# The Measurement of Atmospherics

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## Contents

## Introduction

Atmosphere is an important factor in how a visitor experiences a space or environment. In various studies, visitors name a festival's atmosphere as the most important element in how they experience the festival (Van Vliet, 2012). Atmosphere is also named as an important distinctive element for stores compared to web shops – which can serve to attract consumers to the physical store itself (Van Vliet, Moes & Schrandt, 2015). And many studies highlight the role of atmosphere in cognitive and emotional processes; for example, already in 1956 it was demonstrated that judgments of psychological states of photographed faces differed in three physically different rooms that had different atmospheres (Maslow & Mintz, 1956).

To establish the importance of the atmosphere factor, a good measuring instrument is required. This study offers a proposal for such a measuring instrument. For this purpose, a meta-analysis was carried out on existing empirical and theoretical studies on atmosphere in marketing literature and museum studies. Stores and museums are two relevant examples of places where atmosphere plays an evident role in visitor experience and behavior. So, it's no wonder that atmosphere has received a fair amount of attention from these disciplines.

The role of atmosphere on how people experience a space or environment has been studied for decades by researchers – particularly those from the 'environmental psychology' field who focus on the interplay of humans and their environment (Mehrabian & Russell, 1974). At first, most of this research delved into the work and home environments, as well as environments such as hotels,

schools and prisons. Later, focus also turned to the role of atmosphere in the store environment. One milestone in the research into atmosphere was the introduction of the term *atmospherics* by Kotler (1973) to characterize the atmosphere in a store. However, in previous decades, research had already been done on the relationship between the environment and consumer behavior (including Martineau's research into 'store personality', and Laird's research into odor influencing how a product's quality is perceived).[1] After Kotler's initial 'kick-off', most atmospheric research was in the context of marketing research into consumer behavior in stores and other 'service' environments such as hotels, restaurants and airports. Later, museums and festivals also entered the fold (Van Vliet, 2014). Much of the atmospheric research outside of retail, such as on museums, builds on earlier research and theory related to how consumers experience stores (e.g. Forrest, 2014).

First, we will make an inventory of the burden of proof that exists for the influence of environmental stimuli on the experience and behavior of people in a specific space. We will then look at the theories – largely based on studies on store atmospherics – that have been put forward to explain these results. We will then describe and evaluate the research that has been undertaken into museum atmospherics. Together, these insights will contribute to putting together a reference questionnaire for measuring atmospherics – which will be described in the last section and presented in the appendix.

## The impact of environmental stimuli

The interest in the effect of environmental stimuli on a customer comes from the idea that this can have a direct effect on a customer's buying behavior. Kotler (1973) already modeled this relationship by proposing four consecutive phases: a) a product is offered for sale in a specific spot that has sensorial qualities that may, or may not, have been consciously designed; b) the consumer absorbs certain environmental characteristics which c) influence their "information and affective state"; and, in turn, d) these changes can increase the chance of a purchase. Evidence indeed exists that environmental stimuli can influence purchasing behavior. One example: a study by Donovan et al. (1994) of 60 shoppers in two different stores showed that "pleasure induced by store environments appears to be a strong cause of consumers spending extra time in the store and spending more money than intended" (p. 291). Another example: Peck & Childers (2008) showed that a positive evaluation of a store environment influenced the perceived quality of a product in the store.

The burden of proof is not limited to just these two examples. In-depth research has been undertaken on how store environments influence a consumer's experience (e.g. Turley & Milliman, 2000; Peck & Childers, 2008; Mari & Poggessi, 2011; Olahut, El-Murad & Plaias, 2012; Farias, Aguiar & Melo, 2014). Most of this research has been on the impact of music, largely because it's easy to 'manipulate'. For example, the music's tempo influences the walking pace of consumers, the number of bought products and the stay duration. The popularity of a piece of music influences the stay duration in a store and how time is experienced while waiting in line. By creating a pleasurable mood, music can indirectly

influence product choice and exploratory behavior in the store. Pleasant odors influence how a person estimates how long they have stayed in the store, the number of purchases and exploratory behavior, particularly when the scent is congruent with the sold product, such as the smell of bread in a bakery (Mattila & Wirtz, 2001) or how the smell of chocolate in a bookshop has a positive effect on cookbook sales (Doucé, Poels, Janssens & Backer, 2013). Colors influence (red negatively, blue positively) how much time is spent in a store, the level of pleasant feelings while shopping, the number of purchases, the image a client has of the store and the attractant power of the product presentations. While light clearly influences the experienced atmosphere in a store (Vogels, 2008; Custers et al., 2010), its effects and *what* it affects remain unclear. Taste has been mostly studied in the context of tasting product samples – and therefore focuses more on the product than the environment as a whole. The lay-out of a store elicits consumer movements and gestures that can be performed during the shopping trip, and have shown to influence number of purchases (Bonnin & Goudey, 2012). Where and how a product is placed in a store and how it's referenced to, influences the choices consumers make; however, the results are not always clear to interpretation. The experienced crowdedness has a negative effect on factors such as satisfaction, perception of quality and number of purchases. Friendly personnel who are clearly recognizable and present in required numbers leads to the experience of a higher service quality. In short: music, smell, color, light, the product's placement and available information, store lay-out and personnel can influence the (emotional) experience of consumers. And this, in turn, can influence their purchasing behavior.

Research results don't always all point in the same direction – and are sometimes even contradictory. These differences can be partially explained by differences in how the constructs are put into practice, the used research methods and the specific situations wherein the data is collected – after all, not all stores are the same (Foxall, 1997; Mari & Poggessi, 2011). But another important reason is how different factors can influence how consumers experience environmental stimuli. Examples of such factors include:

- Individual differences. This does not only include age and sex, but also individual differences in one's sensitivity for certain sensory experiences (warmth, noise, crowding *et cetera*) and the coping strategies one has to deal with these experiences. This factor also includes cultural differences and certain dispositions (sensation-seeking, variety-seeking *et cetera*).
- Motivation. Example: 'hedonistic' shopping (for fun) and 'utilitarian' shopping (task-related) are different starting points for experiencing a store (Van Vliet, 2014) and result in different experiences of atmosphere (Rayburn & Voss, 2013). Shopping behavior (impulse buying versus contemplative shopping; rituals in shopping behavior) can also influence how the store's atmosphere is experienced and which environmental stimuli contribute to that experience.
- A store's assortment. Example: clothing is more inviting to touch than CD cases. Touching products has an effect on the evaluation of the products, particularly with higher quality products that have characteristics that appeal to being touched, such as softness and texture (Grohmann, Spangenberg & Sprott, 2007). Certain product types bring certain environmental stimuli to the forefront earlier and thereby can unleash certain behavior and

associated experiences earlier. The difference between 'branded' products and 'normal' products can also play a role.

- Congruence. Similarity between different senses is an important factor: a Christmas scent combined with Christmas music strengthens the store's positive evaluation, sense of space and the available products (Spangenberg, Grohmann & Sprott, 2005); for a jewelry store, classical music is more fitting than pop music *et cetera* (Turley & Milliman, 2000; Mari & Poggessi, 2011). Incongruity between, for example, odor and music can nullify, or even reverse, the effects of the individual elements (see Mattila & Wirtz, 2001).

This last factor also raises an important critical point: namely that most research has focused on discrete elements (color, light, scent *et cetera*) in the store environment and their effects. At most, some studies have combined a small number of cues (e.g. Baker, Parasuraman, Grewal & Voss, 2002; Harris & Ezeh, 2008) or considered the effect of congruency. However, this kind of research remains scarce (Mari & Poggessi, 2011). The preference for discrete elements is driven by the search for causal relations between certain stimuli (e.g. music) and behavioral change with consumers (e.g. increased purchasing) (Eroglu & Machleit, 2008). This leads to an associated experiment methodology that involves manipulating one independent variable. Any found relationship can then be directly translated as advice to retailers ("Classical music in wine stores leads to more expensive purchasing!"). But others take a more holistic view: "When a customer enters a store they do not experience the music in isolation; they do not smell the scent without seeing the colors as well; they do not walk on the floor-covering without feeling the ambient temperature. The typical customer experiences degrees of all these and other stimuli as an

ongoing, collective experience" (Ballantine, Jack & Parsons, 2010, p. 642).[2] This view is also known under such names as the 'Gestalt Conception' (Mari & Poggessi, 2011) and 'transactional approach': "Its unit of analysis is the person-in-environment and its focus the person's transactions (experience and actions) with the environment. Rather than emphasizing the antecedent-consequent or cause-effect relations, the attention is directed on understanding the whole transaction, the relationship between its aspects and how they work in combination" (Eroglu & Machleit, 2008, p. 826). Since people and their evaluation of a behavior in a certain situation cannot be separated from the physical and social context, the phenomena that take place must be regarded as holistic situations instead of independent elements (also see Schorch, 2013). This view also has consequences on the theory and measurement of atmosphere (see pages 47-48).

Meanwhile, attention is now also being directed towards the role of new technologies in stores and the influence these have on visitor experience. Some may regard this as late in the game since these developments seem to be occurring rapidly and seem to have a clear potential to strengthen client behavior – for example, using personalization to play on the behavior and expectations of consumers (Varadarajan et al., 2010; Pantano & Viassone, 2013). But in fact, the introduction of new technologies into retail is going slowly (Pantano & Viassone, 2013; Van Vliet, Moes, Schrandt, 2015) due to: overwhelming choice, smaller stores cannot always afford the required large investments, some of the technologies are not always yet fully developed, the uncertainly around a technology's true effect on revenue, and a certain conservatism among retailers ("I don't need that"). Poncin & Mimoun (2014) is one of few examples of research into new technology's role in stores and the

influence it has on store experience. They found that the use of augmented reality and interactive game terminals in a toy store had a direct effect on how the store was experienced, the level of positive emotions and purchase intention.

From the beginning of this century, attention has also been given to online atmospherics, also known as *virtual servicescapes* or *e-scapes* (Mari & Poggessi, 2011). The manipulation of color, graphics, interactivity, layout, photos, animation, music and design can all lead to a more pleasant online experience for the consumer (e.g. Szymanski & Hise, 2000). The elements studied online may differ from the offline world – involving more design cues and a less prominent role of, for instance, music – but the approach and guiding theoretical frameworks (such as the S-O-R model and the PAD-model, see next section) remain the same (see Eroglu, Machleit & Davis, 2001; Menon & Kahn, 2002). One example of a study of online atmospherics, Eroglu, Machleit & Davis (2003), researched whether changing certain atmosphere characteristics of a website influenced a user's experienced pleasure. The data showed an effect that seemed moderated by the user's level of involvement and atmospheric responsiveness (see further Varadarajan et al., 2010). Yet another approach is to look at how the summoned experiences on a store's website can lead to a more positive view of the physical store. One study by Moes & Van Vliet (2017) reported on how differently presented visual material on a website influenced, among other things, the intention to visit the physical store. Compared to consumers who only saw a regular photo or a 360-degree photo of the store, consumers who saw a VR photo had a more positive store experience, an increased purchase intention, a higher intention to visit the physical store and a better online experience.

Most studies focus on the positive effect that environmental stimuli have on the consumer (e.g. Ballantine, Jack & Parsons, 2010; Muhammad, Musa & Ali, 2014; Poncin & Minoun, 2014). However, it's easy to imagine that negative effects can sometimes have even more of an impact (Baker, Parasuraman, Grewal & Voss, 2002). Mari & Poggessi (2011) refer to this as the 'dark side' of the servicescape. A study by d'Astous (2000) looked at the irritating aspects of the store environment that lead to negative feelings in the consumer. From the preliminary research into shopping irritations named by clients, 18 such irritations were selected that fell under Baker's 3 main categories of environmental stimuli (see page 15). Examples include: *bad smells*, *overly hot*, *overly loud music* and *not clean* (ambient factors), *not being able to find what you need*, *poor directions*, *overly narrow spaces*, *no mirror in changing room* (design factors) and *crowding*, *personnel indifference* and *no available personnel* (social factors). The results from interviews with 281 consumers showed that the ambient and social factors caused more irritation than design factors. Some irritations also showed an effect based on sex (females are irritated more than males when it comes to factors such as *overly hot*, *not being able to find what they are looking for*, or *no mirror in fitting room*) and age (older people get more irritated by *overly loud music*). Stores can immediately adapt these insights into concrete actions that remove these irritations (e.g. training personnel, providing better directions to products, reformulating store's design to combat crowding). You can also choose to take a further step by researching the dysfunctional behavior of clients in a store, such as misbehavior, aggression and theft – where servicescape elements (*dirty*, *loud*, *badly ventilated*, *overcrowded*) have been shown to play a demonstrable (indirect) role (see Reynolds & Harris, 2009).

## Theories on atmospherics

So, what theoretical framework can bring together all these different experimental findings on the impact of environmental stimuli on the consumer/visitor? The writings on atmospherics by Kotler (1973) still form a good basis for further theory development: "The conscious designing of space to create certain effect in buyers", and "the effort to design buying environments to produce specific emotional effects in the buyer that enhance his purchase probability" (p. 50). While over time, different variations have been formulated (see Olahut, El-Murad & Plaias, 2012), the core aspects remain: the conscious manipulation of a space to cause specific effects (behavior, cognition, affect) on those entering that space.

