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Enough is enough! Understanding environmentally driven multisensory experiences

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ENOUGH IS ENOUGH! UNDERSTANDING ENVIRONMENTALLY DRIVEN MULTISENSORY EXPERIENCES

by

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A Dissertation Presented in Partial Fulfillment
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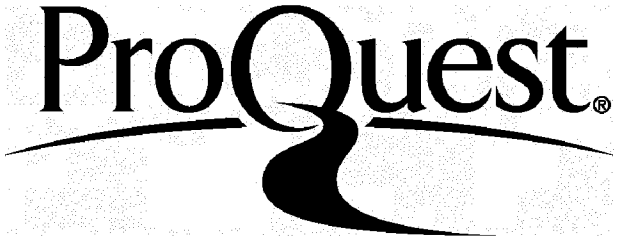

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We hereby recommend that the dissertation prepared under our supervision by Nina Lisa Theresa Eileen Krey

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Enough is Enough! Understanding Environmentally Driven Multisensory Experiences

be accepted in partial fulfillment of the requirements for the Degree of Doctor of Business Administration

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ABSTRACT

The importance of sensory perception and sensory stimulation in creating pleasant consumption experiences has received increasing attention within recent years. Yet, while numerous studies investigate antecedents and consequences of sensory perception specific to a certain sense (vision, touch, audition, smell, and taste), limited research addresses sensation from a broader perspective by examining what constitutes "sensing" in sensations. Multiple studies are employed to investigate the totality of sensation rather than any sense specific sensation, by framing sensational experiences within the long tradition of atmospherics research. Here, the construct of need for sensation is conceptualized to reflect the notion of totality of sensation.

Following a comprehensive review of common overlaps among three main research areas – atmospherics, servicescape, and sensory marketing – exploratory research guides the development of a new scale measuring the construct "need for sensation." The current study posits need for sensation as the manner by which consumers extract value through multiple sensory inputs, both focal and non-focal. This new need for sensation scale encompasses two dimensions namely sensory enjoyment and sensory avoidance, which both can be administered simultaneously to reflect different facets of need for sensation. The scale is validated as part of an experimental design to examine how different environments and levels of sensory stimulation impact consumers.

Findings show that high intensity of sensation environments lower the consumer's ability to accurately complete perceptual and cognitive tasks. However, these high intensity surroundings also elevate hedonic value leading to a more positive and value-added consumption experience. With regard to need for sensation, high need for sensation individuals express higher levels of hedonic value, satisfaction, and positive affect in stimulating environments; thus, confirming the validity of the new scale to detect individual differences across consumers. Results further affirm that while high need for sensation individuals gain more pleasure from a highly sensory stimulation experience; their performance is not negatively impacted. Overall, this research integrates atmospherics, services, and sensory marketing research to advance the marketing discipline. Key findings provide a starting point for an extensive stream of research focusing on sensory value-added consumption experiences.

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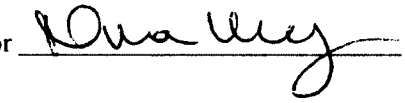
Author 

Date 8/4/16

DEDICATION

Für meine Eltern, Gabriele und Henry Krey.

Für meine Schwestern, Carla und Maya.

Für meine Oma, Ursula Krey.

Ohne eure Unterstützung hätte ich die letzten vier Jahre nicht überstanden.

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CHAPTER I

INTRODUCTION

"All our knowledge comes from the senses."

– Locke (1894)

As we have greater knowledge about the marketing discipline and progress through different marketing eras, we have come to realize that simply offering a good or a service is not enough to entice consumers to spend time and money in a retail environment. Instead, marketers must recognize consumers take value from the total consumption experience, which consists of many attributes and cues in their physical surroundings. As such, the marketplace has changed from being a location for selling products and services to being the stage of a consumption experience complete with actors, scripts, and participating audience in the form of consumers (Pine and Gilmore 1999).

Martineau (1958), in one of the first articles capturing the idea of a consumption experience in marketing acknowledges the influence of a store's retail personality and with it, its functional qualities as well as the "aura" of psychological attributes that yield value. He describes how consumers are consciously and subconsciously affected by a stores' aura that encompasses qualities driven by layout, architecture, symbols, and colors. Since the 1960s, the continuously expanding environmental psychology literature

examines the relationship between humans and their constructed environments (Darley and Gilbert 1985; Bitner 1992). As part of this development, Mehrabian and Russell (1974) introduce two general behaviors that individuals express in response to environmental stimuli: approach and avoidance. This idea has been extrapolated into the retailing literature by Donovan and Rossiter (1982) to identify consumer behaviors within retail environments, such as shopping enjoyment, spending money, and exploration of the store.

The notion of environmental cues influencing consumer behavior is not limited to retail consumers, as service researchers embrace atmospherics as well. Studies such as Bitner (1992) lay the foundation of assessing the role of tangible cues in servicescapes. Not only is the service environment essential in shaping the customer's perception and satisfaction of the service provided, but also in assisting in evaluating the overall service quality (Hooper, Coughlan, and Mullen 2013). In addition, environmental cues can aid or prevent customers in accomplishing their tasks during a consumption experience (Grayson and McNeill 2009).

Consumers encounter shopping environments, servicescapes, and atmospherics through their senses, and consumers come to understand their surrounding based on sensory terms and inputs (Kotler 1973). Regardless of the terminology a researcher adapts – atmospheric, servicescape, or sensory marketing – the fundamental and shared construct is our senses as a means through which we experience sensory stimulation and perceive our surroundings. As discussed by Kaplan and Kaplan (1989), humans have an inert need to make sense of their environment and to explore that environment prior to engaging in a specific behavior in response to the surrounding. The senses are what allow

for cognitive, emotional, and physiological responses to environments, as first established in environmental psychology (Bitner 1992). Physiological responses can be associated with physical discomfort, such as a consumption environment that is too cold and too loud. These physical reactions can directly influence the amount of time an individual remains in a certain environment (Bitner 1992). Further, whereas cognitive responses are grounded in beliefs, attitudes, and associations that can assist in task completion (Brunner-Sperdin, Scholl-Grissemann, and Stokburger-Sauer 2015), affective responses often align with the three dimensions of Mehrabian and Russell's (1974) pleasure-arousal-dominance (PAD) framework that posits emotions as preceding approach/avoidance behaviors.

The differentiation between cognitive and emotional responses has been an area of interest since Aristotle and Plato, who viewed cognition and affect as separate and often opposing processes (Duncan and Barrett 2007). However, as discussed by Duncan and Barrett (2007), modern researchers challenge this traditional view by proposing a more interactive and less opposing perspective of affect and cognition. On one hand, consumers presumably utilize cognition allowing them to process complex information and engage in rational decision making. Here, Vakratsas and Ambler (1999) propose that consumer awareness and consciousness are integral aspects of cognitive responses. On the other hand, consumers are also believed to be influenced by their emotions and affective responses. Berkowitz (1993) refers to affective responses as somewhat basic and automatic processes that occur relatively quickly and precede cognitive processes, such as interpretations or attributions. The concept of order between affective and cognitive responses has been of ongoing interest to scholars. Whereas Zajonc (1980)

argues that affect is not only precognitive in nature, but also happens without extensive cognitive processes; Lazarus (1982) opposes the idea of affective reactions preceding cognition. Instead, Lazarus (1982) positions cognition as a necessary condition for affect and argues that cognitive processes cause, stimulate, and shape affective responses.

The different kind of responses individuals experience in diverse environments shape his/her perceptions, beliefs, attitudes, and behaviors about these environments and the people associated with them. Therefore, the environment can be considered a form of nonverbal communication (Rapoport 1982). Ruesch and Kees (1956) describe consumers extracting meaning through "object language" of the environment; whereas, Kotler (1973) refers to atmospheres as a "silent language" consisting of body language, temporal language, or spatial language. Whatever terminology might be preferred, the premise remains that humans infer meaning and extract value from their environments that in turn influences their behavior. While individuals might notice and perceive single environmental cues, research shows that people respond to environments in an integrative way (Brunner-Sperdin, Scholl-Grissemann, and Stokburger-Sauer 2015). All cues, noticed or not, come together to make a whole. As such, it is essential to employ a holistic perspective when examining the influence of atmospheric and sensory cues on the overall consumption experience to mirror the naturally holistic sensation and perception of humans in a space.

The objectives of this dissertation include a comprehensive review of sensory stimulation and its contribution to creating value through consumption experiences. Rather than focusing on sense specific sensation (vision, touch, audition, smell, or taste), the totality of sensation is explored through an array of approaches. Furthermore, the

succeeding literature review explores common overlaps among three main research areas: atmospherics, servicescape, and sensory marketing. Figure 1.1 reflects how these communalities are represented in the three different literature streams.

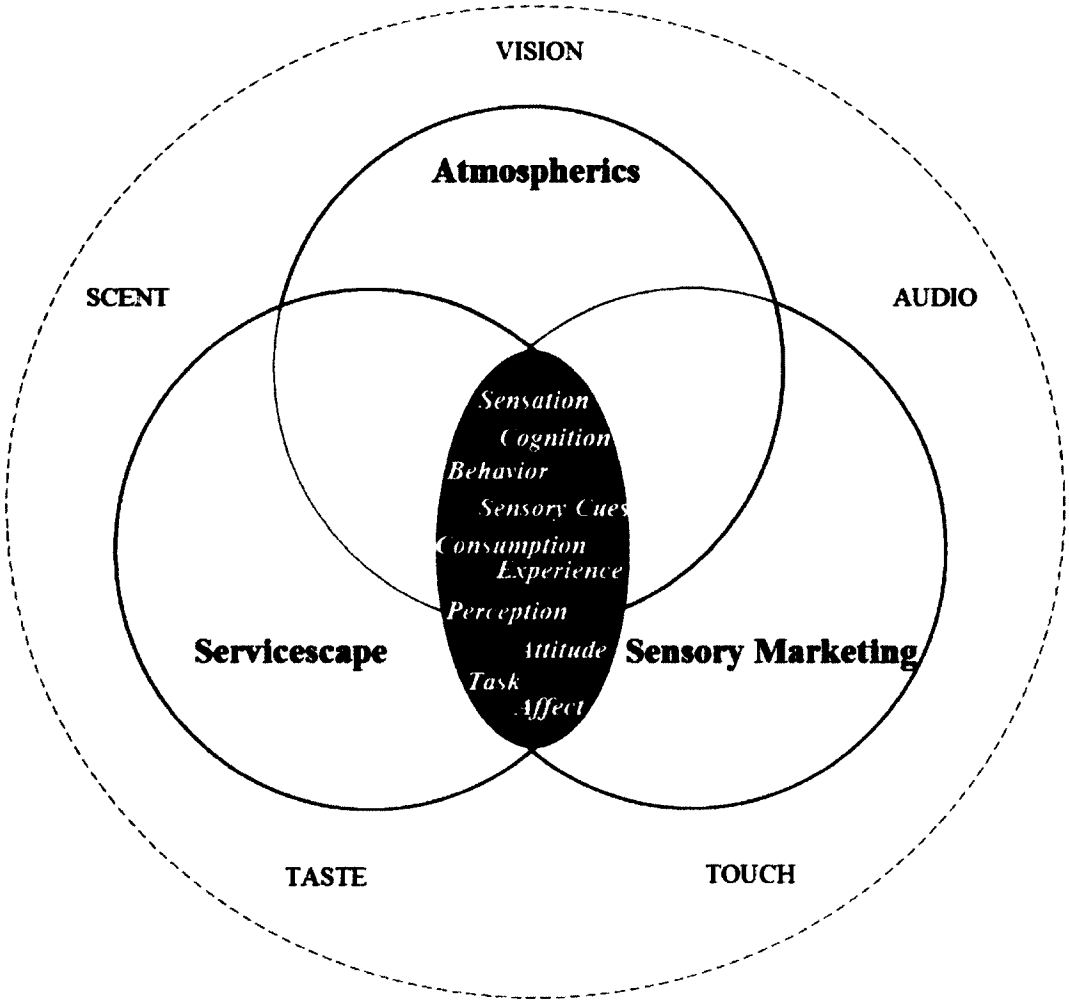

Figure 1.1 - Communalities of Atmospherics, Services, and Sensory Marketing Research

Atmospherics

Atmospherics is defined by Kotler (1973) as intentionally structuring and controlling of cues in the environment. While Kotler (1973) may have been the first to

introduce and clearly define the term in marketing, environmental elements have been manipulated in research studies well in advance to his article (e.g. Cox 1964; Kotzan and Evanson 1969; Frank and Massey 1970). Nevertheless, Kotler (1973) clearly outlines three effects the atmosphere can have on purchase behavior: The atmosphere may serve as 1) attention-creating medium; 2) message-creating medium; and 3) affect-creating medium. All three effects assume that a certain sensory element in the environment acts as a stimulus that influences the buyer's perception of the sensory attributes of the environment. As a result, the buyer's information, affective state, and overall perception are altered leading to potentially higher purchase probability. Thus, the atmosphere acts as a situational factor aiding to convert behavioral intentions into buying behavior (Kotler 1973). The sequence of relationships discussed by Kotler (1973) is represented in the stimulus-organism-response (S-O-R) paradigm grounded in the environmental psychology literature. On the most basic level, an external stimulus (S) influences a consumer's internal state (O) and leads to an array of consumer responses (R) (Brunner-Sperdin, Scholl-Grissemann, and Stokburger-Sauer 2014). Berman and Evans (1995) propose four categories to group external or atmospheric stimuli, namely

1) exterior of the store,
2) general interior,
3) layout/design variables, and
4) point-of-purchase/decoration variables.

While these categories are comprehensive with regard to physical attributes of the environment, they do not encompass additional people aside from the consumer influencing the consumption experiences. As a result, Turley and Milliman (2000)

expand the typology through their human variable category consisting of employee characteristic, employee uniforms, crowding, privacy, and customer characteristics. All five types of stimuli can influence both the consumer and the employee within a given setting. The outcomes are customer– and employee–specific responses, such as enjoyment and purchases or mood and skill respectively. An overview of the typology introduced by Turley and Milliman (2000) is depicted in Figure 1.2.

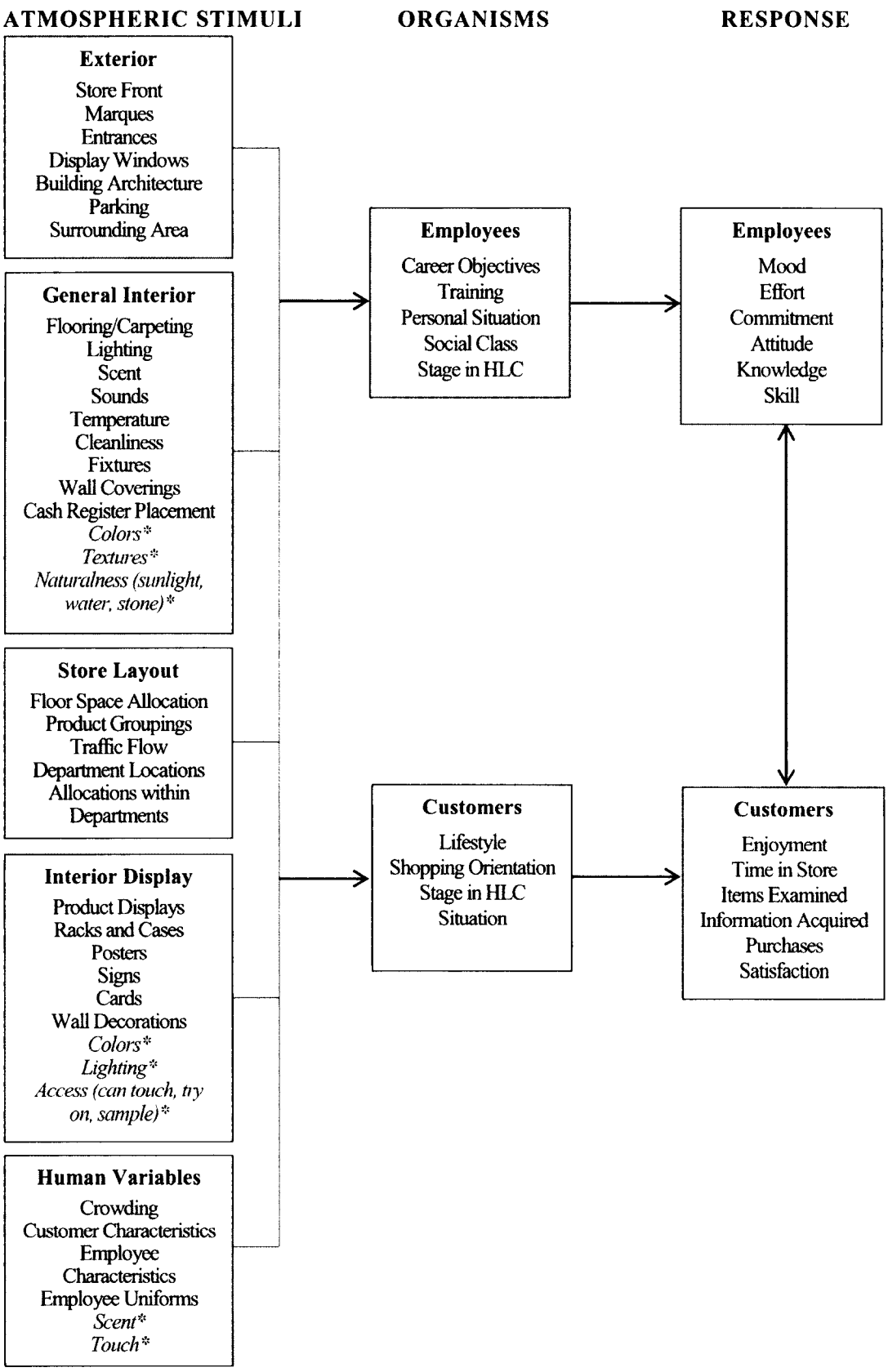

Figure 1.2 - The Influence of Retail Atmospherics (Turley and Milliman 2000)
** suggested additional environmental cues important for atmospherics*

Another framework that incorporates the underlying assumptions of the S-O-R paradigm is the Mehrabian and Russell's (1974) Classical Environment Model. While early studies within the retail environment literature assessed store environment as part of the store image and sometimes measured it as a single attribute (Kotler, 1973; Hansen and Deutscher 1977), Mehrabian and Russell (1974) initiated a shift towards understanding consumer emotional responses triggered by the environment. The Classical Environment Model by Mehrabian and Russell (1974) incorporates a primary emotional response along three dimensions: pleasure, arousal, and dominance (PAD). These emotional responses act as a mediator between the environment's and an individual personality's influence on behavioral response outcomes (approach or avoidance). Figure 1.3 summarizes the proposed relationships of the PAD model.

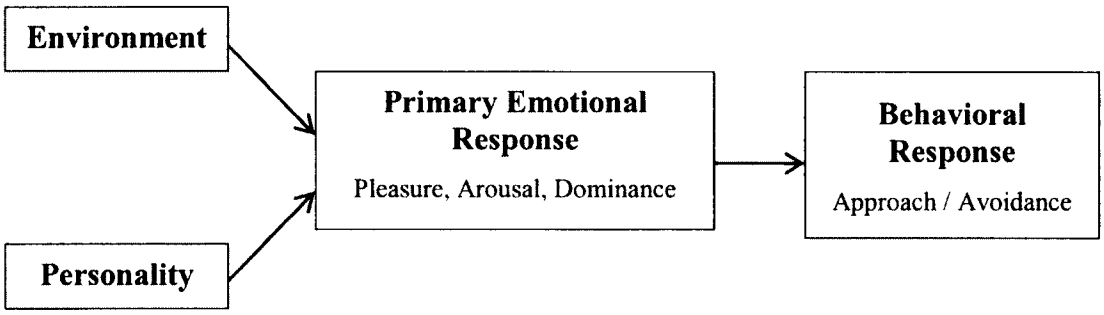

Figure 1.3 - Classic Environmental Psychology Model (Mehrabian and Russell 1974)

As introduced by Mehrabian and Russell (1974), PAD dimensions are assessed with an 18–item semantic differential scale covering emotional responses ranging from happy–unhappy, stimulated–relaxed, to dominant–submissive. All three dimensions are proposed to be orthogonal and unrelated. The approach-avoidance component

traditionally reflects behavior associated with desire to stay, explore, work, or affiliate with in a given situation. Donovan and Rossiter (1982) introduce the framework into the marketing literature and extend approach-avoidance behaviors to increase its relevance within the retail environment context. Now, approach-avoidance behaviors encompass responses such as store patronage, in-store search behavior, repeat purchases, and money expenditure. While their seminal paper validates the importance of emotions influencing consumer behaviors within a retail setting, Donovan and Rossiter (1982) also support a pleasure-arousal interaction and suggest that arousal is more strongly related to behavior than attitudinal outcomes.

Since its first application within the retail environment literature in 1982, PAD has been implemented in various studies looking at specific environmental cues, for example, music (Morrin, Dubé, and Chebat 2007), numerous approach avoidance behaviors (Babin and Darden 1995; Matilla and Wirtz 2001; Jones and Reynolds 2006), and more recently consumer responses within an online atmospherics context (Wang, Minor, and Wei 2011; Rose, Clark, Samouel, and Hair 2012). In general, emotional responses of consumers within store environments is a focus of numerous studies as the physical environment represents an essential element creating the overall consumer shopping experience (Babin and Darden 1995). In addition to influencing a consumer shopping experiences, store atmosphere mediates a consumer's overall perception of the store image and the company (Schlosser 1998; Baker, Parasuraman, Grewal, and Voss 2002). Specifically, studies identify how consumer actions are influenced by certain elements within the retail environment (for example, Chaudhuri and Ligas 2009; Dawson, Bloch, and Ridgway 1990; Matilla and Wirtz 2001). These elements include

atmospheric cues, such as design, ambient, and social factors (Baker and Cameron 1996). While traditionally linked to the servicescape of a consumption environment, the aforementioned elements all involve sensory elements and sensory stimulation. As a result, numerous studies within the atmospheric literature assess specific sensory channels and sensory cues contributing to the understanding of consumer's behavior within retail atmospherics. A review of key studies follows.

Environmental Sensory Elements

A revolution within retail research moves away from a perspective of simply offering customers a physical outlet to purchase a good, towards creating a value-added retail experience (Spence, Puccinelli, Grewal, and Roggeveen 2014). While product features may enhance purchase experience, atmospheric cues can also be adjusted to influence consumer behavior. According to Spence et al. (2014), store atmospherics influences consumer value perceptions, perceived pleasantness, and spending behavior, among many other outcomes. Here, sensation transference is commonly cited as an underlying justification for the influential property of atmospheric cues beyond overall store evaluation. Traditionally, sensation transferences refers to sensory attributes of a product observed by one or more senses, any one of which can bias the perception of other product attributes captured by other sensory modalities (Piqueras-Fiszman and Spence 2012; Spence and Gallace 2011). Within the context of retail environments, sensation transference pertains to the emotion a customer develops in a specific atmosphere that is then transferred to the product being assessed (Vida, Obadia, and Kunz 2007; Gorn 1982; Spence et al. 2014). For example, Gorn (1982) ascertains that listening to music while being exposed to a product directly influences product

preference. As such, hearing liked music leads to a higher product preference in consumers.

Based on a framework developed by Spence et al. (2014), sensory cues within the environment influence cognitive and affective responses and in turn, shopping behavior. This notion of sensory cues not only triggering affective, but also cognitive responses is in line with the general sensory marketing framework developed by Krishna (2012). Her framework incorporates grounded cognition and grounded emotion mediating the relationship between sensory cues and outcome behaviors. Affect in both frameworks represents feelings customers develop from sensory stimulation that often are associated with satisfaction, pleasure, and well-being (Spence et al. 2014). In contrast, cognition is more aligned with associations between specific products and atmospheric cues, which can either be conscious or nonconscious. For example, research suggests report that playing French music in a store will increase sales of French rather than German wine (North, Hargreaves, and McKendrick 1999). On the other hand, Milliman (1982, 1986) connects tempo of background music to traffic flow and gross receipts in supermarkets and restaurants. Spence (2012) supports these findings as his research proposes that faster tempo in music can unconsciously increase speed of food and beverage consumption. However, prior research has not only investigated auditory stimulation in environments, but has examines all five senses.

The Five Senses in Atmospheric Studies. In his seminal article in 1973, Kotler acknowledges that store atmosphere is assessed and understood through the senses. Specifically, he identifies four main sensory channels and corresponding dimensions: 1) visual dimension – color, brightness, size, shapes; 2) aural dimension – volume, pitch;

3) olfactory dimension – scent, freshness; and 4) tactile dimension – softness, smoothness, temperature. While taste does not seem to be a direct component of store atmospherics, certain artifacts in an environment can trigger taste memories. The identified sensory channels represent the connection between atmosphere and purchase probability, as reflected in Kotler's (1973) 4-step causal chain (Figure 1.4).

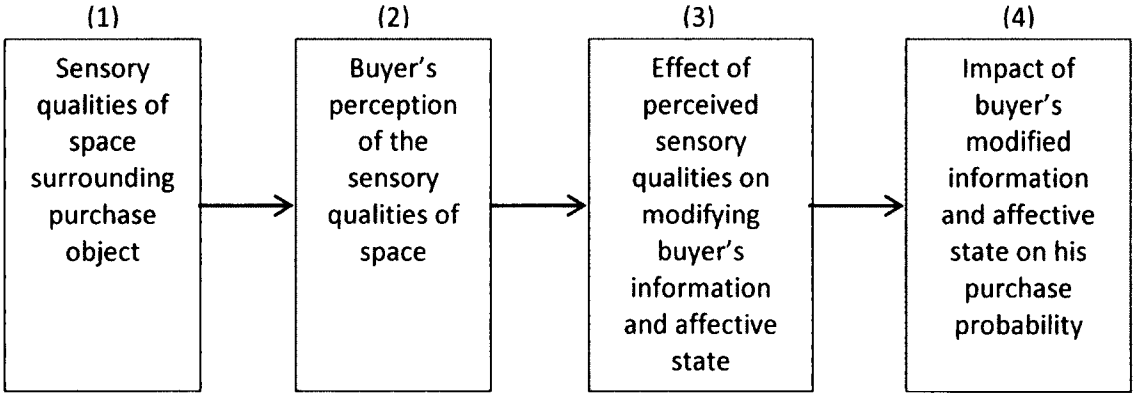

Figure 1.4 - Causal Chain Connecting Atmosphere and Purchase Probability (Kotler 1973)

The causal chain and depicted relationships act as a framework to guide atmospheric research. Vision or sight is studied along the sensory dimensions outlined by Kotler (1973): light, brightness, color, or size of the retail space (Spence et al. 2014). In designing stores, special attention needs to be given to semantic meanings associated with visual cues. For example, the meaning of a specific color needs to be aligned with the overall store and brand image. Auditory stimulation can be separated into physical properties, such as volume, pitch, tempo, positive or negative emotional tone, and customer liking (Kotler 1973). All three properties can be utilized to develop an audio branding position that companies such as Skype have started to focus on. With regard to olfactory atmosphere, the effect of ambient scent is usually assumed to occur outside of

conscious awareness while still asserting a strong influence on consumer behavior and perception (Spence et al. 2014). Kotler (1973) argues that the sense of taste is not important in store atmospherics. However, Spence et al. (2014) mentions in-store food sampling and the use of gin and tonic mist in a London department store as examples of gustatory cues in retail environment literature.

Lastly, touch has been recognized as an important factor when making purchases, especially when buying clothes (McCabe and Nowlis 2003). Yet, not all touch can have positive effects as evident in research focusing on tactile contamination. Referred to as contagion in non-sensory studies, perceived contamination can be triggered by mere contact of a product with people or other products (Krishna 2009). Spence et al. (2014) provides an overview of previous touch literature, yet still focuses primarily on merchandise or staff of the store touching consumers. One facet of touch that has received attention within the atmospheric literature is temperature. In general, Baker and Cameron (1996) suggest a "range of comfort" associated with temperature and deviation from this comfort zone results in negative affective reaction. For example, Hoagland (1966) attributes higher temperatures with consumers' perception of time passing more slowly with, while Bell and Baron (1977) link low temperatures to negative emotional states. However, apart from temperature, little research has specifically examined the touching properties of atmospheric sensory cues. As mentioned by Krishna (2009), the traditional view within the marketing literature is that touch is not ambient, meaning that a certain level of effort or initiative is required by consumers to engage in haptic behavior. However, if the retail atmosphere itself is being considered as the source of haptic stimulation, touch becomes part of the ambient experience negating the need for

active participation or engagement by consumers. Thus, touch as an ambient factor is not always a voluntary participation in sensory experiences, but rather involves automatic participation.

Servicescape

As previously discussed, retail environments can affect customer's behavioral, cognitive, emotional, and physiological responses. While studies in retail atmospherics tend to focus on consumption experiences involving goods, research in services marketing investigates consumption experiences involving services. These consumption experiences are referred to as service encounters that are defined as "a period of time during which a consumer directly interacts with a service" (Shostack 1985, p. 243). In her service encounter evaluation model, Bitner (1990) notes that service encounters include all aspect of the service organization that consumers can interact with, such as employees, physical locations, and additional tangible cues. Because services are usually produced and consumed simultaneously in the same physical setting, consumption environments play a key role in these service encounters. As a result, physical cues strongly impact the shaping of customers' perceptions of the service experience, service quality, firm's image, and overall satisfaction (Berry and Clark 1986; Harrell, Hutt, and Anderson 1980; Baker 1987). In addition, service exchanges typically require direct human interaction between the service provide and the consumer. Thus, social interactions within the organization's facility can not only contribute to overall service experience, but can also be viewed as an essential factor in designing a pleasant consumption environment (Bitner 1992). Most importantly, Lin (2004) argues that an

organizations servicescape often shapes the first impression of customers before experiencing the actual service or interacting with employees. As a result, it is essential to continuously evaluate and adapt the servicescape to maintain a user-friendly environment.

In her seminal article in 1992, Bitner introduced the concept of servicescape defined as "the manmade, physical surroundings as opposed to the natural or social environment" (Bitner 1992, p. 58). Subsequent research solidifies the importance of servicescape in providing customers a pleasant and stimulating shopping experience. Kwon, Kim, Kim, Hong, and Kim (2015) identify two distinct roles of servicescape: 1) assisting customers with task completion and 2) functioning as a signal for overall service quality. Tangible cues in the servicescape, such as layout and signs, can facilitate or hinder customer task completion (Grayson and McNeill 2009), while shaping customers' expectations about ease of navigating through a store (Bonnin and Goudey 2012). Sulek, Lind, and Marucheck (1995) credit a conducive layout with lower search time and higher service reliability throughout the consumption experience. However, confusing or complex layouts with cluttered signage can disturb consumer shopping behavior and decrease revisit intentions (Newman 2007; Wener and Kaminoff 1983). With regard to service quality, research by Kumar and Kim (2014) show how the customer's interaction with the servicescape drives the cognitive evaluation of perceived service quality.

As expressed by Bitner (1992), service providers should strive to maintain a convenient and comfortable servicescape. Here, servicescape design factors, such as functional and esthetic elements, need to be assessed as part of the environment-user relationship in service organizations (Baker, Levy, and Grewal 1992). One of the most

influential frameworks that addresses the planning and designing of service environments to achieve a particular objective was first introduced by Bitner (1992). This framework is discussed in detail in the following section.

Servicescape Framework

Bitner's (1992) servicescape framework encompasses different behavioral responses within various service environments. Similar to the previously discussed PAD model (Mehrabian and Russell 1974) commonly applied in atmospheric studies, the servicescape model, like atmospheric models, is also based on stimulus-organism-response (S-O-R) theory. However, while the PAD model primarily focuses on the consumer, the newer servicescape model also incorporates employees and customer-employee interactions. As such, objective factors of the multidimensional environment (S) are proposed to influence customers and employees (O) that respond with certain behaviors driven by their internal reactions (R). The framework depicted in Figure 1.5 includes physical environment dimensions (ambient conditions, space/function, signs/symbols/artifacts), internal responses of customers and employees (cognitive, emotional, physiological), and specific individual behaviors as well as social interactions.

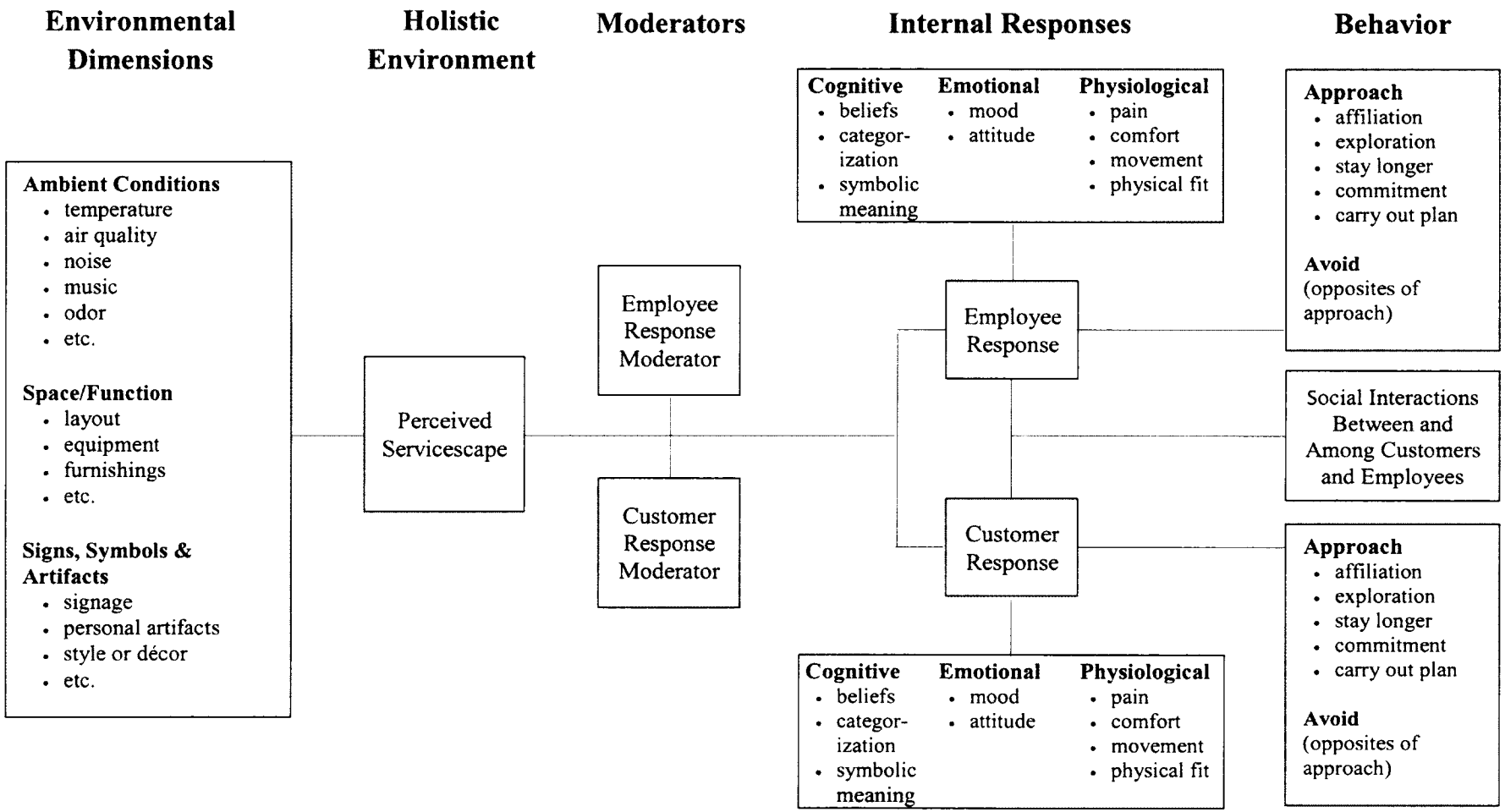

Figure 1.5 - Framework for Understanding Environment – User Relationships in Service Organizations (Bitner 1992)

Behaviors in the Servicescape. The behaviors in the servicescape can either be on an individual level, engaged in by either the customer or the employee, or on a social level including interactions between customers and employees. The individual behavior is differentiated along approach / avoidance dimensions introduced by Mehrabian and Russell (1974). As previously explained, approach behaviors are generally positive behaviors expressed in response to a place, including affiliation, exploration, longer stay, and commitment. In contrast, avoidance behavior is the opposite and includes responses characterized by the desire to leave or disengage with an environment. Research by Donovan and Rossiter (1982) first confirmed the influence of the perceived environment on retail–oriented approach behaviors, such as shopping enjoyment, spending money, and returning intentions.

