in empirically testing the evolutionary claims to which they are often committed. Moreover, within the evolutionary psychology literature the main publications on the topic of evolved habitat preferences (Orians and Heerwagen 1992; Kaplan 1992) already date back to the 1990s, if not earlier (cf., Orians 1980), from the time when the first systematic academic treatments of the field of evolutionary psychology were made (Barkow et al. 1992).

This lack of academic interest does not necessarily imply that this research theme is mistaken or disproves all the proposed claims in the foregoing review. It points out that at this stage one must be cautious about making strong and definite claims that could otherwise be construed as "just so" stories about evolved responses to landscapes. In that regard we consider the cross-fertilization between research about designing business environments – that is, the store atmosphere – and landscape preferences as an opportunity to revitalize this research area. Furthermore, the fact that evolutionary explanations need further validation, does not necessarily imply that the design interventions to be proposed shortly will be less evidence-based or less effective.

What cannot be doubted, however, is that humans are highly adaptable, and as such can inhabit and exploit most environments, ranging from tropical rainforests to modern urban environments. In agreement with this, it seems most plausible to think that the "programs" assessing habitability do not "privilege" the *actual* natural contents or environments as input, but are directed towards the perceptual patterns, structures, and characteristics of (natural contents of) habitable landscapes. The upshot is that, according to this account, non-natural, artificial environments (e.g., interior, architectural and urban design) can be designed and transformed in such a way that they fall within the actual domain of these specialist programs, and thereby tap into these preferences. Note that this approach closely parallels that of "biophilic architecture" (Kellert 2005; Joye 2007; Kellert et al. 2008). This new architectural trend attempts to cause biophilic responses (Wilson 1984) by integrating nature and nature-like forms into architecture and design. In the following sections we will explain how such interventions can be realized in, and be effective for store environments.

2 Evolutionary Store Atmospherics

2.1 Towards an Ultimate Understanding of Store Atmospherics

More than three decades ago, Kotler (1973: 50) introduced the term *atmospherics* to denote "the effort to design buying environments to produce specific emotional effects in the buyer that enhance his purchase probability". He initiated a literature stream by which marketing researchers came to realize that if consumers are influenced by physical stimuli experienced at the point-of-sale, then, the creation of appealing atmospheres should be an important marketing strategy for retail environments (Turley and Milliman 2000). Current studies on store atmospherics have typically investigated the influence of a single environmental cue on shopping behavior, such as colour (Bellizzi et al. 1983), decorative style of the store (Ward and Eaton 1994), or in-store lighting (Areni and Kim 1993).

The impact of store atmospherics on consumer behavior has been predominantly studied from the perspective of Mehrabian and Russell's Stimulus–Organism–Response model (Mehrabian and Russell 1974). This framework models the process by which a store design intervention (i.e., stimulus) entails specific cognitive and affective processes in the consumer (i.e., the organism), which result in a behavioral response. One problem with the SOR model is that the "Organism" component has often remained a "black box". With evolutionary psychology, however, we now have an arsenal of tools that allow us to peek inside this box, enabling us to get better insight into the ultimate origins of consumer attitudes and behavior. Importantly, such insights can provide us with tactics to design store environments that are tuned to evolutionary predispositions, such as the evolved landscape preferences we discussed above. In this chapter we are mainly interested in this last issue. We define the strategy that brings evolved landscape preferences into store environments "*Evolutionary Store Atmospherics*" (ESA).

Although the act of shopping is an extremely recent phenomenon, some researchers have argued that it is similar to the hunting and gathering activities of early humans (Miller 2009; Dennis and McCall 2005). The nature of shopping also reflects situations or problems that were already relevant in ancestral environments. For example, we regularly shop for products that avoid or solve problems, make us attain status or prestige, or attract a mate. As such, it is reasonable to assume that the cues today's consumers use while scanning and exploring the shopping environment can, at least partly, reflect evolved processes related to hunting and gathering in ancestral environments. As we have discussed in previous sections, several landscape configurations have been proposed to influence and facilitate the process of resource gathering in ancestral surroundings. ESA predicts that by integrating such cues in modern shopping environments, the modern act of shopping can be facilitated and even be made more pleasant. The potential importance of such interventions is further underlined by the fact that the typical store environment nowadays frequently contains a cacophony of factors, both within the control of retailers (e.g., loud music) and beyond it (e.g., crowding), that can make the act of

shopping into a stressful and cognitively taxing experience (d'Astous 2000; Fram and Ajami 1994).