Herein are two important assumptions:

1. A product is part of what Kotler calls a 'total package' that includes the atmosphere of the place where the product is sold, which is sometimes even more important than the product itself. For Kotler, a store's atmosphere is therefore an important way to differentiate yourself from the competitors – certainly within a competitive market: "Atmospherics becomes one of the chief tools for attempting to attract and hold a specific segment of the market" (Kotler, 1973, p. 53).[3] With this observation, Kotler foresaw the rise of the 'experience economy' in the 1990s.
2. A difference exists between the *intended atmosphere* (the atmosphere that the designer aspires for with his design) and the *perceived atmosphere* (the atmosphere experienced by the consumers). In other words, a space that was created to come across as 'warm' and inspire 'wonder' may not always come across as such by those in that space. This does not mean that

the 'objective' description of space and the research of experienced environmental cues are meaningless; it is precisely the interaction between *intended* and *perceived* atmosphere that is relevant (see also Belk (1975) for this discussion).

Using Kotler's remarks, we can give a definition of atmospherics. Important elements within this definition are the role of environmental stimuli, the difference between intended and perceived atmosphere and the effect on the (total) experience of the person at that moment in that situation (Kotler, 1973; Fisher, 1974; Belk, 1975; Turley & Mulliman, 2000). Milliman & Fugate (1993) already provide a definition that bring together these elements: "Atmospherics is the study of (a composition of) stimuli in an individual's perceptual field that stimulates one's senses and affects the total experience of being in a given place at a given time". However, within this definition, little is said about *how* that process takes place - a necessary requirement to explain results based on a theoretical framework.

Kotler's efforts in 1973 did not immediately lead to a surge in empirical research and theory development. It is Bitner who concludes some twenty years later: "In marketing there is a surprising lack of empirical research or theoretically based frameworks addressing the role of physical surroundings in consumption settings" (1992, p. 57). The first empirical study based on Kotler's ideas was undertaken almost a decade later (1982), but was then followed by a significant increase in related research (see previous section).[4] However, with theory development, the profits have been much more modest. In a reflection on the achieved results of research into atmospherics to that point, Eroglu & Machleit (2008) concluded: "There have not been major

conceptual developments in the past three decades of work in this area" (p. 826). The various cited studies, use as a theoretical framework the S-O-R (*Stimulus - Organism - Response*) model from environmental psychology – that was also the underlying theory used by the often-cited study by Mehrabian & Russell (1974). Stimuli (S) in the environment are processed by an organism (O), which in turn inspires a response (R). The S-O-R model is categorized as a paradigm (by, for example, Douce, Poels, Janssens, Backer, 2013; Elbachir, 2014) but also as a framework (Grohmann, Spangenberg & Sportt, 2007) and a theory (Turley & Milliman, 2000). However, Eroglu & Machleit (2008) questioned this last category. Rightly so, since a theory would explain *how* and *why* an organism 'selects' stimuli from its *Umwelt* and benefits from this selection (see, for example, Dennett, 2017 for a theory about this). A theory would also explain what the 'processing' of stimuli involves and what this means for the organism in relation to its environment (see, for example, Neisser, 1976). In addition, a theory would explain which behavioral repertoire an organism can have and use in response to, and as a consequence of, its environment – for example through coping strategies (as seen, for example, in Richard Lazarus's studies into stress and coping). These basic theory elements are all still missing. At most, the widely-used PAD model in atmospherics research is a (partial) theory of an organism's emotional processing of stimuli. But this view has some fundamental limitations – as will be shown below (pages 19-22). Various calls have been made, mainly in review articles, for a stronger theoretical foundation. For example, at the turn of the century, Turley & Milliman (2000) wondered: "Are there theories beyond the S-O-R paradigm?" (p. 208). Nonetheless, let us explore the progress on building knowledge of atmospherics in the context of the S-O-R model.

*The S of Stimuli*

The number of elements in an environment that can influence a person, are too many to work with meaningfully within a theory – the *Umwelt* is simply too richly filled with stimuli and information that can directly or indirectly influence a person's thinking, actions and feelings. Even if we limit the studied spaces to, for example, artificially constructed environments (as opposed to natural environments), micro-environments (as opposed to macro environments, such as a landscape), public environments (not private spaces, such as people's homes) and on spaces with consumer-personnel interaction (Eroglu & Machleit, 2008), then an environment such as a store is still an endless "group of cues, messages, and suggestions" (Farias, Aguiar & Melo, 2014, p. 87; also see Mehrabian & Russell, 1974). Even if you only name 57 possible stimuli (Donovan & Rossiter, 1982), this still results in thousands of possible interactions between these stimuli (Ballantine, Jack & Parsons, 2010; Bonnin & Goudey, 2013; Rayburn & Voss, 2013). Back in 1975 it is Belk who already stated: "The ultimate problem for all future situational research is the lack of a comprehensive taxonomy of situational characteristics and normal combinations of these characteristics" (Belk, 1975, p. 162).

But a comprehensive taxonomy is just one of three possible ways to approach the problem of the wealth of cues in environments. First, the impact of individual elements can be put into perspective by favoring the environment's overall impression. We already came across this 'holistic' view above as criticism on the research done to date on individual envirionmental stimuli (Kaltcheva & Weitz, 2006; Ballantine, Jack & Parsons, 2010; Rayburn & Voss, 2013). Consequently, questioning consumers on their experience is

oriented towards general impressions of the atmosphere (see pages 47-48).

A second approach is to not focus particularly on individual elements, but to describe the space's underlying dimensions. Named dimensions are for instance *novelty* (new, unexpected), *complexity* (the number of elements and level of change in the surroundings) and *spaciousness*. In their study, Donovan & Rossiter (1982) found dimensions such as *variety* and *irregularity*. Custers et al. (2010) brought in other found dimensions, such as *mystery*, *legibility*, *coherence* and *order*. Gilboa & Rafaeli (2003) researched the influence the *complexity* and *order* of supermarkets have on experienced emotions and approach/avoidance behavior. These dimensions often arise from the statistical analysis of the words people use to describe a space. Called *intangible atmospheric cues* by Kottasz (2014), these dimensions refer to a quality of atmospherics that the philosopher Böhme describes as "in the air" – dimensions that transcend the objects themselves (Dorrian, 2014). None of these studies offer a theoretical framework that explains *why* it must be these particular dimensions. However, these dimensions can still be used, in a pragmatic way, to organize the items used to describe a space (see page 45).

The third, and most applied, approach is to order stimuli into categories creating a sense of overview, as Belk (1975) hoped for. The question then rises on what categories should be used – and this has been answered with various propositions. Kotler (1973) already used different categories based on the senses to describe a store's atmosphere: *visual* (color, brightness, size, shapes), *aural* (volume, pitch), *olfactory* (scent, freshness) and *tactile* (softness, smoothness, temperature). However, this classification has had few

followers; it's also confusing since it's based on a person's senses and not on environment's elements. Two typologies are often cited in the literature: those of Julie Baker and Mary Jo Bitner.[5]

Baker's proposed typology (Baker, Grewal & Parasuraman, 1994; Baker, Parasuraman, Grewal & Voss, 2002) is regularly used in research and divides the (physical) surroundings into three categories:

1. *Ambient factors*: 'Background features' that are picked up unconsciously or consciously by the person and have influence on their senses, such as smell, light, sound (including music), air quality *et cetera*.
2. *Design factors*: Aesthetic characteristics of the environment that are noticed directly by the consumer, such as architecture, use of color, wall and floor material, *et cetera*. These factors also include more functional features, such as aisles, store layout, signage and comfort.
3. *Social factors*: The presence, appearance and behavior of personnel and other customers.

In her study, Bitner (1992) uses a marketing perspective to highlight the influence of the physical environment on consumers and personnel. Bitner uses the term s*ervicescape* to describe the situation: "All of the objective physical factors that can be controlled by the firm to enhance (or constrain) employee and customer actions." (p. 65). This manipulation can be done through many forms, including light, temperature, furniture, music, color, spatial layout *et cetera*. According to Bitner, these different types of manipulation can be placed under three categories:

1. *Ambient conditions*. This includes characteristics of the space such as temperature, light, sound, music, odor and other factors that play directly to our senses.
2. *Spatial layout and functionality*. This covers both the spatial ordering of the used objects (furniture, plants *et cetera*) and their relative positioning to each other, as well as how the spatial layout supports the achieving of particular goals (e.g. whether the cashiers in the store are easily visible and accessible so the client can pay as quickly as possible).
3. *Signs, symbols & artifacts*. There are all sorts of explicit signs in a space – from labels (name of company, advertising) and directions ('Exit') to signs that communicate behavioral rules ('No smoking'). There are also all sorts of implicit signs, symbols and artifacts that say something about the space: white tablecloths and dimmed lighting in a restaurant represent good service and high prices; the largeness of the desk and the diplomas on the wall influence the image people have of that manager or therapist. Such manipulations create a complex whole that cannot always be controlled or interpreted as intended.

These three categories are intended to clearly describe the influences within the servicescape. However, consumers will not experience these categories as different dimensions. The consumer will form a holistic image based on all the servicescape's stimuli: "Total configuration of environmental dimensions is responsible for the constitution of the servicescape" (Bitner, 1992, p. 67). Bitner calls this general impression the 'perceived servicescape'.

While the three categories of Baker and Bitner are not always easy to map onto each other, their respective elements do share many

similarities. It's striking though that Bitner does not include the social factor in her typology, especially of its importance: "the character of an environment is dependent on part on the typical characteristics of its members" (Moos, 1973, p. 655). Instead she places the social factor in her servicescape model as a 'moderator' – something that influences the end behavior in a store.

All kinds of variations, rearrangements and additions to the categorizations of Baker and Bitner have been published with the most extensive being by Turley & Milliman (2000) – that was then expanded on by others (e.g. Olahut, El-Murad & Plaias, 2012). An important addition in the structuring of Turley & Milliman (2000) is the role of 'external variables', such as the appearance of the building (size, architecture *et cetera*) and its location's environment. Tzortzi (2016) emphasizes how the internal and external architecture of a museum can contribute to the narrative that the museum wants to tell. This effect is rarely mentioned in other studies, apart from Reynolds & Harris (2009). Perhaps this omission is because of the lack of retail research into, for example, the role of display windows. Olahut, El-Murad & Plaias (2012) name just a few studies that show an increase in sales of products shown in a display window, or that entering a store is dependent on the appearance of the store window and the information it provides – which, in turn, is dependent on, among other things, a client's motivation. Also, of the little research that has been done on shopping environment atmospherics, most focused on malls (Michon, Chebat & Turley, 2005 among others). The research of Yüksel (2007) is one of the exceptions: it studied the perception of the macro-environment such as shopping districts and its effect on emotions, the perceived value of shopping experience and approach behavior. The study found, among other things, that a

positively perceived environment leads to more consumer approach behavior.

Nevertheless, the conclusion remains that the offered categories are a pragmatic way to arrange an environment's many elements in a way that makes research feasible. However, no compelling framework exists that explains *why* it must be these particular categories.

*The O of Organism*

Within the S-O-R model, environmental stimuli ensure that the environment does 'something' with the person (the O) in that environment – specifically with the person's emotional state. To model this emotional state, atmospherics research often use the PAD model (Mehrabian & Russel, 1974), a so-called 'dimensional' model of emotions (Van Vliet, in prep.). This model proposes that emotions can be scaled within three independent dimensions: *pleasant/unpleasant*, *active/passive* (degree of arousal) and *dominance/submissiveness*. The PAD model doesn't necessarily measure the emotions, but rather the perceived pleasure, arousal and dominance triggered by the stimuli. This is done using 18 semantic differential items, six for each dimension, such as unhappy/happy (*pleasure*), relaxed/stimulated (*arousal*) and controlled/controlling (*dominance*). Since emotions take a place within the three-dimensional PAD model, the scores can be related to certain emotions. Diverse research has shown that the dominance factor contributes little to explaining phenomena and is therefore often omitted (e.g. Bradley & Lang, 1994; Sherman, Mathur & Smith, 1997). However, Mari & Poggessi (2011) have

signaled that this dimension is making a comeback in empirical research.