The importance of social interactions is based on Barker (1968), who ascertains that patterns in social behaviors are associated with particular physical environments. As a result, individuals entering a specific setting will express predictable social behaviors that firms can shape and leverage to create a positive consumption experience. Both types of behaviors are influenced by internal responses of customers and employees that are categorized into cognitive, emotional, and physiological internal responses.

Internal Responses. The three internal responses outlined by Bitner (1992) are cognitive, affective, and physiological. Employees and customers will experience these internal responses that determine the expressed behavior. Thus, the servicescape doesn't directly cause individual or social behavior, but instead triggers internal responses leading to certain behaviors. While the framework depicts three separate internal responses, Bitner (1992) indicates the interdependent nature of all responses.

Prior research has established the influence of environments in triggering cognitive responses (e.g. Kaplan and Kaplan 1989). These cognitions determine the beliefs about a certain place and people or products/services associated with that place. In addition, categorizing businesses into certain groups is also the result of cognitive responses. Here, environmental cues can act as mnemonic or shortcut method to distinguish between businesses (Bitner 1992).

Emotional responses include mood and attitude of the individual. Often, researchers study affective responses within the pleasure-arousal-dominance framework of Mehrabian and Russell (1974). Studies show that customers in general seek out environments that elicit feelings of pleasure and arousal, which lead to more time spent in such environments (Donovan and Rossiter 1982). However, environments that are too arousing can quickly become unpleasant, and customers will avoid them. Therefore, marketers should maintain the correct balance of sensory involvement and avoid unpleasantly high levels of stimulation.

Finally, physical responses can motivate individuals to stay or avoid particular servicescapes. Ambient conditions of environments not only directly affect behavior, but also influence unrelated beliefs about a place. Griffitt (1970) links a feeling of being physically uncomfortable due to ambient conditions to less positive responses. For example, individuals feeling uncomfortable because of low temperature report a less positive affective response than physically comfortable participants (Turley and Milliman 2000).

Response Moderators. One important response moderator is personality traits of consumers that can influence reactions to environment. Arousal-seeking is a commonly studied personality trait within atmospheric and service research (Mehrabian and Russell 1974). While arousal-seekers enjoy and actively pursue highly stimulating settings, arousal-avoiders prefer lower levels of stimulation. Clearly, a bright service environment playing loud music will appeal to arousal-seekers while it will repel arousal-avoiders. In addition, current mood states of consumers can also act as moderators. Stressed or anxious consumers might respond more negatively to an arousing environment than consumers who are more relaxed.

An individual's expectation about the environment also acts as a moderator and can determine the individual's response to the place. Expectations vary across consumers and are highly influenced by past experiences or prior knowledge collected about the servicescape (Bitner 1992). While response moderators are factors that cannot be easily manipulated by service providers, the next component of the model – environmental dimensions – are in direct control of the service provider and can be altered to reach desired internal responses as well as behavioral outcomes.

Sensory Components in the Servicescape. The environmental dimensions of a servicescape consist of ambient conditions, space/function, signs, symbols, and artifacts. Ambient conditions are background characteristics that affect the five senses, such as temperature, noise, scent, and light. While not all sensory stimulation is always noticeable, including infrasound and gas, individuals are still affected and influenced by these factors (Russell and Snodgrass 1987). For example, Spangenberg, Crowley, and Henderson (1996) show that ambient scent increases purchase intentions for a backpack.

The spatial layout of an environment encompasses the arrangement of furniture, equipment, and machinery as well as the size and shape of these objects. The layout of a service environment can contribute to positive feelings of well-being, but can also lead to a feeling of crowding or chaos. The functionality of a space can facilitate the completion of tasks or overall performance (Bitner 1992). Both factors are highly interdependent and need to be holistically considered when designing a servicescape.

As proposed by Bitner (1992), physical cues of the servicescape can act as explicit or implicit signals shaping expectations, norms, and meanings associated with a place. Displays and signs are examples of explicit communicators that can inform customers about offerings in the store or guide them to facilitate task completion (Grayson and McNeill 2009). In contrast, personal objects, quality of materials, and floor coverings infer more symbolic meanings and influence the overall aesthetic impression of the servicescape (Bitner 1992). These symbolic meanings can also be shaped by the neatness of the physical cues in the environment. Bitner (1990) identified a disorganized working space as a nonverbal cue that can influence consumers' satisfaction with the service provider.

The servicescape framework aids in understanding how the physical environment can assist or hinder customers and employees to complete desired activities. Bitner (1992) views servicescape as a differentiation in communicating intended market segment, distinctiveness from competitors, and overall positioning of the organization. Further, all dimensions of the servicescape come together to create a package of service provider image, service quality, and potential usage (Solomon 1985). These dimensions can also impact the consumer's inference on future performance of the company as

shown by Bitner (1990). Within the context of service failure, Bitner (1990) discovers that an organized working condition decreases consumers' expectations of potential service failures in the future in comparison to a disorganized working space. Thus, the effect of the servicescape not only impacts current service evaluations and attributes towards the service provider, but also contributes to future evaluations and behaviors.

In addition, the framework depicts the importance of sensory input and stimulation when evaluating or experiencing servicescape. Especially ambient conditions are characterized by incorporating the five senses as reflected in the sensory stimuli of temperature, color, light, sound, and odor. Also, it becomes apparent that similarities to models and concepts applied in atmospheric research exist. Not only does the model overlap with atmospheric literature by utilizing the same concepts (SOR, PAD, approach/avoidance), but both also highlight the importance of sensation and sensory input. Therefore, a clear differentiation between the research areas of atmospheric, service, and sensory is rather challenging due to similar theoretical premises and constructs. A review of sensory marketing follows, which will solidify the similarity among research streams.

Sensory Marketing

People rely on their senses to explore and understand the environment around them. Within the marketing discipline, the overall product and service experience is shaped by a multitude of sensory elements and atmospherics. "Sense"/Since the way we perceive products, services, and our environment is influenced by our senses, it is impossible for consumers to eliminate sensory responses from a purchase experience.

The scenario below provides an example of the multisensory experience consumers engage in when participating in a relatively simple exchange of purchasing a cup of coffee:

Imagine a cold afternoon in the middle of December. You are on your way to your favorite coffee shop. Walking across the wet parking lot, you see the illuminated coffee shop and with its fogged up windows. As you open the door, your hand touches the cold and smooth metal handle and as you open the door, warm air and soft music welcomes you. Walking towards the counter, you notice the dimmed ambient lighting and the warm air that slowly heats up your body. After ordering and paying for your drink, you move towards the wooden counter and wait for your drink. You can hear the grinding of espresso beans and the steaming of milk while smelling freshly brewed coffee. All these small details heighten your pleasant anticipation. The barista hands you the steaming coffee and your fingers enclose the smooth yet firm cup. The warmth of the coffee radiates through the cup, warming your fingers and triggering a tingling sensation throughout your hands. Breathing in the mixture of coffee and hot milk, you admire the fine, white foam that covers the dark, strong coffee. Finally, you take your first sip of hot coffee and can feel the smooth, silky texture of steamed milk and espresso. The sweet and luscious taste lingers on your tongue, while the heat of the coffee spreads down your throat, through your body, leaving a pleasant feeling behind. You put the cup down and feel the stress of the day washing away being left with a sweet sense of contentment and relaxation after a busy day.

Sensory marketing has been defined as "marketing that engages the consumers' senses and affects their perception, judgment, and behavior" by Krishna (2012, p. 333). The underlying assumption, that unconscious triggers appealing to basic senses are an efficient way to capture consumers' attention, is the central premise of sensory marketing (Krishna 2012). Due to the primal nature of our senses, Krishna (2009) highlights the immediate and subconscious response of individuals to sensual stimulation, which contrasts with learned responses triggered by stimuli such as brand names or brand image. Because human sensation remains elemental in an individual's life, established sensory feelings are not only difficult to overcome, but relationships based on sensory perception are also nearly impossible to reverse.

In general, sensory marketing incorporates the same concepts and theoretically based research as the overarching field of marketing, with the additional focus of understanding perception and sensation. The conceptual framework developed by Krishna (2012) provides an overview of sensory marketing and its main components (Figure 1.6).

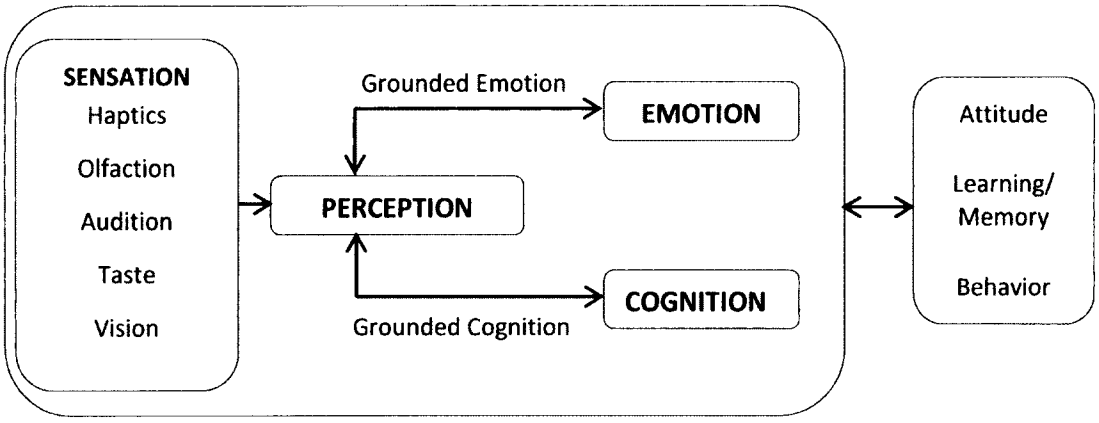

Figure 1.6 - Conceptual Framework of Sensory Marketing (Krishna 2012)

As depicted in the framework above, the foundation of sensory marketing is based on applying the understanding of sensation and perception to the marketing domain by examining areas such as cognition, emotion, learning, choice, and preference. The key aspect of the model is the differentiation between sensation and perception that is discussed in detail later on. According to Krishna (2012), sensation involves the stimulation of receptor cells on any of the five sensory organs. This neural activity is then organized, recorded, and stored in memory to extract meaning, a process referred to as perception by Marks (1978). Perception and not sensation affects emotional and cognitive responses within individuals that ultimately lead to influencing common outcome

variables: attitude, behavior, learning, and memory. While not explicitly stated in the conceptual framework of sensory marketing, sensory cues can also influence consumer value perceptions (Spence et al. 2014). This outcome variable is traditionally included in atmospheric research rather than sensory marketing studies despite the communality of sensory input within both research streams. An application of consumer value within sensory research is a desirable extension of current research approaches within this literature.

One school of thought that supports the notion of perception affecting cognition is grounded cognition. According to Krishna and Schwarz (2014), within the context of grounded cognition all mental processes can be conceptualized as acts of modality specific sensory stimulation. This approach proposes a close connection between conceptual systems and sensor-motor systems (Lintellé 2014). Barsalou (2008) describes how during an experience, multimodal representations are stored in memory once the brain captures various states across modalities and integrates those. In contrast, traditional views on information processing assume cognition to be amodal and to occur independent of perception or context-specific influences (Barsalou 1999). Support for information processing based on grounded cognition can be found in neuroimaging studies that depict amodel processes, such as language comprehension and memory retrieval, to involve "low level" sensory processing (Krishna and Schwarz 2014). Barsalou (2008) discusses how cognitive activities are generated while consumers interact in service environments via situated actions, bodily states, and mental simulations. While precise definitions of bodily states and situated actions are not yet evident across literatures, a few examples of studies reflecting these components of

grounded cognition do exist (Krishna 2012). With reference to situated actions, movement of individual body parts is believed to influence cognition. For example, Wells and Petty (1980) identify the impact of vertical or horizontal head movement on agreement with editorial content of a radio broadcast. A more recent study by Larson and Billeter (2013) examines how physical experiences can change consumer behavior within the context of bodily balance. Linked to the concept of parity, experiencing a physical imbalance, such as by leaning back in a chair or stepping off an elevator, is identified as a reason for a systematical change in choice behavior. Specifically, the activation of balance leads to an increased selection of compromise options in shopping scenarios.

According to Krishna (2012), grounded cognition based on bodily state encompasses unmoving physical conditions. Jostmann, Lakens, and Schubert (2009) incorporate bodily state into their study by having subjects evaluate statements while holding a heavy clipboard. Results show that the mere holding of a heavy object influenced people to attribute greater importance to opinions and foreign currencies. The most commonly studied component of grounded cognition is mental simulation. Barsalou (2008) acknowledges that mental imagery alone can lead to cognition, a concept often studied in consumer behavior research by utilizing visual imagery. Support for the effectiveness of mental simulation is provided across multiple neuroimaging studies that show conceptual processing of sensory perception results in neural activity in the corresponding areas of the brain (Krishna 2012). For example, reading words reflecting strong smells such as "garlic" stimulates the olfactory cortex (González, Barros-Loscertales, Pulvermüller, Meseguer, Sanjuán, Belloch, and Ávila 2006). Further, the activation of the taste cortices is the focus of the study conducted by Simmons, Martin,

and Barsalou (2005). Their research shows that seeing a picture of a chocolate chip cookie activates the part of the brain reserved for taste sensations.

Diversity in Sensory Marketing

The field of sensory marketing lends itself to examine a multitude of research ideas to further investigate the relationships among the various components outlined in Figure 1.6. One concept often discussed along with sensory experience is sensory signature (Krishna 2009). The purpose of a sensory signature is to leave a sensory impression in the individual's mind, which can encompass a particular sense or any combination of our five senses. For example, linking a color to a specific emotion enhances the overall memorability of a brand, since consumers not only remembers the color, but also the associative emotion. One of the most commonly cited and most successful example of such sensory signature is Susan G. Komen's pink ribbon, as the color has been successfully connected to emotions such as goodness, hope, and giving (Krishna 2009). The development of strong relationships as part of a sensory signature and automatic response to sensory stimuli are two reasons why sensory marketing has gained importance over the past years.

In general, research approaches can either focus on relationships between one specific sensory stimulus and common outcome variables, such as haptic cues influence on product judgment (Peck and Childers 2003b) or olfactory effects on mood (Bone and Ellen 1999), or can integrate cross-modal interactions, for instance sound and vision (Russell 2002) or smell (Mattila and Wirtz 2001). In addition, the idea of quality or value perceptions of products being influenced by non-diagnostic sensory input has also been of interest within this stream of research. Studies, similar to Krishna and Morrin (2008),

validate how non-diagnostic haptic quality of bottles or cups can alter taste perception of water. Finally, sensory congruence between various combinations of senses is addressed by multiple researchers. While Spangenberg, Grohmann, and Sprott (2005) identify how scent and music congruence boosts store evaluations, Krishna, Elder, and Caldara (2010) confirm that a match between scent and tactile properties improves perceived effectiveness of packaging.

While the concepts referenced in the preceding discussion primarily manifest a positive influence of sensory input on attitudes or behaviors, challenges associated with sensory experiences also need to be addressed. Usually, studies are administered under the assumption that consumers process sensory input; however, consumers can potentially experience sensory load or sensory blocking. Explained by Krishna (2012) as a prevention of processing sensory perception in a systematic manner, perceptual blocking is often examined in conjunction with grounded cognition. Within experimental settings, manipulations of sensory load have been utilized to establish "causal" rather than correlational relationships between a task and the senses.

In addition, two obstacles associated with sensory interaction are sensory dominance and sensory overload. As reflected in its name, sensory dominance refers to one sense exhibiting dominance over other senses. This effect has been previously supported by Hoegg and Alba (2007) who examine the dominance of visual cues over taste perception when assessing orange juice samples. In contrast, sensory overload is closely aligned with the concept of information overload, which was originally introduced by psychologist such as Georg Simmel and James Miller (Miller 1956). As contended by Krishna (2012), simultaneous stimulation of numerous senses could lead to

sensory overload, which in turn can devalue the overall sensory experience. However, a concurrent belief prevailing within this stream of research is the achievement of product superiority by integrating multisensory stimulation in the product design (e.g. Lindström 2005). Further research is needed to establish parameters to maximize optimal sensory stimulation by products and retail environments while minimizing sensory overload and controlling for sensory dominance.

Sensation vs. Perception

The differentiation between sensation and perception is well-established reaching as far back as Locke (1894) in a study dedicated to the philosophical assessment of human knowledge. In his reflection, Locke (1894) argues that mankind is born with a clear mind void of ideas and characters. He continues to elaborate that all knowledge mankind obtains is grounded in experience. As such, all ideas are obtained in one of two ways: 1) externally sensible objects or 2) internal figments of our minds. Thus, the origin of all knowledge is extracted from sensation and perception. Whereas sensation is the recognition of sensible qualities of the world around us, the comprehension of these sensations is the perception, or "reality," created in our minds (Locke 1894). While sensation and perception contribute to the conceptual representation of our environment, Arnheim (1969) positions perception as a major force behind capturing the essence of cognitive actions. Most importantly, current perceptual input is influenced by remembered associations of past perceptions and, according to Marks (1978), provides the foundation of complex human thought and behaviors.

Within the sensory marketing domain, the notion of distinguishing sensation and perception is reflected in the aforementioned conceptual framework introduced by

Krishna (2012). Here, both concepts are clearly differentiated to underline the varying ways each contributes to the overall sensory experience. The first component is sensation that directly incorporates one or all of the five senses and is neurological in nature. An individual experiences sensation when a stimulus activates receptor cells of a sensory organ and thus undergoes a biochemical sensation (Krishna 2012). In contrast, Krishna (2012) refers to perception as the awareness and comprehension of actual sensory information. Visual illusions are often used to demonstrate divergence of sensation and perception, which is for example explained by Gestalt theory. This specific school of thought views perceptions as inclination of the mind to utilize systematic processing of sensory input (Lintellé 2014). One example of a visual illusion illustrating the difference between sensation and perception based on Gestalt theory is the Café Wall illusion (Figure 1.7). Here, actual parallel horizontal lines are reflected as a biochemical sensation via the eyes.

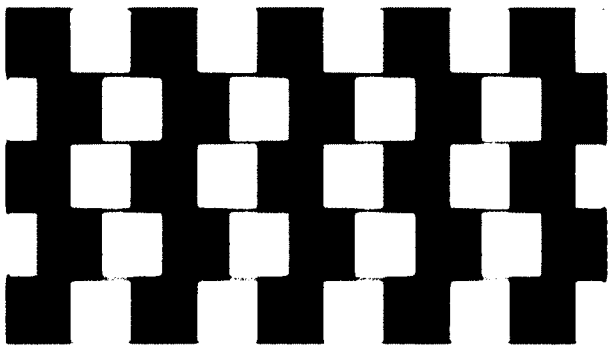

Figure 1.7 - Café Wall illusion (Gregory and Heard 1979)

While the process of sensation leads to the assumption that the lines are indeed parallel, interpretation of the sensory input by the brain makes the lines seem non-parallel (Krishna 2012). Our perception of the lines is influenced by prior knowledge, which

makes us expect lines to bend down once a heavy object is placed on top of it. Interestingly, when we add red lines to the Café Wall illusion and accentuate the parallel nature of the lines, we can counterbalance our perception (Figure 1.8).

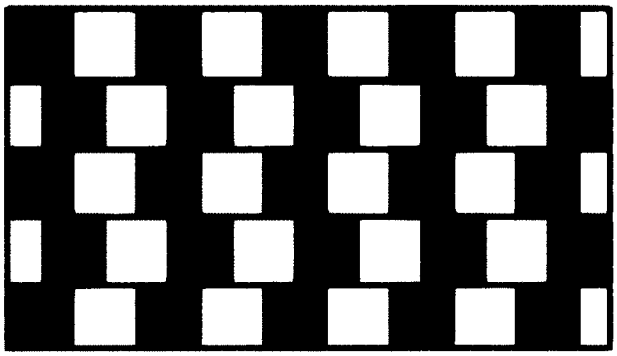

Figure 1.8 - Adapted Café Wall illusion

By adding these minor alterations, the lines appear parallel again and no differentiation is made between sensation and perception of lines. Therefore, while our sensory system processes parallel lines, the information feedback shaping our perception interprets the sensory input as parallel or not. As evident in the example above, sensation and perception are two distinct yet interdependent constructs that are equally essential in assessing environments.

Purpose Statement

The purpose of this dissertation is to take an exhaustive investigation into the way sensory stimulations (sensations) contribute to value derived from consumption experiences. Multiple studies are employed to assess the totality of sensation rather than any sense-specific sensation (vision, touch, audition, smell, and taste). Here, the construct

of need for sensation is conceptualized to reflect the notion of totality of sensation. The proposed working definition of the construct need for sensation is:

"The manner by which consumers extract or detract value from a consumption experience through multiple sensory inputs (i.e. sensation), both focal and non-focal sensation."

Further, a need for sensation scale is developed to provide researchers with a measurement to categorize consumers as either high or low need for sensation individuals. Concurrently, sensational experiences are framed within the long tradition of atmospherics and services (Mehrabian and Russell 1974; Donovan and Rossiter 1982; Bitner 1992).

This approach strives to bridge sensory, atmospherics, and services research to gain a deeper understanding of sensory elements contributing to value-added consumption experiences. Furthermore, research suggests that individuals respond to their environments holistically (Kaplan and Kaplan 1989; Brunner-Sperdin, Scholl-Grissemann, and Stokburger-Sauer 2015). As such, while individual stimuli are perceived and processed by people, the total configuration of stimuli ultimately determines the response to the environment. However, most of the current research especially within sensory marketing limits sensory assessment to a particular sensory stimulus and thus, artificially limits the generalizability of findings. To overcome this limitation, this dissertation employs an experimental design that manipulates multiple sensory elements within the environment to advance research on multisensory stimulation.

In addition, since it's in human nature to utilize our senses to assess our environments, even the most discrete sensory stimulation can contribute to a consumption experience. In contrast to studies focusing on arousal-seeking or sensation-seeking behavior associated with risk taking (Bromiley and Curley 1992; Zuckerman 1990), the

current project is furthering the understanding of how subtle sensory stimulation in the environment can influence task completion of consumers. While the major focus of the dissertation is on assessing how all senses simultaneously contribute to helping consumers extract value from service and shopping experiences, additional research questions are addressed in each specific essay.

The fundamental purpose of this project is to further assess the overlap among the previously introduced research areas: atmospherics, servicescape, and sensory marketing. Even though the communalities appear intuitively plausible and evident throughout various studies, empirical validation seems to be scarce. Regardless of the terminology or approach implemented by researchers, the underlying and common construct remains the senses. Only through the senses can consumers experience sensory stimulation, derive perceptions, and comprehend environments. The senses are the source of cognitive, affective, and physiological responses to environments (Bitner 1992) and are represented in all previously examined frameworks. The aforementioned PAD model acknowledges environmental cues as the major source for emotional responses leading to approach or avoidance behavior (Mehrabian and Russell 1974). These components are also evident in the servicescape model, which extends the original construct by including cognitive and physiological responses, employees, and social interactions.

While some outcome variables are common in research studies across the three different areas, such as purchase intentions, willingness to pay, attitude towards the product or service, attitude towards the company, and approach/avoidance behaviors, a few differences remain. Sensory marketing often examines the response towards a specific product, which lends itself to assess outcomes such as persuasion effectiveness,

confidence in judgment, frustration, and involvement. In contrast, atmospherics and services studies also investigate perceived value added to the consumption experience. A commonly applied measure to assess value is the value scale differentiating between hedonic and utilitarian dimensions introduced by Babin, Darden, and Griffin (1994). While this measure appears in numerous retail and service research, perceived value has largely been neglected in sensory marketing despite the vast support for its importance in creating a positive consumption experience. Therefore, one objective of this dissertation is to introduce value as a construct to the sensory marketing literature. As such, additional support for the communalities among the different research areas is provided in an effort to bridge theoretical and measurement techniques.

In conclusion, the remainder of the dissertation assesses how all senses come together to help consumer extract value from service and shopping experiences. While each of the three following essays addresses specific research questions, four overarching research questions that are guiding the research are:

- Research Question 1: Do individuals express a need for sensation in consumption experiences?
- Research Question 2: What are different ways that the consumer experience is affected by sensory input?
- Research Question 3: How does an individual's overall need for sensation influence consumer perception of specific consumption environments?
- Research Question 4: Do consumers tend to be influenced significantly by the intensity of sensory stimulation?

A graphical representation of the framework encompassing the four research questions is presented in Figure 1.9.

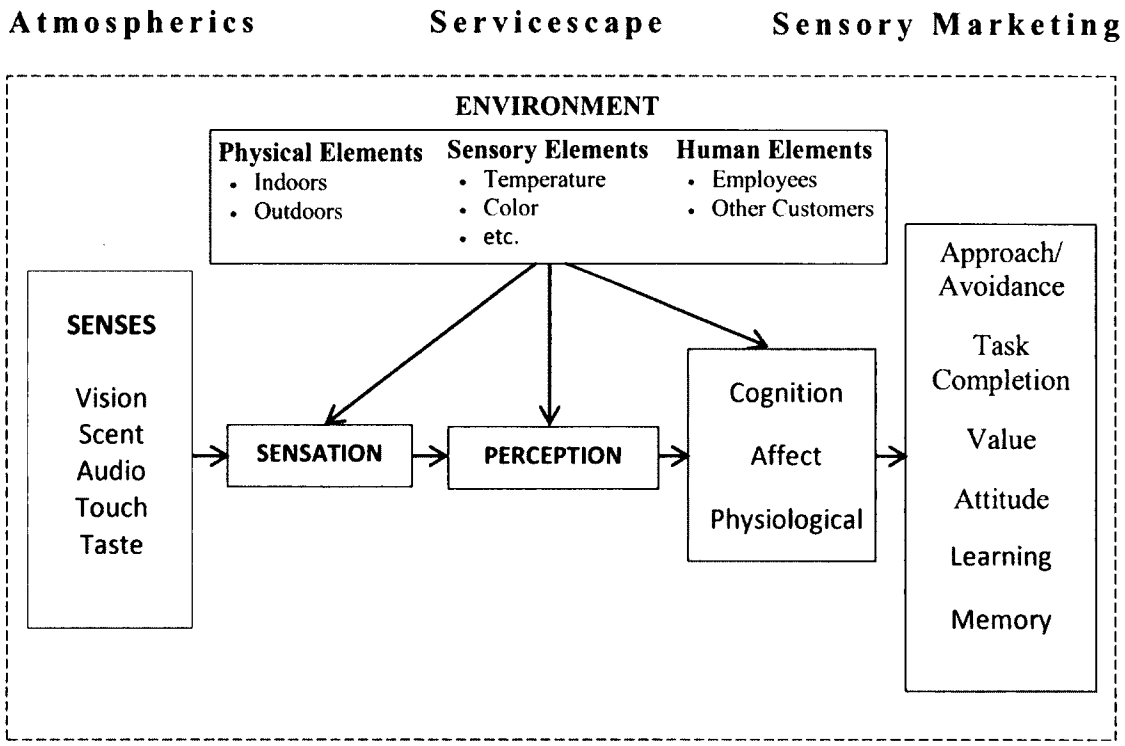

Figure 1.9 - Framework for Research Questions

Specifically, Essay 1 utilizes exploratory research to gain a better understanding of how consumer experiences are affected by sensory input. Here, focus group interviews are implemented to investigate the concept of need for sensation. Insights from the first essay guide Essay 2 in conceptualizing the need for sensation concept within sensory marketing theory. The procedures in Essay 2 develop a new scale that differentiates between varying levels of need for sensation to capture a consumer's perception of the sensory stimulation within consumption environments. The final essay examines the impact of varying sensations on consumer judgment within an experimental setting. The

intensity of sensation is manipulated within a controlled environment to investigate the impact on perceptual and cognitive tasks as well as value perceptions and satisfaction of participants.

Contribution to Research

The dissertation seeks to contribute to marketing theory and practice in multiple ways (Table 1.1). First, assessing the totality, rather than sense-specific sensations, allows for a broader perspective of sensational experiences within an atmospheric, service, and sensory marketing context. Thus, the current study moves away from traditional research that investigates isolated sensory responses (Krishna 2009) and instead employs a holistic design focus to assess the interplay of sensory atmospheric elements and sensory input obtained by physically handling products. As a result, one of the contributions is centered on advancing multisensory research by providing guidance on how to design multisensory experiments and studies.

Theoretical contributions are anchored in the conceptualization of need for sensation within sensory marketing theory. Instead of associating need for sensation with risky behavior (Zuckerman 1979, 1994), the new construct incorporates sensory input and sensitivity of sensory stimulation experiences by consumers. As such, sensation is now associated with incidental or every day sensation that individuals encounter during their daily routine. In contrast to being categorized as risky behavior that is actively sought out, sensation is more automatic and subconscious since individuals don't always deliberately utilize their senses. For example, simply entering a store activates multiple senses, such as visual appearance, haptic sensation of temperature, obligatory cues, and

auditory background music. However, individuals do not consciously activate their senses prior to entering the new environment. Just as we do not consciously think about having to take a breath, we do not consciously think about engaging our senses. We might be able to focus on a particular sensation, but incidental sensation occurs continuously.

Furthermore, the differentiation between focal and non-focal sensation offers a deeper understanding of how consumers extract value from consumption experiences. For example, while the focal sensation while eating chocolate is taste, there are a variety of non-focal sensations that contribute to the total experience. The texture, creaminess, and sound when first biting into the chocolate are just as influential as the temperature, lighting, or music in the current environment. As such, the overall sensational experience develops through the merging of the focal and non-focal sensations pertaining to sensation via product/service interaction and environmental stimulation. Therefore, while atmospherics and servicescape research only looks at how atmospheric cues influence outcome behaviors of consumers, and sensory marketing centers on sensory cues of the product, the new differentiation goes beyond these scopes by treating sensation holistically from all possible sources. One study that reflects this distinction is Meyers-Levy, Zhu, and Jiang (2010) who identify how consumers utilize bodily sensation when evaluating a product once visual cues are diminished due to increased distance to the object. As a result, once the primary or focal sensation is not available, non-focal sensations can be used to gain understanding of one's environment. Therefore, distinguishing between these two types of sensation can provide additional guidance on what particular sensory cues to focus on for particular products, services, or consumption

encounters. Subsequently, a new conceptualization is needed to differentiate not only between sensation seeking and sensation, but also between focal and non-focal sensation.

This advancement of the construct sensation is solidified by the creation of a new scale capturing a consumer's sensitivity to sensations. While different measures have been previously developed to tap into individual differences based on a specific sense, for example, need for touch by Peck and Childers (2003a), the overall need for sensation remains relatively unexplored in the sensory marketing research. Within the psychology literature, current scales predominantly reflect risk-taking behavior of individuals for the sake of experiencing such sensation. Scale items such as "I like to do frightening things" of the Brief Sensation Seeking Scale (Stephenson, Hoyle, Slater, and Palmgreen 2003) do not accurately represent sensory experiences, sensory stimulation, or sensation within the boundaries of sensory marketing. In addition, the Arousal Seeking Tendency scale developed by Mehrabian and Russell (1973) is also not suitable to assess the new conceptualization of sensation with items such as "I wouldn't like to try the new group therapy techniques involving strange body sensations." As such, a substantial theoretical contribution of this dissertation is the development of a scale that accurately reflects the need of consumers to experience sensation and to capture an individual's sensitivity to sensation.

Need for sensation will also be examined with regard to different types of environments. While current frameworks in atmospherics and services studies focus on traditional, indoor environments, this dissertation is comparing sensation sensitivity and expectations between indoor and outdoor consumption environments. Kaplan and Kaplan (1989) show that people respond positively to and often times prefer natural over

manmade environmental elements. This assumption is empirically tested and extended to examine potential consumer differences.

Another theoretical and methodological contribution is extending the construct of value to the sensory marketing literature. By incorporating value measures into the study, the importance of a particular sense can be assessed through the level of value contributed to the overall experience. Here, sensation can be divided into focal and non-focal sensation to investigate what type of sensation contributes the most value. Aligned with this contribution is the potential to utilize these insights in designing consumption environments. Resource allocation can be tailored towards desired sensory stimulation and perceived image of the firm. For example, retailers in Hong Kong keep their stores' temperature low to symbolize luxury and avoid an image of being primitive (Willett 2015). Retailers could enhance the cooling sensation by incorporating cooler lights and colors into their store environment. Therefore, understanding how sensory cues are perceived by consumers can aid in creating a desired store image and environment simply by focusing on certain sensations.

Lastly, establishing thresholds of sensory overload contributes to refuting the assumption that more stimulation is always better. Specifically, consumers' successful task completion will be examined while manipulating multiple sensory cues within environments. These newly defined parameters will provide practitioners with guidance on how to maximize sensory stimulation without decreasing the value derived from sensational experiences.

Overall, this dissertation provides a starting point for an extensive stream of research bridging atmospheric and sensory research with a multitude of potential

publication outlets. As mentioned by Krishna and Schwartz (2014), future research in sensory marketing needs to address conceptual issues related to not adjusting established marketing concepts and tools to the unique context. This dissertation is responding to this challenge by drawing from different research areas and adjusting conceptual and theoretical approaches to fit sensory experiences. Table 1.1 summarizes the contribution potential of this dissertation by theoretical area.

Table 1.1 - Contribution Potential by Theoretical Areas

THEORETICAL AREAS	CONTRIBUTION POTENTIAL		
	Theoretical	**Methodological**	**Practical**
Sensory Marketing	Holistic Approach to Sensation	Manipulate Multiple Sensations Simultaneously	Design of Multisensory Environments
	Conceptualize Need for Sensation in Marketing Theory	Methods for Measuring Need for Sensation	Sensation Sensitivity
	Differentiation Between Focal and Non-Focal Sensation	Methods to Assess Focal or Non-Focal Sensation	Utilize Focal and Non-Focal Sensation in Consumption Experience Design
	Establish Thresholds of Sensory Overload	Methods to Deliberately Cause Sensory Overload	Avoid Overstimulation in Environments
Services Marketing	Add to Servicescape	Apply New Scale in Services Context	Extend Servicescape to Include Sensation Sensitivity
	Introduce Sensation Sensitivity as Response Moderator		
Retailing	Add to Atmospherics	Apply New Scale in Retailing Context	Design of Multisensory Environments
	Identify Most Profitable Sensory Cues		Resource Allocation Based on Sensory Cues
Consumer Behavior	Examine Role of Sensory Blocking in Consumer Behavior		Do Environmental Characteristics Change Consumer's Sensory Utility (Skills)
Overall	New Construct for all 3 Contexts	New Scale to Assess Need for Sensation as Individual Difference Characteristics	Do Sensory Cues add Value to Consumption Experience
	Differentiate Between Indoors vs Outdoor Environments	Sensation Sensitivity Based on Type of Environment	Individualize Sensory Cues Based on Type of Environment

CHAPTER II

EXAMINING SENSATION WITHIN MARKETING

Introduction

The role of marketing has evolved over time and goes beyond simply offering consumers goods and services. Instead, a successful business nowadays needs to provide consumers with a consumption experience from which they can extract value. Prior research supports the idea that consumers utilize relevant features of items or environments as well as internal experiential affective responses while being part of a consumption experience (Meyers-Levy, Zhu, and Jiang 2010). Numerous factors contribute to these internal feeling and thus to the overall consumption experience, such as attributes and cues in the physical surrounding.