2.2 *Design Proposals Based on ESA*

The potential significance and underlying evolutionary mechanisms of ESA interventions are only rarely acknowledged by those studying store atmospherics. One notable exception is the preliminary experiment by Buber et al. (2007), which shows that the presence of evolutionarily significant features in retail settings (e.g., plants, animals, water) has positive effects on consumer behaviour (e.g., a boost of sales). Although the value of ESA is largely based on our common evolutionary heritage and the fact that it appeals to preferences we all share with each other, it should also take into account *personal* (e.g., gender, age, personality) and *situational* (e.g., mood, type of purchase) differences. They are expected to moderate the strength and direction of the effects induced by ESA interventions. If the implementation is to result in a sustainable competitive advantage, retailers need to consider their target segment (e.g., male, utilitarian shoppers), and fine-tune the ESA implementation accordingly.

2.2.1 Preferred Structural Landscape Features in the Store Environment

In the earliest sections of this chapter we have discussed research that contends that humans display (evolved) preference reactions to some particular structural landscape features. In this respect it was pointed out that savanna-type environments seem to contain an ideal "synthesis" of those preferred features. Illustratively, Heerwagen (2003, unpaged) notes that '[s]avannah "mimics" are obvious in many of our modern built spaces including shopping malls, department stores … Research on the design of retail settings shows how the manipulation of space and artifacts influences purchasing behaviors. Many of these manipulations – light, décor, sounds, food, flowers, smells, visual corridors – are consistent with the savannah hypothesis and other research on environmental preferences.' In the following sections we will reiterate the preferred landscape features (that appear to be characteristic to savannas) and illustrate how they can be applied to stores.

Prospect and Refuge

Architectural theoretician Grant Hildebrand (1999) employed Appleton's prospect-refuge theory to explain the aesthetic appeal of architectural work and has illustrated that feelings of prospect and refuge can be evoked by particular architectural organizations. Possible design strategies that refer to refuge are: using small spaces enclosed by thick walls, lowering ceilings, or reducing lighting intensity. In a store

environment this could mean having separate, dimly lit spaces in which consumers can have a rest (e.g., lounge-like spaces where consumers can relax in a comfortable chair). Prospect can be evoked by creating spacious areas, raised ceilings, thin, transparent walls, wide and open views on surrounding spaces, building on an elevated site, or creating balconies. Note that prospect or refuge can be *augmented* in architectural design, which can lead to a dominance of either of these dimensions. For example, refuge areas seem particularly relevant for stores in which high-involvement decisions have to be made (e.g., a car, furniture) and in which the refuge area can create a private and relaxing environment in which consumers can elaborate their decisions.

Perhaps there is even a gender difference in preferences for prospect versus refuge. During the course of evolution men and women have faced partially different adaptive problems. For example women, compared to men, can procreate only a limited number of offspring and consequently invest more energy in their offspring (gestation, birth, lactation). Evolutionary psychology therefore predicts that the most pronounced sex differences will occur in those domains in which the sexes have faced different adaptive problems (Buss 1989; Symons 1979). Related to this, research suggests that compared to males, females have more affinity with refuges than with prospects (and vice versa for males) (Heerwagen and Orians 1993). These differences could be explained by a sexual division in foraging (i.e., men are hunters, women are gatherers) (Eals and Silverman 1994), combined with differences in mating strategies (i.e., due to a costly reproduction system women better apply restricted navigation) (Gaulin and Fitzgerald 1986, 1989). The ESA implication that follows from this is that – on average – ESA strategies based on refuge are probably more effective in shops with a predominantly female audience (e.g., beauty retailers), whereas ESA strategies based on prospect might better fit shops where males are the main customers (e.g., automotive showrooms).

Preference Matrix

In the first part of this chapter, we described the preference matrix by Kaplan and Kaplan (1989) which proposes that four structural landscape features positively influence the aesthetic perception of natural environments, namely complexity, mystery, coherence, and legibility. Below we describe how each of these features can be strategically implemented in stores to attract and appeal to customers.

Complexity refers to sufficient sensory stimulation. Applied to design factors in store environments, complexity can be interpreted as giving sufficient visual richness and variety to the consumer, that is, the store should contain enough interesting "material" for our senses. Complexity can be introduced in different ways: for example, by the sheer number of (decorative) elements in the store environment, the use of multiple colors in the store interior, the amount of products that are being displayed, or the amount of shelves and racks per square meter. As is clear from the preference matrix, complexity should not be randomly presented, but needs to be counterbalanced by *coherence*, which refers to visual features that contribute to

structuring and comprehending the environment, for example, by consistently using specific recurring colors, motifs, or symbols to indicate areas where certain products can be found. Supermarkets often make use of floorings and color codes of displays to define coherent spaces of particular clusters of product-categories within the stores (e.g., "blue" for personal hygiene products).