The first empirical study of atmospherics (Donovan & Rossiter, 1982) followed the train of thought behind the PAD model, and its influence continues through to recent studies by, for example, Farias, Aguiar & Melo (2014): "The store atmosphere is represented psychologically by consumers in terms of two major emotional states – pleasure and arousal" (p. 89). However, five points of criticism can be directed towards the PAD model (Van Vliet, in prep):

1. The PAD model cannot differentiate between clearly different emotions. In other words there's a 'lack of granularity': "The PAD typology (…) has been criticized as being too narrow in scope and not encompassing the range of possible variations in emotional reactions" (Eroglu, Machlet & Davis, 2001, p. 181) and also: "For anyone interested in understanding the rich diversity and subtle nuance of emotional life, a simple characterization of emotions as pleasant or unpleasant, strong or weak, seems both theoretically sterile and experientially implausible" (Smith & Ellsworth, 1985, p. 814). For example, fear and anger are both categorized as unpleasurable (negative valence) and with a high arousal, and therefore end up beside each other in PAD model as similar emotions. As Richins (1997) concluded over the use of the PAD dimensions: "Best used when a researcher (…) does not need to know the specific emotions being experienced by study participants" (p. 128).
2. It remains unclear which dimensions are needed, or are even essential, for the model. The dominance dimension is often left out in empirical studies because 'it doesn't do much'. The model can then be simplified into a V-A (valence – arousal/

activation) model such as the one that forms the basis for the well-known circumplex model. The crucial role of arousal has been under fire for decades: “Its role [autonomic arousal] in emotional experiences certainly has been overrated” (Frijda, Kuipers & Ter Schure, 1989, p. 226). In addition, alternative dimensions have been proposed such as approach/avoidance. But it is also completely unclear why a dimension such as *novelty* does not get a prominent place since there is abundant research showing the 'basicness' of novelty detection (Scherer, 2009). This reflects certain arbitrariness in what dimensions are chosen. Although few researchers will deny the importance of 'valence' and 'activation', there are questions about the claim that these are 'core' dimensions: “It is not clear in what sense and why valence and arousal feelings are considered as more ‘core’, ‘primitive’ or ‘basic’ than other internal representations” (Scherer, 2009, p, 1335). That people can reliably describe their emotions in this way is not a conclusive argument, especially because in free format descriptions of emotional events people rarely answer spontaneously in terms of valence and arousal gradation: “The two-dimensional valence by arousal space seems to be considered basic on the basis of countless factor analyses that show stability for only these two dimensions. However, it is questionable whether this is not an artefact of methodology” (Scherer, 2009, p. 1336).

3. Additionally, one can wonder whether these different dimensions describe the same conceptual ‘space’: arousal is a physiological component, pleasure is a subjective experience and dominance (as well as approach/avoidance) seems to describe a behavioral component. In this way, the different components are not of the same order. It seems more sensible to investigate these components individually and placing them

within a process model that does justice to their specific role and characteristics in emotions (see, for example, Frijda, 1986, Scherer, 2009). By regarding these dimensions as components (physiology, subjective experience, behavior) also makes it clear that an important component is missing: the *appraisal* of the situation (Van Vliet, in prep.).

4. The dimensions of valence and arousal are ambiguous. For instance, it remains mostly unclear what kind of arousal is being referred to: mental activation, sympathetic arousal or parasympathetic arousal? They are quite different in terms of type, the consequences of the activation and how they are measured (Scherer, 2009). Even more important: "One of the major drawbacks (…) is the difficulty of knowing whether the valence dimension describes the intrinsic quality of an eliciting object or the quality of the feeling (which may not coincide)" (Scherer, 2005, p. 719). An 'inherently' funny event may not lead to a good feeling for all kinds of reasons. So, what does the valence score represent for such an event: the assessment of the funniness of the event or one's own feeling state? The same goes for arousal: does the subject's rating refer to the perceived activation in a situation or to the own proprioceptive feeling of arousal as induced by the stimulus event? And methodologically: what does it mean if for instance a wild exciting car chase scene does not lead to a high state of arousal? Is the subject disregarded for not 'getting' the experimental manipulation?
5. The PAD model is based on a so-called bipolar space where emotion words are placed as opposites within a single dimension (e.g. relaxed versus stimulated). This is underlined by the use of the semantic differential in PAD measurement – which presupposes bipolarity. Bipolarity raises the more fundamental

> question on whether positive and negative emotions are indeed polar opposites or are relatively independent of each other. For example, those who accept the idea of a limited set of basic emotions take the latter position. The bipolar view also becomes problematic when trying to explain 'mixed emotions' – situations when we experience multiple (opposite) emotions simultaneously.[6]

The PAD model goes back to an understanding of emotions that is not without problems (Van Vliet, in prep.). However, just like the circumplex model of emotions (another 'dimensional' conception of emotions), it has nestled itself into many empirical studies of atmospherics, and also more broadly in studies of experiences, because of its relatively easy way to question emotions (too easy one might say). Theoretically, research into emotions has already 'moved on' - in the sense that there are alternative theories that can better explain the differentiation of emotions in different situations. The most important example is the appraisal theory of emotions – a theoretical perspective that remains almost non-existent within atmospheric research. A positive exception is provided by Chebat & Michon (2003) and their research into the effect of smell in a shopping mall that explicitly uses two explanatory models to test which one is best – the pleasure/arousal model (PAD model minus the dominance dimension) used by Donovan & Rossiter (1982), and the appraisal model as developed by Richard Lazarus (Lazarus & Folkman, 1984). The results show that smell contributes to having a positive experience of a shopping mall. The study also concludes with: "Our findings strongly support the model derived from Lazarus" (Chebat & Michon, 2003, p. 537). A person's evaluation of an environment is an important predictor of how the product quality and the store surroundings are experienced and how much

is spent – more so than mood (pleasure and arousal). This result also fits nicely with what Bitner (1992) called the 'perceived servicescape', since the 'perceivedness' represents appraisal processes (see Van Vliet, 2012).[7]

Regardless of what explanation model was chosen for the emotional state, various studies have made clear that the 'O' is more complex than just measuring pleasure and arousal. A study from Kaltcheva & Weitz (2006) shows that a consumer's motivation is an important moderator on the arousal effect generated by the shopping environment. When the motivation to shop is more recreational (*hedonistic*), the generated arousal has a positive effect on the experienced pleasure; when the motivation is more task-oriented (*utilitarian*), the generated arousal has a negative effect on the experienced pleasure. Eroglu, Machleit & Davis (2003) found evidence for the moderating effect of user involvement and atmospheric responsiveness on the effect of environmental stimuli on the experienced pleasure of the person. Baker, Parasuraman, Grewal & Voss (2002) found an effect of *time/effort cost* and *psychic cost* (mental stress, emotional work) on the experience of atmosphere. Fischer (1974) had already found an effect on the experienced equality with others in a space on how the space was experienced. Rayburn & Voss (2013) show in their study that there is a direct relation between atmospherics and hedonic and utilitarian shopping evaluations. In review articles, other moderators have also been named, such as: mood, attention, motivation, involvement and attitude, social climate and 'interpersonal and socio-cultural qualities of a setting' (Turley & Milliman, 2000; Eroglu & Machleit, 2008). Besides these moderators, various mediators have also been proposed. In her studies, Baker emphatically placed 'inferences' between the stimuli and the

people's image of the store ('store image'). These inferences had, for example, a relationship with how the quality of the products and services are perceived (Baker, Grewal & Parasuraman, 1994), which acted as antecedents for the consumer image of the store. In a later study (Baker, Parasuraman, Grewal & Voss, 2002), Baker also added the perception of the price and the quality of the personnel as an influence on choosing a store. In theories on atmospherics, little attention is paid to these 'inferences' and also the appraisal processes of the environment. On the other hand, a preoccupation exists with how pleasant an environment is: "Retail atmospherics research focused on the effect of environmental cues on mood" (Chebat & Michon, 2003, p. 531).

*The R of Response*

In the conducted research, the consumer's response is backed by as little theory as with environmental stimuli. There's not even a discussion about specific response categories since such categories are hardly presented. Consumer response merely exists as a collection of (dependent) measured variables, such as revenue, time spent in store, number of items looked at, purchases, purchase intention, purchase attitude and more general variables such as enjoyment, satisfaction and loyalty (e.g. Turley & Milliman, 2000).

Various studies measure approach/avoidance (including Donovan et al., 1982; Gilboa & Rafaeli, 2003; Yüksel, 2007). Bitner (1992) also includes it in her theoretical servicescapes model. This regularly used approach/avoidance response does have some theoretical anchoring (van Vliet, in prep.). Approach represents wanting to stay in a space and explore further; avoidance represents wanting to leave the space and not explore further. The response's

popularity in the literature can be traced back to the study by Donovan & Rossiter (1982). Inspired by Mehrabian & Russell (1974), they propose that all responses to an environment come down to approach or avoidance behavior. This behavior has four characteristics:

1. A desire to physically *stay* in (approach) or to get out of (avoidance) the environment.
2. A desire or willingness to look around and to *explore* the environment (approach) versus a tendency to avoid moving through or interacting with the environment or a tendency to remain inanimate in the environment (avoidance).
3. A desire or willingness to *communicate* with others in the environment (approach) as opposed to a tendency to avoid interacting with others or to ignore communication attempts from others (avoidance).
4. The degree of enhancement (approach) or hindrance (avoidance) of *performance and satisfaction* with task performances. (Donovan & Rossiter, 1982, p. 37).[8]

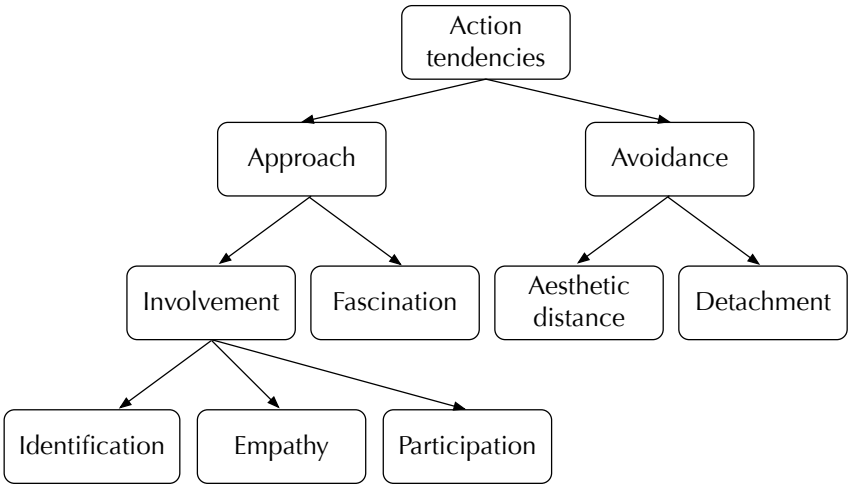
When characterizing approach and avoidance, one must note that it involves 'behavior'. This is important in two ways: 1) it is consistent with the observation that physiological and neurological research into emotions can only reliably establish whether the activation involves approach or avoidance since these are apparently basic reactions (Van Vliet, in prep.); 2) it gives the opportunity to connect approach/avoidance with the concept of action tendency in Frijda's theory (Van Vliet, 2012; in prep.), since behavior is not always externalized (actually walking away) but can also be an (internal) willingness to walk away that can be betrayed by a (unconscious) tensing of muscles and subtle changes in body positioning.

In elaborating this second point, Van Vliet (2012) linked Bitner's servicescape model with Frijda's emotion theory by connecting the previously made distinction between *involvement* and *detachment* (Van Vliet, 1991) with the approach/avoidance concept pair. Involvement is not regarded as a state but a 'movement' – a movement towards, an approaching, a wanting to enter, a desire to become one with something. In short, involvement is an action tendency, a readiness to engage in interaction with the environment, and that follows appraising a situation as relevant and seeing the possibilities to engage with that situation. Involvement can have a dual nature: the action tendency can lead to an actual behavior of the visitor participating, or the involvement can be vicarious whereby the action tendency leads to *reappraisals* to bring the desired situation 'closer'. For such reappraisals, we often use words such as empathy and identification.[9]

One consequence of describing involvement as a 'moving towards' action tendency, is the need for a complementary concept that covers the removal of the situation – to 'move away'. This concept is *detachment* and consists of a range of mechanisms that reference such things as the defense mechanisms formulated by Anna Freud, the coping strategies from Richard Lazarus's research into stress, and all sorts of heuristic rules for dealing with situations, such as humor, relativizing, denial, intellectualizing and simply walking away (Van Vliet, 1991). The detachment concept can be differentiated in a similar way as involvement: the action tendency can lead to actual behavior (walking away, shutting eyes, 'removing' the threat) or to the reappraisal of the situation through, for example, humor, intellectualizing or relativizing.

If the applied approach/avoidance duo is used as a general characterization of the action tendencies, we can then group *involvement* and under there, in the knowledge that other forms of approach and avoidance exist. *Interest/fascination* is a form of approach through the intense focusing of attention on a particular object or subject. *Aesthetic distance* is a form of avoidance whereby people take distance from an (artistic) product such as an art object, film or performance by explicitly focusing on elements that emphasize how the project was realized (technique, structure, author, actor *et cetera*). The figure below shows how the different action tendencies are organized.

*Figure 1:*
General structure of approach/avoidance action tendencies
(Van Vliet, 1991; 2012)



*Conclusion*

The S-O-R model forms the basis for much atmospherics research. The critical questions that have risen around this model can now be answered substantively. We can say that the doubts expressed by Eroglu & Machleit (2008) are warranted. Not only are essential questions not being answered but the only theoretical elements in the model is the PAD model and the dual concept of approach/avoidance. It's indeed a thin theoretical basis. We fully endorse the call by Mari & Poggessi (2011) after an in-depth analysis of research into atmospherics and servicescapes: "We urge researchers to go beyond the S-O-R paradigm in explaining the complexities of customer behavior" (p. 8). We can also give an affirmative answer to the question from Turley & Milliman (2000): "Are there theories beyond the S-O-R paradigm?" (p. 208). Within emotion studies of the past decades, large strides have been made in research into appraisal processes, action tendencies and coping strategies. Integrated theories, such as those of Frijda (1986) and Scherer (2009), can be ably linked with research models for how people behave in (service) environments, such as Bitner's servicescape model (see for example Van Vliet, 2012). These new insights also provides an answer on the *how* of the process of atmosphere experiences: characteristics of a situation and its affordances are appraised in light of the relevance for the organism's well-being; these appraisals and subsequent reappraisals, regulation processes and coping strategies may or may not lead to specific subjective feelings (e.g. joy), action tendencies (e.g. approach behavior), peripheral physiological changes (e.g. arousal) and expressive and instrumental behavior (e.g. laughing).