As previously discussed in detail, Martineau (1958) recognizes the impact of a store's personality or "aura" on the value gained by consumers. This relationship between individuals and constructed environments is the focus of environmental psychology, a research area that has gained increasing attention since the 1960s (Darley and Gilbert 1985; Bitner 1992). Specifically, Mehrabian and Russell (1974) introduce the idea of individuals engaging in either approach or avoidance behavior in response to an environmental stimuli triggering an emotional reaction. Once Donovan and

Rossiter (1982) extrapolated the construct into a retail context, retail atmospherics and its focus on the influence of environmental cues on human behavior established itself within marketing research. Another area that studies this relationship within servicescape settings is services marketing that accentuates service encounters rather than retail shopping experiences. The major communality between both research streams is that consumers assess retail environments and servicescapes though their senses. As positioned by Kotler (1973), individuals come to understand their environment based on sensory terms and sensory cues. These sensory cues and how consumers utilize them when assessing products is the focal point of sensory marketing. While the three seemingly different research streams concurrently exist within the marketing discipline, the three areas share essential communalities. While these similarities seem intuitively plausible and apparent across an abundance of studies, empirical support appears limited.

Whatever terminology might be preferred, the premise remains that humans infer meaning and extract value from their environments, which in turn influences their behavior. This extraction is possible due to sensory input that determines the perception of current environments, products, or tasks at hand. In addition, the senses enable affective, cognitive, and physiological responses to environments as depicted in the previously discussed models. Also, similarities across the different models prevail with regard to incorporated key concepts, namely stimulus-organism-response (S-O-R) paradigm, pleasure, arousal, and dominance (PAD) framework, and approach/avoidance behavioral responses. Meanwhile, all models highlight the importance of sensation and sensory input. Studies across the different areas also share common outcome variables which tend to assess approach or avoidance behaviors, including purchase intention,

willingness to pay, attitudes toward products or services, and attitudes toward the company. However, no matter what context or what outcome variable is implemented, the fundamental component remains the senses. Therefore, a clear differentiation between the research areas of atmospheric, service, and sensory is rather challenging due to similar theoretical premises and constructs.

Exhaustively discussed in the introduction of this dissertation, one essential construct across research streams is sensation, which includes the involvement of one or all of the five senses and refers to a neurological process. Krishna (2012) positions sensation as a stimulus activating receptor cells in a sensory organ which causes a biochemical sensation. In contrast, perception is the comprehension and awareness of sensory information which follows sensation. This differentiation is not a new focus within research. In fact, Locke (1894) already discusses sensation being aligned with recognizing sensible qualities of the world, while perception incorporates creating a reality in the individual's mind.

Despite the seemingly clear differentiation and definition of both constructs, the original meaning of sensation appears to be deviated from in the more recent psychology and marketing literature. Here, the term sensation has come to mean sensational, in the sense that sensation is associated with thrilling experiences only (e.g. Zuckerman 1990). The construct is all but exhaustively discussed within sensory marketing studies. A variety of applications of terminology, meanings, interpretations, and contexts exist across research. Further, sensation is seldom clearly defined leaving the reader to assume meanings are transferable from study to study. Within the scope of this study, sensation is aligned with the definition put forth by Krishna (2012) and incorporates the stimulation

of receptor cells in sensory organs. The subsequent discussion assesses the positioning of sensation within common streams of research to identify deviates from the definition of sensation adapted in this dissertation.

Sensation

As previously discussed, sensation refers to the stimulation of a sensory organ that triggers an immediate and subconscious reaction (Krishna 2009). Senses are primal in nature and represent a biological system that adapts to changing requirements of survival over time (Marks 1978). The evolutionary perspective of sensation beliefs that all five senses (vision, audio, scent, touch, and taste) have evolved from a single primitive sense, an undifferentiated responsiveness to an external stimulus. Marks (1978) outlines the evolution of this unitary sense into various modalities which comprise the sensory system. While distinctive organs process specific stimuli and pass them along as neural activity, Marks (1978) underlines the similarity among sensory pathways consisting of comparable mechanisms and neural tissues. Thus, individual sensory cues might be recognized and processed by multiple sensory organs. As such, the total configuration of stimuli ultimately determines how individuals respond to their environment (Kaplan and Kaplan 1989).

Sensation is also discussed within related areas, such as psychology and management. Within the psychology literature, sensing is positioned as a personality trait as part of their Myers-Briggs Type Indicator (MBTI) developed by Katharine Briggs and Isabel Myers (1993). The MBTI is based on the theoretical premise of psychological types first introduced by Carl Jung in 1921 (Jung 1971) and incorporates four

dimensions: 1) extraversion/introversion; 2) sensing/tuition; 3) thinking/feeling; and 4) judging/perceiving. Each individual is believed to exhibit tendencies on both ends of the dimensions with an expressed preference for a specific end of the dimension. As such, an individual might express characteristics of extraversion and introversion, yet overall the individual will be perceived as mainly introverted.

As positioned by Briggs and Myers (1993), sensing describes an individual that is attentive towards the physical reality including what the person sees, hears, tastes, smells, and feels. In addition to receiving information from the five senses, sensors also pay attention to one's own experiences and create meaning from conscious thought. In contrast, intuiting encompasses a personality characterized by preferring thinking about problems and abstract theories in making sense of the world. These individuals trust their subconscious or gut feeling more than sensory information. Clearly, the sensing personality trait reflects similarities with sensation due to the reference to engaging senses and valuing experiences. However, upon assessing the scale items pertaining to the sensing dimension, such as "I solve problems by working through facts until I understand the problem" and "I trust experience first and trust words and symbols less," it becomes apparent that sensing is not equivalent to sensation as defined in sensory marketing research. While it does encompass the notion of utilizing senses to understand ones environment, only marginal commonalities exist.

The Myers-Briggs Personality Indicator is also applied within marketing studies, frequently within a higher education context. For example, McInnis-Bowers, Chew, and Bowers (2010) try to prepare students for meaningful and successful participation in global marketing environments by assessing personal communication preferences

through MBTI analysis. Another study by Till, Zdravkovic, and Morrison (2010) examines whether personality types vary across different functional areas of an advertising agency. As a result, students can ensure that their individual personality type is congruent with the one representative of the particular area of advertising agency they are interested in.

Clearly, the sensing personality trait reflects similarities with sensation due to the reference to engaging senses and valuing experiences. However, after reviewing the scale items of the sensing dimension, such as "I solve problems by working through facts until I understand the problem" and "I trust experience first and trust words and symbols less," sensing as part of MBTI is not comparable to sensation utilized in sensory marketing studies. While it does encompass the notion of utilizing senses to understand ones environment, only marginal commonalities exist. As a result, MBTI will not be considered further within the scope of this dissertation.

Sensation in Marketing

In its most elementary interpretation, sensation is simply "the input of our five sense modalities" (Lintellé 2014, p. 2). Thus, while sensation results directly from the actual sensory stimulus, perception, particularly as conscious awareness, also results from affective and cognitive or mental states originating elsewhere. To illustrate this differentiation, let's examine the commonly experienced concept of perceived temperature. On a cold winter day with an actual temperature of 50 degrees Fahrenheit, we might perceive the temperature as even colder when we are in a bad mood or tired. Alternatively, if the sun is shining on that same cold winter day, we might perceive the temperature to be warmer than 50 degrees Fahrenheit. This divergence in temperature is

attributed to crossmodal effects of sensory stimuli, which refers to two or more senses interacting to create a perception (Spence 2012). Referring back to the previous example of perceived temperature, when the sun is shining and it is bright outside, a cold outside temperature will seem less cold due to the increased visual stimulation. Therefore, actual and perceived temperatures can diverge considerable depending on affective states or sensory stimulation.

Example of Sensation Measure. Within marketing studies, sensation is relatively seldom measured, unless sensation is aligned with constructs such as sensation seeking or arousal seeking. Oftentimes, sensation is assessed as part of a higher order construct and thus only represents one dimensions of this construct. One example is Internet Retail Service Quality, which encompasses five dimensions: performance, access, security, sensation, and information (Janda, Trocchia, and Gwinner 2002).

As part of Internet Retail Service Quality, Janda, Trocchia, and Gwinner (2002) position sensation is the ability of online consumers to interact with products and other individuals during the shopping experience. Further, features that allow consumers to "try-on" items via virtual mannequins enhance the sensation experience within online settings. Four items represent the sensation factor, including "Has a website that makes you feel part of the community" and "Provides product picture that allow me to view a product from multiple angles." The study only identified sensation to be marginally significant with complaining behavior and none of the other introduced outcome behaviors.

Considering the definition of sensation, the four items, and the outcome behaviors intended to predict with sensation, this dimension shares the terminology but not the

meaning with sensation in sensory marketing. A review of constructs semantically related to sensation follows that includes sensation seeking, sense making, bodily sensation, and others. Additionally, measures associated with these constructs are examined in Essay 2.

Sensation Seeking

Sensation seeking is one of the most common constructs associated with sensation. Positioned as a multifaceted individual difference variable, Zuckerman (1994) defines sensation seeking as a "seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experience" (p. 27). Sensation seeking encompasses four dimensions:

1) thrill and adventure seeking (TAS),

2) experience seeking (ES),

3) disinhibition (DIS), and

4) boredom susceptibility (BS).

All four dimensions represent a different facet of high arousal eliciting behavior, such as thrill and adventure seeking being the desire to engage in extreme sports or dangerous activities, disinhibition referring to lack of inhibited social behavior, and boredom susceptibility describing the distaste of repetitive situations (Wymer, Self, and Findley 2010). According to Zuckerman (1994), sensation seeking is influenced by genetic as well as environmental factors and is a relatively stable trait related to psychophysiological and biochemical measures. Research shows that sensation seeking is correlated with age (Zuckerman 1994) and with gender (Wymer, Self, and Findley 2010).

Therefore, this particular trait appears to be more prominent across male individuals in their adolescence. Support for this assumption is provided by neuroscrientific studies that identify a link between sensation seeking and a brain chemistry profile with an increased drive for stimulation and novel experiences (Zuckerman 2005). This neuro-endocrinological profile is more commonly found in men than women, which makes males higher sensation seekers than females.

The individual difference characteristic of arousal seeking is closely aligned with sensation seeking. Both constructs operate within the theoretical premise of optimal arousal theory that proposes that every individual has a preferred or optimal level of stimulation (Shoham, Rose, and Kahle 1998). As discussed by Mehrabian and Russell (1974), the optimal stimulation level (OSL) of an individual is a unique, homeostatic degree of stimulation a person is most comfortable with. As a result, if environments are not stimulating enough, individuals tend to engage in novel activities. However, if environments are too stimulating, individuals seek to decrease stimulation. Galloway (2009) shows that higher sensation seekers tend to express a lower base arousal and therefore need a more intense stimulation to find novel experiences arousing. The notion of optimal stimulation levels is reflected in measures of arousal seeking and sensation seeking, as they try to quantify optimal desired levels of stimulation and arousal (Mehrabian and Russell 1974; Zuckerman 1990).

Sensation seeking is most commonly associated with risk-taking behavior. While risk taking correlates with sensation seeking, it is not a primary motivation (Zuckerman 1994). Instead, sensation seekers accept risk as a potential outcome when pursuing arousing behavior (Roberti 2004). The underlying assumption of risk–taking behavior

research is that certain individuals have a higher inclination of engaging in inherently risky activities and possess a risk taking personality (Bromiley and Curley 1992; Zuckerman 2005). Here, sensation seeking is used as an individual difference variable to segment the marketing into consumers that are more likely or less likely to express such behavior (Chang and Tseng 2013).

Studies by Burns, Hampson, Severson, and Slovic (1993) and Burns, Gillett, Rubinstein, and Gentry (1990) relate sensation seeking to gambling, greater sexual activity, smoking, drug use, and volunteering for unusual experiments. Specifically, Kusyszyn (1984) establishes profiles of individuals more likely to gamble and identifies risk–taking behavior, sensation seeking, and fantasizing as strong factors influencing gambling. Within the context of compulsive shopping behavior, Burns et al. (1990) identify psychological characteristics shared by addicts and compulsive consumers, such as sensation seeking and thrill seeking. They conclude that shopping and buying become mechanisms for increasing sensation and stimulation levels, which ultimately lowers stress and enables a sense of escape from reality.

But sensation seeking has not only been assessed within the context of risky behavior. Sensation seekers are also linked to being involved with sports, especially extreme form of sports characterized by risk-taking, skill, and athleticism (Wymer, Self, and Findley 2010). Specifically, high impact sports, such as rock climbing, parachute jumping, or scuba diving, can act as a way to achieve desired, increased level of arousal (Roberti 2004). A gender difference is also evident in extreme sports involvement as stated in Wymer, Self, and Findley (2010) with most of the extreme sports participants being male sensation seekers.

Another research area that sensation seeking is applied in is advertising. In general, Galloway (2009) positions higher sensation seekers as preferring higher sensation value messages, which leads to greater comprehension and memory of higher compared to lower arousal ads. Sexually explicit advertisings are also studied with regard to sensation seeking behavior. The study by Chang and Tseng (2013) focuses on the effectiveness of sexual appeals in advertisings for sexual or non-sexual products. Results show that high sensation seekers responded more favorable towards sexual appeal in promoting sexually related products, such as perfume. A previous study by Reichert, LaTour, and Ford (2011) supports these findings as individuals seeking greater levels of sensation show a preference for sexually explicit stimuli.

Sensation seeking tendencies are also linked to persuasiveness of humor in commercials. Galloway (2009) examines humor and ad liking and shows higher sensation seekers expressing higher likability of humorous ads characterized by incongruity-resolution structure. Therefore, marketing practitioners trying to appeal to sensation seekers should integrate humor and sexual appeals in their advertisements.

Sensation Seeking vs. Need for Sensation. As established in the preceding discussion, sensation seeking is commonly used as an individual difference variable and is positioned as a behavioral trait. However, over the years Zuckerman has refined the construct to more clearly illustrate the behavioral nature of the concept and distinguished it from a human need or desire. As such, while the first definition introduced by Zuckerman (1979) still included the terminology "need," revised versions contain the word "seeking" instead:

> Zuckerman (1979) describes sensation seeking *is "a human trait characterized by the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experiences"* (p. 10).
>
> Zuckerman (1994) defines sensation seeking is "*the seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experience*" (p. 27).

In addition, Zuckerman also integrated "intensity" as an additional quality of stimulation impacting sensation seeking in the updated definitions to reflect the higher level of arousal sought by sensation seekers. Nevertheless, the most dramatic adjustment is associated with differentiating the construct of sensation seeking from a human need defined as a directional motivation (Zuckerman 2008). He refers back to the works of Murray (1938), who categorizes and labeled specific traits as either viscerogenic or psychogenic needs. While viscerogenic needs are primary needs that enable us to experience physical satisfaction by engaging in periodic bodily events, psychogenic or secondary needs do not involve localizable bodily origins and develop indirectly from an association of primary needs (Murray 1938).

The need most closely related to sensation is the need of sentience defined as "the inclination for sensuous gratification, particularly from objects in contact with the body" (Murray 1938, p. 78). Considering that sentience is viscerogenic in nature, it is placed in the same category as the need for air, food, water, and passivity. Further, Murray (1938) associates sentience with a desire to seek out and enjoy sensuous impressions. Thus, Murray's (1938) need for sentience or sensation is clearly differentiated from Zuckerman's (1979) sensation seeking in that high level of arousal is only essential in the later construct. Therefore, the risky activities, such as use of alcohol or drugs, gambling,

and high-risk sports, appear to be a part of sensation seeking rather than need for sensation.

Interestingly, a few studies introduce the terminology need for sensation, yet provide Zuckerman's (1979, 1990) definition of sensation seeking (e.g. Burns 1992). For example, Niederdeppe, Davis, Farrelly, and Yarsevich (2007) label their trait characteristic as need for sensation, utilize Zuckerman's (1990) definition of sensation seeking, and measure their construct with a shortened version of the sensation seeking scale. Clearly, need for sensation is falsely applied in this study since the measured construct is sensation seeking and has no resemblance to the concept of need for sentience as introduced by Murray (1938).

Preliminary Assessment. In general, sensation seeking research does not accurately reflect the construct sensation as applied within sensory marketing studies. Instead, sensation seeking is more closely aligned with risky behavior, arousal, and excitement instead of the process of receiving sensory input through sensory organs. While there is a connection between environmental elements contributing to stimulation and individuals seeking optimal level of stimulation – two topics often discussed within sensory marketing, atmospherics, and services – the overall focus remains too firmly on risky behavior in order to be useful in assessing mundane sensations consumers are exposed to in consumption experiences.

Since the current study is positioning sensation as a more incidental sensation and a natural response to sensory stimulation rather than the intense, high arousal sensation associated with sensation seeking, it is more closely aligned with a need based on Murray's (1938) categorization. Thus, sensation relevant to the investigated three

research areas (atmospherics, services, sensory marketing) can be linked to the need for sentience that is stilled by bodily events. These bodily events can be represented by stimulation of sensory organs, which is associated with the biochemical process that Krishna (2012) refers to as sensation. Thus, need for sensation appears to be the more appropriate terminology and more relevant concept with regard to succeeding investigations and studies as part of this dissertation.

Sense Making

Another construct that incorporates the terminology "sense" and thus appears to be related to sensation is sense making. As previously discussed, Kaplan and Kaplan (1989) introduce a preference framework that suggests individuals perceiving their environments along two informational and concomitant needs: 1) the need to make sense of their environment and 2) the need to explore their environment. Environmental psychology argues that such inert need to understand and explore our environment is satisfied through the senses as they allow for cognitive, emotional, and physiological responses to environmental stimuli (Bitner 1992).

However, sense making itself is less focused on how sensory stimuli are organized, processed, and interpreted into perception; instead, it is more focused on the actual understanding and comprehension of surroundings. Thus, sense making is defined as meaning creation involving current and previous interpretations of thoughts (Woodside 2001). It encompasses automatic and controlled scanning of memory and environments. Woodside (2001) states that knowledge applied in sense making can be generated from three distinct sources, which are external stimuli, internal memory, and random foci in working memory. These three sources determine an individual's understanding of the

environment, situation, or task at hand. Therefore, Hopkinson (2001) argues that people act rationally and intentionally in response to how they understand their world rather than objective properties of an environment or situation.

The concept of sense making is often applied within decision making context and across an array of environments, such as online environments (Brunner-Sperdin, Scholl-Grissemann, and Stokburger-Sauer 2014; Demangeot and Broderick 2010), marketing channels (Hopkinson 2001), and performing arts settings (Caldwell 2001). Sense making is also integrated into organizational and managerial studies, which often employ sense-making organizational theory. This theoretical premise views organizational behavior as a response toward the ambiguous environment in an effort to make sense of the world (Smircich and Stubbart 1985). One study that examines the influence of environmental elements on managerial decision making is Rosa (2001), who positions embodied concepts as a means to solve ill-defined problems. His findings reveal that marketing managers commonly utilize embodied concepts and these are influenced by cognitive-processing preferences and managerially controlled environmental factors.

In general, the biggest communality emerging from reviewing sense making studies is the importance of environmental cues in influencing behaviors. One major contributor to this concept is Weick (1995) and his seven identifiable characteristics associated with the process of sense making: 1) grounded in identity construction; 2) retrospective; 3) enactive of sensible environments; 4) social; 5) ongoing; 6) focused on and by extracted cues; and 7) driven by plausibility more than accuracy. The characteristic most eminent within the scope of the current assessment is Weick's interpretation regarding environmental influences. As he proposes, thinking, knowing,

and sense making do not occur in isolation, but are rather affected by external environmental cues (Craig-Lees 2001). This assumption is supported by Rosa (2001) who identifies environmental elements to affect knowledge structures, such as retention and memory. While not completely aligned with sensation as defined in sensory marketing, this interpretation reflects components of the formerly introduced SOR model and reflects one outcome – memory – of the sensory marketing framework. However, these marginal overlaps of sense making with sensation and perception are not sufficient to make these constructs semantically equal. As such, the idea of sense making does not substantially contribute to the overall definition of sensation and to creating value-added, sensory rich consumption experiences.

Bodily Sensation

A specific type of sensation is bodily sensation, which is grounded in the theoretical premise of embodied cognition (Labroo and Nielsen 2010). As discussed by Larson and Billeter (2013), bodily sensation encompasses the activation of a physical sensation or a specific bodily state. The guiding assumption within this research is that individuals infer their attitudes from experienced bodily sensations (Meyers-Levy, Zhu, and Jiang 2010; Markman and Brendl 2005). Thus, a specific bodily sensation can influence an individual's thoughts, such as judgments of power as discussed by Barsalou (2008). With regard to sensory stimulation, bodily sensations result from a stimulus activating an individual's embedded sensory receptors, which according to Meyers-Levy, Zhu, and Jiang (2010), is very sense specific. Labroo and Nielsen (2010) further elaborate that perceptual, motor, and introspective states linked to a sensation are activated when engaging in bodily sensations. For example, people experiencing the sensation of ease

tend to judge outcomes as more familiar since ease is usually associated with familiar outcomes (Schwarz 2004). Furthermore, bodily sensation does not need to be experienced to evoke attitudes, since merely simulating the sensation can impact thinking. Barsalou (2008) extends the idea by proposing that environments are essential in influencing which sensation is associated with which perception, cognition, and introspection. Thus, bodily sensation is also relevant to atmospheric or servicescape research.

One common theory that guides research within bodily sensation or embodied simulation is the perceptual symbols systems model by Barsalou (1999, 2008). The model provides support for the proposition that by thinking about a concept, the accessibility of the physical sensation associated with that concept increases. Further, this increased accessibility can also be triggered by engaging in physical actions linked to the concept. For example, when holding a pen tightly between lips without touching the teeth, Strack, Martin, and Stepper (1988) find participants to judge comics as more humorous. Another study by Bargh, Chen, and Burrows (1996) recognizes that participants walk more slowly down a hallway after activating the concept of elderly people since this concept is associated with slower movements.

Bodily sensation is widely applied within marketing studies across numerous contexts, such as decision making, attitudes towards brands, and product assessment. Larson and Billeter (2013) highlight the importance of how physical experiences can change our behavior. Specifically, the mere sensation of balance or imbalance can influence a consumer to select a compromise option. Linked to the concept of parity, the sensation of balance is proposed to increase accessibility of parity and thus leads to a

systematical change in choice behavior. Therefore, experiencing a heightened sense of balance leads to choosing compromise options. Another approach is to examine how a particular bodily sensation can impact product evaluations implemented, for example, by Meyers-Levy, Zhu, and Jiang (2010). Their study examined how the sensation of the floor can impact product assessment when manipulating the distance to the object. In general, the further the participant was standing away from the product, the higher the influence of the bodily sensation of the floor. Thus, closer distance to the object allowed participants to utilize visual cues in the assessment and decreased reliance on bodily sensations. However, if the target product was atypical by consisting of a bundled assortment of layered goods, a moderate distance is preferred to close up view since the totality of the object was more easily judged from a distance. As a result, the importance of bodily sensation increased with decreased distance.

Assessing the influence of bodily sensation from a broader perspective, Labroo and Nielsen (2010) investigate the relationship between bodily approach and positive attitudes towards a brand. Because rewards and positive attitudes are usually associated with approach behavior (Bem 1972), the authors investigate the opposite assumption by linking physical approach towards a negative stimulus with positively conditioned attitudes. The results confirm that participants indicated a more positive feeling towards a negative outcome when experiencing the sensation of approach.

As evident in the previous discussion of the construct, bodily sensation is related to the sensation as defined in sensory marketing. However, the aspect of sensation is too closely linked to physical movement to be able to substitute as a proxy for sensation as

positioned within the scope of this dissertation. As such, additional exploratory assessment is needed to further investigate the construct of sensation.

Additional Related Constructs

Another construct that incorporates the notion of sensation is consumer innovativeness (CI). Wymer, Self, and Findley (2010) define consumer innovativeness as the desire to engage in new experiences that leads to a higher willingness to adopt new products, services, and ideas. The higher-order construct encompasses two dimensions, namely cognitive and sensory innovativeness. While cognitive innovativeness centers on stimulating the mind through new experiences, sensory innovativeness prefers engaging in new experiences for increased sensory stimulation (Hirunyawipada and Paswan 2006), sensory innovativeness. Self and Findley (2006) managed to establish a relationship between sensation seeking and consumer innovativeness. Thus, both constructs relate to a person's tendency to seek out new and stimulating experiences.

Synopsis

As evident in the prior discussion of the sensation construct and its application within different areas of marketing, no further knowledge on how consumers utilize their senses in consumption experiences as related to sensation is discovered. In addition, the current literature does not accurately reflect the notion of incidental sensation as experienced in daily routine tasks and situations. While constructs such as sensation seeking are related and do incorporate the utilization of senses, their focus is on actively looking for activities and situations that offer high level of stimulation rather than on more automatic or incidental sensation. Lastly, sensation does not always have to involve

extreme levels of stimulation since sensory organs capture subtle sensory cues just as well.

To further understand sensation and due to the limited availability of studies that examine the totality of sensation, an exploratory research approach is selected as a first step. This qualitative assessment is tailored towards how consumers perceive store environments and if they are influenced by sensory cues. The primary purpose of the exploratory study is to investigate how consumers perceive store environments and how they think that they are influenced by sensory cues in service environments.

- Research Question 1: Does sensory stimulation hinder specific task completion (i.e., reduce utilitarian value)?
- Research Question 2: Does sensory stimulation contribute to or diminish hedonic value experienced by the individual?
- Research Question 3: What are the most prominently perceived sensory elements in a service or exchange environment?
- Research Question 4: In what ways do consumers express sensations or consequences of sensations associated with consumer experiences?

Aligned with the research questions proposed above, a focus group interview methodology is selected. Not only are focus groups among the most widely implemented research tools in marketing, but they are also perceived as a relatively convenient method to gain information and knowledge about consumers (McDonald 1994). Cox, Higgenbotham, and Burton (1976) believe that a major benefit of focus groups is the possibility of gaining direction and guidelines for future studies, including hypothesis and

research question generation, by confirming gaps in the current literature of a specific area.

McDonald (1994) identifies three major objectives involved with focus group interviews: 1) phenomenological, 2) exploratory, and 3) clinical. Phenomenological objectives centers on gaining knowledge about everyday experiences of consumers and is more experiential in nature. This approach should be implemented when a disconnect to consumers prevails and no further information about the examined topic is available. Exploratory objectives produce scientific constructs and validate these against everyday experiences of consumers. The primary reason for applying this approach should be the desire to identify scientific explanations due to its comparative scientific emphasis. Lastly, clinical approaches involve clinical judgments to provide consumer behavior and motivation interpretations. Based on this differentiation, the current study employs a phenomenological objective since the aforementioned review of sensation did not result in an adequate scientific explanation. Therefore, increasing the understanding about everyday consumer experiences is the primary objective of the focus group interviews.

Exploratory Study Methodology

This exploratory study seeks to provide preliminary findings towards the question of how consumers experience sensory cues within the store environment. The exact purpose is to generate insights into common cues noticed by consumers. Thus, this study can provide a starting point in determining the cognitive associations people have in conjunction with store environment and specifically with sensory stimulation aroused by these environments. The format of the focus group sessions are aligned with traditional

guidelines in marketing research studies (Zeithaml 1988). One important component of the interviews is the moderator who, according to McDonald (1994), is responsible for promoting participant interaction and guides the discussion through the topics of interest. Further, as suggested by Fern (1982), focus group size was kept above four participants since a larger variety of ideas seems to be generated in sessions with more than four respondents.

Research Approach

Focus group interviews, including a short, preliminary questionnaire and a small task, provide data for the study. The brief questionnaire commences with a few demographic questions followed by three open-ended questions allowing respondents to express free associations responses. The primary purpose of the survey is to allow participants to write down "top of mind" associations elicited by the questions free from the influence of others in the group. In addition, collecting written answers allows a comparison with recorded answers to identify if participants changed their answers in response to opinions expressed by other focus group members. Each focus group interview session was administered in the same conference room to maintain consistent environments across groups. Upon completion of the interviews, participants were debriefed and released from the study.

The initial section of the survey collects basic demographic information of respondents, including gender, age, undergraduate major, and country of origin. The first open-ended question asked respondents to write down what they first notice when entering a store. The second question asks respondents to imagine wanting to look at and evaluate a product in a store and instructs them to describe what they would do first. The

final question asks respondents in what ways they believe the store environment can affect them when they go shopping.

Once respondents complete the questionnaire, they receive instructions to direct their attention to two packages placed in the middle of the table and imagine finding the packages in front of their house. Not knowing what is inside the packages, the interviewer asks respondents to try to figure out what is inside the packages and then open it up to see what is inside. This task allows an examination of steps consumers go through and what senses they use to learn about an unfamiliar package.

Interview Outline

Standard focus group methodology was used including a moderator outline featuring seven additional open-ended questions that are presented in sequence to progress towards more specific questions of sensory stimulation at the end of the session. The primary reason to begin with more general questions about the store environment is to judge if sensory details are associated with and are "top of the mind" when asked about purchase behavior. This free-elicitation approach, recommended by Olson and Reynolds (1983), generates more general and not time–specific insights into stored knowledge structures. Thus, without being primed, do respondents recall and associate sensory information with shopping environments?

Prior to asking new questions, the responses to the three questions of the survey are discussed as a group to ease respondents into the focus group interview setting and make them feel more comfortable. The next question asks respondents to image having to decide if they want to buy a new product and followed up with what type of environment, such a quiet or busy one, would they prefer. Further, respondents provide insights into

what kind of influences in the store would potentially make it difficult for them to complete this purchase decision. The second scenario is built around big open-air markets and assesses if a natural shopping environment tends to make customers more tolerant of changes in temperature, scent, touch, sound, and other environmental attributes. The next discussion point focuses on whether respondents think that retailers control store environments on purpose and if so, how.

Shifting back to purchase decisions, respondents then provide insights into the type of information they use when trying to make a purchase decision. Specifically, the question is followed up by asking if the product's smell, feel, sound, or taste influences the purchase decision. The next question asks if the smell of a product has ever influenced the respondents. Here, respondents are instructed to not think of perfumes, air fresheners, or other products that are purchased due to their scent. The fifth question asks about preference for purchasing products online and factors that respondents like or do not like when buying items over the Internet. In addition, participants respond to if they find it challenging to make a decision without being able to physically evaluate the product. To assess the most suitable environments for completing a specific task, the next question inquires about the type of environment respondents prefer when needing to focus on a task. Examples of tasks include adding up the cost of a product, studying for a test, or purchasing a high ticket item. The question is followed up by specifically asking about crowded or loud environments and the effect these might have on their level of concentration.

The final question explicitly asks about sensory stimulation and the respondent's perceived sensitivity towards it. A scenario is provided to imagine having to decide

between three bottles of wine or three packages of gourmet coffee to assess how important utilizing hands, eyes, ears, and nose is to make a decision. Finally, the participants indicate how important touch, smell, taste, and visual appeal are in making purchase decisions for different types of products and in different contexts. While notes are taken during the focus group interviews, the entire session is also audio recorded to ensure accurate transcription of findings. Respondents consist of a convenience sample consisting of graduate students enrolled in an International Business graduate course. See Appendix C for a copy of the focus group survey and interview outline.

Results

To limit the number of respondents per interview, four separate sessions were scheduled with the goal of including five to six participants per session. In exchange for their participation, students received bonus points from the professor. The total sample of the focus group interviews consists of 20 graduate students. Female respondents account for 40 percent of the sample and most of the participants are between 20 and 22 years of age. Table 2.1 presents the demographics for all focus group sessions.

Table 2.1 - Focus Group Descriptive Statistics

Variable	n	%	Variable	n	%
Gender			**Major**		
Male	12	60.0	Accounting	3	15.0
Female	8	40.0	Economics	2	10.0
Age			Finance	3	15.0
20-22	12	60.0	Management	2	10.0
23-25	3	15.0	CIS	2	10.0
26-28	3	15.0	Biology	2	10.0
29 and over	2	10.0	Other	4	20.0
			Country of Origin		
			USA	16	80.0
			Non-USA	4	20

As common in exploratory research, generated data are not numerical but in the form of protocols (Zeithaml 1988). Thus, the next step consisted of transcribing the four different focus group interview sessions. The data analysis follows systematic and grounded procedure common in qualitative data analytical procedures (Spiggle 1994). Zeithaml (1988) describes that results in this type of research consist of patterns of responses and observed communalities across participants. Therefore, transcribed interviews are first assessed within each focus group session (horizontally) and then examined across sessions (vertically). This two way approach allows for comparison of reoccurring themes to get a more holistic understanding of expressed ideas. A coding scheme identifies common themes based on frequency of discussion among participants' responses.

Themes

A total of eight themes emerged while transcribing and coding focus group interviews. Themes are justified based on frequency of occurrence within discussion among participants. Here, topics must be discussed by multiple participants in various interviews to be considered for inclusion. Thus, the most commonly discussed ideas among participants are summarized and grouped into themes for further assessment. A summary of these eight themes is depicted in Table 2.2. Every theme is further discussed, explained, and supported by verbatims. As proposed by Calder (1977), verbatims are direct quotes from participant comments and used to supplement the provided explanations.

Table 2.2 - Summary of Themes

Theme	Explanation	Example
Source of Sensation	The source of sensation can vary including product, environment, and other individual.	Employees can act as a source of sensation by exhibiting bad body odor.
Touch	Touch is the most important sense for consumers in making purchase decisions. It can complement visual cues.	Consumers check produce for firmness and bruises prior to making a purchase decision
Smell	The scent of an environment or a product is most influential in encouraging or discouraging consumption behavior	A product with an unfamiliar or bad smell will not be purchased by consumers.
Crowding	Crowding can either be elicited by other individuals in the retail environment or by chaotic product displays, which leads to avoidance behavior	Consumers are more willing to pay more money for products or services if the consumption environment is less crowded.
Contagion	Consumers express negative associations with physical, non-physical, and emotional contagion elicited by products, other consumers, or employees.	Seeing other customers upset can influence the affective state of a consumer to the extent that the person will leave the store without making a purchase.
Congruency/ Expectation	Different consumption environments raise different expectations that need to be met in an effort to establish congruency.	Restaurants are expected to be warmer due to limited activity engaged in by consumers.
Cleanliness	The cleanliness of an environment is linked to brighter lighting and can impact perceived product quality.	A brighter store appears cleaner and consumers can easily find merchandise.
Value	Sensory stimulation can enhance or diminish hedonic and utilitarian value extracted from the consumption experiences.	An intense scent in a store can heighten importance of utilitarian value since the focus shifts towards completing the task at hand rather than enjoying the occasion.

Source of Sensation. The general source of sensation emerged as a theme among respondents. The two major categories identified in the interviews are either person specific or ambient sensation. Interestingly, participants only named negative examples of person specific sensation, such as body odor or crowding. These sensations seem to be predominantly elicited by employees who can be a source of disruption and can even inhibit completion of a task. By engaging with customers, employees can unwillingly decrease consumer's focus and decrease the overall consumption experience.

WM (late 20s): "I don't want to be bothered. If they (an employee) comes up to me and asks me "Hey can I help you," then I'll say "No thanks, I'm just looking." But if they come back, I am probably done. I can't make a decision if I am bothered."

Touch. One theme that reoccurred among all focus group interviews is the importance of touch when evaluating a product. Often times, touch is cited as a means to obtain information about a particular product. Depending on the type of product, touch is used to facilitate the purchase decision. As expressed by participants, especially produce or food items are evaluated by physically handling them.

WF (early 20s): "I touch it (the produce) to check the firmness and to check if there are any weird marks on it (the produce)."

The frequency of touch appears to be influenced by the particular environment. Here, retail environments featuring brighter colors and lighting appear to encourage touching of product offerings. Another influential factor is the type of retail environment a consumer is shopping in and the amount of time allocated to the consumption experience. For example, respondents perceived outdoor retail environments as more inviting and friendly leading to a greater frequency of touch.