It is important to note that the optimal degree of complexity and the optimal balance between complexity and coherence seem to depend on situational factors. In that sense, it would be very interesting to inquire about whether minimalistic store design is a suboptimal strategy, or, whether the use of different colors and variation in materials as a complexity-enhancing strategy is a better option. The answer could well depend on the type of purchase decision that has to be made. High-involvement products (e.g., cars, furniture) usually require a lot of deliberation, and store environments that are too complex might hinder this process, because added complexity requires more extensive cognitive processing. Especially within this high-involvement segment minimalistic stores have proven to be successful (e.g., designer stores). On the other hand, when purchasing low-involvement products (e.g., clothing, fast moving consumer goods) adding complexity to the store might make the shopping experience more enjoyable.

One could even add a situational "layer" to the previous one (i.e., level of involvement), based on gender. It is known that female shoppers put more effort and time into searching and comparing products in order to find the best value for money, whereas males tend to go straight for what they want in a fairly purposeful manner. This divergence in shopping behavior has been explained as reflecting an evolved affinity with either hunting and gathering activities, characteristic to males and females, respectively. In their version of the savannah hypothesis, Dennis and McCall (2005: 14) for example argue that "[. . .] gathering has been translated into comparison shopping, and hunting into earning money to support the family".

In terms of ESA implementation, the female shopping style could be accommodated by providing a fair amount of complexity in the store. Presenting many different offerings could meet up to the (female) desire to browse and compare multiple suitable products before finally deciding what to buy. A clothing retailer could strategically adapt his assortment to the male shopping style by, for example, coherently organizing it in terms of purpose (e.g., category of shirts, category of trousers, category of sweaters) and size. This could enhance shopping-efficiency, enabling male individuals to purposefully fulfill their buying objective. Likewise, off-shelf displays (e.g., dump bins with "leftovers") are often surrounded by female shoppers searching for a bargain (Sullivan and Adcock 2002), whereas male consumers are not that fond of finding what they need in a basket full of mixed products, or in a crowd of customers. The implication is that in "mixed" shopping environments the degree of complexity/variation of a certain store-section should be adapted to the target-public of that section.

Another preferred structural landscape feature is *mystery*, which refers to environmental configurations that promise that further information can be acquired when one further enters the scene. Mystery is known to be a significant predictor of preference and, hence, can play an important role in store-atmospherics.

Consider the frequent practice of shop-owners to place a great deal of the offerings that are sold in the shop's store-front. The assumption underlying this practice seems to be that fully displaying all offerings will motivate consumers to enter the store. However, the notion mystery points out that *insufficient* information can create curiosity, which can motivate customers to further explore the shopping environment. Store-owners might profit from only presenting smaller samples or hints about what one can expect to find inside the shop.

Quite probably, type of shopping will interact with mystery. In the case of utilitarian shopping, customers very often know what they want to buy and know where they can find the product, and too much mystery could hinder efficiency. Nevertheless, even in "functional" shopping environments (e.g., supermarkets) there is a role for aesthetic interventions, and adding a little bit of mystery (without compromising way-finding) can fulfill this aesthetic role. Mystery will perhaps be especially interesting for hedonic shopping contexts, where the uniqueness and exclusivity of products are further underlined by the fact that they are not directly visible, but require exploration and discovery. In hedonic shopping, the act of browsing in itself is pleasant and adding mystery to that activity can further enhance the pleasure and can create a sense of surprise.

Some claim that mystery can be conveyed by specific design elements: "When appearing around corners, attached to walls, and hung from ceilings, interesting objects, architectural details or motifs, graphics, video displays and artefacts can create a little mystery and surprise ..." (Hase and Heerwagen 2000: 30). A specific modality of mystery is called "enticement", which refers to the situation where an individual is in the dark, from where he/she can see a partially visible and enlightened scene (Hildebrand 1999). A clear example in a consumer environment is the situation where the most exclusive or premier products are brightly lit, whereas the surroundings only dimly lit.