**Atmospherics in museums**

The field of visitor studies has grown exponentially since the 1970s (Bitgood & Shettel, 1996; Forrest, 2014). However, the portion of research into visitor experience remains limited (Kirchberg & Tröndle, 2012), with specific research into museum atmospherics even more so, according to Kottasz (2014): "Research to date has rarely investigated the impact of atmospheric cues on visitor responses and behavior in museums and little is known about this important topic" (p. 97). Forrest (2014) has also observed that: "The design appearance of the exhibition environment has been studied only rarely, and those experiments that have been conducted are of limited scope" (p. 66). Meanwhile it's not unusual to regard museums as particularly "atmospheric environments" (Dorrian, 2014). Yet decisions around the (re)design of exhibition spaces cannot call on a shared sector-wide analysis framework and validated measuring instruments. Rather, they must rely on experience, intuition and assumptions: "Design decisions frequently rest on intuition and assumptions made about visitor needs, rather than being grounded in research" (Forrest, 2014, p. 5).[10]

Museum atmospherics research generally mirrors that of marketing research into store atmospherics. The museum research builds on, or at least refers to, the research into specific environmental stimuli (music, layout *et cetera*) and the underlying frameworks such as those from environmental psychology. There's also the shared view that a museum visit is a *service encounter* or servicescape (e.g. Goulding, 2000; Hume, 2011; Del Chiappa, Andreu & Gallarza, 2014). Explicit references to the 'source' – Kotler's concept of atmospherics – are also common (e.g. Bonn et al., 2007; Forrest, 2014). This overlap is not surprising since the underlying hypothesis

has the same focus: a person's interaction with a space and their evaluation of that space. In addition, the glory days of environmental psychology more or less coincide historically with the rise of visitor studies.[11] Of course, differences exist between visitor studies in museums and the retail atmospherics research, but these are mainly on the level of objectives (e.g. knowledge transfer in museums versus sales in stores) and the method in which success is measured and made concrete (e.g. visitor satisfaction in museums versus revenue in stores).

We therefore see comparable research between the visitor experience in museum studies and the influence of specific environmental stimuli on visitor experience in retail. Goulding (2000) found the influence of routing and crowding on visitor experience, and Wineman & Peponis (2010) concluded in their research that the movement of visitors in a museum is related to spatial characteristics such as accessibility and visibility. Tröndle (2014) showed the role of a building's architecture on visitor experience. (Background) music in a museum influences the visitor experience – resulting in a longer stay and an increase in learning (Chen & Tsai, 2015; Brenner, 2016). The location, word count and font size of object labels influence the attention and behavior of visitors (Bitgood & Patterson, 1993). Jeong & Lee (2006) found that the exhibition space itself (what is being displayed, how they are being displayed, accessibility, lighting and rest areas) has the biggest effect on the satisfaction of visitors. Trondle et al. (2014) studied the effect of an exhibition's arrangement by hanging up alternate paintings or changing painting placement within the same exhibition. They found that this had an impact on the behavior of visitors and their attention for the paintings. Kent (2010) studied the role of the museum shop as an extension of the museum

experience. Yet other research has focused on labels and other contextual elements, spatial configuration, light use, color use on walls, exhibition size and routing (for an overview, see Forrest, 2014).

There are also studies that take a more overall perspective. Henry (2000), in an analysis of 33 essays from students about their most positive and most negative museum experiences, found that 'exhibition environment' was one of the most determining factors for the museum experience. Specifically: the lighting, layout of the exhibition, crowding, personnel behavior, spatial characteristics (e.g. height of the space) and routing – all familiar elements from our earlier discussion on environmental stimuli in the context of retail.

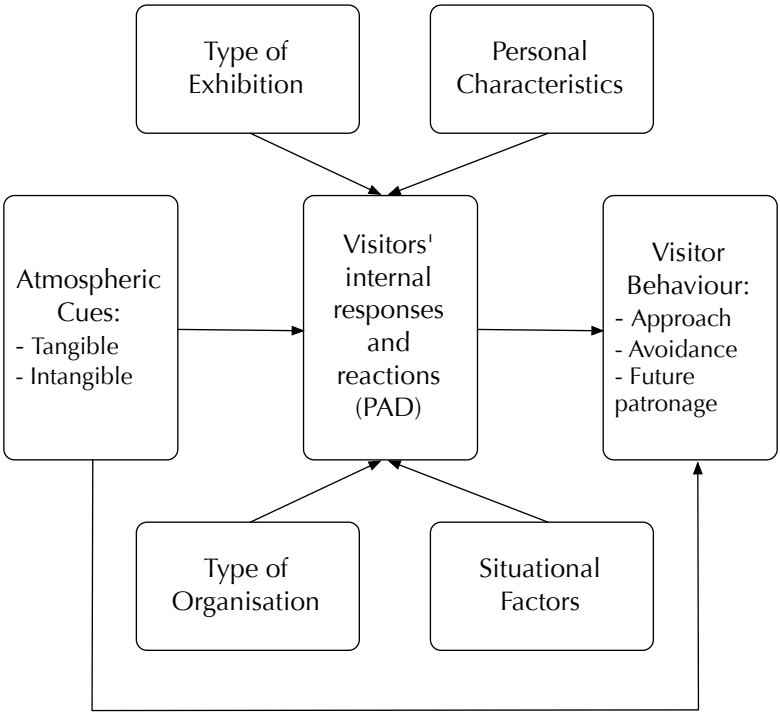
Bonn et al. (2007) researched the influence of environmental stimuli on visitors to heritage sites with the idea that these visitors could make a relevant contribution to helping uniquely position a heritage location within a competitive market: "A major part of creating this 'ideal' experience lies in creating the right atmosphere or physical environment in which to view the display, exhibit, or attraction" (p. 347). The research made use of the categorizing of environmental stimuli of Baker and the S-O-R model. In their study of 500 museum visitors, they found evidence of the influence of ambience (lighting, color), design (layout, routing) and social factors (friendly personnel) on visitor attitude towards the heritage attraction, as well as on the intentions to revisit the site and recommend it to friends and others.

Kottasz (2014) adopted the complete atmospherics framework from the marketing tradition for the museum context: Baker's

classification of environmental stimuli, the PAD model and the approach/avoidance concept pair. The study's results from 140 museum visitors collected over 10 museums, showed that environmental stimuli also have an influence on the PAD dimensions in museums, particularly with such variables as light, temperature and decorative elements: "Clearly there is room for improvement here and museums should re-evaluate their approach to this aspect of the environment if they are to attract and retain audiences" (p. 114). In addition, space-describing dimensions such as *novelty*, *complexity*, *coherence* and *mystery* also have an influence on PAD dimensions and approach/avoidance behavior. The conceptual model presented by Kottasz (Figure 2) is interesting for its relatively rich and nuanced list of aspects that can influence the experience atmosphere and the exhibited behavior (see also the model in Van Vliet, 2012).

The most extensive and recent study of atmospherics in museums is the study by Forrest (2014). Like Kottasz (2014), Forrest observes that little research has been carried out into how museum visitors react to the physical museum space, despite the recognized importance of this and the (financial) interests involved, such as in the redesign of museum spaces. Forrest's study aims to provide insight into how visitors perceive different exhibition spaces and its relationship with different aspects of the visitor experience. Forrest developed a model and a measuring instrument for this purpose.

*Figure 2:*
Kottasz's conceptual model of the effect of atmosphere stimuli on emotions and behavior
(Kottasz, 2014)




For the development of her model, Forrest reaches back to several theoretical frameworks: Kotler (definition of atmospherics), Baker (categorizing environmental stimuli) and environmental psychology (the interaction between person and environments as a transactional model). Thereby Forrest follows the distinction Kotler

made between *intended atmosphere* and *perceived atmosphere*, and focuses her research on perceived atmosphere. She follows Baker's categorizing and focuses on design factors – particularly, the "visual dimensions of the environment" (2014, p. 37). Herein, she chooses neither for social factors nor for ambient factors, except for lighting. She gives no substantive reasons for this choice – only that it's beyond the scope of the research. Forrest recognizes the importance that the S-O-R model has played in atmospheric theory formation and the use of the PAD model within empirical research, but mentions two limitations of such research: 1) atmospherics are not studied in depth, and 2) the S-O-R model cannot be adapted to multisensory experiences and therefore cannot be used for a more holistic study of perceived atmospheres. Both points of criticism are debatable: enough studies exist that try to make precise statements about the workings of atmospherics, including the involvement of unpleasant emotions and negative cues (e.g. d'Astous, 2000). Also, other studies have looked at multiple cues simultaneously (e.g. Baker, Parasuraman, Grewal & Voss, 2002). Forrest's points of criticism are more technical than fundamental in nature, and can be resolved through better and additional research. However, it must be noted that the above observations here are not meant to defend the S-O-R model (see above). The consequence that Forrest draws from this criticism is interesting because it is in line with the proposed approach of integrating the appraisal theory of emotion with the servicescape theory (see above; Van Vliet, 2012). Forrest summarizes the cognitive appraisal theory by stating that it involves the cognitive evaluation (appraisals) of stimuli related to the goals and needs of the person. These evaluations include recurring aspects, such as the degree of control over the situation and the agency (who 'causes' the situation).

Forrest's resulting model for atmospherics is presented as an alternative for the S-O-R model and as a synthesis of the literature and research around atmospherics and servicescapes (see Figure 3). But this stated ambition does raise some relevant questions:

1. The most important 'change' that Forrest brings to the S-O-R model is in the way she speaks of perceived atmosphere instead of the direct influence of environmental stimuli on the emotions.[12] We have seen that Kotler (1973) already differentiated between *intended* and *perceived atmosphere* and that Bitner's servicescape model (1992) already used the concept of a 'perceived servicescape'. We've also seen that diverse empirical studies from decades ago were already talking about 'inferences' and, for example, 'perceived price and quality' (Baker, Grewal & Parasuraman, 1994; Baker, Parasuraman, Grewal & Voss, 2002). While it's correct to state that these insights were not all included in the original S-O-R model, too little credit is given to the (theoretical) work that followed.
2. The introduction of 'perceived atmosphere', in the sense of a person's appraisals of the environment, has impact on how the relationship between the environment and the person must be seen. Cognitive appraisal theories as proposed by, for example, Frijda (1986) and Scherer (2009) can be seen as an elaboration of this relationship. However, we see little or nothing of this impact in Forrest's model, which still follows the same triplet of S, O (albeit now 'perceived') and R. The introduction of 'perceivedness' in the model lacks any further (theoretical) backing or elaboration. At first it seems that Forrest is following the path of cognitive appraisal theory (2014, p. 41), but this later proves to be mere lip service since the term appraisal only appears sporadically. In addition, only indirect references are made to the theory via appraisal dimensions such as *agency*,

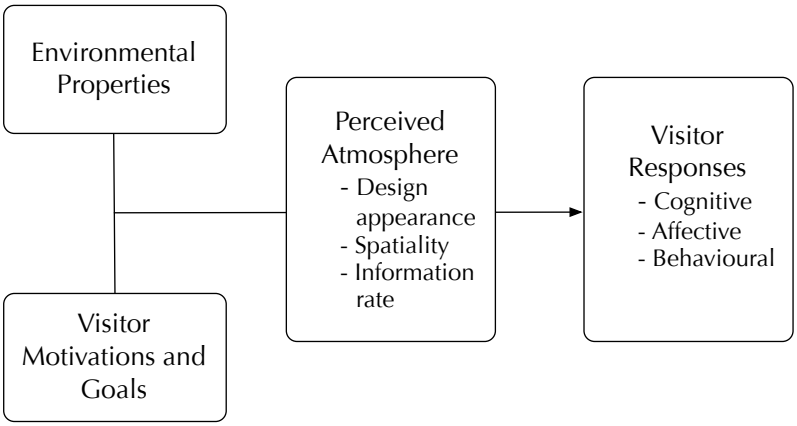
*controllability* and *outcome desirability*. In fact, the empirical research itself 'reaches back' to the PAD model (just as Kottasz, 2014) and the theory of basic emotions. So, the model is not really an elaboration on the appraisal theory – which is also evident in Forrest's discussion about measuring emotions (2014, p. 113/114).