WF (early 20s): "I would touch products more in an open-air market. It's a friendlier atmosphere and more interaction with others. So I would stay longer and touch products more since I am spending more time."

An interesting concern that emerges is the inability to touch or physically examine a product. For example, electronics tend to be locked away or displayed behind protective glass. Rather than making a purchase decision solely based on visual input, respondents seek help of employees to gain physical access to such product. Within the context of online shopping, consumers try to obtain sensory information from product descriptions or pictures. Here, the source of information appears to be a key influential factor. Reviews offered by other consumers are perceived to be more credible and more useful with regard to sensory details than descriptions offered by sellers. Further, pictures can not only supplement product descriptions, but can also be the primary source of information. In particular, zooming capabilities and various backgrounds provide valuable information concerning texture and feel of a product.

BM (mid 20s): "I can usually find someone who went into great detail in his review, describing texture and feel of the product. Then I know what to expect."

WM (end 20s): "One feature I really like is the ability to view the product from different angles and zooming in. Because sometimes when you zoom in you can see actual textures. If it's only one picture and no zooming in, I don't even consider it (the product)."

Smell. One of the most influential sensations emerging from the interviews is scent. Numerous respondents agreed that while touch might be most influential in evaluating a product, the scent of a retail environment is most influential in encouraging or discouraging consumption behavior. As such, scent can influence the amount of time consumers spend in a store. Specifically, a bad odor can deter consumers from spending time in the store and purchasing products.

BM (mid 20s): "The scent (of the store) can either encourage or discourage the time I am in the store."

In addition, an unexpected smell can discourage consumption behavior even if the scent is not the primary attribute of a particular product. While the focal sense engaged in a consumption experience might be a different one, a non-focal scent can provide the deciding sensory information.

WM (mid 20s): "If the product smells bad or just not like it's supposed to, I will not buy it. For example, I wanted to buy some towels the other day, and when I picked them up they smelled moldy and dirty. I did not buy them."

Based on the focus group discussions, consumers tend to differentiate between intentionally seeking out sensory input versus peripheral sensory input. Here, touch was most commonly named as the sensation actively sought out and most influential with either a positive or negative experience. Yet touch was listed as the most influential in a peripheral capacity of providing sensory input and was limited to negative sensations. As such, a negative odor can lead to not purchasing a product even if it visually looks appealing and feels good.

BM (mid 20s): "Smell can be the most important factor. Even if it (the product) looks good or feels good, if it smells bad or like something it shouldn't, it's bad. For example, if chicken smells bad, I don't buy it even if it looks good or feels firm."

Crowding. When consumers explore retail environments, they usually tend to share the retail space with other customers or employees. One theme aligned with the number of people present in a retail environment is crowding. Respondents identify crowding as a major contributing factor to negative shopping experiences that can motivate consumers to leave the store without completing the intended task. In addition,

in an attempt to avoid crowded store environments, participants expressed a greater tolerance for higher prices in exchange for a more pleasant shopping environment.

WF (early 20s): "If it's crowded, it's very unpleasant. I get impatient; I have no time to wait. I rather pay a higher price at a different store, but at least it's convenient and not crowded."

While crowding is often associated with the number of people present in a given retail environment, the sensation of crowding can also be elicited by displays or product arrangements. Contrary to common practices of store owners, numerous displays or sale signs by the entrance can signal a crowded store atmosphere. Another source of crowding can be the product display on the shelves. Unorganized or cluttered shelves can heighten the sense of chaos within the entire store and contribute to perceived crowding as expressed by the respondent below.

WF (early 20s): "If the shelves are cluttered and the items are out of order, I feel like it's crowded. It just stresses me out and gets to me. I will not shop there and leave."

Contagion. Product contagion is a common theme within the retail literature and also emerged as an influential factor among respondents. Witnessing another consumer interacting with a product can trigger a negative response and a feeling of disgust within individuals. These negative responses are commonly referred to as contagion and can occur in a variety of settings. Oftentimes this response does not have to occur consciously, but is an automatic response to seeing someone else interacting with a product.

BM (mid 20s): "If someone else touches the produce and I see it, I won't buy it. But I don't think I consciously do it, I just don't touch the exact same product."

WF (early 20s): "If I see others smell a product, I will not buy it."

Contagion is not limited to in–store encounters. The consumer does not need to be present when someone else touches the product. The sole imagination of someone else touching a product can already deter the consumer from purchasing a product. Interestingly, even online shopping can be associated with contagion.

WM (mid 20s): "Since I can't really see and inspect the product before I buy it, I think more about the process it goes through before it gets to me. I don't know what has been done to it, who has touched it, and what's been involved with it before it comes to me. I feel more comfortable to buy it in the store."

Another concept discussed by participants is that contagion is not necessarily limited to physical products. Emotional contagion can also occur and can determine how comfortable a customer feels in the store as well as if he or she will stay long enough to make a purchase.

WF (early 20s): "If I see other customers being upset, I think I will be upset too, and that's not good. I might just leave."

Congruency/Expectations. Among the different interviews, the importance of congruency and expectations attached to certain retail environments emerged. This theme was especially evident when comparing outdoor shopping environments (open-air market) to traditional indoor environments (supermarket).

WM (end 20s): "Scent can be stronger as long as it's congruent. You expect it to smell more and smell the food at a market, but not in a supermarket."

Even negative sensation such as crowding can be more tolerable in certain environments, hence in an outside market. Since consumers enter the specific retail environment with preexisting expectations, sensory stimulation unacceptable in one environment is deemed appropriate in others.

WF (early 20s): "It's ok if it's more crowded in an open-air market, I would expect that since it's a smaller area."

Congruency is also important with regards to temperature. Certain types of retail environments are expected to feature a lower temperature than others. This expected level of temperature appears to be linked to the intensity of active behavior displayed in the store. As such, restaurants in which consumers primarily sit and enjoy their meal are expected to be warmer than stores that require more walking around, such as supermarkets.

WM (mid 20s): "Too cold temperature is not good in restaurants, but cold is good for food or beverage stores. Colder is better than because you move around more. That's why restaurants should be warmer."

In addition, congruency also needs to prevail between the type of product purchased and the store environment. It can help consumers envision themselves in a situation when they would use the merchandise. Therefore, when consumers are shopping for clothes, the temperature of the store needs to reflect the type of clothes consumers are looking for.

WF (early 20s): "If you were going to try on ski clothes, you want it to be colder. But if you are trying on bathing suits, you want it to be warmer. It just helps putting you in that mindset to go do that thing."

Cleanliness. Another interesting theme identified in the interviews is the conjunction between cleanliness and lighting. As indicated by respondents, a brighter lighting is often associated with a cleaner store, which in turn provides a signal of carrying the desired merchandise.

WF (early 20s): "The first thing I notice in a store is the lighting. I'm not sure why, but the way the store is lit affects my perception of the store. If it's bright, I feel it will be clean and possibly have the items I need. Dimly lit stores make me feel like they're not as clean and what I will have to dig to find what I'm wanting."

WM (end 20s): "Brighter lights make it seem cleaner and it's easier to find what you want."

In addition, cleanliness is also linked the perceived quality of products. Hence, sensory inputs not only influence the evaluation of a product, but also contribute to overall quality and value perceptions. This phenomenon underlines the importance of non-focal sensation enhancing the entire consumption experience.

WM (early 20s): "The cleaner the store, the higher quality I feel the product is."

Value. Sensory stimulation can also contribute to hedonic or utilitarian value extracted from the consumption experience. While sensory experiences are conceptually more closely related to hedonic shopping value, too much sensory input can cause a consumer to focus on utilitarian value. Respondents describe how a higher level of sensation diminishes hedonic value during the consumption experience. As a result, utilitarian value gains in importance since the primary goal of participants is now on completing the task at hand.

WF (early 20s): "I went into a store that smelled horrible this weekend, so I just got what I needed and quickly left."

BM (mid 20s): "Scent can be risky. It can smell clean without odor. But if it has a bad odor, you only quickly buy items you need and then leave."

Conclusion

The focus group interviews resulted in a total of eight themes centering on product specific and atmospheric sensation. One major finding is the differentiation between focal and non-focal sensation that both contribute to the sensory experience. Interestingly, non-focal sensation can be more influential than focal sensation, such as expressed by respondents when not purchasing a towel due to bad odor regardless of impeccable visual or haptic inspection. Further, different consumers appear to express

varying levels of sensitivity towards sensory stimulation. Here, pre-established expectations regarding specific retail environments can adjust the threshold of sensitivity of sensation. For example, an open-air market triggers a lower sensitivity to sensory stimulation and a greater acceptance of sensory input. In addition, while certain behavior such as interaction with employees might be perceived as crowding and is unwanted in traditional retail environments, consumers encourage such behavior in open-air markets. Furthermore, respondents also expressed the importance of value extracted from sensory experiences. Since current sensory marketing studies often focus on other outcome variable, adding value to future studies can strengthen explanatory power of findings.

Upon completion of the qualitative study, a further investigation of what constitutes sensation and how it can be measured seems essential to fully comprehend the value extracted from sensory experiences. A key concept of interest remains the distinction between focal and non-focal sensation. The next essay will address these areas by developing a scale capable of capturing a consumer's need for sensation by differentiation between focal and non-focal sensation.

CHAPTER III

NEED FOR SENSATION - A SCALE DEVELOPMENT

Introduction

The Introduction and Essay 1 of this dissertation depict the importance of marketers offering a stimulating consumption experiences from which consumers can extract value. As discussed, environmental and sensory cues can shape affective, cognitive, and behavioral consumer responses (Bitner 1992; Donovan and Rossiter 1982; Krishna 2012; Mehrabian and Russell 1974). These relationships are studied in three prominent research streams: atmospherics, services, and sensory marketing. While differences remain across studies within these three areas, communalities prevail due to the shared foundational assumption that humans infer meaning and value from their environments.

Sensation and perception are essential constructs across all the relevant research streams, which are exhaustively examined in the previous sections. To recap, Krishna (2012) defines sensation as the process of activating receptor cells in sensory organs by a stimulus resulting in a biochemical sensation. In comparison, perception encompasses the comprehension of sensory information identified during sensation. The term sensation is loosely applied in marketing and psychology studies, and as a consequence, researchers

apply numerous, diverse constructs all under the sensation rubric. However, sensation in many marketing and consumer research studies is more closely aligned to sensational, in that sensation becomes synonymous with thrilling experiences rather than a somatic, biochemical process (e.g. Zuckerman 1990; Krishna 2012). A review of the various terminologies, meanings, interpretations, and contexts is included in prior sections. In contrast, the subsequent discussion continues the assessment of sensation by focusing on measures commonly applied in studies investigating constructs related to sensation.

Up to this point, the examination of sensation involves key concepts across multiple research areas. However, interaction of senses and multisensory stimulation also need to be incorporated in this exhaustive review of sensation. As mentioned earlier, humans respond to environments in an integrative way and utilize the total configuration of stimuli when responding to environmental cues (Kaplan and Kaplan 1989; Brunner-Sperdin, Scholl-Grissemann, and Stokburger-Sauer 2015). This holistic perspective is still under-researched according to Krishna (2012) and more conclusive findings about multisensory stimulation are necessary to gain deeper understanding of sensational consumption experiences.

The previous marketing research introduces the assessment of sensory interactions, yet the scope of study often is limited to unimodal or bimodal sensory stimulation. For example, when evaluating quality of water, consumers not only rely on visual inputs, but also on perceived haptic quality of containers (Krishna and Morrin 2008). Other areas that have been addressed in various research studies are intersensory effects and experiences between sound and taste (Zampini and Spence 2004), vision and

taste (Hoegg and Alba 2007), as well as vision and touch (Raghubir and Krishna 1999). A closer look into multisensory studies and related concepts follows below.

Overall, Essay 2 examines multisensory studies and measures associated with sensation. The objective is to conceptualize need for sensation within sensory marketing theory and to develop a scale that captures varying levels of sensitivity to sensation that influence a consumer's overall experience. To capture this individual difference, a new scale is proposed and developed aligned with common measurement development procedures (Churchill 1979; Gerbing and Anderson 1988). The expected deliverable of this essay is an exhaustive and validated scale applicable within sensory, atmospherics, and services research.

Multisensory Sensation

The assumption that individuals assess their environment holistically has been established in multiple sections of this dissertation by now. Instead of utilizing one specific sensory cue, consumers consolidate sensory information from various modalities in an effort to understand their surroundings. With regard to atmospheric research, multiple studies support this holistic assessment of environments. For example, Zimmer and Golden (1988) identify that consumers develop a global impression of a store by consolidating perceptions of specific features and attributes. Furthermore, servicescapes are also judged holistically with various cues being considered simultaneously (Mattila and Wirtz 2001). Moreover, studies examining product assessment also support the holistic assessment of items. Meyers-Levy, Zhu, and Jiang (2010) document the multisensory judgment of products by incorporating visual cues and bodily sensations.

However, while research acknowledges the importance of holistic perception of environments and products, the majority of studies still focus on individual senses or single sensory modalities (Coulter and Chowdhury 2006). If studies assess multisensory sensation, the examination of two of the five senses appears to be most common. This lack of multisensory studies is also evident in developed scales. Most of the instruments developed and utilized in sensation research focus on a specific sense. One exception is the cross-sensory heterogeneity index by Coulter and Chowdhury (2006) described below. One commonly cited reason why multisensory studies are still relatively rare is the complexity of conducting experiments that assess more than one or two senses (Krishna 2009). Also, multiple concept and theoretical assumptions are unique to this specific research context, a few of which are reviewed below. However, prior to examining specific construct in multisensory research, the origin of the unity of the senses is explored.

Origin of Sensory Unity

As previously established, all five senses (vision, audio, scent, touch, and taste) have evolved from a single primitive sense, an undifferentiated responsiveness to an external stimulus (Marks 1978). This common heritage is believed to be one reason why individuals utilize sensory cues from various sensory modalities in understanding their surroundings. According to Werner (1934), the interactions among sensory processes and the commonalities across sensory attributes remains from the primitive sense first developed in living organisms. He continues to argue that sensory stimulations produce undifferentiated muscular responses, which represent the synesthetic assessment of

sensory responses. Only after this holistic response do specific sensory modalities process and perceive sensory stimuli.

Marks (1978) further supports the assumption of sensory unity by identifying three specific processes which illustrate this unity: 1) sensory processes; 2) perceptual processes; and 3) cognitive processes. Sensory processes encompass psychophysical behavior of different senses that all reflect numerous similarities. With regard to perceptual processes, different senses can provide common information and characteristics of sensory experiences depict likeness. These processes are evident in crossmodal correspondences, which is further explained later. Finally, cognitive processes also reflect unity of senses since verbal metaphors suggest similarities across sensory phenomena. These sensory metaphors are commonly examined in sensory research (e.g. Coulter and Chowdhury 2006).

Multisensory unity is also present on metaphorical language applied in everyday situations. Often, words denote attributes of individual or multiple senses. For example, the word bright was originally applied to describe luminous objects, yet throughout history it has become to describe sounds as well (Marks 1978). Sometimes, words describing a sensory modality transfer to other modalities, which usually occur in specific and limited directions. Williams (1976) develops a scheme to illustrate a hierarchical progression from most primitive to most advanced synesthetic transfer (see Figure 3.1).

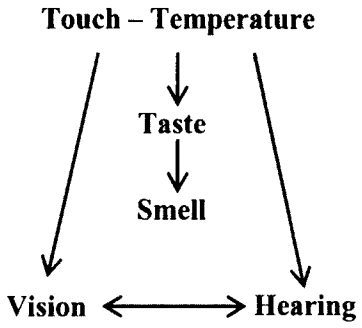

Figure 3.1 - Hierarchical Progression of Synesthetic Transfer (Marks 1978)

As depicted in Figure 3.1, touch is assumed to be the most primitive of the sensory systems that originates expressions related to sensory qualities. Thus, terms that first described tactile properties later expanded to gustatory, visual, and auditory experiences. For example, we might refer to tastes as sharp, sounds as dull, and colors as soft. However, we do not utilize expressions such as loud or fragranced touched, which supports the unidirectional and hierarchical nature of this progression.

The next section elaborates on constructs more closely aligned to multisensory sensation within related research areas. Two major concepts that are based on the assumption that individuals assess their environment and judge products holistically are crossmodal correspondences and sensation transference.

Crossmodal Correspondences

One common construct with regard to multisensory stimulation is crossmodal correspondences. According to Spence and Parise (2012), crossmodal correspondences reflect if sensory features of one modality are matched with the sensory features in another modality. As further elaborated by Spence (2011), "compatibility effects" occur between attributes of a stimulus in different sensory modalities. Numerous studies show

that crossmodal correspondences prevail among various pairings of sensory modalities (Spence and Parise 2012).

However, the presence of crossmodal correspondences has been established for a long time. Psychologist identified the existence of this effect more than 80 years ago with regard to sound and symbolism. Edward Sapir (1929) links speech sounds 'a' to larger objects than speech sounds 'i'. As such, participants assigned 'mal' to the bigger round shape and 'mil' to the smaller shape. In addition, Köhler (1929) identifies that the nonsense word "Baluma" is more commonly matched with rounded shapes while the nonsense word "Takete" is matched to edged shapes. Both examples are depicted in Figures 3.2 and 3.3.

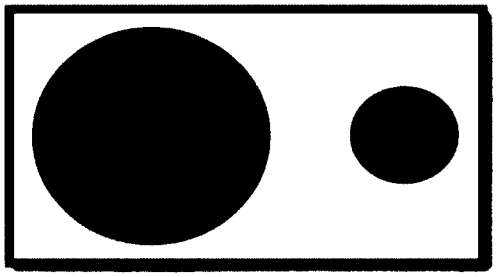

Figure 3.2 - Schematic Figures (Sapir 1929)

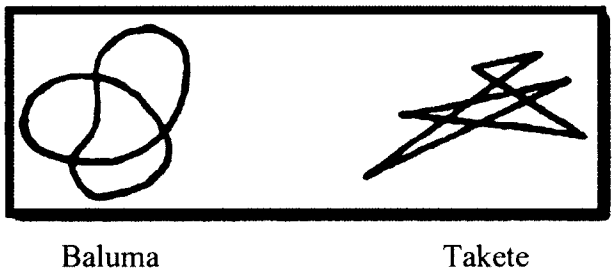

Figure 3.3 - Schematic Figures (Köhler 1929)

These and other associations are studies in a large stream of research. For example, one study matches visual shapes to particular scents (Hanson-Vaux, Crisinel, and Spence 2013). The findings reflect that participants relate a round shape with scents of vanilla and raspberry and an angular shape with lemon or pepper scents. The crossmodal correspondence between sound and taste is the focus of Crisinel and Spence (2010). In their study, participants taste different solutions and in turn match the taste of each solution to a sound made by a classical musical instrument. While bitter flavors seem to match lower-pitched sounds, sweet and sour tastes are associated with higher-pitched notes.

Sensation Transference

A concept closely related to crossmodal correspondences is sensation transference. This term is more loosely defined than crossmodal correspondences and has been differently positioned within atmospheric and sensory marketing studies. In general, sensation transference describes a psychological mechanisms that incorporates unconscious and crossmodal transfer of an attribute to other items (Piqueras-Fiszman and Spence 2012).

Within the context of atmospherics research, sensation transference involves the transferring of a feeling a customer develops in an atmosphere to the product evaluated in a store (Spence et al. 2014). One example that assesses atmospheric influences on product assessment is Spence, Harrar, and Piqueras-Fiszman (2012). In their study, participants indicated a greater liking for wine when the lighting in the room is tinted in blue or red. In contrast, green or yellow lighting elicits a lower liking for the same wine.

Piqueras-Fiszman and Spence (2012) focus on sensation transference for product evaluations and construe the mechanism as a bias. Certain sensory attributes of a product can influence a consumer's perception of other product attributes via other sensory modalities. In their assessment, sensory modalities can be diverging and still influence product perception. For example, Guéguen (2003) shows that the color of a glass can influence the thirst-quenching qualities of a beverage. Here, blue and green colors that are usually associated with coldness elicit a greater thirst-quenching sensation that yellow or red colored glasses.

Importance of Congruence

Overall, value from a multisensory experience or store environment depends on an assumption that congruence prevails, for example, congruence based on sensory cue arousal potential (Mattila and Wirtz 2001). In general, it is assumed that consistency across sensory cues can elicit a more optimal level of stimulation, which can lead to more pleasant consumer experiences (Spence et al. 2014). For example, Chebat, Gelinas-Chebat, and Filiatrault (1993) show that congruent multisensory cues in store environments can minimize perceived wait times.

Within the context of product assessment, the packaging of the item itself can hinder or support perceived multisensory coherence. Here, package design can positively influence consumer preference for a particular product (Schifferstein and Spence 2008). Packaging can also evoke associations about the product inside, such as sounds perceived when opening a product can lead to assumptions of freshness and crispiness of foods (Brown 1958). Thus, crispy paper or foil as a packaging material will be congruent with perceived freshness of food.

However, some studies have argued that cue congruity doesn't always lead to desired evaluations. Certain product categories or store environments may benefit from purposefully creating incongruent environments, such as high-end design stores (Schifferstein and Spence 2008) or modernists restaurants (Spence et al. 2014). Roggeveen, Goodstein, and Grewal (2014) apply the concepts of meaning and valence incongruity within the context of retail atmosphere. For example, meaning incongruity refers to retailers known for offering great visual merchandising also offering tactile opportunities, whereas valence incongruity reflects retailers not known for carrying expensive merchandise using atmospheric cues that connote high status.

Synopsis

The various studies establishing relationships between different sensory modalities provide guidance for creating congruent and harmonious consumption experiences. On one hand, multisensory perspective in atmospherics argues that customers perceived environments and servicescapes holistically (Spence et al. 2014). On the other hand, research on multisensory product experiences state that multiple sensory modalities guide consumers in product assessment (Schifferstein and Spence 2008). Yet, the interaction of atmospheric sensory cues and product sensory cues is still under-researched, especially within the marketing literature. Most of the studies identified above have their origin in psychology or other related areas. Thus, designing multisensory consumption experiences that allow consumers to extract value from a particular task or judgment completion needs to be further assessed within marketing research studies.

Therefore, the next section evaluates commonly applied measures that are used to assess sensation or sensory stimulations across various contexts. Further examining multisensory consumption experiences is only possible if appropriate instruments exist that assess the correct content area of the sensation construct. Considering that most of the discussed studies originate in psychology, the utilized measured might not correspond to sensation as defined in this dissertation. This question is further examined below.

Sensation Measures

Considering sensation and sensory stimulation is a component in frameworks across all three literature streams, a measure assessing individual differences or sensitivity to sensation should be an important tool in these studies. Essay 1 identifies the large variety of constructs that appear to be semantically related to sensation are evident in numerous studies. As sensation in those studies is more closely related to thrilling or arousal seeking, it is essential to examine the various measures utilized to test individual differences associated with sensation constructs. The subsequent elaboration reviews common measurement tools and its potential to assess sensation as defined within the scope of this dissertation.

Sensation Seeking Scale (SSS)

As examined in the previous essay, sensation seeking is one of the most common constructs associated with sensation and is defined as a "seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experience" (Zuckerman 1994, p. 27). The sensation seeking scale (SSS) is the standard test instrument to assess the

sensation seeking trait. The preliminary version of the scale, SSS II, is more general and includes items that express a desire to explore activities characterized by excitement, risk, or novelty (Zuckerman, Kolin, Price, and Zoob 1964). Subsequent studies and further analysis resulted in a new scale that incorporates the four dimensions of sensation seeking reflected by four sub-scales with representative items:

1) thrill and adventure seeking (TAS) – e.g. "I often wish I could be a mountain climber
2) disinhibition (Dis) – e.g. "I like wild 'unhibited' parties"
3) experience seeking (ES) – e.g. "people should dress in individual ways even if the effects are sometimes strange"
4) boredom susceptibility (BS) – e.g. "I can't stand watching a movie that I've seen before"

The most widely applied form of the sensation seeking scale is SSS-V developed by Zuckerman, Eysenck, and Eysenck (1978), which contains 40 questions with two possible items each. This scale incorporates forced choice responses in an effort to control for social desirability bias and assesses behavioral experiences, desires, attitudes, and intentions (Zuckerman 2004). According to Zuckerman (2008), the underlying assumption of "optimal" levels of stimulation essential to the conceptual construct of sensation seeking is also reflected in the scale, as items describe the intention or desire to experience activities causing unusual or novel sensations. Multiple studies have validated the scale content with self and/or pee rating of behaviors (Roberti 2004). Further, the scale is available in multiple languages, such as Arabic, Chinese, French, German,

Hebrew, and Finnish, and several cross-country studies confirm the four factor structure with a few items shifting from one factor to another (Zuckerman 1990).

Since the original items were developed in the 1960's and 1970's, wordings of some of the items became outdated and inappropriate which was corrected in the SSS-V scale published by Zuckerman (1994). For example, items such as "I stay away from anyone I suspect of being queer" are now worded as "I stay away from anyone I suspect of being 'gay or 'lesbian'." Another issue that presented itself in a few studies is the confounding of some items with dependent variables of interest (Zuckerman 2004). For example, items asking about the desire to take drugs or drink confounded in research of actual substance abuse. Zuckerman (2004) points out that removing confounding items or scales from the test tended to resolve the issues.

While SSS-V is the most commonly applied measure, shortened versions of the original scale exist. One example is the brief sensation seeking scale (BSSS-4) by Stephenson et al. (2003). This scale incorporates a five-point Likert scale format (1="strongly disagree" to 5="strongly agree") and consists of four items, such as "I would like to do frightening things." An even shorter version called SS-2 only utilizes two items to assess sensation seeking: 1) How often do you do dangerous things for fun? and 2) How often do you do exciting things, even if they are dangerous? (Slater 2003).

In addition to shortened versions, new scales closely aligned to sensation seeking are continuously introduced under labels such as novelty seeking, thrill seeking, experience seeking, and fun seeking. However, Zuckerman (2008) contents that these new scales might have a new title, yet many items are usually taken from existing scale. As a result, high correlations between new and existing measures are evident, which

limits content variation and potential contribution of introducing a new scale (Zuckerman 2008). Nevertheless, a few examples of related scales are explored below.

Impulsive Sensation Seeking (ImpSS)

The Impulsive Sensation Seeking Scale combines the two personality traits of impulsivity (Imp) and sensation seeking (SS), which are reflected in two distinct factors constituting the overall scale. It assesses a preference for uncertainty or change and a tendency to act without planning or further elaboration (Zuckerman, Kuhlman, Joireman, Teta, and Kraft 1993). The scale is one of five subscales of a comprehensive model of personality called the Alternative Five, which utilized the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) to determine specific traits. Zuckerman et al. (1993) developed 19 items as part of the ImpSS, with 11 items assessing sensation seeking and eight items measuring impulsivity. The measure incorporates a true/false format by assigning the values "0" to false and "1" to true. The scores of each subscale are added to create a composite score ranging from 0 to 19 (McDaniel and Mahan 2008). Sample items include "I usually think about what I am going to do before I do it" for impulsivity and "I tend to change interests frequently" for sensation seeking.

ImpSS is often compared to SSS-V and contains a number of advantages over the older scale. De Leo, Van Dam, Hobkirk, and Earleywine (2011) note that ImpSS is more parsimonious and exhibits fewer confounds than SSS-V. One suggested reason for limited confounding is that the scale does not include any specific activities, such as objectionable behaviors or culture-bond sporting activities (Zuckerman 2008). Thus, due to its shorter list of item and less specificity reflected by items, ImpSS has been increasingly used to assess sensation seeking (McDaniel and Mahan 2008).

Need Inventory of Sensation Seeking (NISS)

In response to the SSS-V which includes items expressing specific behaviors, Roth, Hammelstein, and Brähler (2007) develop the Need Inventory of Sensation Seeking (NISS) to measure sensation seeking as an overall need for stimulation. The new scale refrains from describing specific behaviors and positions sensation seeking as "a global need for stimulation based on varied, novel, complex, and intensive sensations and experiences" (Hammelstein and Roth 2010, p. 661). Based on the inclusion of the concept of need in this definition of sensation seeking, the NISS distinguishes itself from SSS-V and Zuckerman's conceptualization of sensation seeking as a desire or a tendency. Instead, the new scale follows Arnett's (1994) assumption that sensation seeking is quality of seeking intensity in sensory experiences, which can be achieved in multiple areas of life.

NISS is a 17-item measure consisting of two subscales: need for stimulation and avoidance of risk. Upon reading the different items, respondents rate how often they have felt this way in the past six months based on a five-point Likert scale (Hammelstein and Roth 2010). Align with the goal of avoiding specific behaviors, sample items include "I like loud music," "Finding myself in unfamiliar situations is exciting," and "I like to be aware of the excitement in my body."

Arnett's Inventory of Sensation Seeking (AISS)

In 1994, Arnett developed a new measure to assess a re-conceptualized sensation seeking construct that incorporates the concept of need. As previously mentioned, a need provides insights into the aim of a behavior but not about the way in which it is achieve. Thus, similar to the NISS, the AISS does not describe specific, risky, or socially-

undesirable behaviors (McDaniel and Mahan 2008). However, AISS is still based on the idea of high versus low level of arousal that is not limited to sensory stimulation within a consumption experience. Instead, items reflect behaviors across all aspects of life that can result in high physiological arousal. The overall scale consists of 20 items, which are divided into the two 10-item subscales, intensity (e.g. "When I listen to music, I like it to be loud") and novelty (e.g. "I can see how it would be interesting to marry someone from a foreign country") (Arnett 1994). As illustrated by the example items, intensity reflects the intensity of sensory stimulation, while novelty represents openness to experience (Carretero-Dios and Salinas 2008). All items are rated on a four-point Likert scale indicating the extent to which they describe the respondent.

While the shorter length of the instrument is perceived as an advantage over SSS-V, the internal consistency can be a reason for concern. McDaniel and Mahan (2008) report low reliability estimates, which can be explained by respondents choosing items based on face validity rather than psychometric analysis. Thus, the major reason for selecting AISS over SSS-V is the conceptualization of sensation seeking as a need rather than a seeking or desire.

Arousal Seeking Tendency (AST)

Arousal seeking is another individual difference characteristic that is closely aligned with sensation seeking. As previously established, both constructs utilize the theoretical premise of optimal arousal theory, which proposes that every individual has a preferred or optimal level of stimulation (Mehrabian and Russell 1974). With regard to arousal seeking tendency, individuals are assumed to have a preference for an environment that is in agreement with their preferred arousal level. Mehrabian and

Russell (1974) introduce the Arousal Seeking Tendency (AST) instrument to measure this tendency within individuals.

The AST comprises 40 scale items (16 positive and 16 negative) that are evaluated on a nine-point Likert scale ranging from -4 = "very strong disagreement" to +4 = "very strong agreement." Mehrabian and Russell (1974) suggest that the scale can either be used to create an overall index by summing the scores for all 40 items or that researchers can utilize the five underlying factors of the scale to determine factor-specific scores. While the authors do not clearly state which items correspond to a particular factor, the few examples provided in their book and the five source-specific factors itself are listed below:

1) Arousal from change (12 items): "I like to experience novelty and change in my daily routine" or "My ideal home would be peaceful and quiet"
2) Arousal from unusual stimuli (11 items): "It's unpleasant seeing people in strange, weird clothes" or "Designs or patterns should be bold and exciting"
3) Arousal from risk (9 items): "I sometimes like to do things that are a little frightening" or "I prefer friends who are reliable and predictable to those who are excitingly unpredictable"
4) Arousal from sensuality (5 items): "I never notice texture" or "I like to run through heaps of fallen leaves"
5) Arousal from new environments (3 items): "I would be content to live in the same town for the rest of my life" or "As a child, I often imagined leaving home just to explore the world"

The original AST scale was later revised by Mehrabian (1978). The result is a 32-item scale without an underlying five factor structure. However, the shorter scale still contains positively and negatively worded items and features the same nine-point Likert scale format. Both scales are largely utilized in numerous studies within various disciplines and are often utilized since the scales reflect a wider range of arousal seeking behaviors than alternative measures (Raju 1980). Cox and Cox (1994) also refer to the good performance of AST score on a variety of reliability and validity tests as a reason for its wide application.

Need for Touch

According to Krishna (2012), the sense of touch is the most influential sense when evaluating our environment. This assumption reaches as far back as Aristotle, who sees touch as a mechanism that provides human with the true nature of objects (Krishna 2012). In general, haptic studies center on three major areas: individuals touching products, individuals touching other humans, or products touching other products. One overarching contribution within this literature is the Need for Touch (NFT) scale developed by Peck and Childers (2003a), which detects individual differences with regard to touch preferences. NFT is based on motivational rather than ability differences among individuals and thus conceptually aligns with other scales incorporating a dichotomous differentiation or assessing individual's needs, such as hedonic and utilitarian shopping value (Babin, Darden, and Griffin 1994) or need for cognition (Cacioppo and Petty 1982). As such, need for touch is an overall preference for extracting and utilizing information gained through the haptic system (Peck and Childers 2003a).

The twelve-item NFT scale categorizes individual tactile differences based on high versus low need for touch. Items such as "Touching products can be fun" And "I place more trust in products that can be touched before purchase" are used to determine if an individual expresses high versus low need for touch tendencies. Research shows that high NFT people utilize material properties earlier during the product evaluation process and express a higher chronic accessibility to haptic information (Peck and Childers 2003a). These tendencies lead to greater confidence in product judgments when haptic stimulation is permitted (Peck and Childers 2003a; Krishna and Morrin 2008). In contrast, low NFT reflects a bimodal assessment by incorporating visual cues as well as haptic cues.

The scale reflects a two-factor structure with two distinct dimensions termed instrumental and autotelic need for touch. Each dimension consists of six items that can either be separately or simultaneously incorporated into studies since both factors correspond to different individual preferences. While autotelic is more emotional in nature and incorporates compulsive touching, the instrumental dimension is more functional and reflects touching with a specific objective (Krishna 2012). In addition, the autotelic sub-dimension is related to a hedonic-oriented response to touch with individuals seeking fun, enjoyment, or higher sensory stimulation (Peck and Childers 2006). Most studies limit product assessment on high versus low autotelic NFT on a variety of outcomes, such as purchase intention (Peck and Childers 2006), confidence (Peck and Childers 2003b), affective response (Peck and Wiggins 2006), and frustration (Peck and Childers 2003b).

As evident by the steady stream of research incorporating NFT scale, assessing individual differences with regard to utilizing, preferring, and needing sensory information for task completion is of interest to researchers. However, the NFT is limited to haptic sensation and thus does not assess an individual's sensitivity or preference for overall sensory stimulation. As a result, a more general scale assessing sensation tendencies is needed to develop positive sensational consumption experiences.

Cross-Sensory Heterogeneity Index

One example of a measure that acknowledges the importance of considering more than one sense and the interplay of different senses is the Cross-Sensory Heterogeneity Index (CSHI) developed by Coulter and Chowdhury (2006). This specific measurement tool is used to determine consumer tendency to engage in multi-sensory imaging. Multi-sensory imaging refers to consumers articulating thematic meanings consistently across multiple senses (Coulter and Chowdhury 2006). Thus, the index is based on sensory metaphors at its meanings which consumers associate with regard to a specific topic. The CHSI incorporates three distinct measures:

1) N – total number of meanings expressed across all senses;
2) U – total number of unique meanings expressed across all senses; and
3) H – number of homogenous pair-wise connections for the individual.

These three variables are used to compute a pairwise connection homogeneity ratio (F), which is used to derive at the final CSHI score. In general, the index ranges between 0 and 1, with a higher value indicating that an individual named a greater number of meanings and more heterogeneous meanings across senses.

While this measure assesses multisensory stimulation, its applicability is limited to sensory imaging. Also, to this date the index is not featured in additional studies within sensory, atmospherics, or service research areas, making an assessment of validity challenging. Thus, an alternative measure that taps into multisensory sensation is still lacking.