Despite its appeal, too much mystery can make the layout of the store environment confusing and ambiguous, ultimately leading to challenges associated with orientation and way-finding. In this sense the last element from the preference matrix comes at play, namely *legibility*. This predictor refers mainly to the capacity to retain orientation inside an environment. Classic retail design scholars have already hinted to the importance of legibility. For example, McGoldrick (2002: 472) suggests that "unnecessary changes to product locations are all likely to give the impression of a chaotic or, worse, a conniving store". Furthermore, Titus and Everett (1995) note that a store layout needs to achieve "environmental legibility" to avoid causing anger and frustration among shoppers. The legibility of the shopping environment can be enhanced by integrating signalizations and distinctive markings, by offering views to the outside of the store, by making the building shape more regular (Evans and McCoy 1998) or by inserting a specific landmark into the setting.

An issue relevant to legibility is that men and women differ in how they find their way through a particular environment, and through shopping malls more specifically. A study by Chebat et al. (2008) shows that women prefer to use landmarks (e.g., other shops or central areas in a mall), rely more on social information (e.g.,

talking to other people), and more frequently make use of object properties such as shape and color. Men, on the other hand, use more spatial properties such as location and spatial relations. These findings are in line with evolutionary insights of women excelling in spatial memory and men having better spatial navigation abilities (Ecuyer-Dab and Robert 2004). However, it should also be noted that recent research indicates that when the navigational tasks involve specific contents a reversal of navigational skills can be observed (New et al. 2007a, 2007b). Specifically, females appear to more accurately remember where they have previously encountered food sources (i.e., vegetables) than men, which might reflect an evolved sex difference in foraging behavior.

2.2.2 Integrating Actual Nature in Store Design

There are many ways to integrate actual nature in store environments. For example, bringing vegetation (e.g., flowers, potted plants) inside a store can yield positive consumer emotions and potentially enhance social contact between customers and employees. Consistent with this, pioneering research within health psychology has shown that hospital patients have better health outcomes when placed in rooms with windows to natural settings than when in rooms overlooking built elements (Ulrich 1984). Also, when visiting someone in convalescence at a hospital or at home, people typically bring flowers or plants as gifts. Such findings can be translated into different store design strategies:

- Making outside nature visible from inside the store
- Potted plants and flowers in the retail environment
- Interior planting beds
- Greening the shopping streets
- Interior/exterior gardens
- Vines on the shop's exterior surface
- Roof gardens or green-roofs, and providing views to these
- Green or vegetated walls
- Natural materials, like wood or marble

Water can be integrated in stores in a number of ways: by a fountain, a small pond, waterfalls, interior/exterior water gardens, or kinetic water sculptures (Mador 2008). What is furthermore interesting is that a water-feature (e.g., a pond) allows one to elegantly and non-obtrusively integrate actual animals (i.e., fish) in the shopping environment. A possible difficulty with animals in store environments is that these could be experienced as a nuisance, or as being inappropriate for retail contexts. Moreover, certain customers will probably consider that animals are not meant to serve as decorative pieces for the fickle and frivolous enjoyment of mankind.

In a store context, the positive effects of views on greenery or water-features could either make customers less vulnerable for stressing factors (such as crowding) or dampen the stress that has already incurred. The relevance and value of such

effects is clear from the fact that the number of shoppers entering a store in a negative mood comprises approximately 10% of the total shopping population (Maxwell and Kover 2003) and this segment tends to have an avoidance response towards stores (Eroglu and Machleit 1990). Many retail environments are furthermore laden with (sensory) stimuli and alternatives (Lipowski 1970). This can cognitively overload the shopper's limited processing capacity, and perhaps even further exacerbate negative feelings in shoppers. Although they may actually spend the same amount of money as consumers who are in a good mood (some basic human needs will always remain), negative mood shoppers could eventually spend less time shopping and are likely to be less satisfied overall (Babin and Darden 1996). Although retailers may not have direct control over consumers' pre-existing feelings when visiting a store, ESA interventions like integrating greenery might trigger more positively toned feelings in them and, as such, favor patronage and loyalty (Mano 1999; Joye et al. 2010).

Imitated Natural Contents in Store Design

Particularly relevant to ESA is that affective responses to natural landscapes can also be triggered by imitations (e.g., photos, videos) of actual nature (Joye 2007). The use of "imitated" nature increases the creative possibilities for store designers because there are many possible ways in which one particular natural element (e.g., a flower) can be imitated. Furthermore, it is sometimes undesirable (cf., hygienic reasons) or practically difficult to keep actual nature in the business environment (e.g., flowers are costly and wither). Therefore the majority of ESA design recommendations will concern imitated rather than actual natural contents.