3. Forrest's model also encompasses few new insights. In marketing research into store experience, we have already encountered all sorts of 'moderators' and 'mediators' that influence the visitor experience. A similar summary can also be found in research into museum experience that apply aspects such as motivations, values, expectations, a person's characteristics, demographic characteristics, experience, mood, involvement, emotions, exhibition type, museum type, social context of who you visit the museum with, how your social group looks at museum visits (social approval/cultural capital), how you identify with other visitors (social identification) *et cetera* (e.g. Van Vliet, 2009; Sheng & Chen, 2012; Del Chiappa, Andreu & Gallarza, 2014; Kottasz, 2014). Few of these aspects can be found in Forrest's model; only 'motivations and goals' are explicitly named in the end as visitor aspects, and based on the empirical material the revised model sees the addition of personality characteristics such as *arousal seeking* – although this element was already there in the original model of Mehrabian & Russel (1974, p. 8). Also in Forrest's discussion of different contextual aspects of the visitor experience, there are enough points of departure to be found to enrich the model. But as is, it remains stuck in the 'environmental properties', and lacks, for example, anything related to social context as covered in the work of John Falk (Falk & Dierking, 1992). Furthermore, the model's components have been only slightly elaborated

upon in terms of content. For the 'environmental properties' there are enough proposals (Baker, Bitner), including the discussion about research into individual environmental cues and a more holistic approach. Forrest seems to be open to the latter (e.g. "Such findings reinforce the need to research atmospheres holistically and in context" p. 52) but chooses to research only one limited set of stimuli (design appearance) – resulting in the model being neither fish nor fowl. And finally, the comment about "visitor experience should encompass affective elements as well as cognitive and behavioral responses" (p. 80) is perhaps a new insight for the visitor studies field but adds little to current research into atmospherics. The question is how these aspects relate to each other and 'react' to the appraisal and reappraisal of the environment. A concept pair such as approach/avoidance (see above) can already give a more specific and directly testable interpretation – something that Kottasz (2014) at least does attempt but Forrest does not.

Forrest's model as a general atmospheric model contributes little to the models that already exist (e.g. Bitner, Kottasz). In fact, it's but a pale mirror of the theoretical and empirical knowledge that already exists. It's also a missed opportunity for what Forrest herself so nicely formulates: "The challenge for researchers is thus to develop theoretical frameworks that have the capacity to incorporate the full spectrum of the visitor experience, ranging from the public and social aspects to the deeply personal" (p. 71).

*Figure 3:*
Forrest's Atmospherics Model
(Forrest, 2014)




In the end, Forrest studies three aspects of the perceived atmosphere: *design appearance* (the visual impression that the environment makes via such things as light and color); *spatiality* (architectural characteristics of the space and its layout), and *information rate* (the impression of the complexity of the space, the effort that is needed to use that space). At different exhibitions at the South Australian Museum, she collected both qualitative and quantitative data via visitor research. This led to, among other things, to the development of a measuring instrument called the Perceived Atmosphere Instrument (PAI). This instrument consists of 30 semantically differential items that focus on describing a space's atmosphere, such as *dark/light*, *active/passive*, *cozy/formal* et *cetera*.[13]

A quantitative analysis of the 602 completed PAI questionnaires delivers four factors: *vibrancy* (with traits such as vibrant, striking, dynamic, energetic), *spatiality* (wide, spacious, open), theatricality (winding, modern, new) and *order* (ordered, structured, flowing). Three of the four factors align nicely with aspects isolated by Forrest of the perceived atmosphere: *design* (*vibrancy*), *spatiality* (*spatiality*) and *information rate* (*order*). Forrest has difficulty explaining the factor *theatricality* while saying further research is outside the scope of her research – even though this factor shows the most variation between the different exhibitions in the research.[14]

Forrest also studied the connection between perceived atmosphere and visitor experience. Little relationship was found between perceived atmosphere and her 15 dimensions of visitor experience – save for a found correlation between *vibrancy* and *excitement* and *fascination*, which while significant, only explains 12% to 13% of the total variance. Other relationships studied by Forrest were: the 'affective responses' (consisting of affective engagement, displeasure and relaxation) and cognitive responses (consisting of cognitive engagement and cognitive overload). She summarizes these results with: "This indicates that visitors feel more affectively and cognitively engaged, more relaxed and less overloaded and dissatisfied in environments they perceive to be more vibrant, ordered and spacious" (p. 175).[15]

Forrest's research is one of the most extensive studies of atmosphere in museums. However, the building up of theory is only beginning: "Theory in this area [visitor centered investigations of the exhibition environment] [is] at a relatively early stage of development" (2014, p. 83). Of course, there are already theories in the field of visitor studies, and Forrest integrates several of these in her study but it

remains fragmented. The segmenting of the public is given a lot of attention, such as the IPOP model (Pekarik et al., 2014), which posits four primary visitor interests[16] that determine where one's attention is directed, what the visitor does, and how the visitor reacts (but then without explaining why it must be these four interests). Furthermore, many proposals exist on how to categorize visitors (see Van Vliet, 2009), as well as on the motivations of museum visitors and learning in museums. In a review article, Kirchberg & Tröndle (2012) discuss five additional general theories about visitor experience in museums, including Falk & Dierking's contextual learning model and Csikszentmihalyi's flow model. With atmosphere not being a specific point of attention within these models, we will not evaluate the possible consequences these theories may have on how to look at museum atmospherics. In the summary offered by Kirchberg & Tröndle, where they integrate different models, no elements are offered that we have not already encountered above: "Overall, the studies exhibit a rather homogeneous kind of knowledge concerning visitor experiences in the museum. A predominant resemblance is the general idea of chronology and causality, perpetually using the same underlying schema. There are always social, personal, or physical characteristics (pre-visit parameters) that influence the visit experiences (satisfying, confirming, or aesthetic). Subsequently, the effects of the visit experiences are always some kind of utilitarian measures of post-visit satisfaction and reward consequences, either cognitive or emotional" (2012, p. 447-448).

**How to measure atmospherics?**

The big question remains… How do you measure atmospherics? We can now finally make a proposal based on the research and theory discussed above. However, it must be said that not all the discussed studies explicitly describe how atmosphere is studied or measured. Some just name a few sample questions (e.g. Michon, Chebat & Turley, 2005); others just mention a few catchwords used in the data analysis without citing the actual questions (e.g. Mattila & Wirtz, 2001); and yet others just refer to a selection of questions from other studies without actually listing the selection (e.g. Poncin & Mimoun, 2014). In addition, we are focusing here on measuring atmosphere using a questionnaire, this method is not only the most often used, but is also a very economical research method and has high response rates compared to other methods. Other research methods are also possible: may it be qualitative through interviews (e.g. Schorch, 2013) or diaries/essays (e.g. Henry, 2000), or quantitative in the form of measuring the position and walking behavior in the museum using sensors or Wi-Fi tracking (e.g. Tröndle, 2014) (see Van Vliet, in prep. for a discussion).

In the described studies on atmospherics, four components appear regularly and play a role in every presented 'model': environmental cues, perceived atmosphere, felt emotion and approach/avoidance (see also Milliman & Fugate, 1993). We will go through these components one by one. However, this neither means that these components can determine the full experience of atmosphere, as we have seen personality traits but also mood, involvement and other factors have their influence on atmospherics. Nor does this means that these will be the only components measured in the atmospherics research. Attention also needs to be directed on

aspects that the visitor 'brings along', such as expectations (Sheng & Chen, 2012; Kottasz, 2014), motivations (Kaltcheva & Weitz, 2006; Sheng & Chen, 2012; Forrest, 2014; Kottasz, 2014) and mood (Kottasz, 2014); the 'effort' that a visitor must exert during a visit, such as cognitive overload and cognitive engagement (Brenner, 2016; Forrest, 2014), fatigue (Jeong & Lee, 2006); and the 'reaction' of the visitor to the visit, such as the experienced quality (Baker et al., 1994; Donovan et al., 1994; Baker et al., 2002; Chebat & Michon, 2003; Michon et al., 2005; Hume, 2011), satisfaction (Mattila & Wirtz, 2001; Baker et al., 2002; Eroglu et al., 2003; Jeong & Lee, 2006; Hume, 2011; Del Chiappa et al., 2014; Poncin & Mimoun, 2014) and loyalty (Baker et al., 2002; Kaltcheva & Weitz, 2006; Bonn et al., 2007; Poncin & Minoun, 2014). All these components can be put into a mutual relationship within a model of experiencescapes (see Van Vliet, 2012).

*Environmental cues*

Almost all the cases presented here of research on the effect of certain environmental stimuli on visitors follow Baker's categorizations of *ambient*, *design* and *social* (Baker et al., 1994; d'Astous, 2000; Baker et al., 2002; Bonn et al., 2007; Harris & Ezeh, 2008; Reynolds & Harris, 2009; Kottasz, 2014; Muhammad, Musa & Ali, 2014). Jeong & Lee (2006) use another category they call 'physical environment', which includes environmental stimuli that we've encountered in other studies, such as illumination, noise and visitor density. Elbachir (2014) chooses for music, odor and store design from a 'sensory marketing' perspective where the store design represents the visual aspect. The use of these items fits seamlessly with those items used in studies that are based on Baker. On occasion, an addition is made to Baker's trio, such as the 'exterior'

aspect (e.g. Reynolds & Harris, 2009; Kottasz, 2014) where, for example, questions are asked about the building itself or parking availability; or the aspect of 'kinect quality', as the appreciation of the store with regard to the movements and gestures that can be performed during the shopping trip (Bonnin & Goudey, 2012).

The three categories are usually investigated using a limited number of elements, often 3 or 4 items per category. In most cases, use is made of a 5-point or 7-point Likert scale from 'strongly disagree' to 'strongly agree'. Examples of items are: "This facility has good lightning" (Bonn et al., 2007), "The employees were well dressed and appeared neat" (Baker et al., 1994), "The restaurant had clean walkways and exits" (Harris & Ezeh, 2008), and "It was easy to move around the outlet" (Reynolds & Harris, 2009). The choices of questions seem quite arbitrary, with one study asking about music while another study might focus on color. This has to do with an environment's vast number of possible stimuli – they simply cannot all be investigated. Custers et al. (2010) came up with 31items for lighting alone; while d'Astous (2000) generated 38 possible irritating elements in a store. Studies by Baker et al. (1994), Harris & Ezeh (2008) and Reynolds & Harris (2009) involve the most extensive questioning around environmental stimuli. A selection of questions can be found in Appendix 1.

Research into environmental stimuli is certainly enriched by the careful examination of the effects of an environment's specific elements. However, one must remain aware of the mutual influence of that the stimuli in the total space have on each other. In terms of method, one could take an alternative experimental approach where a small but relevant change is made in the environment, for example by replacing an artwork, or making a specific manipu-

lation such as with the layout of the exhibition (see for example Tröndle et al., 2014). However, such an approach requires significant cooperation with, in this case, the museum. The most important point remains the previously mentioned theoretical objection involving how a visitor's experience is more holistic in nature and is therefore difficult, or even impossible, to reduce to individual environmental stimuli. Therefore, it seems necessary to take a position in this discussion before proceeding to measuring the effects of environmental stimuli.

*Perceived Atmosphere*

We describe a space by using words such as cozy, cramped, uplifting, organized, inspiring or gloomy. In fact, there is no shortage of terms to describe the impression that a space gives. In an early study, Kasmar (1970) already found 500 different adjectives used by test subjects to describe just a few different spaces. When measuring perceived atmosphere, it's essential to differentiate between a space's descriptive description and its evaluative description. The difference is not black-and-white since we are dealing with the meaning of words that are used to describe a space in a more objective or subjective manner. However, the difference is not meaningless: for example, you can *describe* a space as being full or busy, but then *evaluate* it as claustrophobic (a train at rush hour) or as stimulating (a sold-out concert hall).

In both museum studies (Kent, 2010; Forrest, 2015; Brenner, 2016) and other studies into atmospherics (Fischer, 1974; Donovan & Rossiter, 1982; Vogels, 2008; Rayburn & Voss, 2013), you can find examples of descriptive terms being used to measure the experienced atmosphere. The used terms vary greatly, with 64

different adjective pairs being used in this small set of studies, measured via a semantic differential.[17] There are 12 adjective pairs that are used in more than 1 study: active/passive, dramatic/plain, warm/cool, ordinary/striking, vibrant/dull, hard/soft, symmetrical/asymmetrical, small scale/large scale, large/small, crowded/uncrowded, dynamic/static (2x), simple/complex (4x).

A more limited, yet qualitative, selection of terms can be made by applying three criteria that exclude the following: 1) terms related to a specific element in the space such as light, color and sound (e.g. well-lit/dark, colorful/uncolorful, quiet/noisy, airy/not airy); 2) terms with an evaluative connotation (e.g. vibrant/dull, energetic/serene, cozy/formal, interesting/monotonous); 3) terms that are abstract descriptions of the space (e.g. hard/soft, dynamic/static, far/close, hidden/obvious). The 20 remaining adjective pairs cover 7 aspects of the space:[18]

1. *Order*: ordered/jumbled, cluttered/uncluttered, symmetrical/asymmetrical;
2. *Coherence*: structured/unstructured, patterned/random, organized/random;
3. *Variety*: varied/repetitive, similar/contrasting, redundant/varied, non-uniform/uniform;
4. *Scale*: small/large, small scale/large scale;
5. *Crowdedness*: sparse/dense, roomy/cramped, crowded/uncrowded, crowdy/empty;
6. *Spaciousness*: open/enclosed, spacious/confined, wide/narrow;
7. *Complexity*: simple/complex.