Synopsis

The tendency of sensation to represent various meanings, interpretations, and constructs is also evident in common measures incorporated in studies attempting to assess sensation as an individual difference variable. Existing instruments assessing sensational experiences are methodologically as well as semantically more closely related to risky behavior, high arousal, or variety seeking (Zuckerman 1990; Mehrabian and Russell 1974). While one individual measurement tool does assess a person's preference for tactile information, the scale is limited to one sense: touch (Peck and Childers 2003a). Other scales, such as SSS-V or ImpSS, are too narrowly examining sensation based on intense or extreme level of sensation to be considered for application in quantitative sections of this dissertation. Also, AST items are proposed to represent a factor of arousal from sensation, yet sensation items focus more on arousal seeking behaviors and do not reflect sensation experienced when handling a product. Thus, upon reviewing current measurement tools related to the concept of sensation or sensation seeking, no instrument appears to reflect the content area of sensation as defined in this project and as aligned with the biochemical process of sensory stimulation. Furthermore, not one of the assessed

scales seems to appropriately reflect the multisensory aspect of consumer sensation, which is a necessary precondition to examine multisensory consumption experiences.

Need for Sensation

In contrast to assuming sensation reflects high risk or high arousal experiences, the current study positions need for sensation as a tendency of consumers to extract value from a consumption experience through multiple sensory inputs (sensations). Established in Essay 1, the positioning of sensation as a more incidental and natural response to sensory stimulation aligns more closely with need based categorization of traits by Murray (1938). Thus, the terminology of need for sensation for a new scale seems more appropriate than reflecting the idea of seeking and arousal commonly applied in scales such as SSS-V, ImpSS, and AST. Therefore, the new need for sensation scale will share conceptual connotations with the Need Inventory of Sensation Seeking (NISS) and Arnett's Inventory of Sensation Seeking (AISS), since both scales incorporate motivational rather than ability differences among individuals. This conceptualization also follows suit with Need for Touch (NFT) and other individual's need instruments applied within marketing studies. It is proposed that need for sensation will be able to differentiate between high versus low need for sensation people.

Another important element to consider when developing a new scale is the nature of humans to experience multisensory stimulation. The only instrument described above that reflects a multisensory orientation is the Cross-Sensory Heterogeneity Index. However, this index focuses on multisensory imaging and does not consider multisensory stimulation in a broader sense. Thus, while prior scales such as need for touch assess one specific sensation, a scale that reflects the holistic sensation perspective suggested by

prior research has yet to be developed. Furthermore, the previously introduced differentiation between focal and non-focal sensations can add deeper insights into ways consumers extract value from consumption experiences. As argued by Meyers-Levy, Zhu, and Jiang (2010), consumers depend on different sensory input depending on the availability of these cues. For example, instead of utilizing visual input (focal sensation) to assess a product, bodily sensations (non-focal sensation) can supplement visual information in the judgment process. These different methods of examining a consumption experience should be incorporated in a new need for sensation scale.

The assessment of established literature, concepts, and scales associated with sensation support the new positioning of need for sensation away from the sensation seeking content area originated in the psychology literature. Since current measures are based on domains that utilize sensation seeking definitions, a new scale needs to establish a domain and a new definition prior to developing items. As such, the proposed working definition of need for sensation is:

"The manner by which consumers extract or detract value from a consumption experience through multiple sensory inputs (i.e. sensation), both focal and non-focal sensation."

To accurately capture this individual difference, a new scale needs to be developed capable of distinguishing between varying levels of sensation that contribute to an individual's overall consumption experience. As such, common scale development procedures will be applied to generate an extensive item pool based on input received from the focus group interviews discussed in Essay 1. In addition, previously established scales and experts will guide the item generation process prior to following necessary item reduction and purification procedures. The anticipated outcome is an exhaustive

scale that assesses need for sensation levels, identifies individual's tendency to utilize focal or non-focal sensation in task completion, and applies across atmospheric, services, and sensory studies alike.

Scale Development Methodology

The current study relies on established methods of scale development and incorporates assessment of multi-item measures (Churchill 1979; Gerbing and Anderson 1988) as illustrated by Babin, Darden, and Griffin (1994), Peck and Childers (2003a), and others. The general procedure of developing new measures follows a sequence of steps including: 1) domain specification; 2) sample item generation; 3) data collection; 4) measure purification; 5) new data collection; 6) reliability assessment; 7) validity assessment; and 8) norm development. An essential consideration in this procedure is the utilization of various data sets within the different stages of the scale development process. Especially exploratory and confirmatory factor analyses need to be conducted with different samples to accurately assess unidimensionality (Gerbing and Anderson 1988). Aligned with these traditional procedures, the current study encompasses various steps, including expert judgment, preliminary item assessment, and purification steps, prior to testing the final scale and establishing validity. Further, data are collected by utilizing student samples as well as online sampling techniques.

The first step within scale development is to clearly establish domain specification and define the construct. Based on the extensive review of the existing literature, need for sensation is repositioned and defined as "the manner by which consumers extract or detract value from a consumption experience through multiple

sensory inputs (i.e. sensation), both focal and non-focal sensation." This working definition acts as a guide in the identification of preliminary items. Table 3.1displays these preliminary items generated based on thorough review of established literature and on findings from focus group interviews described in the previous essay.

Development of Preliminary Items

The aforementioned definition of sensation seeking is compared to existing measures tapping into the content area of sensation to identify potential items. These previously developed items utilized heterogeneous samples that reflect various age groups and other demographic characteristics. In addition, input gained from focus group interviews outlined in Essay 1 influenced item development and wording. For example, since focus group participants identified smell as an influential factor in leaving the store, an item reflecting this assumption is added to the item pool. In general, three different kinds of items were developed: 1) sense specific items, 2) multisensory items, and 3) general sensation items. Sense specific items focus on identifying focal sensations of value to consumers when being in a consumption environment ("I prefer service environments that are colorful"). To distinguish between focal and non-focal sensation, a few items are worded to highlight non-focal sensation. For example, the item "I can just as well have crunchy or smooth peanut butter, as long as the taste is okay" emphasizes the non-focal sensation of texture while asking about the focal sensation of taste. Further, general sensation items are developed to identify individuals with an overall high sensitivity or desire for sensation, such as "I prefer an environment that simulates all my senses." Positively and negatively worded items are also included to reflect high or low

need for sensation. Two items from previously established scales are also added to compare performance among items later on. The total preliminary item pool includes 70 items, which are listed in Table 3.1 on the following pages.

Table 3.1 - Overview of Preliminary Item Pool

#	Item	Eliminated			Wording Adjusted	
		Stage 1	Stage 2	Stage 3	Stage 1	Stage 2
1	It's hard to tell how comfortable clothes will be without feeling them on you.					
2	Good French bread makes a specific sound when cutting into it.				✓	
3	Sometimes an environment smells so bad, I can taste it.	✓				
4	You can judge a service employee by the way they look.		✓			
5	I enjoy eating outside because of the sights, sounds, smell, and feeling of the outdoors.					
6	You can tell enough about most products to make a good decision from written descriptions.				✓	
7	I would prefer to shop in a supermarket than in an outdoor market.	✓				
8	A sticky carpet in a service environment is a sign of poor quality.		✓			
9	Chocolate has to have a certain texture in your mouth to be good.					
10	The sound of a dental office makes me nervous.				✓	
11	I usually go to stores that have pleasant and stimulating environments.	✓				
12	I avoid reading eBooks because I miss the sensation of regular books.				✓	
13	I don't enjoy eating hard candy because it is too crunchy.	✓				
14	A service environment without background music is awkward to me.	✓				
15	The touch of a salesperson's hand can be comforting.				✓	
16	I'm ok with buying a new car that does not have a new car smell.					
17	A poorly lit store is a sign of selling low quality products.					
18	A variety of pictures of a product provide enough information to make a purchase decision.					
19	When I buy summer clothes, I prefer a store that is bright and warm to reflect the summer season.					
20	I understand why some people thumb melons when choosing which one to buy	✓				
21	An extreme temperature in a store could make me leave the store quickly.		✓			✓
22	I'm quick to notice if a store clerk is wearing too much cologne.		✓			
23	Background music annoys me.					
24	I can just as well have crunchy or creamy peanut butter, as long as the taste is okay.					
25	Pictures can never replace the information you get from physically handling a product.					

Table 3.1 - Overview of Preliminary Item Pool (continued)

#	Item	Eliminated			Wording Adjusted	
		Stage 1	Stage 2	Stage 3	Stage 1	Stage 2
26	When sitting next to a stranger, I immediately notice bad body odor.		✓			✓
27	I prefer an environment that stimulates my senses.					
28	I am very sensitive towards sensory stimulation.				✓	
29	I have decided against buying a product like a towel because it smelled bad.					
30	I find it challenging to purchase a product online because I can't physically inspect it.					✓
31	I feel most comfortable in quiet environments.		✓			
32	All bottled water feels the same.				✓	
33	The texture of food does not influence its taste.		✓			
34	I don't care what my doctor looks like.	✓				
35	I need total quiet to make a good choice.		✓			
36	I tend to smell gifts when opening them.					✓
37	I find the environment in a coffee shop pleasantly stimulating.				✓	
38	I rarely complain about the temperature of a service environment.					
39	A quiet environment is necessary to make an accurate decision.					
40	I prefer to sit outside when restaurants have a patio area.	✓				
41	I continually seek out environments with new and exciting sensations.	✓				
42	You can tell the quality of a glass by the way it sounds when you tap it.					
43	It annoys me when a waitress touches my shoulder while taking my order.	✓				
44	Environments with thousand of exotic fragrances and scents make me anxious.	✓				
45	I find background music intruding.				✓	
46	I enjoy using all my senses when evaluating a product.					
47	At Christmas time, the sound of Christmas music in a store is just right.		✓			✓
48	The smell of fresh air relaxes me.		✓			
49	An unexpected texture can make food taste bad.	✓				✓
50	A supermarket has to have bright lighting for me to shop in.					✓
51	Meat should be packaged to allow one to see the color of the meat before buying it.		✓	✓	✓	

Table 3.1 - Overview of Preliminary Item Pool (continued)

#	Item	Eliminated			Wording Adjusted	
		Stage 1	Stage 2	Stage 3	Stage 1	Stage 2
52	I do not want any sensory stimulation when I need to focus.		✓			
53	It makes it difficult for me to make a decision when other customers loudly talk to employees.					✓
54	It's important to feel bedding prior to purchasing it.		✓			
55	Shops should be plain and quiet to get the shopping done faster.					
56	I will not buy produce unless I can check for firmness and bruises.			✓		
57	I do not need a stimulating environment to shop in.					✓
58	I avoid stores with strong scents.					✓
59	The color of an eggshell is important in determining which eggs to buy.	✓				
60	I should smell the scent of freshly made popcorn in a theater.		✓			
61	I will leave a service environment if it's too stimulating.					
62	If a store smells bad, I only get what I need and do not shop around.		✓			
63	When I see another customer touching a product, I will not buy that particular item.	✓				
64	I prefer service environments that are colorful.					
65	I like to use all my senses to assess a product before purchasing it.		✓			
66	I don't care what products smell like.				✓	
67	I find that the smells of a grocery store encourages me to quickly get what I need.					✓
68	I'm sensitive towards the shape of ice (cubed or crushed) in my drink.					
69	I am continually seeking new ideas and experiences. (ORIGINAL SCALE ITEM)					
70	Shops with thousands of exotic herbs and fragrances fascinate me. (ORIGINAL SCALE ITEM)					

Initial Scale Development

Initial quantitative analysis is conducted to assess preliminary items. This section of the scale development procedure includes three stages that use diverging samples with regard to type of respondent and sample size. The first stage includes item assessment based on representativeness of content area by four experts. During the second stage, undergraduate students rate remaining items on a seven-point Likert scale. Lastly, 79 student respondents report the degree to which the items describe them completely or do not describe them at all.

Stage 1

The first stage of item assessment includes four experts to establish representativeness of scale domain. These four experts are marketing academics, with one of the experts having a background in sensory marketing. Gender is equally distributed (female = 2; male = 2) and the average age is 36 years. The 70 items are matched to the provided definition of need for sensation by assigning values from 1 = "does not match at all" to 3 = "matches a lot." Any items classified by all judges as "does not match at all," compared to the NFS definition are eliminated at this stage. In addition, items primarily rated as "matching a little" are further evaluated and adapted to more accurately match the definition. At the end of stage 1, a total of 14 items are deleted and 11 items are reworded while maintaining the same content.

Stage 2

To further assess the items and to receive additional feedback from a different audience, a small group of students (N=19) were asked to respond to an online survey for

bonus points. The survey encompasses the remaining items in addition to demographic questions, which is provided to undergraduate students from a large southern university. Each respondent receives the following instructions:

"A Consumer's shopping experience is impacted by all physical senses (taste, smell, feel, sound, sight). When responding to the statements listed below, think about how you respond to different shopping environments relative to other consumers."

Based on the instructions, respondents rate every proposed scale item on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree). The order of the items is completely randomized. The sample consists of 19 students (female = 42%) with a mean age of 23 years. The majority of the respondents are senior-level undergraduates (89%) and marketing majors (63%). Respondents report an average involvement with shopping activities of 72 out of 100 with responses ranging from 25 to 100, a median of 80, and a mode of 50.

An initial analysis looked for "no brainer" items that tend to produce constant responses (Babin and Zikmund, 2016). Items with low variance are eliminated from the item pool. Specifically, any item with a mean within 1 point of either scale end-point becomes a candidate for deletion with this approach. Items that are assumed to be misunderstood by respondents are adjusted and remained in the item pool. For example, the item "the touch of a salesperson's hand can be comforting" is reworded to "when trying on clothes, the helpful touch of a salesperson can be reassuring" to avoid any potential misunderstandings. As a result, elimination of 16 items and rewording of 11 items leads to an item pool of 51 items.

Stage 3

The final preliminary 51 items are examined further using a sample of 91 undergraduate and graduate students of the same university. As an incentive, students received bonus points awarded by their professors for survey completion. The survey instructions are slightly adapted to the following:

"Consumer experiences can be shaped by numerous physical senses (taste, smell, feel, sound, sight). The items below concern how sensitive you, as a typical consumer, are to various sensory elements when shopping, being served, or when consuming some product.
When responding to the items below, think about how you respond to differing sensations during a shopping/service/consumption experience relative to other consumers."

In contrast to before, respondents now use a seven-point Likert scale with anchors 1 = "does not describe me at all" to 7 = "describes me completely" to assess the items. The instructions and anchors are altered based on respondent feedback. The new instructions and anchors focus more on the person itself and help individuals relate item contents to their own behavior. The order of the items is again completely randomized. The survey includes demographic variables and questions pertaining to usual shopping behavior in addition to the scale items of interest.

After eliminating 12 survey responses that are only partially completed, the final sample consists of 79 useful responses (female = 41%; age_m = 22 years). While the majority of the students are seniors with 46 percent, 10 percent of the sample indicates a classification of graduate student or sophomore. Represented majors range from accounting (10%) to marketing (11%) and CIS (10%). Also, 58 percent of the sample selects Caucasian in responding to a racial background item.

Mean and variance are computed for all 51 scale items. Any item with a mean of above 5.5 or below 2 is subject to removal to avoid scale items that majority of

respondents would either agree or disagree with and thus, not accurately reflect both sides of the need for sensation construct. Items yielding means so close to either end or suppressing variance and/or reflecting little meaningful content (sometimes called "no-brainer" items) are also considered for deletion. As a result, two additional items are removed from the item pool. Since sample size is not sufficiently large and the pool of items still too comprehensive, an exploratory factor analysis is not suitable for item reduction at this time. Therefore, a variety of assessment tools are used to determine items for elimination. These tools include for example means, item-total correlation, principal component analysis (PCA) loadings, and communalities. Thus, items that show no evidence of communality with others, as evidenced by communalities below 0.3 or low item-total correlation, and that do not seem to reflect unique content are flagged for potential deletion.

Upon examining the items based on the tools outlined above, ten additional items are deleted leading to a total of 37 items (Table 3.2 - Preliminary Scale Items after Stage 3). While the current pool of items still contains items that are similar in wording, the applied techniques do not provide enough justification to remove any of these items. Therefore, additional data will be collected to further purify the remaining 37 items. Specifically, the next step of the scale development process includes the collection of a big enough sample to conduct an exploratory factor analysis to examine the number of dimensions and to identify items with low factor loadings.

Table 3.2 - Preliminary Scale Items after Stage 3

ITEM	N	MEAN	VARIANCE
An unusual texture can make food unappealing.	81	5.09	3.20
I have decided against buying a product like a towel because it smelled bad.	80	4.83	3.11
I prefer service environments that are colorful.	86	4.78	1.94
The packaging of water (i.e., type of bottle) does not impact the taste of the water itself.	86	4.63	4.10
At Christmas time, the sound of Christmas music in a store makes shopping better.	82	4.63	3.96
A supermarket should have bright lighting to make for a good shopping experience.	79	4.51	2.38
An extremely cold store could make me leave the store quickly.	86	4.50	4.23
I enjoy eating outside because of the sights, sounds, smell, and feeling of the outdoors.	86	4.49	2.54
It makes it difficult for me to make a decision when other customers are loudly talking to employees or each other.	80	4.40	2.60
I enjoy using all my senses when evaluating a product.	80	4.35	2.84
The type of ice (cubed or crushed) in my drink affects how much I like the drink.	80	4.33	4.35
When sitting next to a stranger on a plane and we are incidentally touching each other, it makes the flight seem a lot longer.	88	4.32	3.90
I prefer an environment that stimulates all my senses.	80	4.31	2.04
The sights, sounds, smells, and feeling of an outdoor market make shopping better than in a store where the environment is cont	83	4.30	2.33
When I buy summer clothes, I prefer shopping in a store that is bright and warm to reflect the summer season.	82	4.24	3.00
I like to smell products when I take them out of a box.	80	4.24	2.97
A supermarket has to have bright lighting for me to shop in.	82	4.23	2.58
I rarely complain about the temperature of a service environment.	83	4.22	3.49
When reading eBooks, I miss the sensations of handling a real book.	82	4.15	4.74
I am very sensitive towards sensory stimulation in a shopping environment.	86	4.03	2.48
I prefer environments with new and exciting sensations over more familiar sensations.	80	4.01	2.19
The sights, sounds, smells, and feeling of an outdoor market make me a better shopper.	81	3.93	2.74
I will leave a service environment if it's too stimulating.	81	3.88	2.86
Unless I buy fragranced products, the smell of products is not important to me.	80	3.84	2.57
I avoid stores with strong scents.	81	3.84	2.54

Table 3.2 - Preliminary Scale Items after Stage 3 (continued)

ITEM	N	MEAN	VARIANCE
A variety of pictures of a product provide enough information to make a purchase decision.	87	3.82	2.97
Chocolate has to have a certain texture in your mouth to be good.	86	3.80	4.18
I can just as well have crunchy or creamy peanut butter, as long as the taste is okay.	81	3.80	5.04
Strong scents in stores do not influence my shopping behavior.	80	3.79	2.30
A quiet environment is necessary to make an accurate purchase decision.	83	3.65	2.55
The sound of a dental office makes me nervous, particularly while waiting to be seen.	81	3.65	3.83
I know if French bread will taste good by the sound it makes when cutting into it.	80	3.44	3.87
I find that the smells of a grocery store encourage me to quickly get what I need and leave.	88	3.32	3.37
I visit coffee shops for the pleasant sensation and not only for the coffee.	88	3.32	4.01
I find background music unnecessary in a consumption environment.	86	3.21	2.64
You can tell the quality of a glass by the way it sounds when you tap it.	88	3.01	3.46
You can tell enough about most products from written descriptions, so you don't really need to handle them.	81	3.01	2.21
I am continually seeking new ideas and experiences. (ORIGINAL SCALE ITEM)	88	5.16	2.16
Shops with thousands of exotic herbs and fragrances fascinate me. (ORIGINAL SCALE ITEM)	86	3.45	4.16

Scale Purification

Once a set of initial scale items is finalized, the scale development procedure shifts towards further scale purification and item reduction. Thus, stage 4 involves quantitatively exploring the dimensional space and refining the individual item pool. Specifically, exploratory factor analysis (EFA) produces insight into the underlying dimensional structure of the construct and allows for further item reduction. Stage 5 confirms the proposed measurement theory through implementation of confirmatory factor analysis (CFA). In line with established scale development procedures, both steps utilize different samples to control for effects or potential biases introduced by the sample and to allow for greater generalizability.

Stage 4

To further assess and purify the remaining 37 items, a new survey is designed and administered by utilizing the online survey platform Qualtrics. As part of the survey design step, scale items are finalized and a few adjustments are made. Particularly, seven items are reworded to more accurately fit the domain of need for sensation, such as "I prefer service environments that are colorful" is changed to "service/shopping environments that are very colorful are better than ones with simple colors." An additional 11 items are included into the item pool, which are based on previously eliminated items and mirror the wording of items of established scales (need for touch and value). For example, the item "an experience that engages all my senses is more fun than work" derives from hedonic value, while items such as "I make better choices when I can touch, see, smell, hear and taste products" and "as a consumer, I am aware of all my

senses" are influenced by need for touch. Therefore, analysis moves forward with an item pool of 50.

The survey includes two screener questions – are you at least 18 years of age? Are you currently living in the USA? – and five attention checks (e.g., please select "strongly disagree"). In addition, household panel data and a gender split of 50/50 assured adequate generalizability. Consistent with the previous survey, respondents evaluate need for sensation scale items on a seven-point Likert scale anchored at 1 = "does not describe me at all" to 7 = "describes me completely." Complete randomization controls for potential order effects. The questionnaire includes scales assessing usual shopping behavior, value perceptions, emotions, and demographic variables.

The initial sample of 213 respondents is reviewed for potential removal of responses and identifies 33 questionable surveys based on: a) straight-lined responses with low long-string value (17) or high long-string value (13); b) patterns in responses (2); and c) time concerns due to fast survey completion (1) (Babin and Zikmund 2016). After collecting an additional 23 responses and further evaluating the quality of the data, 9 responses are removed due to high string values (2) or low variance (7). The final sample of 224 consumers consists of 50.8% females with an average age of 50 years. The majority of respondents either completed some college (29.5%) or graduated with a Bachelor degree (30.4%). Further, 83.1 percent of the sample indicates Caucasian as their racial background. Sample statistics are summarized in Table 3.3.

Table 3.3 - Exploratory Scale Development Sample Descriptive Statistics

Variable	n	%	Variable	n	%
Gender			**Education**		
Male	110	49.1	High School	40	17.9
Female	114	50.8	Some College	66	29.5
Age			Bachelor	68	30.4
22-30	18	8.0	Master	34	15.2
31-40	42	18.8	Doctorate	5	2.2
41-50	42	18.8	Other	10	4.5
51-60	60	26.8	**Ethnicity**		
61-70	54	24.1	Caucasian	187	83.1
> 70	8	3.6	African American	17	7.5
			Hispanic	12	5.3
			Asian	5	2.2
			Other	3	1.3

Prior to examining the underlying dimensionality, items are initially screened by estimating and comparing means, variances, and communalities. Since the primary objective at this stage remains item reduction, communalities are computed with principal component analysis (PCA). Table 3.4 depicts the entire set of 50 items, their means, variances, and communalities. Items with a low variance (~2) and a mean greater than 5 are flagged for potential removal and further examined by looking at the wording as well as content of the items. In addition, among similarly worded items, items with the most promising results based on the aforementioned criteria are retained. Items lacking communality with others evident by computed communalities of below 0.6 are eliminated. Overall, 35 items remain in the item pool based on additional elimination of 13 items and exclusion of 2 original scale items.

Table 3.4 - Scale Purification – Communalities

ITEM	MEAN	VARIANCE	COMMUNALITIES
A variety of pictures of a product provide enough information to make a purchase decision.	3.84	3.23	0.67
An unusual texture can make food unappealing.	3.37	2.55	0.76
You can tell the quality of a glass by the way it sounds when you tap it.	4.50	2.29	0.77
I find that the smells of a grocery store encourage me to quickly get what I need and leave.	4.33	2.79	0.79
Browsing engages all my senses.	3.76	3.71	0.72
I visit coffee shops for the pleasant sensation and not only for the coffee.	4.62	3.97	0.50
Service/shopping environments that are very colorful are better than ones with simple colors.	5.07	2.07	0.72
An extremely stimulating environment makes it difficult for me to focus on making a purchase.	4.94	2.72	0.54
I don't worry about water packaging (i.e., type of bottle) because it does not impact the quality of the water at all.	5.00	3.74	0.62
I enjoy eating outside because of the sights, sounds, smell, and feeling of the outdoors.	4.41	3.12	0.61
An experience that engages all my senses is more fun than work.	4.62	4.45	0.66
I find background music unnecessary in a consumption environment.	4.63	3.91	0.68
I know that chocolate has to have a certain texture in your mouth to be good.	3.50	3.02	0.66
I need a supermarket with bright lighting to make for a good shopping experience.	4.89	3.22	0.65
I prefer an environment that stimulates all my senses.	4.21	4.40	0.71
I am very sensitive towards sensory stimulation in a shopping environment.	4.51	3.78	0.61
It makes it difficult for me to make a decision when other customers are loudly talking to employees or each other.	3.63	3.15	0.61
I enjoy the "feel" of a stimulating environment, even if I don't intent to make a purchase.	4.77	3.10	0.62
I need a quiet environment to make an accurate purchase decision.	4.03	3.96	0.62
I make better choices when I can touch, see, smell, hear and taste products.	5.52	1.69	0.64
When I buy summer clothes, I prefer shopping in a store that is bright and warm to reflect the summer season.	4.57	2.74	0.69
I enjoy using all my senses when evaluating a product.	4.96	2.11	0.74
The type of ice (cubed or crushed) in my drink affects how much I like the drink.	3.96	4.07	0.63
I rarely complain about the temperature of a service environment.	4.70	3.01	0.68
I like to smell products when I take them out of a box.	4.66	2.94	0.64
I prefer environments with new and exciting sensations over more familiar sensations.	4.23	2.35	0.64
A supermarket has to have bright lighting for me to feel comfortable shopping.	5.01	2.25	0.76
The sights, sounds, smells, and feeling of an outdoor market make shopping better than in a store where the environment is controlled.	4.49	2.47	0.72
Strong scents in stores do not influence my shopping behavior.	3.95	3.24	0.55
I like all my senses to be highly stimulating when exploring consumption alternatives.	4.33	2.37	0.71
Unless I buy fragranced products, the smell of products is not important to me.	3.73	3.14	0.73

Table 3.4 - Scale Purification – Communalities (continued)

ITEM	MEAN	VARIANCE	COMMUNA-NALITIES
I know if French bread will taste good by the sound it makes when cutting into it.	3.84	3.23	0.67
You can tell enough about most products from written descriptions, so you don't really need to handle them.	3.37	2.55	0.76
I prefer environments that stimulate all my senses rather than pleasing only one sensation.	4.50	2.29	0.77
The sights, sounds, smells, and feeling of an outdoor market make me a better shopper.	4.33	2.79	0.79
I avoid stores with strong scents.	3.76	3.71	0.72
The sound of a dental office makes me nervous, particularly while waiting to be seen.	4.62	3.97	0.50
As a consumer, I am aware of all my senses	5.07	2.07	0.72
Good food is good food no matter what the atmosphere is like.	4.94	2.72	0.54
At Christmas time, the sound of Christmas music in a store makes shopping better.	5.00	3.74	0.62
It must be difficult for blind people to assess the quality of a store.	4.41	3.12	0.61
When reading eBooks, I miss the sensations of handling a real book.	4.62	4.45	0.66
I have decided against buying a product like a towel because it smelled bad.	4.63	3.91	0.68
If I can't evaluate an item with all my senses, I will not consider buying it.	3.50	3.02	0.66
An extremely cold store could make me leave the store quickly.	4.89	3.22	0.65
I can just as well have crunchy or creamy peanut butter, as long as the taste is okay.	4.21	4.40	0.71
When sitting next to a stranger on a plane and we are incidentally touching each other, it makes the flight seem a lot longer.	4.51	3.78	0.61
I will leave a service environment if it is too stimulating.	3.63	3.15	0.61
I am continually seeking new ideas and experiences. (ORIGINAL SCALE ITEM)	4.77	3.10	0.62
Shops with thousands of exotic herbs and fragrances fascinate me. (ORIGINAL SCALE ITEM)	4.03	3.96	0.62

Exploratory factor analysis (EFA) with PCA extraction followed by Varimax rotation enables examination of dimensionality and provides additional insights into further item purification. PCA is particularly useful in identifying items with low correspondence to an underlying dimension. To improve and further validate the initial 8-factor structure, items with low factor loadings (below 0.50) and/or high cross-loadings (above 0.40) are deleted (Hair, Black, Babin, and Anderson 2006). Preliminary results lead to a three factor solution encompassing 18 items, explaining 59.3% of the total item

variance, and reflecting three distinct facets of sensation named: 1) Sensory Enjoyment; 2) Shopping Improvement; and 3) Sensory Avoidance. The next step involves confirming and validating factor structure by running separate EFA and reliabilities for each factor.

I explored the possibility that some items in the deleted pool may actually work well empirically with the reduced item battery. Previously eliminated items that seem to fit semantically and contextually with the new factor are added individually to see if factor loadings support inclusion of items. For example, two items that address sensory stimulation in an outdoor market now load on the second factor, while a third item that encompasses dining outside loads on sensory enjoyment. In addition, all items that reflect multisensory product evaluation are combined into one analysis to examine the possibility of adding a fourth factor.

The resulting exploratory factor analysis suggests a four-factor solution based on Kaiser's Rule (Eigenvalues > 1) including 25 items and the following dimensions: 1) Sensory Enjoyment – seven items; 2) Shopping Improvement – eight items; 3) multisensory product evaluation – five items; and 4) Sensory Avoidance – five items (Table 3.5 - Initial Scale Development Results (Exploratory Factor Structure, Principal Component Analysis with Varimax Rotation)). Reliability analyses show alpha coefficients for each factor above the established threshold of 0.70 (Nunnally 1978), except for sensory avoidance. Upon examination of item-total correlations, the sensory avoidance factor reflects relatively low correlations. However, at this point inclusion of a factor reflecting the preference for absence of sensory stimulation is theoretically preferred.

As outlined by Hair, Black, Babin, and Anderson (2010), the most representative and parsimonious set of factors should be aimed for. Therefore, the need for sensation domain is more comprehensively represented by items that not only grasp the enjoyment and value extracted from the multisensory environments and product evaluations, but also the preference for limited sensory stimulation in consumption environments. In addition, Hair et al. (2010) recommends considering +/- one factor solutions for possible clarity in meaning. Thus, instead of examining only a three-factor solution, two- and four-factor solutions should also be considered. Acknowledging the complexity of need for sensation, limiting the construct to a two-factor structure seems inadequate to reflect the holistic nature of sensory stimulation in consumption environments. As such, the subsequent analysis will focus on examining a three- and four-factor solution for need for sensation. By decreasing the item pool to 25 for the next step in the scale development process, noise should be further eliminated and a cleaner factor structure of the remaining items should emerge during the confirmatory factor analysis (CFA).

Table 3.5 - Initial Scale Development Results (Exploratory Factor Structure, Principal Component Analysis with Varimax Rotation)

	Loading				
Scale and Item	**Sensory Enjoyment**	**Shopping Improvement**	**Multisensory Product Evaluation**	**Sensory Avoidance**	**Item-Total-Correlation**
Sensory Enjoyment:					
I prefer an environment that stimulates all my senses.	0.85				0.77
I enjoy the "feel" of a stimulating environment, even if I don't intend to make a purchase.	0.82				0.74
An experience that engages all my senses is more fun than work.	0.76				0.70
I like all my senses to be highly stimulating when exploring consumption alternatives.	0.72				0.66
Browsing engages all my senses.	0.67				0.63
I prefer environments with new and exciting sensations over more familiar sensations.	0.65				0.61
I enjoy eating outside because of the sights, sounds, smell, and feeling of the outdoors.	0.51				0.48
Shopping Improvement:					
The sights, sounds, smells, and feeling of an outdoor market make me a better shopper.		0.88			0.79
The sights, sounds, smells, and feeling of an outdoor market make shopping better than in a store where the environment is controlled.		0.77			0.69
I prefer environments that stimulate all my senses rather than pleasing only one sensation.		0.75			0.70
When I buy summer clothes, I prefer shopping in a store that is bright and warm to reflect the summer season.		0.64			0.59
I am very sensitive towards sensory stimulation in a shopping environment.		0.59			0.54
At Christmas time, the sound of Christmas music in a store makes shopping better.		0.52			0.47
I know if French bread will taste good by the sound it makes when cutting into it.		0.52			0.46
Service/shopping environments that are very colorful are better than ones with simple colors.		0.51			0.48
Multisensory Product Evaluation:					
I enjoy using all my senses when evaluating a product.			0.83		0.71
As a consumer, I am aware of all my senses			0.76		0.67
I like to smell products when I take them out of a box.			0.70		0.61
I make better choices when I can touch, see, smell, hear and taste products.			0.66		0.59
If I can't evaluate an item with all my senses, I will not consider buying it.			0.51		0.46
Sensory Avoidance:					
I will leave a service environment if it is too stimulating.				0.69	0.51
An extremely stimulating environment makes it difficult for me to focus on making a purchase.				0.59	0.47
I need a quiet environment to make an accurate purchase decision.				0.58	0.44
I avoid stores with strong scents.				0.47	0.38
I find that the smells of a grocery store encourage me to quickly get what I need and leave.				0.32	0.27
Cronbach Alpha	0.87	0.85	0.81	0.66	

Stage 5

While stage 4 provides insights into the underlying structure of the need for sensation construct, stage 5 validates this structure with confirmatory factor analysis (CFA). As discussed by Gerbing and Anderson (1988), a new sample is necessary to conclusively confirm the proposed measurement theory. Therefore, 154 undergraduate and graduate students completed an online survey in exchange for bonus points. The new survey includes the 25 scale items encompassing the previously identified four-factor structure of need for sensation. One item was slightly reworded to more accurately reflect the sensory enjoyment component and to introduce valence: "Browsing is enjoyable when it engages all my senses" rather than "browsing engages all my senses." Both items are included to allow the most suitable wording to be confirmed in the following analysis. The same seven-point Liker scale (1 = "does not describe me at all" to 7 = "describes me completely") is used by students to assess the scale items. The complete survey also features measures for value perceptions, emotions, shopping behavior, and demographic.

After removing six responses due to common issues – variance of 0 (2), patterns in responses (3), and fast survey completion combined with failed attention check (1), the final sample consists of 148 students (see Table 3.6). The sample consists of 52 percent female students with an average age of 21 years. The majority of the students identify as Caucasians (64.2%), followed by African American (29.7%). Both student classification and majors are pretty evenly represented in the sample with 33.8% being seniors and majoring in business (63.5%).

Table 3.6 - Confirmatory Scale Development Sample Descriptive Statistics

Variable	n	%	Variable	n	%
Gender			**Major**		
Male	71	48.0	Accounting	16	10.8
Female	77	52.0	Biology	10	6.8
Age			Business	24	16.2
19 or under	49	33.1	Engineering	9	6.1
20-21	54	36.5	Finance	10	6.8
22-23	31	20.9	Management	24	16.2
24 and above	14	9.5	Marketing	20	13.5
Classification			Psychology	18	12.2
Freshman	29	19.6	Other	17	11.5
Sophomore	32	21.6	**Ethnicity**		
Junior	34	23	Caucasian	95	64.2
Senior	50	33.8	African American	44	49.7
Graduate	3	2	Hispanic	4	2.7
			Asian	4	2.7
			Other	1	0.7

Confirmatory factor analysis with maximum likelihood estimation provides a tool for validation. SPSS AMOS is used to further examine the remaining scale items. Upon modeling the previously established four-factor structure, a few items reflect a relatively high residual value and low loadings (below 0.52), which can suggest dropping an item to improve overall model fit (Hair et al. 2006). Also, sense specific items such as "at Christmas time, the sound of Christmas music in a store makes shopping better" are eliminated since additional sense-specific items were removed at a previous step of the scale development and thus, the remaining sense-specific items loaded on single factors. Some multisensory product evaluation items express a strong disposition to load on the sensory enjoyment factor and after the removal of low- or cross-loading items, these product items are now part of the first factor. Furthermore, items reflecting outdoor sensory stimulation no longer load on previously established factors and represent a

separate factor. However, upon reflecting back to the domain of need for sensation, the outdoor items are removed from further analysis since they are too context specific. Based on these exploratory results and theoretical evidence, the following two-factor CFA is tested: sensory enjoyment (six) and sensory avoidance (three).