Animal Life

Let us begin by relating some visual characteristics of animals to the design of retail environments (for a discussion about predator and prey characteristics, see Barrett 2005). A first observation is that biological entities – and animals specifically – have a specific way of moving about, which seems to be categorically different from the way manufactured objects move. Martin and Weisberg (2003) found that the observation of biological and mechanical movement activates distinct neural regions in the human brain, which also overlap with regions recognized as being specialized in processing (conceptual) information about animals and tools, respectively (Martin and Weisberg 2003). Biological movement is furthermore found to activate the amygdala, potentially reflecting the affective significance (e.g., fear) associated with processing biological features. These findings are consistent with the claim that there exist evolved domain-specific mechanisms for processing perceptual features about biological versus manufactured objects (cf., Camarazza and Shelton 1998).

In store environments design interventions can be created that meet up to the input conditions of these domain-specific mechanisms. For example, computers

sometimes have screensavers displaying organically moving shapes. In a quite similar way, biological movement can be projected on walls or ceilings in stores, or it can be displayed on LCD or television screens, or even media walls. Research indicates that when such organic movement is slow or "heraclitean", it seems to have relaxing effects on the viewers (Katcher and Wilkins 1993). More arousing effects can probably be obtained by making the movement patterns more erratic: that is, with rapid and sudden changes in movement (Heerwagen and Gregory 2008). Notice that the application of either such slow or erratic movement in retail environments should preferably be situational, depending on the time consumers have available or their level of involvement. In that regard, it is relevant to note that a distinction can be made between utilitarian shopping or "shopping for work" and hedonic shopping or "shopping for fun" (Holbrook and Hirschmann 1982; Babin et al. 1994; Kaltcheva and Weitz 2006). Babin et al. (1994) found that utilitarian shoppers strive to complete shopping tasks in an efficient way, whereas hedonistic shoppers enjoy the act of shopping, and take their time to browse through the stores. In environments that profit from a quick turnaround, erratic movement could – just like uptempo music (Oaks 2000) – facilitate utilitarian customers to make faster use of the services offered (e.g., fastfood restaurant). (Care should however be taken that such movement is not a reason to avoid the setting in the first place). Slow organic movement better fits shopping in those hedonic environments where customers need sufficient time and a relaxed state of mind to make purchase decisions, such as an electronics or a furniture store.

Apart from biological movement, also the *shapes* characteristic to biological entities have a distinctly different affective tone compared to shapes more characteristic to manufactured objects. For example, research into the affective tone of different types of line configurations shows that organic and rounded shapes, which are characteristic to animals (cf., Levin et al. 2001), are preferred over sharp-angled shapes (Aiken 1998b; Bar and Neta 2006). fMRI studies furthermore indicate that downwardly pointing shapes (Larson et al. 2009) and sharp-angled objects (Bar and Neta 2007) activate brain regions that are involved in fear responses (i.e., the amygdala). It has been proposed that the lesser preference for sharp-angled objects is rooted in the fact that such shapes convey a sense of threat (Bar and Neta 2008). Coss (2003) even speculates that it is an evolved trait that must be related to the piercing characteristics of canines and horns, and to the thorny plants and seeds that are abundant in African savannas. Irrespective of whether this is a correct interpretation, it seems quite certain that curved forms and surfaces are more "affiliative" or inviting, whereas sharp forms predominantly lead to negatively valenced arousal and defensive responses.

The previous findings can be directly applied to different features of a store's atmosphere. For example, varying the amount of either curvilinearity or rectilinearity in fonts of product logos or of shopping displays can already convey a substantially different affective feeling. In agreement with this, research by Leder and Carbon (2005) indicates that subjects prefer car interiors with organic, rounded forms over more "straight" interiors. Figure 2 illustrates how soft, rounded surfaces have recently been integrated into retail environments. Note again, however,

Fig. 2 The romanticism women clothing store interior (by SAKO Architects), China (Courtesy SAKO Architects)

that – ideally – the application of this design feature should be situational. For example, the higher sense of arousal and excitement which sharp-angled shapes might evoke seems to be more compatible with a store selling the newest specs for youngsters hooked on skateboarding than with shopping centers' waiting corners that invite customers to relax. In the latter case, soft, organic forms that express a sense of calmness and serenity might be a better option.