These items can be questioned via the sentence "I would describe the space as …" and using a 5-point Likert scale ('Totally disagree' – 'Totally agree'). It's advisable to cover both positively and

negatively formulated items. Another option, and one that fits with the named studies that use these terms, is to use a 7-point semantic differential since the terms lend themselves to being opposites (see Appendix 1).

Museum studies rarely use evaluative terms to measure atmospherics. Only Forrest (2014) used two general items (see below). Retail studies, however, often use evaluative terms to measure atmospherics (Fischer, 1974; Mattila & Wirtz, 2001; Sherman, Mathur & Smith, 1997; Spangenberg, Grohman & Sprott, 2005; Yüksel, 2007; Vogels, 2008; Custers et al., 2010; Bonnin & Goudey, 2012; Rayburn & Voss, 2013; Elbachir, 2014; Moes & Van Vliet, 2017). With the exceptions of Vogels (2008), Custers et al. (2010) and Bonnin & Goudey (2012), these studies use a semantic differential scale for measurement. A relatively large similarity exists in what adjectives are used: only 26 different adjective pairs are used in these studies[19], of which half appear in more than 1 study: uninteresting/interesting (2x), unmotivating/motivating, tense/relaxed (3x), boring/stimulating, negative/positive, colorful/drab, un-lively/lively (4x), good/bad, bright/dull, attractive/unattractive, comfortable/uncomfortable, pleasant/unpleasant (5x) and depressing/cheerful (7x).

Also here, one can use three qualitative criteria to limit the number of terms by omitting the following: 1) terms related to a specific element in the space such as light, color and sound (e.g. colorful/drab, cluttered aisles/uncluttered aisles, pleasant smelling/unpleasant smelling, courteous salespeople/discourteous salespeople); 2) terms that are descriptive (e.g. roomy/cramped, large/small, well-organized layout/unorganized layout); 3) terms that are abstract descriptions of the space (e.g. good/bad, negative/positive,

innovative/average). As a result, only 13 adjective pairs remain (see Appendix 1). Several other adjective pairs can be added based on specific research. Firstly, from the found dimensions (see above): *mysterious* (mysterious/clear) and *novelty* (novel/familiar). Secondly, Rayburn & Voss (2013) use the adjective pair charming/obnoxious, which is an interesting addition. And thirdly, the study of Vogels (2008) has a few terms that offer a substantial contribution:[20] intimate (intimate/distant), cozy (cozy/formal), hostile (hostile/friendly) and threatening (threatening/inviting). All these twenty items can be questioned using a 7-point semantic differential (see Appendix 1).

In addition to differentiating between the descriptive and the evaluative, we must also decide whether to choose for a more holistic basis (see above). Such an approach is not at odds with the already presented items – on the contrary. The descriptive and evaluative terms already in fact 'transcend' the concrete environmental stimuli, as those measured by the environmental cues (see above), to capture more of a total impression – as *intangible atmospheric cues* as Kottasz (2014) calls them. Those few studies that aspire for a more holistic approach also often use the same (evaluative) terms, such as pleasant, uncomfortable (Baker et al., 2002), boring, lively, interesting (Chebat & Michon, 2003), complexity, order (Gilboa & Rafaeli, 2003) and (un)comfortable, charming/obnoxious, (dis)pleasing, (un)appealing (Rayburn & Voss, 2013). Another addition to a holistic measurement is to ask for a total judgment about the visit, as Forrest (2014) did with her two questions about how 'enjoyable' the exhibition was and whether it was a 'worthwhile experience'. While legitimate questions, they do go further than a final judgment about the atmosphere. The same argument arises with the 'holistic' questions used by Moes & Van

Vliet (2017) that include terms such as immersion, connection and memorableness. While relevant concepts, they have more to do with measuring the experience rather than being aspects of the atmosphere. It is possible to apply Forrest's more general questions to explore the space, which would also connect more with the studies that ask more general attitude questions related to the space – which often use such recurring words such as favorable/unfavorable, positive/negative, good/bad, like/dislike, enjoyable/not enjoyable (Eroglu, Machleit & Davis, 2003; Spangenberg, Grohman & Sprott, 2005; Kaltcheva & Weitz, 2006; Bonn et al. 2007). These questions can be asked using a 7-point semantic differential (see Appendix 1) and should be enough to serve as input for the "paramount" need, as argued by Farias, Aguiar & Melo (2014) for "a scale that aims to measure customer's retail experience in a holistic way" (p. 95).

*Felt Emotion*

It seems that perceived atmosphere can be charted out nicely using descriptive, evaluative and holistic questions. So, what added value does asking about the experienced emotions provide? There are two possible – and complementary – answers for this. One inadequate yet undeniably practical answer would be: the clear majority of atmospheric studies measured felt emotion, particularly when these studies were about perceived atmosphere. The prominence of felt emotion in the research is related to the importance given to the studies of Mehrabian & Russell (1974) and Kotler (1973) – from which a lot of research has been derived. These studies also gave an explicit role to 'emotional responses' and 'affective states' as intervening variables in the behavior reaction of people in a space. Only those studies that mainly focused on researching environ-

mental cues often did not include felt emotion because they were looking into what categories precisely existed, such as lighting with Vogels (2008) and Custers et al. (2010) and irritating elements in the store environment with d'Astous (2000); or they were studying the relationship between environmental cues and dependent variables such as service quality (Baker et al., 1994; Baker et al., 2002), satisfaction (Harris & Ezeh, 2008; Reynolds & Harris, 2009) or loyalty (Bonn et al., 2007).

The second answer is related to theory development. Over the last decades an awareness has grown, based on empirical research, that emotions have a greater coherence with perception and behavior than just being an 'intermediate' variable. The perceivedness of a situation is already an essential part of the emotional process – and in fact are intrinsically linked with each other. Building on the work of Magda Arnold, Richard Lazarus and others, new theories of cognitive emotions have been developed wherein appraisal plays a large (causal) role (Frijda, 1986; Scherer, 2009; Moors, Ellsworth, Scherer & Frijda, 2013). While a complex discussion (see Van Vliet, in press), a simplistic and previously mentioned example can provide some insight: that of the difference between the descriptive and the evaluative as exemplified by how a full space can be regarded either as claustrophobic (a full train) or as stimulating (a full concert venue). Here, nothing is being said of the emotions being felt: a claustrophobic train can be paired with frustration but also with joy from having a chance conversation. Meanwhile, a stimulating full concert venue does not always have to be paired with positive emotions – stimulation can be paired with fear since movement is now restricted. A different appraisal of the same kind of situation stimuli can therefore be paired with different emotions (see pages 52-56).

Based on the above answers, we can consider measuring emotions as an important part of measuring atmospherics. The choices on what emotions to measure and how to measure them are closely related to a person's theoretical view on what emotions are. Herein we can roughly differentiate between three points of view: a dimensional view (including PAD), the basic emotion theory and the appraisal theory (Van Vliet, in prep.). These different theoretical points of view lead to different lines of questioning.

In the previously discussed retail studies, emotions are most commonly measured using the PAD model (Foxall, 1979; Donovan & Rossiter, 1982; Donovan et al., 1994; Sherman, Mathur & Smith, 1997; Mattila & Wirtz, 2001; Chebat & Michon, 2003; Eroglu et al., 2003; Gilboa & Rafaeli, 2003; Michon et al., 2005; Spangenberg, Grohman & Sprott, 2005; Kaltcheva & Weitz, 2006; Yüksel, 2007; Poncin & Minoun, 2014). Only a few cases, such as with Foxall (1997) and Spangenberg, Grohmann & Sprott (2005), use the full list of 18 items that formed the original basis of the PAD model (Mehrabian & Russell, 1974) and which was also already proposed by Dovovan & Rossiter (1982).[21] In most cases, the dominance items were not used. As for the other two dimensions, only 3 or 4 of the original 6 are usually used, and sometimes with other wording. For *pleasure*, these are often the items: happy/unhappy, pleased/annoyed, satisfied/dissatisfied, contended/depressed. For *arousal*, the terms were often: stimulated/relaxed, excited/calm, wide awake/sleepy, aroused/un-aroused. These words were queried in the form of a semantic differential (see Appendix 1 for a list of the original terms from Mehrabian & Russell, 1974).[22]

With museum studies, the PAD is used much less, with only Kottasz (2014) applying it consistently. Other studies seem to make an

arbitrary choice of emotion words. In his study on the influence of music, Brenner (2016) uses 10 emotion terms, such as *irritated*, *bored* and *confusing*. Del Chappia et al. (2014) uses a complete mixed bag of 'emotions', such as *disoriented*, *surprised*, *waste of my time* (!) and *learned something new*. Based on preliminary research, Forrest (2014) concluded that the PAD analysis provides no useable results, and seeks refuge in the viewpoint of basic emotions, despite her positive presentation of appraisal theory.

Forrest (2014) is the only found study that reaches back to the theoretical view that there are basic emotions. Basic emotions are universal, have a unique biological basis and have evolutionary advantage (for example, fear helps avoid dangerous situations). In addition, basic emotions can be easily recognized in facial expressions and underlying biological processes. This view is also described as a 'discrete' or 'categorical' take on emotions. These basic emotions are by definition a limited set, although there is no agreement on the actual number of basic emotions and which emotions are precisely included. Silvan Tomkins distinguished nine affects: interest, enjoyment, surprise, distress, anger, fear, shame, dissmell and disgust. Carroll Izard came up with ten basic emotions: interest, enjoyment, surprise, sadness, anger, disgust, contempt, fear, shame/shyness and guilt. Her Differential Emotions Scale (DES) measures these 10 basic emotions using three adjectives for each. Robert Plutchik tallied eight basic emotions: fear, anger, joy, sadness, acceptance, disgust, expectancy and surprise. These are measured with the Emotions Profile Index (EPI) where respondents build a score around these basic emotions using 62 forced-choice emotion descriptor pairs. A shorter measure was developed with three adjectives for each emotion (Richins, 1997). Despite the differences, a basic consensus exists on 6 basic

emotions: joy, anger, disgust, fear, sadness and surprise. As a whole, the theory of basic emotions is not without criticism (Richins, 1997; Van Vliet, in press). Forrest uses 24 items based on Plutchik's theory of 8 basic emotions. In Appendix 1 the 8 basic emotions mentioned by Plutchik are included in the reference questionnaire with different adjectives that can be used. There is no reason not to include also the 'additional' basic emotions as mentioned by Izard and Tomkins.

The appraisal theory, also known as the *cognitive appraisal theory* (CAT), is currently the most attractive theory to explain emotions, bot theoretically and empirically (Van Vliet, 1991, 2012, in press). In short, the appraisal theory of emotion states that: 1) Emotions are functional adaptive responses based on appraisals of features and (action) affordances of the environment that are relevant to the person's well-being; and 2) Emotions are multi-componential response patterns in which appraisals are the main causal determinants of the (quality and intensity of) various other components: subjective feeling, instrumental behavior, action tendencies and physiological responses. The component view on emotions leads to a process architecture involving discussions on the sequencing of (sub)processes, interdependencies and feedback loops (Frijda, 1986; Scherer, 2009). As an essential phase in emotions, appraisals can be broken down into different stages, such as primary appraisal, establishment of relevance, and secondary appraisal, the assessment of coping abilities (Lazarus & Folkman, 1984). The theory can also work to define appraisal patterns that underlie specific emotions (Frijda, 1986; Scherer, 2005, 2009). While still in development in regards to how the specific mechanisms work (see Moors, Ellsworth, Scherer & Frijda, 2013), appraisal theory is already far more explicit in explaining the confluence of cognition

and emotion (and behavior for that matter) than the many other models that list emotion, cognition and behavior as visitor responses, but then without providing much explanation of their interdependencies and workings (e.g. Forrest, but also Bitner). In addition, over the last 30 years numerous empirical studies have found substantial experimental evidence for many of the predications provided by the appraisal theory (e.g. Scherer, Schorr & Johnstone, 2001; Scherer, 2009).

In appraisal theory, only the assessment of all component changes involved can provide a comprehensive measure of an emotion: appraisal process, neurophysiological response patterns, action tendencies, patterns of facial and vocal expression as well as body movements, and subjective feelings. But: "Such comprehensive measurement of emotion has never been performed and is unlikely to become standard procedure in the near future" (Scherer, 2005, p. 709). Most research has focused on the process of appraisal, not only because it is the most distinctive element in the theory compared to other emotion theories, but also because appraisal is the (causal) trigger that sets off a chain of response patterns: "If one knows the result of an individual's event appraisal on the major checks, one can approximately predict what kind of emotion he or she will most likely experience (…) what motor expressions, action tendencies, and physiological changes can be expected to underlie this experience" (Scherer, 2009, p. 1326) – a statement that has been backed by several experimental studies (e.g. Frijda, Kuijpers & Ter Schure, 1989; Roseman & Evdokas, 2004). Considering atmospherics research, the appraisal component is also of primary interest because it focuses on the assessment of environmental stimuli. Herein, the main viewpoint of appraisal theory is that: "Appraisal theories assume that there is a variable relation between

stimuli and emotions, but a stable relation between appraisals and emotions. In general, the same appraisals lead to the same emotions; different appraisals lead to different emotions." (Moors, Ellsworth, Scherer & Frijda, 2013, p. 121). In other words, different emotions may be elicited by the same situation and the same environmental stimuli when people differ in their appraisal of the situation.