The model with all two dimensions has a chi-square residual of 29.0 (df= 26, $p < 0.310$), yielding a CFI of 0.99 (above 0.9), RMSR of 0.028 (below 0.08), and GFI of 0.96. To assess convergent and discriminant validity, factors loadings of above 0.5, construct composite reliabilities greater than 0.7, and average variance extracted (AVE) above 0.5 are desirable (Hair et al. 2006). Discriminant validity prevails if AVE values are above each squared construct correlation. As shown in Table 3.7, all factor loadings and construct reliabilities are above the suggested cutoff values. While AVEs for sensory avoidance reflects sufficiently high values, sensory enjoyment is a little low with close to 0.45. Thus, mixed support for discriminant and convergent validity remains as of now. An assessment of the relationships between the two dimensions reveals that sensory enjoyment and sensory avoidance reflect a relatively weak negative relationship ($\Phi = -0.02$). Thus, a consumer could express tendencies on both facets of need for sensation simultaneously.

Table 3.7 - Confirmatory Factor Analysis Results

Item		Factor Loadings	
		Sensory Enjoyment	**Sensory Avoidance**
Sensory Enjoyment			
An experience that engages all my senses is more fun than work.		0.69	
I enjoy using all my senses when evaluating a product.		0.64	
I prefer environments that stimulate all my senses rather than pleasing only one sensation.		0.71	
I enjoy the "feel" of a stimulating environment, even if I don't intent to make a purchase.		0.63	
I like all my senses to be highly stimulating when exploring consumption alternatives.		0.71	
Browsing is enjoyable when it engages all my senses.		0.64	
Sensory Avoidance			
I will leave a service environment if it is too stimulating.			0.70
An extremely stimulating environment makes it difficult for me to focus on making a purchase.			0.80
I avoid stores with strong scents.			0.64
AVE		0.45	0.51
C.R.		0.83	0.76
X^2	29.02		
df	26		
p-value	0.310		
Φ	-0.02		
CFI	0.992		
GFI	0.960		
RMSEA	0.028		

An additional step to assess the need for sensation scale is to test for nomological validity. This type of validity examines if the two need for sensation dimensions behave as expected in a network of related and established variables (Hair et al. 2006). As previously discussed, two variables commonly applied in atmospherics and services research are hedonic/utilitarian value and PAD. Based on prior theory and considering that hedonic value captures the immediate gratification of a consumption experience (Babin, Darden, and Griffin 1994), sensory enjoyment is expected to be positively and sensory avoidance to be negatively correlated to hedonic value. The opposite relationships are anticipated for utilitarian value, since it encompasses task-related and efficient consumption behaviors (Babin, Darden, and Griffin 1994).

As outlined by Mehrabian and Russell (1974), the arousal dimension of PAD reflects a feeling state that ranges from sleep to frantic excitement and is tied to physiological arousal of a person. Thus, arousal should reflect a positive relationship with sensory enjoyment and a negative relationship with sensory avoidance. Lastly, dominance, as part of PAD, captures the feeling of being unrestricted or free to act in a variety of ways (Mehrabian and Russell 1974), such as being able to leave a highly simulating environment. Conceptually, dominance and sensory avoidance should be positively related, while dominance and sensory enjoyment should be negatively related. Correlation estimates representing the proposed relationships are depicted in Table 3.8.

Table 3.8 - Correlation Estimates Between Need for Sensation, Value, and PAD

Scale	Number of Items	α	Correlation Estimates: Sensory Enjoyment	Correlation Estimates: Sensory Avoidance
Hedonic Value	10	0.74	0.233 (0.004)	-0.012 (0.565)
Utilitarian Value	3	0.58	0.223 (0.006)	-0.022 (0.790)
Pleasure	6	0.79	-0.151 (0.067)	-0.085 (0.306)
Arousal	6	0.66	0.118 (0.153)	-0.039 (0.637)
Dominance	6	0.49	-0.126 (0.154)	0.109 (0.185)

As expected, hedonic value is positively related to sensory enjoyment ($\varphi = 0.233$, $p < 0.004$). Therefore, the enjoyment of an experience in itself is reflected in the need for sensation dimension. While the relationship between hedonic value and sensory avoidance ($\varphi = -0.012$, $p < 0.565$) is not significant, the relationship is negative and provides directional evidence of predicted behavior. Here, a person seeking sensory avoidance will most likely not be looking for a hedonic consumption experience. The computed relationships between utilitarian value and sensory enjoyment ($\varphi = 0.233$, $p < 0.006$) suggests that sensory stimulation remains important to consumers even if consumption environments are sought out for a specific purpose.

Interestingly, the tendency to either seek out or avoid sensory stimulation is reflected in the positive correlations between arousal and sensory enjoyment ($\varphi = 0.118$, $p < 0.153$) and the negative correlations between arousal and sensory avoidance ($\varphi = -0.039$, $p < 0.637$). When evaluating the negative relationship among dominance and sensory enjoyment ($\varphi = -0.126$, $p < 0.154$), correlation estimates suggest that perceived control is not essential when enjoying high sensory environments. In contrast, a preference for sensory avoidance ($\varphi = 0.109$, $p < 0.185$) entails a higher desire for

perceived control, even though the positive relationship is not quite as significant as desired. However, prior research does suggest issues with this dimension of PAD that make specific predictions complicated.

Overall, the various assessments conducted here confirm the two dimensional structure of need for sensation scale: 1) sensory enjoyment and 2) sensory avoidance. It is important to note that individual application of each dimension is possible since sensory enjoyment and sensory avoidance do not reflect a strong correlation. Therefore, future studies can implement the dimension most suitable for the context at hand since consumption experiences and environments can determine a consumer's desire to avoid sensory stimulation yet still experience sensory enjoyment. The various stages of the scale development process are summarized in Table 3.9.

Table 3.9 - Summary of Scale Development Stages

	Stage	Participants	Sample	Method	Finding
	Preliminary			Development of initial item pool based on focus group interviews and established scales.	70 items
Initial Scale Development	1	4	Experts	Items matched to definition of need for sensation for construct representativeness.	Deleted: 14 Reworded: 11
	2	19	Students	Item reduction by assessing means, standard deviations, and variances.	Deleted: 16 Reworded: 11 Total: 51
	3	79	Students	Item reduction by assessing means, item-total correlation, principal component analysis (PCA) loadings, and communalities. Elimination of "no-brainer" items.	37 items
Item Purification	4	224	Consumers	Item reduction by assessing means, variances, and communalities. Exploratory factor analysis to examine dimensionality.	4 dimensions: sensory enjoyment (7), shopping improvement (8), multisensory product evaluation (5), and sensory avoidance (5)
	5	148	Students	Validate dimensionality with confirmatory factor analysis.	2 dimensions: sensory enjoyment (6) and sensory avoidance (3)

One interesting finding during the scale development process is the tendency of consumers to express an affinity to outdoor environments and separate those experiences from sensory enjoyment or sensory avoidance. Literature does support the idea of outdoor environments being naturally high in stimulation and possessing restorative qualities. Therefore, a logical extension of need for sensation could encompass an individual's tendency to frequent and enjoy outdoor consumption environments. A future scale development will further explore the idea of outdoor sensation.

The behavior of the different need for sensation dimensions will be further examined in Essay 3. Specifically, the subsequent section of the dissertation will focus on testing and validating the new need for sensation scale in different experimental settings. The proposed experimental design assesses varying levels of intensity of sensation rather than sense-specific sensation. It incorporates manipulation of sensation intensity experienced in a controlled environment to examine participants' responses to changes in environmental conditions. This approach deviates from common techniques applied in sensory marketing studies that usually manipulate only a single sense while holding every additional sensation constant. By implementing a localized manipulation, effects can be attributed to one specific sense rather than overall experienced sensation and potential confounds can be avoided. However, since the focus of this project is not on sense-specific sensation, the individual manipulation of each sense will not be necessary. Instead, techniques more common in atmospheric research are applied and extended by assessing the holistic sensation experienced by participants. In addition, rather than simply adjusting the intensity of sensation, respondents will also face a perceptual task, such as product testing or judging, to examine how changes in level of sensation intensity

affects task performance. Furthermore, cognitive abilities within different environmental settings are also examined. Therefore, the experimental design will implement perceptual and cognitive tasks while administering measures to evaluate the overall experience along satisfaction, value, and affect.

CHAPTER IV

THE IMPACT OF INTENSITY OF SENSATION IN DIFFERENT ENVIRONMENTS ON TASK PERFORMANCE

Introduction

Up to this point, the importance of marketers offering a stimulating consumption experience that allows consumers to extract value from experience has been discussed from multiple angles. The dissertation introduction provides an insight into the three prominent research streams that examine the influence of sensory and environmental cues in shaping cognitive, affective, and behavioral consumer responses – atmospherics, services, and sensory marketing (Bitner 1992; Donovan and Rossiter 1982; Krishna 2012). Specifically, the research emphasizes communalities in the shared foundational assumption of humans inferring meaning and value from environments. Essay 1 focuses on the construct of sensation, its key concepts across multiple research areas, and the positioning of sensation within this dissertation. Qualitative analysis of focus group interviews helps to frame sensation as a more incidental and natural response to sensory stimulation, which aligns with a needs-based categorization of traits proposed by Murray (1938). The notion of multisensory stimulation and holistic perspective of human responses to environments is reviewed in Essay 2, which also addresses the question of

measurements of sensation. The main outcome of Essay 2 is the conceptualization of need for sensation and the corresponding need for sensation scale.

As previously mentioned by Krishna (2012), multisensory stimulation and its influence on affective, cognitive, and behavioral consumer responses remains an under-researched area within the literature. Traditionally, research primarily focuses on bimodal sensory stimulation or sensory interactions, such as vision and touch (Raghubir and Krishna 1999) or sound and taste (Zampini and Spence 2004). Essay 3 is deviating from this research approach by looking at sensation holistically and examining varying levels of intensity of sensation rather than specific individual sensory cues. To accurately assess the influence of overall sensation within different environments on affective, cognitive, and behavioral responses, a brief review of theories applied in atmospherics, services, and sensory marketing studies follows next.

Restorative Environments

As discussed in previous sections of this dissertation, different research streams assess the influence of the surrounding on an individual from various angles. In marketing, atmospherics and servicescape research concentrates on environmental cues and their impact on consumption behavior in various contexts. Another environmental psychology approach is to look at the influence of environments on an individual's life, activities, and mental state more broadly. Specifically, environments capable of renewing drained psychological resources to allow for efficient human functioning are the focal point in this research area (Hartig, Kaiser, and Boweler 2001). Restorative environments contain these inherent qualities and are said to increase relaxation, provide an escape

from social pressures, and foster a sense of control and freedom (e.g., Kaplan and Kaplan 1989; Kaplan 1992, 1995). When one lacks a mechanism to recharge, he/she becomes prone to an inability to concentrate, impaired decision making capabilities, and increased negative affect including stress, anxiety, and irritation (e.g., Kaplan 1995; Korpela and Hartig 1996).

The idea of recovering from mental fatigue is introduced by Kaplan and Kaplan (1989) and reflected in their attention restoration theory (ART). ART is a cognitive framework that identifies restorative environments which improve or replenish directed attention capacities (Kaplan and Kaplan 1989; Kaplan 1992). ART is grounded in the distinction between two types of attentions: involuntary and directed attention. As first discussed by James (1892), involuntary attention is associated with interesting or exciting environmental elements, which trigger an effortless attention. In contrast, directed attention does require some type of effort and encompasses a selective focus on stimuli in the environment to allow for higher mental processing, such as problem-solving or task completion (Stuss and Benson 1986). Thus, the suppressing of competing mental activities allows for prolonged concentration on a single task (Kaplan 1995). Since directed attention necessitates effort, Kaplan (1992) argues for the finite nature of this type of attention and the limited capacity of individuals to engage in such. He also cautions about a continuous increase of mental fatigue due to greater pressures on direct attention in everyday life through factors such as technological developments, information overload, and hectic lifestyles.

In general, Kaplan (1995) associates mental fatigue with human error and ineffectiveness that contribute to a variety of negative outcomes, such as a lack of

implementing pertinent actions, a short-term focus on behavioral consequences, and increased negative emotions. The impaired performance of individuals is associated with a decline in resources caused by demanding tasks or aversive stimuli in environments (Kaplan 1995; Korpela and Hartig 1996). Bohen, Houx, Nicolson, and Jolles (1990) find support for this assumption as continuous exposure to mentally challenging tasks resulted in higher stress level and lower overall performance of respondents. Considering the array of negative consequences, the need to reduce directed attention fatigue to reclaim effectiveness is essential for human well-being and restorative environments can facilitate this process.

The question remains what constitutes a restorative environment, and ART encompasses four components that prompt mental processes contributing to a restorative experience: 1) being away; 2) extent; 3) fascination; and 4) compatibility (Kaplan and Kaplan 1989; Kaplan 1992, 1995). First, a change in usual settings or routines allows for psychological distance, which can be achieved by an array of means including looking at a different object or experiencing an old environment from a new perspective. Kaplan (1995) emphasizes that being away is not limited to physical adjustment but can also be achieved by a conceptual transformation. For an environment to classify as extent, it needs to be sufficiently rich and coherent to permit exploration of the mind (Laumann, Gärling, and Stormark 2001). One way of improving an environment is through artifacts; for example, Kaplan (1995) suggests that historic artifacts help create a sense of immersion in a past environment. Fascination promotes effortless attention and sense making of the environment through content or objects. Scopelliti and Guiliani (2004) distinguish between hard fascination – watching a race with intense involvement – and

soft fascination – taking a walk in some park rich in aesthetically pleasant stimuli. Lastly, compatibility is the congruence between the purpose of being in the environment and information provided by the environment; thus, environmental elements and personal inclinations need to match (Kaplan 1995).

In general, these four components acts as environmental support provided to an individual to understand its surrounding. Kaplan and Kaplan (1989) describe how individuals create models of environments in their head and use these models to guide appropriate behavior. As such, even an unfamiliar environment might include a sufficient amount of familiar elements to be able to apply previously established models, which reduces the utilization of directed attention. This idea of extracting knowledge from environments and applying them to novel settings is also evident in other research streams, such as schema discussed later on. Furthermore, a variety of scales exist that tap into the domain of restorative environments and their four facets.

Two multi-item measures often incorporated in restorative research are Perceived Restorativeness Scale (PRS) and Restorative Components Scale (RCS) (Herzog, Maguire, and Nebel 2003). One difference between the scale are the number of factors; while PRS represents a four-factor solution as outlined by attention restoration theory, RCS includes five factors since 'being away' is divided into novelty and escape.

Previous research supports the innate restorative quality of nature, which makes natural environments and their psychological value a fundamental element of restoration (e.g., Kaplan 1995; Korpela and Hartig 1996; Hartig, Kaiser, and Boweler 2001). The need to recover within natural surroundings is guided by the works of Frederick Law Olmstead from 1865, who first expressed the importance of coping with stress by

frequenting natural locations (Kaplan 1995). Berman, Jonides, and Kaplan (2008) compare natural with urban settings and identify modestly attention-grabbing stimuli in natural environments that allow for mental replenishing, while dramatically attention-grabbing stimuli in urban areas impede cognitive restoration. Furthermore, the previously discussed four components of restorative environments are also readily obtainable in natural settings. Being away is reflected in idyllic places, mountains, forests, or other natural locations (Kaplan 1995). While Kaplan (1992) relates extent to vast lands or miniature Japanese gardens as being immersed in a different world, fascination often involves sensory cues such as colorful sunsets, hauling winds, or floating leaves carried by a breeze. Lastly, natural environments are seen as high in compatibility since functioning is often easier in these settings suggesting a special resonance between nature and human aptitude (Kaplan 1995). This affinity with nature is supported by Korpela and Hartig (1996), who link natural elements, such as greenery and water, to favorite places of individuals. In addition, Korpela, Hartig, Kaiser, and Fuhrer (2001) posit that natural restorative environments are more likely to generate place attachment and ultimately drive place identity.

While restorative environmental studies initially focused on reducing stress, an abundance of research supports additional physiological and psychological benefits of restoration, such as holding attention and interest (Ulrich 1979; Ulrich and Parsons 1992), improve performance behavior (Hartig, Mang, and Evens 1991; Berman, Jonides, and Kaplan 2008), greater quality of life (Cimprich 1993), positive affect including happiness, enjoyment, relax, calm (Korpela and Hartig 1996; Korepla, Hartig, Kaiser, and Fuhrer 2001; Laumann, Gärling, and Stormark 2001), motivate ecological behavior

(Hartig, Kaiser, and Boweler 2001; Byrka, Hartig, and Kaiser 2010), recovery from illness (Cimprich 1993; Laumann, Gärling, and Stormark 2001), and increased self-control and self-regulation (Korepla, Hartig, Kaiser, and Fuhrer 2001; Newman and Brucks 2016) to name a few. Here, it is important to note that restorative environments elicit aforementioned benefits through actual sensory experiences and interactions as well as viewing of pictures, listening of sounds, and other representations environmental stimuli (Kaplan 1995; Van den Berg, Hartig, and Staats 2007; Berman, Jonides, and Kaplan 2008). However, while actual and simulated natural environments reduce stress equally, Kjellgren and Buhrkall (2010) observe increase in energy levels only during actual engagement with natural environments. Thus, a few differences across environmental settings do remain.

Restorative research encompasses an increasingly wider scope to address overall restorative experiences which are not necessarily limited to natural or physical attributes of environments. Scopelliti and Giuliani (2004) define restorative experiences as an interaction of social and physical elements characterized by additional affective dimensions, such as excitement. Furthermore, diversity in contexts beyond natural settings is also increasingly common as evident in the following examples: museums (Kaplan, Bardwell, and Slakter 1993), casinos (Finlay, Marmurek, Kanetkar, and Londerville 2009; Rosenbaum and Wong 2015), cafés (Rosenbaum, Sweeney, and Windhorst 2009), health-care settings (Rosenbaum, Sweeney, and Smallwood 2011; Nejati, Rodiek, and Shepley 2016), and workplaces (Gilchrist, Brown, and Montarzino 2015). Finally, concepts and ideas of restorative research are merged with existing

theories and frameworks resulting in modified constructs such as restorative servicescape.

Restorative Servicescape

As previously outlined, servicescape refers to the physical setting in which service transactions are performed and is conceptualized into the well-known servicescape framework by Bitner (1992). By merging previous additions as well as restorative qualities of service environments with the seminal framework, a new restorative servicescape is generated for a more exhaustive tool to create optimal consumption environments (Rosenbaum 2009; Rosenbaum and Massiah 2011). Bitners (1992) original environmental stimuli – ambient conditions, spatial layout, functionality, signs, symbols, and artifacts – now denote the physical dimension of servicescape, which is complemented by social (Berry, Carbone, and Haeckel 2002), socially symbolic (Rosenbaum 2005), and natural (Rosenbaum 2009) dimensions. The new framework with the four environmental dimensions is illustrated in Figure 4.1.

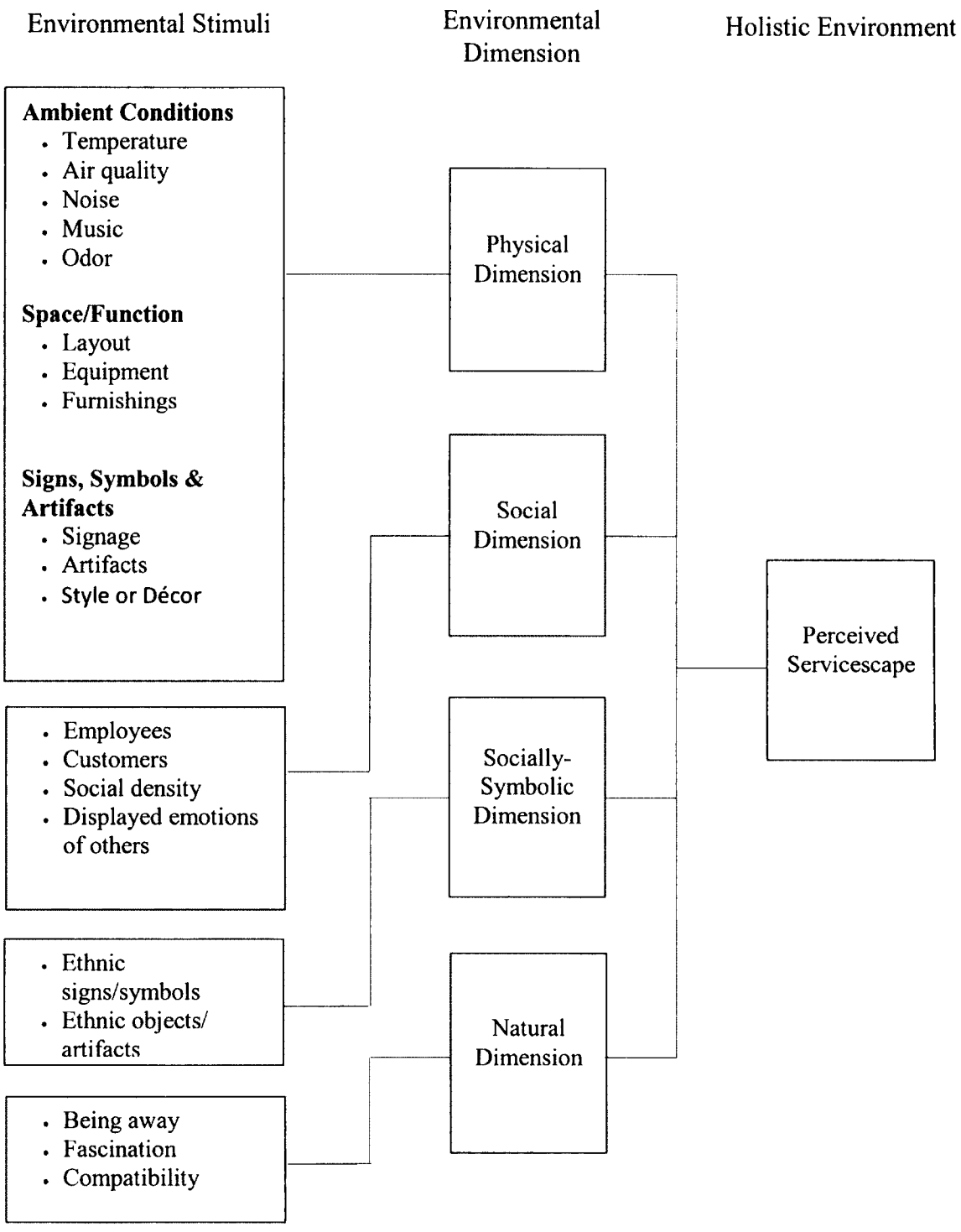

Figure 4.1 - Transformative Servicescape (Rosenbaum and Massiah 2011)

The newly added natural dimension includes three components of attention restoration theory, namely being away, fascination, and compatibility. Thus, Rosenbaum and Massiah (2011) argue for restorative qualities of servicescape that influence approach/avoidance behaviors, customer health, and subjective well-being. The reference to customer well-being positions restorative servicescape within the scope of transformative service research (TSR) since it assesses the influence of the macro environment on service and consumer entities based on outcome measures, including health, happiness, and literacy (Anderson et al. 2013). Service environments, such as cafés, have been shown to not only promote personal restoration, but also life-enhancing social supportive resources that foster well-being and loyalty to these service establishments (Rosenbaum, Sweeney, and Windhorst 2009). Therefore, design elements within servicescape should include natural elements (e.g., water fountains or in-store greenery) to promote a feeling of being in a different world, social interactions, and relaxation (Brengman, Willems, and Joye 2012; Rosenbaum and Wong 2015; Rosenbaum, Otalora, and Ramírez 2016).

Since natural features encourage approach behaviors and positive affect (Brengman, Willems, and Joye 2012), restorative servicescape also generate financial benefits for owners. According to Rosenbaum (2009) and Rosenbaum, Otalora, and Ramírez (2016), perceived restoration in servicescapes can enhance customer satisfaction, customer loyalty, positive word-of-mouth, and patronage behavior, which translates to higher monetary expenditures. Thus, insights of restorative research offer a novel approach to examining servicescapes and consumer behavior. It appears that one prerequisite of restorative effects is the customer's ability to fully immerse in the

sensational experience and to block out any distractions. For example, even if an environment features restorative qualities, checking emails on the smartphone would negative any effects. However, considering that shopping is often perceived as challenging and exhaustive, applying mechanisms that can facilitate consumer interaction with servicescape not only enhances customer well-being, but also contributes to the overall success of the business.

Schema

As previously mentioned, Kaplan and Kaplan (1989) outline a mechanism in which individuals create environmental models that are used to make sense of unfamiliar surroundings. This idea of utilizing preexisting knowledge to guide interpretation of information, behavior, and expectations is also applied in schema research (Graesser, Woll, Kowalski, and Smith 1980). Giola and Poole (1984) position schema as a cognitive framework that structures and extracts meaning from social interactions. Furthermore, schema stores knowledge about specific stimuli, attributes, and relations between these attributes, which impacts perceptions and behaviors in familiar contexts (Fiske and Linville 1980; Rumelhart and Ortony 1977). As such, the activation of a schema can change the information environmental and can impact the conveyed information, its coding and recall (Babin, Boles, and Darden 1995). Congruity is an essential factor that can facilitate knowledge transference from a schema to an object or situation; for example, Fiske (1982) talks about the affective responses being transposed from a schema to an object. As outlined by Meyers-Levy and Tybout (1989), incongruity represents the extent that structural coherence is established between the totality of

attributes associated with an object and the specified schema. While congruity between an object and a schema can positively impact satisfaction, incongruity can lead to frustration associated with the experience (Meyers-Levy and Tybout 1989).

Mandler (1982) argues the extremity and valence of affective responses is impacted by interacting with various levels of schema congruity. As such, the additional necessary cognitive effort required to comprehend incongruity between a schema and an object leads to greater extremity of evaluation. In general, individuals prefer objects to conform to their expectations and offer predictability, which is why schema congruity reflects more favorable outcomes (Mandler 1982). While congruent situations prompt less extensive cognitive processing, they also tend to be less noteworthy. In contrast, moderate incongruences are more interesting due to their novelty, are more positively valued, and can be resolved with minimal cognitive processing (Meyers-Levy and Tybout 1989). Thus, Mandler (1982) argues that moderate incongruences elicit responses viewed as more positively in comparison to than schema congruence ones. The final level of congruity is extreme incongruity, which can only be resolved (if at all) by implementing essential adjustments to existing cognitive structures, such as redefining selected schema. This increased cognitive elaboration necessary to understand these extremely novel objects or environments can lead to frustration rather than resolution (Meyers-Levy and Tybout 1989).

These relationships between schema congruity/incongruity and evaluations are described as non-monotonic by Mandler (1982) as moderate incongruity evoke more positive evaluations than extreme incongruity or congruity. Research supports this finding as some moderate level of distinctiveness or unexpectedness seems to be higher

valued by customers (Fiske and Maddi 1961; Myers-Levy and Tybout 1989). In addition, Fiske and Taylor (1991) identify prior knowledge to be a significant influencer of schema congruity effects. Here, the authors posit that well-developed prior knowledge structures enable individuals to apply schema-consistent and –inconsistent information, while limited prior knowledge leaves the individual more sensitive to schema-inconsistent information.

Script

Apart from schema and the four restorative experience components that provide consumers with guidance on how to extract knowledge from and understand their surroundings, script and role theories provide an additional approach to explain this process. Gioia and Poole (1984) define scripts as schematic knowledge structures that hold information about events or behavior characteristic of a certain context. They further elaborate that scripts provide understanding which guides appropriate behavior in these circumstances. In addition, scripts are stored in a prototypical manner in memory that involve an abstract set of representative attributes used to define members of corresponding categories (Cantor and Mischel 1977, 1979; Tsujimoto 1978). Two different types of scripts are proposed by Abelson (1976): weak scripts and strong scripts.

Weak scripts parallel other similar types of cognitive structures which formulate expectations about behaviors without specifying an exact sequence of such (Abelson 1976). In contrast, strong scripts do not only encompass expectations about events and behaviors, but also about the order they occur in (Abelson 1976). Strong scripts are more commonly applied in stereotypical situations, such as job interviews. Gioia and Poole (1984) introduce a continuum of scripts anchored by novel and stereotypical events that

outlines the type of script being applied in specific situations. As just mentioned, stereotypical events are familiar and rely on strong scripts to guide behavior. As such, few conscious cognitions are necessary allowing for automatic script processing. Novel situations entail intensive cognitive processing as little or no script for behavior exists here. Therefore, new schematic knowledge needs to be obtained and stored for these occurrences. One mechanism that facilitates encounters with new situations is the idea of "protoscripts" discussed by Gioia and Poole (1984). These generic scripts for a class of events can guide behavior and their sequences when common elements are shared with prior experiences. Thus, protoscripts act as a basis for responding to the new situation until more permanent scripts are developed.

Aligned with the idea of scripts is the concept of role and role expectations that can be drawn on in situations. Bitner, Booms, and Mohr (1994) suggest that customers and employees share views of their roles and associated behaviors in service exchanges. While roles are appropriate behaviors corresponding to socially defined positions (Solomon, Surprenant, Czepiel, and Gutman 1985), role expectations encompass a set of standards for these role behaviors (Biddle 1986). Both roles and role expectations contribute to a successful service encounter and appropriate adherence to both can lead to positive outcomes, such as satisfaction and value (Zeithaml, Bitner, and Gremler 2013).

Synopsis - Sensation in Restorative, Schema Research

While often not explicitly named, various theoretical tools used to investigate the impact of the environment on consumer behavior encompass sensory cues or sensory stimulation. For example, Bitner's (1992) servicescape framework outlines the influential

quality of ambient conditions, such as temperature, noise, and lighting, which clearly manifest sensory characteristics. As reviewed earlier, the positive attributes of restorative environments are associated with sensation. The notion of soft fascination refers predominantly to sensory cues, such as the smell of fresh air or the movement of leaves (Kaplan 1992, 1995). Van den Berg, Hartig, and Staats (2007) suggest painting facades of buildings green to enhance restorative component of cities. Furthermore, Kjellgren and Buhrkall (2010) identify intense sensory perceptions, such as smell of flowers and sounds of nature, to contribute to the greater restorative capability of actual environments in comparison to simulate ones. As illustrated by these examples, the suggested influences of environments on consumer outcomes and behaviors can be attained by adjusting sensory cues in the environment. Considering the continuous call for compatible, congruent, fascinating, and harmonious environments to ensure efficient functioning (Mandler 1982; Myers-Levy and Tybout 1989; Kaplan 1995), any deviation from this comfort zone would negatively impact consumers. This quest for comfort is supported by Grahn and Stigsdotter (2010). When asked about their preferred sensory dimension of environments, respondents predominantly selected serene characterized by calm and quiet attributes. Grahn and Stigsdotter (2010) reiterate the previously deliberated necessity to view sensation holistically rather than as isolated sensory stimulation. The authors state that a complete experience involves the simultaneous interpretation of all senses by the brain, which substitutes missing knowledge with memories of earlier events.

One concept that reflects the holistic approach to sensory assessment of the environment is sensescape. Sensescape describes the full range of sensory modalities that

enables individuals to interact with and experience their environment (Andringa et al. 2013). Berg and Sevón (2014) denote that the accumulation of all these multimodal experiences create an unparalleled 'landscape' of senses. Prior research reflects a variety of '-scapes' that are situation dependent and explains how people navigate through and engage with their surrounds: soundscape (Cain, Jennings, and Poxon 2013), smellscape (Landry 2007), and tastescape (Berg and Sevón 2014). While each specific sense-scape communicates information and fosters understanding, sensescape is the most inclusive approach to examine how humans perceive and function in their environment. According to Andringa et al. (2013), a compatible multisensory environment leads to optimal levels of satisfaction and increases experiential value. This perceived compatible environment is influenced by sensory order, which Low (2013) defines as a particular set of senses, their importance, and use within a particular context. As such, depending on the context, the intensity, and the aesthetics of sensory stimulation associated with the surrounding, individuals are more or less sensitive towards disruption of sensory order (Low 2013).

Violations or sensory transgressions, such as the presence of body odor, can result in sensory overload which diminishes the overall sensory encounter and can even impair social processes (Low 2013). These negative psychological and physiological impacts are supported by research in sense specific studies. For example, Andringa et al. (2013) identify acute noise consisting of either high sound levels or incongruent low environmental sounds to diminish concentration. The authors argue that the perception of sound is determined not only by the stimuli itself, but also by the needs of the moment. For example, the same level of environmental sound will be deemed as intrusive while completing a challenging task, yet welcomed while exploring a big city. Clearly,

dysfunctional sensory stimulation or sensory overload can negatively impact consumers and thus, will be discussed in more detail in the following section.

Sensory Overload

The idea of sensory overload aligns with the reasoning for continuous directed attention fatigue of restorative environment research: urbanization, crowding, technological advances, and mass media. Whereas attention restoration theory focuses primarily on the explosive growth of information people have to process, sensory overload also explicitly considers the intensification of sensory stimulation. Since people deal with more sensory input due to changing environments, the brain simultaneously has to engage in more decision-making and more cognitively challenging tasks leading to overload (Malhotra 1984). Sensory overload is closely aligned with the concept of information overload, which was originally introduced by psychologist such as Georg Simmel and James Miller (Miller 1956). The major difference between both constructs is that information input comprises of symbolic stimuli and sensory input involves physical stimuli void of actual messages.

According to Malhotra (1984), an increase in sensory stimuli leads to an increase in cognitive and behavioral integration until processing capacity diminishes. The effects of overload are numerous and range from affective responses to impaired performances and can devalue the overall sensory experience (Krishna 2012). While limited research exists on sensory overload, some studies have investigated sense specific overload. For example, noise overload can lower information integration and intellectual performance (Siegel and Steele 1980; Malhotra 1984). In addition, auditory and visual overload causes

disorganizing and psychogenic effects, such as illusions and paranoia (Ludwig 1972). Lastly, Morrin and Chebat (2005) report a decline in expenditure for consumers in environments featuring scent and auditory sensory input in comparison to environments with only a single sensation and attribute this effect to stimulus overload.

As described by Malhotra (1984), three main factors can contribute to sensory overload: individual difference traits, task variables, and situational elements. Dunn (2001) posits that individuals express different thresholds for perceiving, responding, to and experiencing sensory overload. These differences are reflected in people's moods, temperaments, and lifestyle choices. In addition, people can differ in cognitive processing capabilities, which can often be categorized by variables such as age, intelligence, arousal seeking, and sensation seeking (Malhotra 1984). Providing individuals with a task in high sensation environments can also impact sensory processing. Here, sensory modality and intensity, as well as novelty and perceived complexity of the task itself might cause perceived overstimulation. The last element outlined by Malhotra (1984) is the situation, which includes the degree of control over and the freedom to withdraw from the stimulation. Furthermore, imposing a task or requiring making a choice between alternatives adds additional stimulation to a sensory rich environment. Based on what type of combination of individual difference trait, task variables, and situational elements result in sensory overload, researchers can measure this effect by looking at choice accuracy, time, and subjective states measures (Malhotra 1984).