According to Jay Appleton (1975) it was not only adaptive for our species to be sensitive to the prospect and refuge dimension of landscapes, but also to certain cues of *dangers* or *hazards*. Think for example of turbulent water, heights, predators, or signals of impending bad weather. Architecturally, the fascinating or arousing aspects of certain buildings could well derive from their hazardous or perilous character (Hildebrand 1999; Appleton 1990). In this regard, the fear of falling, associated with skyscrapers, could be one of the reasons for their appeal and arousing properties.[5]

In some circumstances it might be strategically relevant to include hints to such hazards in a store environment, especially when sensation-seekers are the target-audience. In that regard store atmosphere designers might get inspiration from (features about) animals that are known to elicit arousal and fearful reactions in humans, such as snakes, spiders, or scorpions. As contact with, for example, snakes was common during hominin evolution, it can be expected that affectively

[5]It must be noted that, historically, skyscrapers were not primarily constructed to appeal to this sense of hazards, but arose because of real estate realities, i.e., they were cheaper to build.

guided perceptual mechanisms have evolved to quickly recognize specific perceptual characteristics of these animals (Mineka and Öhman 2002; Coss 2003).

Predator animals or animal symbols are often present in product logos and commercials, and perhaps this can be interpreted as an intuitive recognition and application of their arousing and fascinating properties (Saad 2007). Probably one of the most famous examples of (unconsciously) integrating features about perennial threats in architecture can be found in the *Casa Battló* (Barcelona), designed by the Catalan architect Antoni Gaudí. The roof of the building consists of ceramic tiles and looks like the scaled-skin of a reptile. Quite similarly, skin patterns and prints of perennial threats could be integrated in certain designed features of store and commercial settings. In a retail context, skins or skin motifs of, say, snakes, leopards, tigers can be (and have been) applied to numerous products and design features, ranging from shoes, floor coverings, lighting designs, tiling designs, jewellery or as prints on furniture.

A morphological feature of animals, whose arousing effects have been more thoroughly inquired than skin patterns, are eyes or eye-like features/schemas. It is well-known that staring eyes can elicit fear in humans and other nonhuman species (Eibl-Eibesfeldt 1989; Aiken 1998a) because such patterns are associated with ambushing predators and aggressive conspecifics (Coss 2003: 115). Eyespots are exploited by certain organisms to ward off potential predators and sometimes they are even present in art, architecture, and design (Joye 2007). For example, some car brands seem to tap into these arousing effects by designing vehicles whose headlights are similar to frowning and threatening "eyes", which can give them a conspicuously aggressive look (Coss 2003; Joye 2007). Recent research by Aggarwal and McGill (2007) indeed confirms that car fronts are perceived as face-like and can express different types of emotions.

An intriguing finding, discussed in Coss (2003) and relevant for the theme of this paper, is that banners with eyespots significantly reduce shoplifting in stores. We already know from research that when subjects are exposed to eyespots during an economic game they behave more socially, i.e., they give more money to a second party (Haley and Fessler 2005). Although this is not really a "design" intervention, it would nevertheless be interesting to see how the insertion of eyespots in retail environments affects consumer behavior. One example of non-social behavior in clothing shops is that after fitting, customers frequently do not put the (unbought) clothing back from where they have taken it. Based on the previous research, a possible suggestion would be to introduce eye-like features in the changing rooms. The feeling of being watched will probably make customers more inclined to put the clothes back where they belong.

Vegetative Life

Imitations of vegetative elements can be incorporated in business environment in a number of ways (Joye 2007), for example with posters, pictures, photographs, or paintings of vegetated landscapes. In architecture, botanical motifs have been a perennial design element, especially in more traditional architectural styles or

historical buildings, such as *Art Nouveau* and Classic architecture. In stores, plant-based motifs and ornaments can be integrated in floors, walls, ceiling, or stained glass. For example, the interior of the famous department store *Galleries Lafayette* in Paris is richly decorated with ornamental elements similar to, and reminiscent of vegetative elements. Of course, when using botanical decorations it is important to get a sense of what the audience of the store will be. Applying ornamental moldings of flowers can perhaps be a good idea for a classy jewelry store or premier clothing boutique, but it will be less convincing when introduced in a high-end sports store.

One important visual feature about natural structures (and vegetative elements in particular) is that they are characterized by a particular kind of geometry, coined "fractal geometry" (Mandelbrot 1982). A defining characteristic of a fractal is that it is self-similar, which means that the smaller details of the structure are more or less similar to the entire structure. In a tree, for example, the smaller branches, twigs, and even the individual leaves, are scaled-down versions of the entire tree, or structurally equivalent to it. Recent research seems to suggest that the positive responses triggered by natural/vegetated landscapes (as opposed to urban settings) are – for a part – due to their underlying fractal characteristics (Hagerhall et al. 2004; Joye 2007).