The appraisal process is made up of different variables that play a role in the detection and assessment of the significance of the environment for a person's well-being. Several appraisals variables have been proposed and tested, not only by emotion researchers (e.g. Frijda, 1986; Scherer, 2009), but also by researchers in the context of, for instance, consumer behavior (e.g. Watson & Spence, 2007), tourism (e.g. Hosany, 2012) and leisure (e.g. Ma & Gao, 2013). However, as far as could be established, no such variables have been tested in atmospherics research.[23] The most recurring and widely agreed upon appraisal variables are:

- *Goal relevance*: How relevant is this event for me, for my concerns?
- *Goal congruence/Outcome desirability*: Is this event conductive to fulfilment of my goals?
- *Certainty/Outcome predictability*: How do I perceive the likelihood of a particular outcome?
- *Agency*: Is the event caused by myself, someone else, or impersonal circumstances?
- *Controllability*: Do I have control over the event?
- *Coping potential*: How well can I cope with the event?
- *Novelty/Expectancy*: Does the event deviates from what I expected?

Other appraisal variables that have been proposed are: *urgency*, *intentionality*, *legitimacy or fairness*, *norm compatibility* (relevance for self-concept and social norms and values), *pleasantness*, *modifiability*, *focality*, *attention*, *anticipated effort* (Smith & Ellsworth, 1985; Frijda, 1986; Roseman, Antoniou & Jose, 1996; Watson & Spence, 2007; Scherer, 2009) and *reality level* (van Vliet, 1991). This growing list of appraisal variables is not a weakness of the theory but its strongpoint: "Appraisal theories allow variation in the number of appraisals that are made (appraisal variables that are processed). If only a few appraisals yield results, the emotional experience is relatively undifferentiated and global, if many appraisals are made, the emotional experience is highly differentiated and specific" (Moors, Ellsworth, Scherer & Frijda, 2013, p. 121).

The scores on the appraisal variables result in a specific pattern or profile that represent a certain emotion. For instance, 'agency' differs between surprise and anger (others), and pride, shame and guilt (oneself as agent); 'certainty' differentiates between hope and fear (uncertain) and happy and proud (certain). Fear and anger have different appraisal profiles and can therefore be easily distinguished: anger is caused by goal incongruence, others or circumstances (agency), in an event that is thought to be modifiable (control), whereas fear is caused by uncertainty of the outcome and lack of control. While both are unpleasant and lead to arousal, there is more to it than that. Also, more uncommon emotions such as delight have an appraisal profile, it is caused by high goal relevance, high goal congruence, certain outcome, circumstances (agency) and unexpectedness. Much research effort has gone into mapping appraisals profiles onto specific emotions (Smith & Ellsworth, 1985; Frijda, 1986; Smith & Lazarus, 1993; Roseman,

Antoniou & Jose, 1996; Scherer, Schorr & Johnstone, 2001; Scherer, 2009).

The measurement of felt emotion through appraisal variables can be done by asking question on the specific appraisal variables. These questions can be extracted from the several studies mentioned in this discussion – however, this is not without its problems (see Schorr, 2001). Or one can use the Geneva Appraisal Questionnaire (2002) – which is, however, likely too extensive for many cases. In Appendix 1, a selection of questions is proposed. It's important to ask about the *cause* of the experienced emotion and not to ask for a characterization of the content of the emotion itself. With scores on these questions and the resulting profiles, one can look up corresponding emotions in the literature. Or one can also ask for specific subjective feelings through use of emotion words and then do one's own mapping based on the gathered data. But either way: "The issue of predicting emotion names from appraisals and action readiness is, however, complex" (Frijda, Kuipers & Ter Schure, 1989, p. 213). One final remark concerns the fact that most research on appraisal up until now has targeted 'modal' or 'elementary' emotions - namely emotions focused on adapting to events that have important consequences for our well-being: joy, anger, sadness, fear, disgust. Other specific groups of emotions, such as aesthetic emotions, emotions related to specific situations (e.g. shopping) and more specific emotions such as wonder, admiration, bliss and solemnity, have not yet received much attention.

*Approach/Avoidance*

The relationship of a person to a space in terms of behavior (intention and readiness) is expressed with the concept pair approach/avoidance. Within retail research into atmospherics, this has been measured in various studies, from the very first study by Donovan & Rossiter (1982) to later studies (Foxall, 1997; Sherman, Mathur & Smith, 1997; Mattila & Wirtz, 2001; Eroglu et al., 2003; Gilboa & Rafaeli, 2003; Kaltcheva & Weitz, 2006; Yüksel, 2007). Within museum research, only Kottasz (2014) has measured approach/avoidance. In the study by Forrest (2014, p. 122), there is 1 item that seems to refer to approach/avoidance ("This environment really invites me to explore it"), but this item is placed under the construct *cognitive engagement*.

Many studies use similar concrete items, since they mostly build on the study of Donovan & Rossiter (1982) and use the categories of Mehrabian & Russell (1974). One exception is the study by Sherman, Mathur & Smith (1997) that measures approach/avoidance using concrete metrics such as 'number of items purchased' and 'amount of time spent in the store'. Sometimes an item is used that is not properly put into practice, such as 'I like this location' (no behavior intention) in Yüksel (2007) and 'I like the store environment' in Sherman, Mathur & Smith (1997)[24], or a question on fulfilled expectations such as the item 'the current visit has entirely met my expectations' used by Kottasz (2014).

The items can be separated into the four categories of Mehrabian & Russell (1974) and Donovan & Rossiter (1982): questions on wanting or not wanting to leave the space (avoidance or approach); questions on wanting or not wanting to explore the space further;

questions on seeking or avoiding contact with others in the space; and questions on wanting or not wanting, or being able, to work on a difficult task within that space. There's something to be said about dropping the last category, as Foxall (1997) argues, since it's less directly relevant in the context of a store or museum. However, for the sake of completeness, the category remains included here.

In most of the discussed studies, a 5- or 7-point Likert scale is used; only Ergolu et al. (2003) use a semantic differential and place approach and avoidance opposite each other. However, it's plausible that approach and avoidance each have their own repertoire of behaviors as is also evident from the various coping strategies people have on hand (Van Vliet, 1991; in press). It's therefore recommended to use separate questions for approach and avoidance using, for example, a 7-point Likert scale. Since with approach/avoidance it's about a certain degree of action tendencies, it's wise to use suitable descriptions for the Likert scale, such as 'not at all - extremely so' as already proposed by Mehrabian & Russell (1974) (See Appendix 1).[25]

*Atmospheric responsiveness*

Since many moderators and mediators have been mentioned that influence the experiencing of a space (see above), these will have to be looked at elsewhere to see how they can be measured. But we will make one exception. The influence of personal characteristics on the experiencing of a space runs like a recurring thread in the explanatory models from Mehrabian & Russel (1974) to Forrest (2014). These characteristics can be general ones, such as the disposition for *sensation seeking* (Mehrabian & Russell, 1974; Zuckerman, 1979). However, specific research has also been done

into so-called 'environmental dispositions' – the difference ways people 'habitually interact with the environment'. The most well-known measuring instrument for environmental dispositions is likely the *Environmental Response Inventory* (ERI) from McKechnie (1970; 1977) that consists of 184 statements about daily situations. While the ERI measures 8 underlying factors, it does not specifically focus on atmospherics. Grossbart et al. (1990) did show however that these underlying factors relate to each other in varying degrees in how clients react to store atmospherics. Other examples are Mehrabian's S*timulus Screening Questionnaire* (Mehrabian, 1977) which later became the *Trait Arousability Scale* (TAS) and also Aiko Satow's *Environmental Sensory Stimulus Scale*. Although these questionnaires contain some useful items (e.g. "My moods are not quickly affected when I enter new places") they are not directed at specific atmospheric dispositions.

A specific disposition does exist that relates directly to atmospherics: *atmospheric responsiveness*. This can be characterized as "the extent to which environmental characteristics influence customers' decisions on where and how to shop and how much time to spend shopping" (Eroglu, Machleit & Davis, 2001, p. 181). The only found study that actually measures *atmospheric responsiveness* is one from Eroglu, Machleit & Davis (2003), where four items are used in the context of a store. With some fine-tuning, these items can also be used for other spaces, including museums (see Appendix 1).

## Conclusion

This study set out to propose a measuring tool for atmospherics based on empirical and theoretical studies available in marketing literature and museum visitor studies. Since empirical testing is intertwined with a theoretical perspective, it's impossible to design one ultimate atmospherics survey. Regardless, the evaluation of current research has brought forward several recurring components and items in the measurement of atmospherics as well as the theoretical decisions to make in selecting components and items. The proposed set of survey items is largely based on earlier measurements of atmospherics in a wide range of studies, with some fine-tuning in the exact wording of items and some methodological refinements (such as not asking two things in the same question, e.g. 'Feel friendly and talkative') and harmonization (such as the consequential use of a 7-point measurement scale). The items need further refinement depending on the context of use: items can be added (for instance more or different environmental cues items), omitted (for instance several items in the PAD dimensions), or rephrased to be more appropriate for the situation at hand. These adjustments will have consequences for the interpretation of the results but still it is believed that the presented reference survey item list will help to push research on atmospherics forward and make results more reliable and comparable over different situations.

**Notes**

1) A different historical background on the concept of *atmospherics* goes back to Walter Benjamin's concept of *aura*, its interpretation by the philosopher Genot Böhme as atmospherics and the incorporation of this idea in an aesthetic theory (see Dorrian, 2014). We don't explore this historical line since it ultimately does not focus on making atmospherics measurable.
2) Mehrabian & Russell (1974) already observed this: "Most environments that are encountered are much more complex and simultaneously include stimulation in all the sense modalities, as well as along several stimulus dimensions within each modality (e.g. the many colors in a typical setting, together with various combinations of sounds, odors, temperatures, or textures). Many of these stimulus components also vary in time. The combination of all these variations results in different overall patterns, contrasts, and levels of information, which then determine responses" (p. 77). For this 'combination', they use the concept of *information rate*. This concept stays very close to the characteristics of environmental stimuli and differs greatly from the appraisal processes that are inherent in a concept such as 'perceived atmosphere'. Hence with Mehrabian & Russell, the information rate has a direct effect on, for example, arousal.
3) This argument is still being made in recent publications. For example, Tzortzi (2016) talks about internal and external architectural elements of a building having a "differential advantage" in the '"competitive leisure marketplace".
4) That is not to say that in the interim period nothing happened in atmospherics research. For example, there's the study from Grossbart et al. (1975). However, Donovan & Rossiter's study from 1982 can be considered a precursor of much of the research that followed.
5) See also earlier discussions on typologies of situations, such as in Kasmar (1970), Moos (1973) and Belk (1975), and also on the structure of situations ('frames'), in Goffman (1974). A more recent proposal on categorization of environmental stimuli is, for example, the study by Rayburn & Voss (2013), which distinguishes between perceived organization, perceived style and perceived moderness. However, this is a reshuffle of elements that have been mentioned before, mainly from the categories *design* (Baker) and *spatial layout* (Bitner).

6) See, for example, Penz & Hogg (2008) who use the PAD model in their study to investigate mixed emotions in consumer behavior, and for example find that 'arousal' in traditional stores does not correlate with emotional states such as enjoyment, pleasure and dominance (!), in contrast to online stores. Furthermore, they do not find a clear distinction between online and offline in regard to the mediating effects of mixed emotions. In the discussion they do not question the PAD model, whereas in my opinion this should have been done given these results and the existence of other emotion theories that could possibly explain these results conclusively.
7) Chebat & Michon (2003) hold the view that in Bitner's servicescape model pleasure and arousal precede cognition. They give no arguments to support this statement (p. 531). This seems to be an incorrect interpretation of Bitner's proposals for two reasons: 1) Bitner explicitly talks about 'perceived servicescape' that can be interpreted as the moment of inferences or appraisal; 2) Bitner's model includes 'internal processes' under which cognition, emotion and physiology collectively fall together, with no specific sequentially.
8) The wording of Donovan & Rossiter (1982) varies slightly with that of Mehrabian & Russell (1974). They cover the 'desire to work in the situation' in the 4th category, with on one hand the question whether the space offers a good chance at completing a difficult task, and on the other hand the straightforward question on whether there is a 'dislike' in working in this particular space.
9) The determining factor in differentiating empathy from identification is called the 'self-other distinction': 'I imagine how the other feels' (empathy) versus 'I coincide with that person' (identification). In the first case, emotions arise as a reaction to what other person feels (compassion, sympathy, admiration). In the second case, you are experiencing the same emotions as the other. The arts, literature, film and television of course 'play around' with these reactions to induce empathy or distance in the viewer. Identification can be subdivided further into different types: wish identification, similarity identification *et cetera*. For an in-depth discussion and analysis, see Van Vliet (1991).
10) Not limited to museums, similar observations can be made in other sectors. For example, with the performing arts, "despite the great investment of the last twenty years in developing strategic marketing knowhow, we do no know enough about – and do not know how to describe – the benefits that audiences derive from arts experiences" (Radbourne, Glow & Johanson, 2013, p. xiv).