Research Questions and Conceptual Development

- Research Question 1: Does increased intensity of sensory stimulation hinder specific task completion? What is the influence of increased intensity of sensation on value extracted from a consumption experience?

  How do different types of environments impact these relationships?
- Research Question 2: How does the individual's level of need for sensation influence task completion and value extracted from consumption experiences?
- Research Question 3: Do consumers express a difference in utilizing focal versus non-focal sensation in evaluating consumption experiences?
- Research Question 4: What is the impact of a relatively highly intense sensory environment on task completion? Is there a difference based on a consumer's level of need for sensation?

Hypothesis Development

Research Question 1

The first research question explores the effect that different intensity levels of sensory stimulation have on task completion and if these effects vary across different types of environments: outdoor, indoor, and outdoor/indoor. Specifically, in contrast to common approaches within the sensory marketing literature that focus on senses separately (Spence et al. 2014), the holistic environment and its sensory input is considered, which allows for an assessment of overall intensity of sensory stimulation. Based on attention restoration theory, individuals have a limited capacity of directed attention, which is necessary for higher mental processing involved in consumer

problem-solving activities (Stuss and Benson 1986). This finite nature of directed attention leads to mental fatigue and human ineffectiveness if not replenished by restorative environments (Kaplan 1995). An absence of restorative experiences can lead to low concentration, impaired decision making capabilities, and negative affect, including stress, anxiety, and irritation (e.g., Kaplan 1995; Korpela and Hartig 1996). Demanding tasks or aversive stimuli in environments can enhance these effects (Kaplan 1992).

The notion of impaired performance and heightened negative affect is also reflected in sensory overload. Malhotra (1984), states that an increase in sensory stimuli in a given environment diminishes cognitive concentration, judgment, and mood. These effects are intensified by presenting individuals with a challenging task and a selection of alternatives, which can negatively impact choice accuracy, completion time, and subjective state measures (Malhotra 1984). In addition, eliminating having control over the sensory stimulation while increasing sensory modality and intensity further supports sensory overload effects. Kaltcheva and Weitz (2006) also suggest that unpleasant stimuli can impede goal achievement. Overall, Krishna (2012) expresses the potential of sensory overload to devalue the entire sensory experience. As a result, the following relationships are proposed:

H1: High (low) intensity of sensation leads to decreased (increased) (a) accuracy of water identification, (b) accuracy of food selection, and (c) utilitarian value, while increasing (decreasing) (d) total completion time.

Research also provides support for the positive impact of restorative environments and sensory stimulation as they have been linked to enhanced customer satisfaction, customer loyalty, positive word-of-mouth, and patronage behavior, which translates to higher monetary expenditures (Rosenbaum 2009; Rosenbaum, Otalora, and Ramírez 2016). Cafes have been specifically identified as a potential source of a restorative environment (Rosenbaum, Sweeney, and Windhorst 2009). In a review of atmospheric studies, Turley and Milliman (2000) find evidence of stimulating and experiential environments positively influencing customer satisfaction. In addition, Spence et al. (2014) identify stimulating environments as more enjoyable and link more intense lighting as well as ambient scent to positive shopping behaviors. Thus,

H2: High (low) intensity of sensation results in increased (decreased) levels of (a) hedonic value, (b) positive affect, and (c) satisfaction.

Prior studies in atmospherics, servicescapes, and restorative environments demonstrate how different types of environments can influence consumers affective, behavioral, or cognitive responses (e.g., Mehrabian and Russel 1974; Kaplan and Kaplan 1989; Bitner 1992). Findings support the innate connection between nature and humans expressed in higher restorative effects of environments rich in natural elements (Kaplan 1995; Hartig, Mang, and Evens 1991; Korpela and Hartig 1996; Laumann, Gärling, and Stormark 2001). Here, simulated natural environments can have similar, yet not as positive effects as do actual natural environments (Kjellgren and Buhrkall 2010). One possible explanation is provided by Murray, De Muro, Finn, and Leszczyc (2010) who posit weather and sunlight to have an impact on positive affect and arousal. Both factors, weather and sunlight, can experienced most efficiently in outdoor environments. And

even Mehrabian and Russell (1974) identify light as one source to enhance arousal and pleasantness, which in turn enhances shopping outcomes. Further, artifacts can also be used to create the sense of being away and impact a conceptual transformation (Kaplan 1995).

The compatibility component between the environment and task is not only addressed in restorative research, but also in schema. Schema is a cognitive framework that utilizes existing knowledge to guide interpretation of information, behavior, and expectations (Graesser et al. 1980; Giola and Poole 1984). Thus, consumers can access existing schema when situated in environments and social interactions. Congruity is an essential factor that can facilitate knowledge transference from a schema to an object or situation (Fiske 1982). While congruity between an object and a schema can positively impact satisfaction, incongruity can lead to frustration associated with the experience (Meyers-Levy and Tybout 1989). In addition, Mandler (1982) suggests that moderate incongruity evokes more positive evaluations than extreme incongruity or congruity. Based on these findings, it is expected that:

> H3: The relationships (in H1 and H2) vary across environments in such a way that (a) the accuracy of water identification decreases from control to indoor to indoor/outdoor to an outdoor environment and (b) hedonic value increases as you move from control to outdoor to indoor/outdoor to an indoor environment.

Research Question 2

Research Question 2 further investigates the proposed relationships by looking at the influence of need for sensation as an individual difference trait. Individual differences are commonly assessed in research studies and variables such as age and gender often act

as a moderator between environmental influences and consumer behaviors (Malhotra 1984; Turley and Milliman 2000; Spence et al. 2014). For example, Mehrabian and Russell (1974) introduce individual differences in affective, behavior, and cognitive responses as part of their S-O-R framework. Some individual difference traits included in atmospheric and sensory research include arousal seeking, sensation seeking, and need for touch (Zuckerman, Eysenck, and Eysenck 1978; Malhotra 1984; Peck and Childers 2003b). Dunn (2001) specifically identifies a varying threshold of perceiving, responding, and being overwhelmed by sensory stimulation among individuals. The author uses Sensory-Processing Sensitivity (SPS) to categorize individuals based on their perceptual threshold for sensory stimulation. This threshold is influenced by an individual's neurological predisposition to sensory stimulation and impacts a person's temperament and personality (Dunn 2001). High SPS is associated with lower thresholds for sensory overload leading to greater negative affect, anxiety, and irritation in stimulation environments (Bakker and Moulding 2012). This lower threshold for sensory overload is anticipated for low need for sensation individuals as well.

Another construct that taps into different responses to tactile stimulation is need for touch (NFT). As outlined by Peck and Childers (2003b), individuals high in NFT enjoy tactile interaction with products, while low NFT individuals use the information from touching products to make decisions. Thus, high NFT and low NFT is associated with hedonic and utilitarian value respectively. In addition, since high NFT people love touching products, they tend to report higher levels of pleasure and positive affect from the experience (Krishna and Morrin 2008). However, while numerous individual characteristic traits have been developed within past research, Kaltcheva and Weitz

(2006) propose that inconclusive findings across studies investigating arousal in response to environmental stimuli are due to additional moderators previously not considered in research. Therefore, need for sensation is introduced as an additional individual difference measure to examine diverging reactions to sensory stimulation:

> H4: High (low) need for sensation individuals report higher (lower) levels of (a) hedonic value, (b) positive affect, and (c) satisfaction, while reporting lower (higher) levels of (d) accuracy of water identification, (e) accuracy of food selection, and (f) utilitarian value.

Research Question 3

The next research question further explores the differentiation between focal and non-focal sensation. As previously discussed, the overall sensational experience of consumers develops through the merging of the focal and non-focal sensations pertaining to sensation via product/service interaction and environmental stimulation. This new differentiation goes beyond the scope of prior studies by treating sensation holistically from all possible sources. One study that reflects this proposed distinction is Meyers-Levy, Zhu, and Jiang (2010). The authors describe how consumers utilize bodily sensation (non-focal sensation) when evaluating a product once visual cues (focal sensation) are diminished due to increased distance to the object.

The theoretical premise tapping into this phenomenon is sensation transference. In general, sensation transference is a psychological mechanisms that integrated unconscious and crossmodal transfer of an attribute to other items (Piqueras-Fiszman and Spence 2012). More specifically, retail atmospheric studies suggest sensation transference to reflect the process of transferring emotional responses developed in a

specific environment to a product assessed in that surrounding (Vida et al. 2007; Gorn 1982; Spence et al. 2014). For example, Spence, Harrar, and Piqueras-Fiszman (2012) indicated a greater liking for wine when the lighting in the room is tinted in blue or red. Considering the process within the context of focal and non-focal sensation, the positive affect experienced when evaluating a product can influence the overall experience in a certain environment.

The two-stage model of cognition is another theory that relates to focal and non-focal sensation (Raghubir and Krishna 1996). When evaluating and judging a product, individuals will engage in a preliminary, automatic processing followed by more deliberate, controlled processing. Krishna and Morrin (2008) argue that automatic processing involves the consideration of nondiagnostic haptic input in product judgment. However, once controlled processing is involved in the product judgment, knowledgeable and able consumers will disregard the nondiagnostic inputs. The authors identify nondiagnostic haptic qualities of a product to affect product evaluation more for haptically non-experts. If extrapolated to the current context, one could argue that low need for sensation individuals will utilize nondiagnostic / non-focal sensation in evaluating a sensational experience (automatic processing), while high need for sensation people will use focal and non-focal sensation to judge an experience (controlled processing). Therefore, low need for sensation individuals should base their overall evaluation of the consumption experience more on the focal sensation associated with tasting water than do high need for sensation people. Thus:

H5: High (low) need for sensation individuals base their judgment of the overall experience less (more) on focal sensation in such a way that water taste ratings are less (more) associated with levels of satisfaction of the experience.

Research Question 4

The final research question further investigates potential difference across individuals regarding sensitivity of sensation. Specifically, task completion is examined in high intensity environments for high and low need for sensation individuals. In accordance with literature outlined above, demanding tasks or aversive stimuli in environments lead to diminished directed attention and subsequently to human error as well as impaired cognitive performances (Stuss and Benson 1986; Kaplan 1995). In addition, atmospheric, servicescape, and sensory marketing studies commonly apply individual differences variables as moderators between environmental cues and consumer behaviors. Dunn (2001) advocates varying thresholds for sensory stimulation among individuals that can increase or decrease the likelihood of experiencing sensory overload. For example, Sensory-Processing Sensitivity (SPS) identifies low SPS individuals to be less sensitive to sensory stimuli reflecting in their higher sensory tolerance before experiencing sensory overload. Since this study introduces need for sensation as an individual difference variable, I suggest the relationship outlined in H6. As part of all six hypotheses, control variables such as gender are included.

H6: In high intensity sensation environments, the accuracy of water identification is higher (lower) for high (low) need for sensation individuals.

Methodology

The current study investigates the effect that the intensity of sensation has on consumer behaviors and performances. Rather than focusing on one specific sensation, the holistic sensation within an environment is manipulated by integrating a high or a low level of intensity. Furthermore, findings are replicated across a various types of environments to reach rigorous conclusions. The methodological approach is influenced by prior research looking at restorative environments (Kaplan 1995; Korpela and Hartig 1996; Kjellgren and Buhrkall 2010), water tasting (Koster et al. 1981; Krishna and Morrin 2008; Hoehl, Schoenberger, and Busch-Stockfisch 2010; Teillet, Schlich, Urbano, Cordelle, and Guichard 2010), music (North, Hargreaves, and McKendrick 1999; Garlin and Owen 2006), lighting (Summers and Hebert 2001; Murray et al. 2010), temperature (Cheema and Patrick 2012; Huang, Zhang, Hui, and Wyer Jr. 2014; Zwebner, Lee, and Goldenberg 2014), scent (Spangenberg, Crowley, and Henderson 1996; Turley and Milliman 2000; Morrin and Ratneshwar 2003), greenery (Van den Berg, Hartig, and Staats 2007; Berman, Jonides, and Kaplan 2008; Joye, Willems, Brengman, and Wolf 2010; Rosenbaum, Otalora, and Ramírez 2016), café settings (Waxman 2006; Rosenbaum, Sweeney, and Windhorst 2009; Walsh, Shiu, Hassan, Michaelidou, and Beatty 2011; Vanharanta, Kantola, and Seikola 2015), coffee (Bhumiratana, Adhikari, and Chambers 2014; Labbe, Ferrage, Rytz, Pace, and Martin 2015), and touch (Krishna 2006; Krishna and Morrin 2008; Littel and Orth 2013).

Procedure, Design, and Participants

While some studies rely on survey research in sensory and atmospheric studies to assess effects of sensory stimulation, in-person experiments can produce more conclusive

results (Kaplan 1995). Therefore, an experimental design is selected to examine the proposed relationships. Specifically, a 2 (intensity of sensation: high vs. low) x 4 (environment: indoor vs. outdoor vs. indoor/outdoor vs. control) between subject design is implemented. As suggested by previous research, servicescapes and especially cafés are high in restorative qualities and are perceived as a pleasant environment (Korpela and Hartig 1996; Rosenbaum, Sweeney, and Windhorst 2009). Therefore, the setting of the experiment is a replication of a French café. The selected setting fulfills the four components of restorative environments, since a French café creates a different world that is fascinating enough to distract from usual routines and is compatible with the tasks presented to participants (Kaplan 1995; Laumann, Gärling, and Stormark 2001). Artifacts and natural elements are used to distinguish the different environments while ensuring a sensational experience (Kaplan and Kaplan 1989).

Environments. A total of four different environmental conditions are included in this experiment: indoor, outdoor, indoor/outdoor, and control. The first environment reflects the indoor environment of a French café. As seen in the subsequent pictures (Figure 4.2), numerous artifacts are used to create a representative environment. Accessories such as a coat rack, restroom signs in French, and a divider depicting French scenery completed the environment. The room does not have windows to control for natural light.

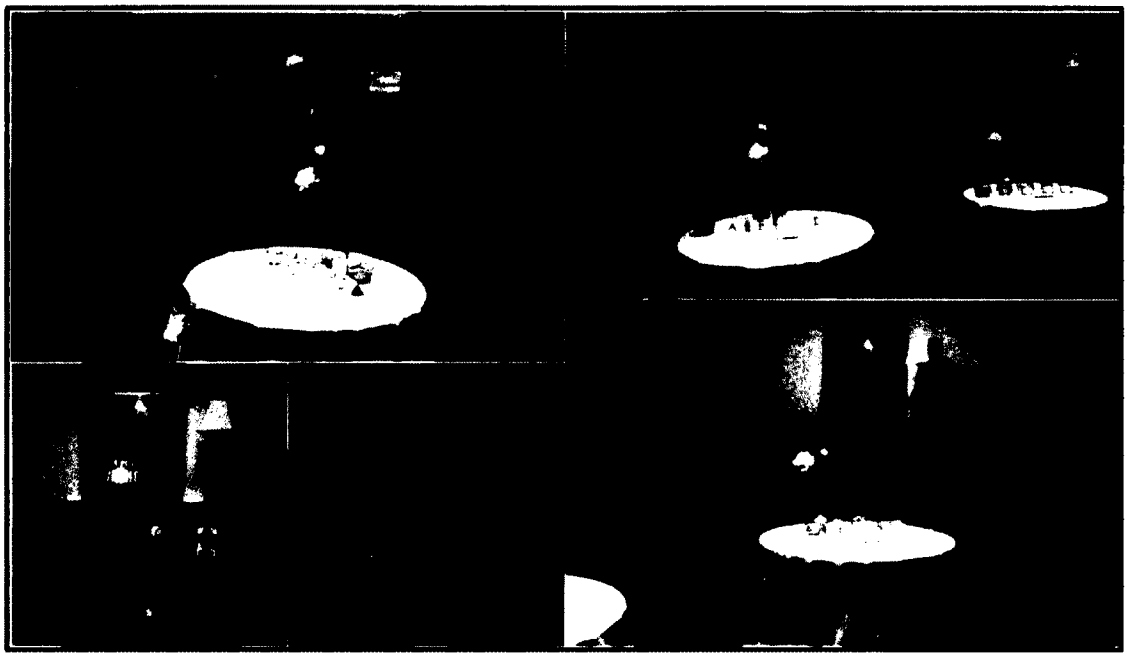

Figure 4.2 - Environmental Condition – Indoor

The second, outside condition features a balcony converted to outside scenery of a French café. Plants, an outside menu, and the divider with the French scenery contribute to the outdoor experience (Figure 4.3).

Figure 4.3 - Environmental Condition – Outdoor

According to Kjellgren and Buhrkall (2010), simulated environments on pictures elicit similar but not exact complementary findings in comparison to actual engagement with an environment. This assumption is further investigated by simulating an outside environment indoors. The indoor/outdoor condition includes the same plants, menu, and divider from the outdoor condition, but inside a room. The room features full-size windows to allow for natural lighting and natural scenery in addition to the plants. Furthermore, opening an adjacent balcony door also enabled the capturing of natural street sounds and the addition of fresh air. The simulated outdoor environment is depicted in Figure 4.4.

Figure 4.4 - Environmental Condition – Indoor/Outdoor

The control condition consists of a regular meeting room without artifacts, plants, or natural elements (Figure 4.5). The set up in all three manipulated environments is consistent: two round tables covered with white table clothes, two chairs on each side of the tables, a vase with a single white rose, sugar dispenser, and a glass bowl filled with crackers. In addition, each table includes four signs with letters to label each glass of water. The control condition only features a conference table, the four signs with letters to label each glass of water, and a glass bowl filled with crackers.

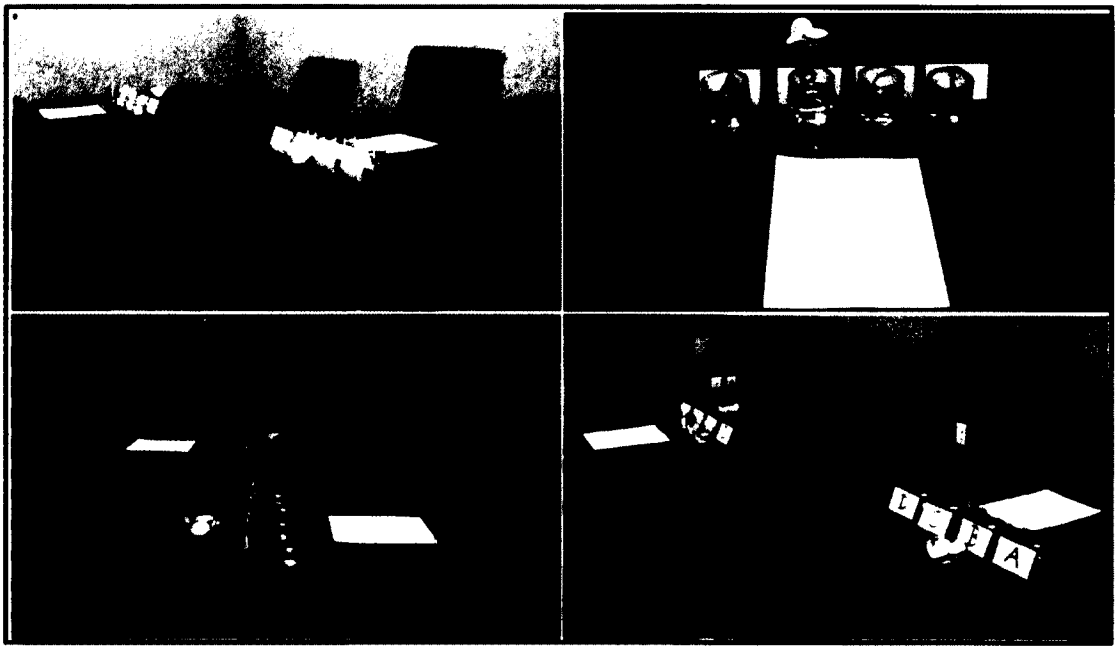

Figure 4.5 - Environmental Condition – Control

Intensity of Sensation. The intensity of sensation has two conditions – high versus low. Here, the focus remains on manipulating the totality of sensation rather than changing only one specific sense. As such, sensation is conceptualized by four senses: vision (lighting), haptic (room temperature), olfaction (coffee scent), and audition (music). Since the perceptual task is a water taste test, taste is not included in the intensity of sensation manipulation to avoid confounds. All four sensory elements are simultaneously manipulated either as high or low stimulation for each of the two intensity conditions. Objective measures are used to differentiate between high and low intensity of sensory stimulation, such as measuring temperature and volume of music.

The room temperature is set around 62 degrees Fahrenheit for the high (more intensely cool) and 74 degrees Fahrenheit for the low (comfortably air conditioned) intensity condition. In general, lighting is adjusted as either soft or bright; however,

depending on the environmental condition, natural light is also used when appropriate. To ensure compatibility with the selected café setting, a coffee scent is incorporated in the sensation manipulation. High coffee scent consist of natural coffee scented oil in a vapor diffuser as well as sweet coffee scented oil cubes in a wall plug-in diffuser. The same amount of oil is used in every high intensity condition, namely 100 drops of coffee oil in the diffuser and 2 cubes in a plug-in oil dispenser. The amount was halved for the low sensation condition. Lastly, a one-hour long recording of French music commonly played in French cafés ("French Café Music") is used for the sound sensation. The music is played from the same device in both conditions, to control for any additional sound effects. Furthermore, the music is either played on 100% or 50% for the high and low intensity of sensation manipulation respectively. For the outdoor and the indoor/outdoor condition, natural sounds and traffic noise is incorporated as well by either being outside or opening the balcony door to allow outdoor sounds to permeate the environment. A summary of the intensity of sensation manipulations within each environment is depicted in Table 4.1.

Table 4.1 - Experimental Conditions – Intensity of Sensation and Environment

INTENSITY OF SENSATION	ENVIRONMENT			
	Indoor	**Outdoor**	**Indoor/Outdoor**	**Control**
Low	Lighting - soft Temperature - 74 °F Scent - low coffee oil, sweet Sound - low music	Lighting - natural Temperture - outside Scent - outside Sound - outside with music	Lighting - natural Temperature - 74 °F Scent - low coffee oil, sweet Sound - low music with outside noise	Lighting - on Temperature - 70°F Scent - no Sound - no
High	Lighting - bright Temperature - 62 °F Scent - high coffee oil, sweet Sound - high music		Lighting - natural with bright light Temperature - 65 °F Scent - high coffee oil, sweet Sound - high music with outside noise	

Procedure. The experiment consists of various parts involving a perceptual task, a cognitive task, and a questionnaire. The perceptual task consists of a water taste test including the following four waters: tap water, bottled purified water, bottled spring water, and sparkling water. The bottled spring water and the sparkling water are the same brand to keep the taste consistent and only changing the sparking sensation. To avoid any biases each type of water is serviced in the same glass container, filled with 5oz of water, and placed on the table prior to the arrival of the participant. The order in which the water appears on the table is completely randomized in all four conditions. After indicating their perceived level of knowledge about water, respondents try each of the four waters and match the water to the corresponding label (tap water, bottled purified water, bottled spring water, and sparkling water). Respondents answer a few questions about the

sampled water, their usual water consumption, and their preference among the provided waters.

The second, cognitive task involves a café menu and the instruction to order a main course plus a dessert within their $20 budget. Calories, fairness, and value are estimated before completing measures for hedonic/utilitarian value and pleasure-arousal-dominance (PAD). Respondents then move to a neutral environment to complete a new questionnaire. The second survey features additional constructs, such as satisfaction, need for sensation, and need for touch, and ends with demographic variables. Manipulation checks and a question about guessing the purpose of this study complete the questionnaire. The task performances as well as value and PAD are assessed in the manipulated environment, while the additional questions are completed in a neutral environment. In the control condition, all tasks and surveys are completed within the same location.

Measures. Three multi-item measures are included in the experiment. The first is hedonic/utilitarian value, which is adapted from Babin, Darden, and Griffin (1994) and uses a seven-point scale (1 = strongly disagree to 7 = strongly agree). The hedonic dimension includes items asking participants to rate the experience with statements such as "I enjoyed the experience for its own sake, not just for things I ate and drank," "eating at this café truly feels like an escape," and "I enjoyed being immersed in this experience." The composite scale yields a Cronbach alpha of 0.81. The items incorporated in the utilitarian factor are "I accomplished just what I wanted to during my visit to the café," "I probably will go somewhere else right after to get something else to eat and drink," and "at the café, I found something good for lunch." The resulting scale reflects a Cronbach

alpha of 0.50, which is relatively low for an established scale. Therefore, results associated with utilitarian value will be rather exploratory in nature. The second variable is positive affect based on PAD by Mehrabian and Russell (1974). Here, the pleasure dimension of PAD is selected to represent positive affect with semantic differential scale items: unhappy/happy, annoyed/pleased, unsatisfied/satisfied, despairing/hopeful, and bored/relaxed. After eliminating contended due to low factor loading, the scale yields a Cronbach alpha of 0.80.

The previously developed need for sensation scale also is included in the experiment. Specifically, the two dimensions of sensory enjoyment and sensory avoidance are measured using a seven-point scale (1 = doesn't describe me at all to 7 = describes me perfectly). Participants are asked to respond to sensory enjoyment items, such as "an experience that engages all my senses is more fun than work," "I enjoy using all my senses when evaluating a product," and "I enjoy the "feel" of a stimulating environment, even if I don't intent to make a purchase." The scale results in a Cronbach alpha of 0.83. A median split is used to classify participants into high and low need for sensation. Further, sensory avoidance is measured with three items: "I will leave a service environment if it is too stimulating," "an extremely stimulating environment makes it difficult for me to focus on making a purchase," and "I avoid stores with strong scents." The composite scale yields a Cronbach alpha of 0.64. Again, subjects are classified into high or low need for sensation based on a median split.

As part of the experiment, participants are asked to indicate their overall level of satisfaction with the experience at the café by responding to one item ranging from 1 = "no satisfaction" to 5 = "extreme satisfaction." Furthermore, a few additional variables

are recorded and controlled for. The completion time for both tasks is recorded and a total time computed. In addition, the water consumption is noted for each type of water as part of the perceptual task. Environmental conditions including date, time, outside weather, and outside temperature are also documented and controlled for. Finally, the number of crackers consumed and if the participants were alone or in company completes the procedure. A copy of the measures used in this study is provided in Appendix C.

Data Collection and Sample. Data collection took place for five weeks during the fall and winter 2015 academic quarter. Undergraduate and graduate students at Louisiana Tech University were recruited to participate in the study. On campus facilities were utilized and converted to reflect the four environmental conditions. Early November was selected for the outside condition to take advantage of the mild climate during that season. Criteria for eligibility to complete the experiment included being over 18 years of age. Participants were screened for potential allergies and excluded if dietary restrictions would interfere with the completion of the experiment. A copy of the surveys used in this experiment is provided in Appendix D.

The initial sample of 280 respondents is reviewed for potential removal of responses. A total of six responses are eliminated due to common issues – variance of 0 (2), patterns in responses (3), and fast survey completion combined with failed attention check (1), leaving a final sample of 274 students. The total sample consists of 51.8 percent male students with an average age of 22 years (Table 4.2). The majority of the students identify as Caucasians (70.4%), followed by African American (20.8%). The average student represented in this sample is a senior (35.3%) and majors in Marketing (18.8%) or Business (15.1%).

Table 4.2 - Experiment Sample Descriptive Statistics – Total, Environmental Condition, and Intensity Condition

			Environments (n = 272)								**Intensity of Sensation** (n = 171)			
	Total		Indoor		Outdoor		Indoor/Outdoor		Control		Low		High	
Variable	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Gender														
Male	142	51.8	47	50.3	28	59.6	39	50.0	28	50.0	42	50.0	44	50.6
Female	132	48.2	46	49.7	19	40.4	39	50.0	28	50.0	42	50.0	43	49.4
Age														
19 or under	62	22.6	35	56.5	7	11.3	11	17.7	9	14.5	25	54.3	21	45.7
20-21	113	41.2	31	27.4	21	18.6	38	33.6	23	20.4	34	49.3	35	50.7
22-23	64	23.4	18	28.1	9	14.1	19	29.7	18	28.1	19	51.4	18	48.6
24 and above	35	12.8	9	25.7	10	28.6	10	28.6	6	17.1	6	31.6	13	68.4
Ethnicity														
Caucasian	193	70.4	68	35.2	37	19.2	49	25.4	39	20.2	54	46.2	63	53.8
African American	57	20.8	20	35.1	6	10.5	18	31.6	13	22.8	23	60.5	15	39.5
Hispanic	5	1.8	3	60.0	0	0.0	1	20.0	1	20.0	3	75.0	1	25.0
Asian	15	5.5	1	6.7	2	13.3	9	60.0	3	20.0	0	0.0	0	0.0
Middle Eastern	2	0.7	0	0.0	2	100	0	0.0	0	0.0	4	40.0	6	60.0
Other	2	0.7	1	50.0	0	0.0	1	50.0	0	0.0	0	0.0	2	100.0
Classification														
Freshman	29	10.7	19	65.5	0	0.0	3	10.3	7	24.1	13	59.1	9	40.9
Sophomore	53	19.5	23	43.4	10	18.9	14	26.4	6	11.3	17	45.9	20	54.1
Junior	62	22.8	23	37.1	8	12.9	18	29.00	13	21.0	18	43.9	23	56.1
Senior	96	35.3	27	28.1	19	19.8	30	31.3	20	20.8	31	54.4	26	45.6
Graduate	32	11.8	1	3.1	10	31.3	12	37.5	9	28.1	4	30.8	9	69.2
Major														
Accounting	38	14	9	23.7	10	26.3	12	31.6	7	18.4	9	42.9	12	57.1
Business	41	15.1	20	48.8	6	14.6	10	24.4	5	12.2	11	36.7	19	63.3
Engineering	16	5.9	8	50.0	3	18.7	3	18.7	2	12.5	6	54.5	5	45.5
Finance	22	8.1	4	18.2	8	36.4	6	27.3	4	18.2	5	50.0	5	50.0
MBA	13	4.8	0	0.0	3	23.1	5	38.5	5	38.5	2	40.0	3	60.0
Management	38	14	13	34.2	4	10.5	6	15.8	15	39.5	10	52.6	9	47.4
Marketing	51	18.8	14	25.5	12	21.8	26	47.3	3	5.5	18	47.4	20	52.6
Psychology	23	8.5	10	40.0	0	0.0	6	24.0	9	36.0	10	62.5	6	37.5
Other	30	11	15	62.5	1	4.2	3	12.5	5	20.8	12	60.0	8	40.0

Results

The first part of the results focuses on the overall experiment and the numerous measured variables. Table 4.3 provides a comprehensive overview of the descriptive statistics associated with the overall experiment. In general, only 57 subjects correctly identified all four water types. Sparkling water was identified most often with 95.6 percent, followed by tap water with 46.7 percent. Interestingly, while subjects identified sparkling water correctly, the average consumption is the lowest across all water typed with 0.78 oz. On average, subjects indicate a confidence level of 4.43 out of 7 in their capability to correctly identify the four water types. The most ordered food items were Quiche Saumon (21.9%) and Crepe au Chocolat (26.6%). Overwhelmingly, respondents correctly selected a main course and a dessert (86.1%); yet, 49 subjects went over budget. The overall experience received a mean of 3.77 out of 5 on satisfaction, and a mean of 4.91 as well as 4.81 out of 7 on hedonic and utilitarian value respectively. While some control variables are included in the analysis, only gender is relevant to the subsequent findings and reported below.

Table 4.3 - Experiment Descriptive Statistics

GENERAL DETAILS			WATER		
Variable	**n**	**%**	**Variable**	**n**	**%**
Environment			Water Identified		
Indoor	93	33.9	Tap	128	46.7
Outdoor	47	17.2	Purified	89	32.5
Indoor/Outdoor	78	28.5	Spring	103	37.6
Control	56	20.4	Sparkling	262	95.6
Intensity			Number Identified		
Low	84	30.7	0	3	1.1
High	87	31.8	1	74	27
			2	140	51.1
Company			4	57	20.8
Alone	106	38.7			
Not Alone	168	61.3	Usually Consumed Water		
			Tap	38	13.9
Average Time			Filtered Tap	56	20.4
Water	7:18		Purified	128	46.7
Menu	5:31		Spring	51	18.6
Total	12:49		Sparkling	1	0.4
Crackers			Water Consumed		
Average	1		Tap	1.27 oz	
Min	0		Purified	1.28 oz	
Max	10		Spring	1.33 oz	
			Sparkling	0.78 oz	

FOOD			ADDITIONAL MEASURES	
Variable	**n**	**%**	**Variable**	**mean**
Food Ordered			Water	
Quiche Saumon	60	21.9	Confident	4.43
Crepe Chocolat	73	26.6	Knowledgable	4.86
			Like container	7.96
Correctly Ordered				
Yes	236	86.1	Satisfied	3.77
No	38	12.9	Hedonic Value	4.91
			Utilitarian Value	4.81
Budget			Pos Affect	5.56
In Budget	225	82.1		
Over Budget	49	17.9		

Hypotheses Tests

Research Question 1 - Hypotheses 1-3. Research Question 1 examines the influence of intensity of sensory stimulation on task completion and value. These relationships are further assessed by looking at potential differenced by type of environments. In particular, hypothesis one states that a participant in a high intensity of sensation environment will have a lower score on accuracy of water identification, accuracy of food selection, and utilitarian value while exhibiting an increased total completion time. Hypothesis two focuses on individuals in high intensity of sensation environments and suggests that respondents will experience an increased level of hedonic value, positive affect, and satisfaction. The final hypothesis looks at the aforementioned relationships in different environmental conditions, namely indoor, outdoor, indoor/outdoor, and control. Here, the variables accuracy of water identification and hedonic value are selected for H1 and H2 respectively. To analyze the various proposed relationships across all research questions, a dummy variable represents intensity of sensation (0 = low intensity, 1 = high intensity). The conceptualization of each variable is explained below as part of the corresponding hypotheses.

Hypothesis 1 is tested with crosstabs and a univariate general linear model (GLM) depending on the nature of the dependent and independent variables. Accuracy of water identification is conceptualized in two ways: 1) dummy variable (0 = not correctly identified, 1 = correctly identified) and 2) actual quantity of waters ranging from 1 to 4.

First, a crosstab is computed with intensity of sensation and correctly identification of water dummy variables. The X^2 of 2.94 with 1 degree of freedom is significant (type I error of 0.1) ($p < 0.086$) indicating that differences exist across both

categorical variables exist. Table 4.4 depicts the cross-classification suggesting that more participants correctly identified all four water types in low versus high intensity sensation environments with 19 and 11 subjects respectively. Further, the most mistakes in the water taste test occur in the high sensation intensity environment, with 87.4%.

Table 4.4 - Crosstab: Intensity of Sensation and Correct Water Identification (H1a)

Intensity of Sensation	Correct Water Identification		
	No	Yes	Total
Low	65	19	84
% intensity	77.4	22.6	
% correct	46.1	63.3	
High	76	11	87
% intensity	87.4	12.6	
% correct	53.9	36.7	
Total	141	30	171

Next, univariate general linear model (GLM) is conducted with subject number of waters correctly identified as the dependent variable and intensity of sensation, gender as independent variables (Table 4.5). The model yields an F ($_{df=3, 171}$, $R^2 = 0.33$) of 2.02 ($p < 0.131$). The main effect for intensity of sensation is insignificant with $F_{(1, 171)} = 1.63$, $p < 0.204$, however the main effect for gender is significant ($F_{(1, 171)} = 4.07$, $p < 0.045$). The interaction between intensity of sensation and gender remains insignificant with F-value of 0.06 and 1 degree of freedom ($p < 0.802$). Overall, men identified more accurately the water types with a mean of 2.17 in comparison to women ($m = 1.85$). Since low intensity of sensation environment had more correctly identified waters ($m = 2.11$) in contrast to high intensity conditions ($m = 1.91$), the hypotheses is

directionally supported. Taking into consideration both conceptualizations of accuracy of water identification – dummy variable and continuous variable – hypothesis 1a is supported.