An innovative aspect of ESA would be to tap into the positive effects of interacting with nature by introducing fractals or fractal-like patterns in store environments. It is noteworthy that nature's fractal "language" is also used for creating attractive artificial or mathematical fractal patterns (Fig. 3) (as opposed to actual natural fractals). Such patterns could be inserted in store environments on wallpaper, on posters, or by playing so-called "fractal movies", which progressively zoom in on the finer details of the fractal. Fractal-like forms or organizations have been introduced in architectural design through floor-mosaics and ornamentation (Bonner 2003), floor and wall tiling (Mikiten et al. 2000), and stained glass (Joye 2007). In traditional architectural styles (e.g., Gothic architecture) building

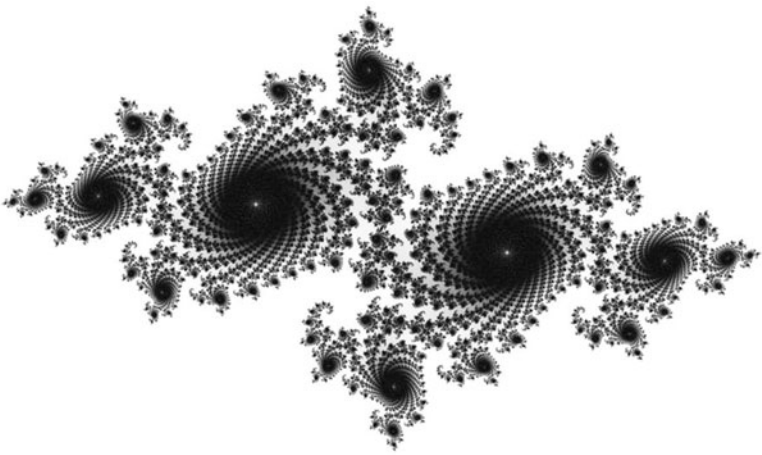

Fig. 3 A mathematical fractal

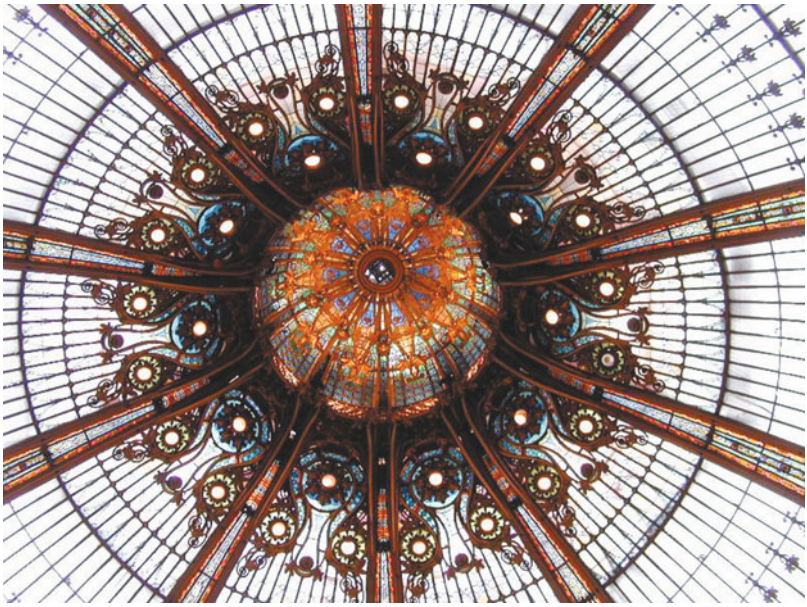

Fig. 4 The fractal-like cupola of the *Galleries Lafayette*, Paris (Courtesy Wayne Boucher)

exteriors and facades often have fractal aspects because there is a "cascade of architectural detail" from the largest to the smallest scales (Bovill 1996). In retail environments, this continuous progression of detail on increasingly finer scales is very evident in the cupola of the *Galleries Lafayette* in Paris (Fig. 4). ESA proposes that integrating fractal-like structures into store environments can make the setting aesthetically fascinating for customers (and perhaps such designs will even have restorative effects).