11) Forrest (2014) also refers to a "history of cross-fertilization between retail and museum design, with the same practitioners undertaking both over the course of their careers" (p. 32).
12) This contrasts with Kottasz (2014) who sees cues having an immediate effect on emotions.
13) In the development of a measurement scale, evaluative terms were originally included, such as *cheerful, exciting* and *gloomy* (Forrest, 2014, p. 98). But in the end, these were removed: "The evaluative terms appear to be less useful in characterizing the exhibition environment than the descriptive terminology, as they do not characterize the environment beyond the simple positive or negative judgments" (p. 104). This is a striking argument for several reasons: 1) From a 'perceived' or appraisal standpoint, the attention should actually be directed to the evaluative terms instead of the purely descriptive terms, since this says more about the personal evaluation of the space than more 'objective' terms, such as *light/dark*, *full/empty et cetera*; 2) This 'simple judgment' argument does not return when Forrest reaches back to the PAD model where a 'simple' dimension such as 'valence' (*pleasant/unpleasant*) plays a big role; 3) In the results of the measured emotions, 'displeasure' is one of the three found factors (p. 119). Forrest makes no comment here about its 'usefulness' (or lack of it). In the end, Forrest uses two evaluative questions to measure the 'general perceptions of pleasantness' (p. 155). When the measurements are analyzed, she concludes: "These results show that the Perceived Atmosphere Instrument offers a characterization of the environment that is more nuanced than a simple evaluative judgment" (p. 156). This conclusion is of course somewhat skewed since if you base an analysis on 30 specific items as with the PAI and then compare it to 2 general items, then it's not surprising that the 30 specific items give a more nuanced image.
14) It's of course somewhat of a 'self-fulfilling prophecy' to statistically find 3 factors that coincide with 3 presumed aspects for which you have selected specific items to measure them with. Indeed, you show that you can separately measure these aspects. But it goes too far to say that you have hereby identified the "underlying dimensions of perceived atmosphere" (p. 113). For this, you also have to include all the factors in the environment – including the social aspects, for example. Now you still don't know if, for example, social factors interacting with design factors can expose other 'underlying' dimensions.

15) More precisely: "Vibrancy is the strongest predictor of both affective and cognitive engagement. In addition, there is a weak positive relationship between Spatiality and Relaxation, and a weak negative relationship between Order and Cognitive Overload." (Forrest, 2014, p. 177)
16) Namely: 1) Ideas: an attraction to concepts, abstractions, linear thought, facts and reasons; 2) People: an attraction to human connection, affective experience, stories and social interactions; 3) Objects: an attraction to things, aesthetics, craftsmanship, ownership, and visual language; 4) Physical: an attraction to somatic sensations, including movement, touch, sound, taste, light, and smell (Pekarik et al., 2014, p. 6).
17) In 8 cases, there is a correspondence with the 66 'environmental descriptors' of Mehrabian & Russell (1974): *cluttered/uncluttered*, *crowded/uncrowded*, *dark/light, tidy/untidy, large/small, simple/complex, old/new, warm/cool*. This modest correspondence may be related to Mehrabian & Russell not making any distinctions between descriptive and evaluative terms.
18) These are the five previously mentioned underlying dimensions, with the addition of 'scale' and 'crowdedness' from Mehrabian & Russell (1974). The adjective pairs strongly resemble the 14 adjective pairs that Mehrabian & Russell used to measure the level of 'information rate' of an environment – only 5 adjective pairs do not appear in the list presented here. Three of these (*novel/familiar, usual/surprising, common/rare*) are considered to be more evaluative terms. The adjective pair *intermittent/continuous* could be added to *variety*, and *immediate/distant* to *spaciousness*.
19) Twelve of these match the list of 66 'environmental descriptors' in Mehrabian & Russell (1974).
20) Vogels (2008) does not use adjective pairs. In fact, for her terms *intimate*, *cozy*, *hostile* and *threatening,* opposite terms were added.
21) A number of small differences exist between the 18 items from Mehrabian & Russell (1974) and the 18 items from Donovan & Rossiter (1982):
    - *Contented/melancholic* is replaced by *contented/depressed*.
    - *Important/awed* is replaced by *important/insignificant*.
    - *In control/cared for* and *autonomous/guided* no longer appear with Donovan & Rossiter (1982). The items *restricted/free* and *crowded/overcrowded* have been added in their place.

22) Besides the semantic differential other forms are available, such as an *affective grid* as used by Falk & Gillepsie (2009) wherein *arousal* and *pleasantness* are asked about at the same time. There's also the *Self-Assessment Manikin* (SAM) that works with pictograms (Bradley & Lang, 1994). See Van Vliet (in prep.) for a discussion on the different research methods used in the measuring of emotions.
23) Cheat & Michon (2003) is the only found study on atmospherics that refers to the appraisal theory, but it does not use specific appraisal items in its questionnaire. Forrest (2014) refers also to appraisal theory but fails to implement this in her own empirical research.
24) And actually, also in the original study from Donnovan & Rossiter (1982): "Do you like this store environment?". Also, the item "Would you enjoy shopping in this store?" puts more emphasis on 'enjoyment' than it has to do with behavior (intention).
25) Additional items can be extracted from action readiness dimensions in appraisal theory such as *avoidance* ("I wanted to have nothing to do with something or someone, to be bothered by it as little as possible, to stay away"), *attending* ("I wanted to observe well, to understand, or I paid attention"), and *be with* ("I wanted to stay close, to be receptive to someone"). See for example Frijda, Kuipers & Ter Schure, 1989).

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**Appendix 1: Survey items for measuring atmospherics**

*(Environmental cues: ambient)*
The music was appropriate (+)
The place was clean (+)
The temperature in the place was too hot (-)
The smell of the place was bad (-)

*(Environmental cues: design)*
The color scheme of the space was pleasing (+)
The physical facilities were attractive (+)
Directions in the place were inadequate (-)
The layout of the place was confusing (-)

*(Environmental cues: social)*
The employees appeared neat (+)
The employees had a negative attitude (-)
Other visitors behaved in an unpleasant manner (-)
It was enjoyable being around other visitors (+)

*(Environmental cues: exterior)*
The place was located in a nice area (+)
The exterior of the building was unappealing (-)

* measurement scale:
Strongly disagree (1) _ _ _ _ _ _ _ Strongly agree (7)

*(descriptive atmospherics)*
How would you describe the space you visited?
Ordered _ _ _ _ _ _ _ Jumbled

| | | |
|---|---|---|
| Patterned | _ _ _ _ _ _ _ | Random |
| Varied | _ _ _ _ _ _ _ | Repetitive |
| Small | _ _ _ _ _ _ _ | Large |
| Roomy | _ _ _ _ _ _ _ | Cramped |
| Open | _ _ _ _ _ _ _ | Enclosed |
| Simple | _ _ _ _ _ _ _ | Complex |

*(evaluative atmospherics)*

I found the space…

| | | |
|---|---|---|
| Depressing | _ _ _ _ _ _ _ | Cheerful |
| Pleasant | _ _ _ _ _ _ _ | Unpleasant |
| Comfortable | _ _ _ _ _ _ _ | Uncomfortable |
| Attractive | _ _ _ _ _ _ _ | Unattractive |
| Bright | _ _ _ _ _ _ _ | Dull |
| Unlively | _ _ _ _ _ _ _ | Lively |
| Boring | _ _ _ _ _ _ _ | Stimulating |
| Tense | _ _ _ _ _ _ _ | Relaxed |
| Unmotivating | _ _ _ _ _ _ _ | Motivating |
| Uninteresting | _ _ _ _ _ _ _ | Interesting |
| Annoying | _ _ _ _ _ _ _ | Appeasing |
| Unusual | _ _ _ _ _ _ _ | Usual |
| Unique | _ _ _ _ _ _ _ | Ordinary |
| Mysterious | _ _ _ _ _ _ _ | Clear |
| Charming | _ _ _ _ _ _ _ | Obnoxious |
| Novel | _ _ _ _ _ _ _ | Familiar |
| Intimate | _ _ _ _ _ _ _ | Distant |
| Cozy | _ _ _ _ _ _ _ | Formal |
| Hostile | _ _ _ _ _ _ _ | Friendly |
| Threatening | _ _ _ _ _ _ _ | Inviting |

*(holistic atmospherics)*

My general attitude towards the space is…

| | | |
|---|---|---|
| Favorable | _ _ _ _ _ _ _ | Unfavorable |
| Positive | _ _ _ _ _ _ _ | Negative |
| Good | _ _ _ _ _ _ _ | Bad |
| Like | _ _ _ _ _ _ _ | Dislike |
| Enjoyable | _ _ _ _ _ _ _ | Unenjoyable |

*(felt emotion - PAD)*

I felt…

| | | |
|---|---|---|
| Happy | _ _ _ _ _ _ _ | Unhappy |
| Pleased | _ _ _ _ _ _ _ | Annoyed |
| Satisfied | _ _ _ _ _ _ _ | Unsatisfied |
| Contented | _ _ _ _ _ _ _ | Melancholic |
| Hopeful | _ _ _ _ _ _ _ | Despairing |
| Relaxed | _ _ _ _ _ _ _ | Bored |
| | | |
| Stimulated | _ _ _ _ _ _ _ | Relaxed |
| Excited | _ _ _ _ _ _ _ | Calm |
| Frenzied | _ _ _ _ _ _ _ | Sluggish |
| Jittery | _ _ _ _ _ _ _ | Dull |
| Wide-awake | _ _ _ _ _ _ _ | Sleepy |
| Aroused | _ _ _ _ _ _ _ | Unaroused |
| | | |
| Controlling | _ _ _ _ _ _ _ | Controlled |
| Influential | _ _ _ _ _ _ _ | Influenced |
| In control | _ _ _ _ _ _ _ | Cared-for |
| Important | _ _ _ _ _ _ _ | Awed |
| Dominant | _ _ _ _ _ _ _ | Submissive |

Autonomous _ _ _ _ _ _ _ Guided

*(felt emotion - Basic emotions)*
I felt…

Enjoyment/Joy (happy/cheerful/delighted)
Surprise (puzzled/confused/startled)
Sadness (gloomy/sad/depressed)
Anger (hostile/annoyed/irritated)
Disgust (disgusted/offended/unpleasant)
Acceptance (helped/accepted/trusted)
Expectancy (alert/attentive/curious)
Fear (threatened/frightened/intimidated)
Interest (attentive/concentrating/alert)
Sadness (downhearted/sad/discouraged)
Shame (sheepish/bashful/shy)
Guilt (repentant/guilty/blameworthy)
Contempt (contemptuous/scornful/disdainful)
Distress
Dissmell

* measurement scale:
Not at all (1) _ _ _ _ _ _ _ Extremely so (7)

*(felt emotion - Appraisals)*
The emotion I felt was caused by:

*Goal relevance:*
The situation having a personal relevance for me (+)

The situation having an importance for my well-being (+)
The situation meaning nothing to me (-)

*Goal congruence:*
The situation being obstructive to my goals (-)
The situation being inconsistent with what I wanted (-)
The situation helped me satisfy my needs (+)

*Certainty/Outcome predictability*:
I knew how the situation would end (+)
I could predict the outcome (+)
I was not certain how things would unfold (-)

*Agency*:
Things happening beyond anyone's control
Other people were controlling the situation
My own behavior

*Controllability*:
I had no control over the situation (-)
I was in control of the situation (+)
I could change the situation the way I wanted (+)

*Coping potential*:
I could cope with what the situation asked of me (+)
I did not know what to do to change the situation (-)
I did not know how to react (-)

*Novelty/Expectancy*:
That the situation was new to me (+)
Things happening that I did not expect (+)

The fact that nothing surprised me (-)

* measurement scale:
Not at all (1) _ _ _ _ _ _ _ Extremely so (7)

*(approach - avoidance)*
How much would you want to spend more time in this space?
How much would you like to return to this space?
How much would you try to get out of this space?
How much would you avoid ever having to return to this space?
How much would you try to explore the space?
How much would you try to avoid looking around in this space?
How much does this space makes you talkative to a stranger next to you?
How much does this space makes you want to avoid talking to strangers next to you?
How much would you dislike having to work in this space
How much do you think is this space a good opportunity to think out some difficult task you have been working on?

* measurement scale:
Not at all (1) _ _ _ _ _ _ _ Extremely so (7)

*(atmospheric responsiveness)*
When I go shopping/to a museum, I pay attention to the store/ museum environment

Things like sound, color, lighting in a store/museum make a difference to me in deciding which store I will shop at/museum I will visit

I find myself making decisions at what store to shop/what museum to visit, based on the store/museum looks

Store/Museum decor influences my decision about where I shop / which museum to visit

* measurement scale:

Strongly disagree (1) _ _ _ _ _ _ _ Strongly agree (7)