3 Discussion and Future Research on ESA

Considering the high cost of retail design programs, and in some cases, their lack of commercial success, the need for a scientific approach to the design of retail environments is clear (McGoldrick 2002). The introduction of the notion ESA constitutes an attempt to fill in this void. Although ESA's benefits to customers seem clear from the previous discussion, retailers will probably wish to see how ESA affects their bottom line prior to investing in ESA. Although there are no exact numbers on this issue, there are some indications that carefully-planned ESA interventions can result in significant returns-on-investment. Consider Wolf's finding that the willingness-to-pay for certain goods is significantly higher in green shopping environments as opposed to retail settings without trees (see Joye et al. 2010). Of further relevance is that dampening negative consumer emotions

in stores or creating positive affect are theoretically predicted to result in approach reactions towards the store (cf., the SOR-model, Sect. 2.1). Finally, it must be noted that not only customers, but also store employees could reap the benefits of properly designed store environments (Bitner 1992). For example, integrating (unthreatening) natural elements can offer a breather from stress and uplift moods, which in turn could translate into increased helpfulness and friendliness toward customers (Cohen and Spacapan 1978) and into more job satisfaction, which are obviously important components for retail service quality (Vazquez et al. 2001). Other possible effects which indirectly influence the bottom-line are: less stress-related health problems in employees; reduced costs associated with sick leaves (Bringslimark et al. 2007) and increased productivity (Lohr et al. 1996).

The evolutionary significance of specific atmospheric elements and their role in shaping consumer behavior and attitudes have hitherto remained largely unrecognized in the literature on atmospherics. Most of the ESA interventions we have proposed are therefore circumstantial, i.e., they are informed by empirical evidence from disciplines outside the field of consumer behavior. One of the future challenges is to directly test some of the actual proposals (e.g., are better decisions regarding high-involvement products indeed made within stores with a high refuge dimension?). When the effects would be robust across different cultures this could point to an underlying common heritage and thus further support the evolutionary assumptions underlying the ESA hypotheses. We have offered a substantial number of research possibilities and call for future studies to test the effects of ESA designs and the associated moderating factors in business settings.

Finally, some will perhaps note that ESA interventions are already frequently introduced in commercial and business related environments (albeit largely on intuitive grounds) (Fig. 5), so why should one be interested in the evolutionary psychology framework underlying it? Our answer is that better insight into the underlying (evolutionary) causes of consumer behavior and attitudes can have valuable practical ramifications, not anticipated by intuition. The insights we provide imply that conscious integrations of evolutionarily significant atmospheric elements (e.g., greenery) – as opposed to intuitive ones – should no longer be a shot in the dark, but can become theoretically informed. For example, an evolutionary-informed version of ESA is aware that the adaptive mechanisms handling, say, prey animals, do not necessarily favour the actual animal as input, but also certain key perceptual features. The upshot is that such an informed version can produce a much larger design vocabulary than an intuitive/uninformed account, which could become preoccupied with all too literal interpretations of natural elements in the store setting.

4 Conclusion

Dennett (1995) considered evolutionary theory as a "universal acid" that affects ideas/concepts in almost any field of (scientific) research. In agreement with this,

Fig. 5 The interior of the Mandarin Oriental Hotel in Barcelona seems to integrate different ESA interventions at once: fractal-like window screens, natural materials, vegetative elements and botanical motifs (Courtesy Mandarin Oriental Hotel Group)

evolutionary thinking is also beginning to penetrate research into the business sciences. In this paper we have discussed the fruitfulness of the cross-fertilization between research into evolved landscape preferences and the field of store atmospherics. We coined this new area of research "Evolutionary Store Atmospherics", which taps into evolved mechanisms specialized in scanning and processing the environment for habitability, resource opportunities, and threats (e.g., predators).

The approach adopted in this chapter was both theoretical and practical. On the one hand, we have discussed a substantial amount of theory and empirical research into human preferences for landscape features and characteristics. Although we were fairly critical to the evolutionary commitments that seem part and parcel to this field of research, we hope that future inquiries into ESA will invigorate interest to test these evolutionary assumptions. On the other hand, we have formulated a number of concrete design suggestions for ESA. If we have insights regarding the natural elements and structures that were present in ancestral environments, and if we know which kind of behavior these elements are able to activate, we can translate these elements into ESA proposals and make predictions about how consumers will react to them. However, it must be noted that we have only scratched the proverbial surface. The further elaboration of ESA and its concrete implementation are up to the actual store designers and marketers. Their creativity and strategic talent puts them in a unique position to choose the best fit according to the context of the shop and the type of experience which they wish their store environment to convey.

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