Table 4.5 - GLM: Number of Waters Identified, Intensity of Sensation, and Gender (H1a)

	Number of Water Identified			
	df	F	Sig.	Mean
Main Effects				
Intensity of Sensation	1	1.63	0.204	2.11(low)
				1.91(high)
Gender	1	4.07	0.045	1.85(♀)
				2.17(♂)
Interaction				
Intensity * Gender	1	0.06	0.802	

The analysis for the next part of the hypothesis focuses on if participants correctly select a main course and a dessert from the café menu. Since both intensity of sensation and food selected are dummy variables, a crosstab is computed. The X^2 (1) is 0.02 ($p < 0.883$) and reflects no significant differences across the categories. However, the relationships are directionally supported since more subjects did not select the correct food items in the high intensity of sensation environment with 52.4% (Table 4.6).

Table 4.6 - Crosstab: Intensity of Sensation and Correct Food Selection (H1b)

Intensity of Sensation	Correct Food Selection		
	No	Yes	Total
Low	10	74	84
% intensity	11.9	88.1	
% correct	47.8	49.3	
High	11	76	87
% intensity	12.6	87.4	
% correct	52.4	50.7	
Total	21	150	171

Hypothesis H1b is also tested by looking at how many participants stayed within the allotted $20 budget when selecting food items off the café menu. Again, the nature of the variables warrants a crosstab analysis, which is reported in Table 4.7. In contrast to the previous measure of accuracy of food selection, assessing the budget restriction results in a significant $X^2 = 2.82$ with 1 degrees of freedom (type I error of 0.1) ($p < 0.093$). As predicted, more participants went over budget in high intensity sensation condition with 64.5% and stayed within the budget in low intensity setting (86.9%). Therefore, H1b is partially supported.

Table 4.7 - Crosstab: Intensity of Sensation and Food Selection Budget (H1b)

Intensity of Sensation	Food Selection Budget		
	No	Yes	Total
Low	11	73	84
% intensity	13.1	86.9	
% correct	35.5	52.1	
High	20	67	87
% intensity	23.0	77.0	
% correct	64.5	47.9	
Total	31	140	171

Next, the relationship between intensity of sensation and utilitarian value (UV) is tested by running a univariate general linear model (GLM) with utilitarian value as the dependent variable and intensity of sensation, gender as independent variables. Since total time completion is also continuous, a correlation analysis was computed for UV and completion time to rule out the possibility of using MANOVA for the remaining hypotheses. The GLM model has an F ($_{df=3, 171,}$ $R^2 = 0.13$) of 0.72 ($p < 0.540$). Both main effects are insignificant with an F-value of 0.12 and 1 degree of freedom ($p < 0.731$) for intensity of sensation and $F_{(1, 171)} = 2.04$, $p < 0.155$ for gender. The interaction between the two variables is also insignificant for UV with $F_{(1, 171)} = 0.01$, $p < 0.924$. Overall, utilitarian value is higher in low intensity sensation settings ($m = 0.15$) than in high intensity surroundings ($m = 0.11$). Further, men express lower UV with a mean of 0.03 in contrast to women with a mean of 0.23. These findings are depicted in Table 4.8 and do not support H1c.

Table 4.8 - GLM: Utilitarian Value, Intensity of Sensation, and Gender (H1c)

	Utilitarian Value			
	df	F	Sig.	Mean
Main Effects				
Intensity of Sensation	1	0.12	0.731	0.15(low)
				0.11(high)
Gender	1	2.04	0.155	0.23(♀)
				0.03(♂)
Interaction				
Intensity * Gender	1	0.01	0.942	

To test hypothesis 1d a univariate general linear model is conducted. Total completion time is the dependent variable, while intensity of sensation and gender are independent variables (Table 4.9). The model yields an $F_{(3, 171)} = 1.63$, $p < 0.185$ with an $R^2 = 0.028$. The main effect for intensity of sensation is significant with an F-value (1, 171) of 3.51, $p < 0.063$, however the main effect for gender is insignificant ($F_{(1, 171)} = 0.003$, $p < 0.960$). The interaction between intensity of sensation and gender remains insignificant with F-value of 1.35 and 1 degree of freedom ($p < 0.246$). H1d is supported as participants required more time to complete the taste test in high intensity sensation environments than in low ones with a mean of 7:83 minutes and 7:22 minutes respectively.

Table 4.9 - GLM: Total Completion Time, Intensity of Sensation, and Gender (H1d)

	Total Completion Time			
	df	F	Sig.	Mean
Main Effects				
Intensity of Sensation	1	3.51	0.063	7:22(low)
				7:83(high)
Gender	1	0.03	0.960	7:53(♀)
				7:52(♂)
Interaction				
Intensity * Gender	1	1.35	0.246	

Hypothesis 2. To determine how to test hypothesis 2, correlations between the dependent variables hedonic value (HV), satisfaction, and positive affect are computed. Based on the correlations above 0.3, MANOVA is selected for the analysis. Hedonic value, satisfaction, and positive affect are entered as dependent variables, while intensity of sensation and gender are entered as independent variables into the model. Intensity of sensation is insignificant ($p = 0.100$) with Wilkes $\Lambda = 0.96$ and an $F_{(3,171)} = 2.04$ ($p < 0.110$), while gender is significant (Wilkes $\Lambda = 0.96$; $F_{(3,171)} = 2.50$; $p < 0.061$). The interaction of both variables is insignificant based on Wilkes $\Lambda = 0.96$ and an $F_{(3,171)} = 1.97$ ($p < 0.120$). Intensity of sensation is significant for hedonic value ($F_{(1,171)} = 3.55$; $p < 0.061$), with a higher hedonic value expressed in low sensation intensity environments ($m_{low} = 0.34$; $m_{high} = 0.08$). Gender also reflects significance with hedonic value ($F_{(1,171)} = 5.14$; $p < 0.025$) since women ($m = 0.36$) rate experiences higher on hedonic value than men ($m = 0.05$). These findings do not support H2 (Table 4.10).

Table 4.10 - MANOVA: Hedonic Value, Satisfaction, Positive Affect, Intensity of Sensation, and Gender (H2)

	Overall		Hedonic Value		Satisfaction		Positive Affect	
	df	F	F	Mean	F	Mean	F	Mean
Main Effects								
Intensity of Sensation	3	2.04 (0.110)	3.55 (0.061)	0.34 (low)	0.26 (0.609)	3.93 (low)	0.09 (0.763)	0.13 (low)
				0.08 (high)		3.87 (high)		0.17 (high)
Gender	3	2.50 (0.061)	5.14 (0.025)	0.36 (♀)	0.01 (0.909)	3.91 (♀)	0.18 (0.669)	0.18 (♀)
				0.05 (♂)		3.89 (♂)		0.12 (♂)
Interaction								
Intensity * Gender	3	1.97 (0.120)	1.95 (0.165)		1.44 (0.232)		0.79 (0.373)	

Hypothesis 3. Hypothesis 3 is tested by using a crosstab for accuracy of water identification and a univariate general linear model (GLM) for hedonic value (HV). The crosstab of environment and water accuracy has a significant X^2 of 25.5 with 3 degree of freedom ($p< 0.000$) indicating that differences across both categorical variables exist. Table 4.11 depicts that participants correctly identified the four water types the most accurately in the control condition with 42.1 percent followed by indoors with 35.1 percent. The outdoor reflects the highest number of missed taste tests with 93.6%. Clearly, findings reflect a difference of accuracy of water identification across different types of environments.

Table 4.11 - Crosstab: Environment and Correct Water Identification (H3)

Environment	Correct Water Identification		
	No	Yes	Total
Indoor	73	20	93
% environment	78.5	21.5	
% correct	33.6	35.1	
Outdoor	44	3	47
% environment	93.6	6.4	
% correct	20.3	5.3	
Indoor/Outdoor	68	10	78
% environment	87.2	12.8	
% correct	31.3	17.5	
Outdoor	32	24	56
% environment	57.1	42.9	
% correct	14.7	42.1	
Total	217	57	274

The second part of hypothesis 3 is tested with a univariate general linear model (GLM) featuring hedonic value (HV) as the dependent and environment, gender as independent variables. The model yields an $F_{(df=7, 274,}$ $R^2 = 0.13)$ of 5.64 ($p < 0.000$). Both main effects are significant with $F_{(3, 274)} = 10.09$, $p < 0.000$ for environment and $F_{(1, 274)} = 8.74$, $p < 0.003$ for gender. The interaction between environment and gender remains insignificant with F-value of 0.14 and 3 degree of freedom ($p < 0.938$). These findings are depicted in Table 4.12. Overall, participants rated the indoor environment has most hedonic with a mean of 0.29 and the control condition environment at least hedonic with -0.57. Women indicate environments to be hedonic more often than men

($m_{female} = 0.13$; $m_{male} = -0.23$). Considering accuracy of water and hedonic value differ across environments in the predicted direction, hypothesis 3 is supported.

Table 4.12 - GLM: Hedonic Value, Environment, and Gender (H3)

	Hedonic Value			
	df	F	Sig.	Mean
Main Effects				
Environment	3	10.09	0.000	-0.57(control)
				-0.02(outdoor)
				0.10(in/out)
				0.29(indoor)
Gender	1	8.74	0.003	0.13(♀)
				-0.23(♂)
Interaction				
Environment * Gender	3	0.14	0.983	

Research Question 2 - Hypothesis 4. The second research question investigates how different individuals are influenced by high intensity of sensation and its impact on value extracted from the consumption experience. The corresponding hypothesis, H_4, states that high need for sensation individuals report a higher level of hedonic value, positive affect, and satisfaction relative to low need for sensation subjects. Furthermore, these individuals also report lower levels of utilitarian value, accuracy of food and water selection. As previously mentioned, need for sensation is conceptualized with two dimensions: sensory enjoyment and sensory avoidance. A median split is computed to categorize individuals as either high or low need for sensation (0 = low, 1 = high) for both dimensions. Because sensory enjoyment reflects the positive experience with

sensation in a consumption experience and sensory avoidance pertains to the desire to avoid stimulating environments, the outcomes will respond accordingly.

The first part of H4 is tested by computing a multivariate GLM with hedonic value, satisfaction, and positive affect as dependent variables and need for sensation as well as gender as independent variables. For sensory enjoyment need for sensation model, the sensory enjoyment (Wilkes $\Lambda = 0.95$ and an $F_{(3, 272)} = 4.96$; $p < 0.002$) and gender (Wilkes $\Lambda = 0.97$; $F_{(3, 272)} = 3.12$; $p < 0.026$) are significant predictors. The interaction of both variables is insignificant based on Wilkes $\Lambda = 0.99$ and an $F_{(3, 272)} = 0.53$ ($p < 0.662$). Sensory enjoyment is significant for hedonic value ($F_{(1, 272)} = 14.66$; $p < 0.000$), satisfaction ($F_{(1, 272)} = 5.83$; $p < 0.016$), and positive affect ($F_{(1, 272)} = 5.49$; $p < 0.020$). As predicted, high need for sensation individuals report higher levels of hedonic value ($m_{low} = -0.22$; $m_{high} = 0.23$), higher levels of satisfaction ($m_{low} = 3.66$; $m_{high} = 2.89$), and higher positive affect ($m_{low} = -0.13$; $m_{high} = 0.15$). Gender's significance is limited to hedonic value ($F_{(1, 272)} = 8.20$; $p < 0.005$) since women ($m = 0.17$) rate experiences higher on hedonic value than men ($m = -0.17$). These findings support H4a-c.

For sensory avoidance need for sensation model, reported gender relates significantly to the outcomes (Wilkes $\Lambda = 0.96$; $F_{(3, 272)} = 3.66$; $p < 0.013$) although sensory avoidance does not (Wilkes $\Lambda = 0.99$; $F_{(3, 272)} = 0.78$; $p < 0.505$). The interaction of both variables is insignificant based on Wilkes $\Lambda = 0.99$ and an $F_{(3, 272)} = 0.64$ ($p < 0.586$). Gender is significant for hedonic value ($F_{(1, 272)} = 9.45$; $p < 0.002$) as women ($m = 0.19$) rate experiences higher on hedonic value than men ($m = -0.19$). While the remaining univariate effects are not significant, it is interesting that high need for sensory

avoidance sensation reflects a negative relationship with hedonic value with a mean of -0.091.

Next, crosstab is utilized for need for sensation and accuracy of water. The $X^2_{(1)}$ is 1.46 ($p < 0.227$) for sensory enjoyment and reflects no significant differences across the categories. However, the relationships are directionally supported since more subjects scoring high on need for sensation (sensory enjoyment) failed to correctly identify the water samples with 53.7% (Table 4.13). Further, low need for sensation individuals identified the most waters correctly with 55.4 percent.

Table 4.13 - Crosstab: Sensory Enjoyment, Sensory Avoidance, and Correct Water Identification (H4d)

	Correct Water Identification						
	No	Yes	Total		No	Yes	Total
Low SENJ	100	31	131	**Low SAV**	120	28	148
%sensory enjoyment	76.3	23.7		%sensory avoidance	81.1	18.9	
% correct	46.3	55.4		% correct	55.6	50.0	
High SENJ	116	25	141	**High SAV**	96	28	124
%sensory enjoyment	82.3	17.7		%sensory avoidance	77.4	22.6	
% correct	53.7	44.6		% correct	44.4	50.0	
Total	216	56	272	Total	216	56	272

The same analysis is conducted for sensory avoidance and correct water identification as depicted in Table 4.13. Results indicate an insignificant X^2 of 0.55 with 1 degree of freedom ($p < 0.457$). As hypothesized, respondents scoring higher on sensory avoidance are more likely to correctly identify water samples in comparison to low need

for sensation individuals (22.6% and 18.9% respectively). Therefore, sensory enjoyment and sensory avoidance provide directional support for H4d.

Consistent with before, a univariate general linear model (GLM) is utilized with subject number of waters correctly identified as the dependent variable and need for sensation, gender as independent variables (Table 4.14). The model including sensory enjoyment yields an F ($_{df=3, 272,}$ $R^2 = 0.01$) of 0.82 ($p < 0.523$) and the model featuring sensory avoidance yields an F ($_{df=3, 272,}$ $R^2 = 0.01$) of 0.72 ($p < 0.537$). The main effect for sensory enjoyment is insignificant with $F_{(1, 272)} = 0.41$, $p < 0.522$ and the main effect for gender is also insignificant ($F_{(1, 272)} = 1.28$, $p < 0.259$). The interaction between sensory enjoyment and gender remains insignificant with F-value of 0.50 and 1 degree of freedom ($p < 0.479$). However, when looking at the corresponding means, participants high in need for sensation report a lower accuracy in identifying water than low need for sensation individuals ($m_{high} = 2.08$; $m_{low} = 2.16$). This difference in means does provide directional support for the hypothesized relationship. Examining the main effects for sensory avoidance and gender also reflects insignificant findings ($F_{sav\,(1, 272)} = 0.43$, $p < 0.511$; $F_{gender\,(1, 272)} = 1.41$, $p < 0.253$).The interaction between sensory avoidance and gender is insignificant at $p > 0.100$ with an F-value of 0.39 with 1 degree of freedom. Consistent with the means for sensory enjoyment, participants high in sensory avoidance report a higher accuracy in correctly identifying water. Thus, the crosstabs and the GLM computations provide directional support for H4d.

Table 4.14 - GLM: Number of Waters Identified, Sensory Enjoyment, Sensory Avoidance, and Gender (H4d)

	Number of Water Identified							
	df	F	Sig.	Mean	df	F	Sig.	Mean
Main Effects					**Main Effects**			
Sensory Enjoyment	1	0.41	0.522	2.16(low) 2.08(high)	Sensory Avoidance	1	0.43	0.511	2.07(low) 2.16(high)
Gender	1	1.28	0.259	2.04(♀) 2.19(♂)	Gender	1	1.41	0.237	2.04(♀) 2.19(♂)
Interaction					**Interaction**			
Sensory Enjoyment*Gender	1	0.50	0.479		Sensory Avoidance*Gender	1	0.39	0.535	

The crosstab for the next part of hypothesis four investigates if the correct selection of a main course and a dessert from the café menu by considering the individual difference trait need for sensation. The $X^2_{(1)}$ is 0.06 ($p < 0.807$) for sensory enjoyment and $X^2_{(1)}$ is 0.35 ($p < 0.556$) for sensory avoidance; thus, both need for sensation dimensions reflect no significant differences across the categories (Table 4.15). When reviewing means, more high need for sensory enjoyment subjects correctly selected food items (52.1%) than low need for sensory enjoyment individuals (47.9%), which is consistent with sensory avoidance ($m_{lowsav} = 55.1\%$; $m_{highsav} = 44.95$). Therefore, H4e is not supported with the conceptualization of food accuracy by looking at the correct food selection; however, the need for sensation trait reflects consistent relationships - high need for sensory enjoyment is consistent with low need for sensory avoidance.

Table 4.15 - Crosstab: Sensory Enjoyment, Sensory Avoidance, and Correct Food Selection (H4e)

	Correct Food Selection						
	No	Yes	Total		No	Yes	Total
Low SENJ	19	112	131	**Low SAV**	19	129	148
%sensory enjoyment	14.5	85.5		%sensory avoidance	12.8	87.2	
% correct	50.0	47.9		% correct	50.0	55.1	
High SENJ	19	122	141	**High SAV**	19	105	124
%sensory enjoyment	13.5	86.5		%sensory avoidance	15.3	84.7	
% correct	50.0	52.1		% correct	50.0	44.9	
Total	38	234	272	Total	38	234	272

Hypothesis H4e is further tested by investigating how many participants stayed within the allotted $20 budget when selecting food items off the café menu. Table 4.16 summarizes the crosstab findings for food selection budget and need for sensation. The $X^2_{(1)}$ is 0.06 ($p < 0.807$) for sensory enjoyment and $X^2_{(1)}$ is 0.35 ($p < 0.556$) for sensory avoidance; thus, both need for sensation dimensions reflect no significant differences across the categories, Examining budget restriction indicates insignificant differences across categories with $X^2 = 0.99$ with 1 degrees of freedom at $p < 0.321$ for sensory enjoyment and $X^2 = 0.46$ with 1 degrees of freedom at $p < 0.499$ for sensory avoidance. As predicted, more high need for sensory enjoyment participants went over budget with 58.3% in comparison to low need for sensory enjoyment subjects (41.7%). Therefore, H4e is directionally supported for sensory enjoyment and food selection budget.

Table 4.16 - Crosstab: Sensory Enjoyment, Sensory Avoidance, and Food Selection Budget (H4e)

	Food Selection Budget						
	No	Yes	Total		No	Yes	Total
Low SENJ	20	111	131	**Low SAV**	24	124	148
%sensory enjoyment	15.3	84.7		%sensory avoidance	16.2	83.8	
% correct	41.7	49.6		% correct	50.0	55.4	
High SENJ	28	113	141	**High SAV**	24	100	124
%sensory enjoyment	19.9	80.1		%sensory avoidance	19.4	80.6	
% correct	58.3	50.4		% correct	50.0	44.6	
Total	48	224	272	Total	48	224	272

Next, the relationship between need for sensation and utilitarian value (UV) is tested by running a univariate general linear model (GLM) with utilitarian value as the dependent variable and need for sensation, gender as independent variables. The sensory enjoyment model has an F ($_{df=3, 272,}$ $R^2 = 0.057$) of 5.44 ($p < 0.001$). Both main effects are significant with an F-value of 9.17 and 1 degree of freedom ($p < 0.003$) for sensory enjoyment and $F_{(1, 272)} = 5.90$, $p < 0.016$ for gender. The interaction between the two variables is insignificant for UV with $F_{(1, 272)} = 0.94$, $p < 0.333$. While the relationships remain significant, the directions are not as hypothesized. Low need for sensory enjoyment subjects rate the experience lower in utilitarian value (m = -0.17) compared to high need for sensory enjoyment subjects (m = 0.18). Further, men expressed lower UV with a mean of -0.14 in contrast to women with a mean of 0.15. These findings are depicted in Table 4.17.

Table 4.17 - GLM: Utilitarian Value, Sensory Enjoyment, Sensory Avoidance, and Gender (H4f)

				Utilitarian Value					
	df	F	Sig.	Mean		df	F	Sig.	Mean
Main Effects					**Main Effects**				
Sensory Enjoyment	1	9.17	0.003	-0.17(low)	Sensory Avoidance	1	0.12	0.727	0.02(low)
				0.18(high)					-0.02(high)
Gender	1	5.90	0.016	0.15(♀)	Gender	1	7.05	0.008	0.16(♀)
				-0.14(♂)					-0.16(♂)
Interaction					**Interaction**				
Sensory Enjoyment*Gender	1	0.94	0.333		Sensory Avoidance*Gender	1	2.55	0.111	

For sensory avoidance, the model yields $F_{(3, 272,}\ R^2 = 0.032) = 2.99$, $p<0.031$. While the main effect for sensory avoidance is insignificant ($F_{(1, 272)} = 0.12$, $p < 0.727$), the main effect is significant for gender with an F-value of 7.05 with 1 degree of freedom and $p < 0.008$. The interaction between both variables is insignificant with $F_{(1, 272)} = 2.55$, $p < 0.111$. In general, men express lower level of utilitarian value than women ($m_{male} = -0.16$; $m_{female} = 0.16$). In addition, low need for sensation individuals rate the experience higher on utilitarian value ($m = 0.02$) providing directional support for the hypothesis. Overall, inconsistent support remains for H4e.

Research Question 3 - Hypothesis 5. Research Question 3 assesses how different types of consumers based their judgment of the consumption experience more or less on focus versus non-focal sensation. Hypotheses five describes that subjects high in need for sensation, relative to those low in need for sensation, subjects base their evaluation of the overall experience less on focal sensation, which is reflected in water taste ratings being less consistent with ratings of satisfaction. To conceptualize focal and non-focal sensation, an average water rating is generated by averaging the water attribute items

completed during the water taste test. Based on exploratory factor analysis results, the following attributes are translated into a factor score reflecting average water taste rating per respondent: taste, deliciousness, quality, feel in mouth, and feel during swallowing.

To test hypothesis 5 a multi-group regression analysis is conducted with satisfaction as the dependent variable and average water rating as the independent variable. This regression is computed for high and low need for sensation individuals by splitting the sample prior to running the analysis. For low sensory enjoyment need for sensation individuals the overall model yields $F_{(1, 131)} = 1.631$ ($p < 0.206$) and for high sensory enjoyment need for sensation the overall model has an F-value of 0.408 with 1 degree of freedom ($p < 0.524$). While both models are not statistically significant, the standardized beta coefficients are examined to see if the relationships represent the hypothesized relationship. The relationship between water rating and satisfaction is stronger for low need for sensation individuals ($\beta = 0.11$; $t=1.27$; $p < 0.206$) than for high need for sensation individuals ($\beta = 0.05$; $t = 0.639$; $p < 0.524$). Therefore, low need for sensation individuals' base their judgment of the overall experience more on the focal sensation conceptualized by the average water rating. As a result, the direction of the relationship is confirmed, directionally supporting H5 (Table 4.18).

Table 4.18 - Regression: Satisfaction and Water Rating for High/Low Sensory Enjoyment (H5)

	Satisfaction				
	df	F	R^2	β	t
Water Rating (Low NFS)	1	1.63 (0.206)	0.012	0.11	1.27 (0.206)
Water Rating (High NFS)	1	0.41 (0.524)	0.004	0.05	0.64 (0.524)

Research Question 4 - Hypothesis 6. The final research questions focuses on high intensity sensory environments and compares task completion between high and low need for sensation consumers. Therefore, hypotheses six states that high need for sensation individuals report a higher accuracy of water identification in high intensity of sensation environments. The following analysis is conducted only for high intensity of sensation environments.

To test hypothesis 6 a crosstab is conducted with need for sensation and correctly identified water dummy variables. The sensation enjoyment X^2 of 0.59 with 1 degree of freedom is insignificant at $p < 0.444$ indicating that no statistically significant differences across both categorical variables exist (Table 4.19). Nevertheless, directional support is evident since 63.6% of accurate water identification is achieved by high need for sensory enjoyment individuals. The second crosstab of sensory avoidance yields $X^2_{(1)} = 0.079$, $p < 0.778$ and is also insignificant. No directional support is found for sensory avoidance since low need for sensory avoidance individuals did not do worse than high need for sensory avoidance individuals. However, the low cell sizes doe suggest issues with the analysis.

Table 4.19 - Crosstab: Sensory Enjoyment, Sensory Avoidance, and Correct Water Identification for High Intensity Environments (H6)

	Correct Water Identification						
	No	Yes	Total		No	Yes	Total
Low SENJ	37	4	41	**Low SAV**	38	5	43
%sensory enjoyment	90.2	9.8		%sensory avoidance	88.4	11.6	
% correct	48.7	36.4		% correct	50.0	45.5	
High SENJ	39	7	46	**High SAV**	38	6	124
%sensory enjoyment	84.8	15.2		%sensory avoidance	86.4	13.6	
% correct	51.3	63.6		% correct	50.0	54.5	
Total	76	11	87	Total	76	11	87

A univariate general linear model (GLM) is conducted with subject number of waters correctly identified as the dependent variable and need for sensation, gender as independent variables. Results are shown in Table 4.20. The model including sensory enjoyment yields an $F_{(df=3, 87,} R^2 = 0.026)$ of 0.73 ($p < 0.537$) and the model featuring sensory avoidance yields an $F_{(df=3, 87,} R^2 = 0.056)$ of 1.65 ($p < 0.183$). The main effect for sensory enjoyment is insignificant with $F_{(1, 87)} = 0.28$, $p < 0.599$ and the main effect for gender is also insignificant ($F_{(1, 87)} = 1.93$, $p < 0.169$). The interaction between sensory enjoyment and gender remains insignificant with F-value of 0.09 and 1 degree of freedom ($p < 0.923$). However, when looking at the corresponding means, participants high in sensory enjoyment need for sensation report a higher accuracy in identifying water than low need for sensation individuals ($m_{high} = 1.96$; $m_{low} = 1.85$). This difference in means does provide directional support for the hypothesized relationship. Examining the main effects for sensory avoidance and gender also reflects insignificant findings ($F_{sav\,(1, 87)} = 0.12$, $p < 0.730$; $F_{gender\,(1, 87)} = 2.07$, $p < 0.154$). The interaction between

sensory avoidance and gender is significant at $p < 0.100$ with an F-value of 2.89 with 1 degree of freedom. Men who are low need of sensation individuals identify more number of waters correctly (m = 2.18) than females (m = 1.55). In contrast, for high need of sensation individuals, women express a slightly better accuracy of identifying water (m = 1.96) than men do (m = 1.90). Thus, the crosstabs and the GLM computations provide directional support for H6 since high need for sensation individuals perform better in high intensity of sensation environments.

Table 4.20 - GLM: Number of Waters Identified, Sensory Enjoyment, Sensory Avoidance, and Gender for High Intensity Environments (H6)

	Number of Water Identified								
	df	F	Sig.	Mean		df	F	Sig.	Mean
Main Effects					**Main Effects**				
Sensory Enjoyment	1	0.28	0.599	1.85 (low)	Sensory Avoidance	1	0.20	0.730	1.86 (low)
				1.96 (high)					1.93 (high)
Gender	1	1.93	0.169	1.76 (♀)	Gender	1	2.07	0.154	1.75 (♀)
				2.04 (♂)					2.04 (♂)
Interaction					**Interaction**				
Sensory Enjoyment*Gender	1	0.01	0.923		Sensory Avoidance*Gender	1	2.89	0.093	

Conclusion of Hypotheses Tests

The results of the hypotheses tests are summarized in Table 4.21. While not all hypotheses were supported, a majority of hypotheses were either supported or directionally supported. One contributing factor of some of the not supported hypotheses can be attributed to the small cell sample size of some of the analysis. However, these findings do provide support for the assumption that people respond differently towards intensity of sensation across different environments. Furthermore, results confirm an

individual difference among consumers with regard to extracting value from sensory stimulation within consumption environments. This difference is expressed in perceptual and cognitive task completion abilities. A comprehensive discussion of findings and contributions follows after post hoc analyses.

Table 4.21 - Overview of Hypotheses Results

Hypothesis	Direction	Analysis	Support
H1- intensity of sensation	↑		
accuracy of water identification	↓		
correct water identification		Crosstab	Yes
number of water identified		ANOVA	Directionally
accuracy of food selection	↓		
correct food selection		Crosstab	Directionally
food selection budget		Crosstab	Yes
utilitarian value	↓	ANOVA	No
completion time	↓	ANOVA	Yes
H2 - intensity of sensation	↑		
hedonic value	↑	MANOVA	Yes
satisfaction	↑	MANOVA	No
positive affect	↑	MANOVA	No
H3 - environment (indoor, outdoor, indoor/outdoor, control)			
accuracy of water identification			
correct water identification		Crosstab	Yes
hedonic value		ANOVA	Yes
H4 - need for sensation (sensory enjoyment)	↑		
hedonic value	↑	MANOVA	Yes
satisfaction	↑	MANOVA	Yes
positive affect	↑	MANOVA	Yes
accuracy of water identification	↓		
correct water identification		Crosstab	Directionally
number of water identified		ANOVA	
accuracy of food selection	↓		
correct food selection		Crosstab	No
food selection budget		Crosstab	Directionally
utilitarian value	↓	ANOVA	No
H5 - focal/non-focal (satisfaction)			
water taste rating	↑	Regression	Directionally
need for sensation (sensory enjoyment)	↓	Regression	
H6 - high intensity of sensation, high NFS			
accuracy of water identification	↑		
correct water identification		Crosstab	Directionally
number of water identified		ANOVA	

Post Hoc Results

Although not related to any specific hypotheses, a number of other findings are of interest. To further explore the idea of focal and non-focal sensation, hypothesis five is extended by looking at a different independent variable: willingness to pay. Since respondents provided willingness to pay scores for each water sample, an average of all four scores is computed and utilized in the analysis. A multi-group regression analysis is implemented to examine if low and high need for sensation individuals base their overall rating of the environment more or less on their willingness to pay score. As such, a regression model with satisfaction as the dependent variable and average willingness to pay as the independent variable is computed for low and high need for sensation samples.

For low sensory enjoyment need for sensation individuals the overall model is significant with an F-value of 2.95 with 1 degree of freedom ($p < 0.088$) and for high sensory enjoyment need for sensation the overall model is insignificant with an F-value of 0.1.57 with 1 degree of freedom ($p < 0.212$). As depicted in Table 4.22, the relationship between willingness to pay and satisfaction is stronger for low need for sensation individuals ($\beta = 0.15$; $t=1.72$; $p < 0.088$) than for high need for sensation individuals ($\beta = 0.11$; $t = 1.25$; $p < 0.212$). Therefore, low need for sensation individuals' base their judgment of the overall experience more on the focal sensation conceptualized by average willingness to pay.

Table 4.22 - Regression: Satisfaction and Willingness to Pay for High/Low Sensory Enjoyment

	Satisfaction				
	df	F	R^2	β	t
Willingness to Pay (Low NFS)	1	2.95 (0.088)	0.149	0.15	1.72 (0.088)
Willingness to Pay (High NFS)	1	1.57 (0.212)	0.106	0.11	1.25 (0.212)

Another construct used to conceptualize overall judgment of the experience is value in experience in the form of hedonic and utilitarian value. While hedonic value is more commonly associated with sensory experiences, utilitarian value seems a suitable dependent variable predicted by willingness to pay. As such, two regression models with hedonic and utilitarian value as dependent variables and average willingness to pay as the independent variable are estimated. For low need for sensation individuals the overall hedonic value model is significant and yields $F_{(1, 131)} = 3.30$ ($p < 0.072$). In contrast, for high need for sensation the overall hedonic value model is insignificant and yields $F_{(1, 141)} = 2.25$ ($p < 0.136$). The corresponding results are shown in Table 4.23. Comparing standardized beta coefficients, the relationship between willingness to pay and hedonic value is slightly stronger for low need for sensation individuals ($\beta = 0.16$; $t = 1.82$; $p < 0.072$) than for high need for sensation individuals ($\beta = 0.13$; $t = 1.50$; $p < 0.136$). Thus, focal sensation conceptualized by willingness to pay is utilized more by low need for sensation individuals when judging the overall experience represented by hedonic value.

Table 4.23 - Regression: Hedonic Value and Willingness to Pay for High/Low Sensory Enjoyment

	Hedonic Value				
	df	F	R^2	β	t
Willingness to Pay (Low NFS)	1	3.30 (0.072)	0.158	0.16	1.82 (0.072)
Willingness to Pay (High NFS)	1	2.25 (0.136)	0.126	0.13	1.50 (0.136)

The final model includes utilitarian value as the dependent and average willingness to pay as the independent variable (Table 4.24). Both models are statistically significant with low need for sensation yielding $F_{(1, 131)} = 3.59$ ($p < 0.060$) and high need for sensation yielding $F_{(1, 141)} = 10.65$ ($p < 0.001$). Furthermore, the relationship is stronger for high need for sensation individuals ($\beta = 0.27$; $t = 3.26$; $p < 0.001$) than for low need for sensation individuals ($\beta = 0.17$; $t = 1.90$; $p < 0.060$). Therefore, high rather than low need for sensation individuals rely more on focal sensation when judging the overall experience.

Table 4.24 - Regression: Utilitarian Value and Willingness to Pay for High/Low Sensory Enjoyment

	Utilitarian Value				
	df	F	R^2	β	t
Willingness to Pay (Low NFS)	1	3.59 (0.060)	0.165	0.17	1.90 (0.060)
Willingness to Pay (High NFS)	1	10.65 (0.001)	0.267	0.27	3.26 (0.001)

In general, willingness to pay seems to be a stronger predictor for judging the overall experience than average water rating. Furthermore, the hypothesized relationships in H5 are confirmed in the post hoc analysis with the exception of utilitarian value. Interestingly, high need for sensation individuals rely more on focal sensation conceptualized by willingness to pay than low need for sensation individuals. However, considering that utilitarian value is more associated with functioning in an environment, high need for sensation individuals might get distracted by sensory inputs and as such, rely more on focal sensation.

Hypothesis six focuses on high intensity sensory environments and assesses task completion between high and low need for sensation individuals. A post hoc analysis is investigating the same behavioral constructs in low intensity environments. Specifically, accuracy of water identification and number of correctly identified water samples is compared between high and low need for sensation consumers in low intensity environments.

A crosstab is completed with need for sensation and correctly identified water as a dummy variable. The sensation enjoyment X^2 of 0.19 with 1 degree of freedom is insignificant at $p < 0.659$ indicating that no statistically significant differences across both categorical variables exist (Table 4.25). However, in contrast to high intensity environments, low need for sensation individuals achieve a higher accuracy of water identification that high need for sensation people with 52.6% and 47.4% respectively. The second crosstab for sensory avoidance is also insignificant yielding $X^2_{(1)} = 0.60$, $p < 0.440$. Comparable to results for sensory enjoyment, low need for sensation individuals identified water samples more accurately with 52.6%. Interestingly, while

sensory enjoyment reflects high need for sensation individuals to perform the least accurate (53.1%), sensory avoidance depicts low need for sensation consumers to be least accurate (62.5%).

Table 4.25 - Crosstab: Sensory Enjoyment, Sensory Avoidance, and Correct Water Identification for Low Intensity Environments

	Correct Water Identification						
	No	Yes	Total		No	Yes	Total
Low SENJ	30	10	40	**Low SAV**	40	10	50
%sensory enjoyment	75.0	25.0		%sensory avoidance	80.0	20.0	
% correct	46.9	52.6		% correct	62.5	52.6	
High SENJ	34	9	43	**High SAV**	24	9	33
%sensory enjoyment	79.1	20.9		%sensory avoidance	72.7	27.3	
% correct	53.1	47.4		% correct	37.5	47.4	
Total	64	19	83	Total	64	19	83

To further examine how respondents perform in low intensity environments, a univariate general linear model (GLM) is computed with number of waters correctly identified as the dependent variable and need for sensation, gender as independent variables. Table 4.26 summarizes the results of this GLM. The sensory enjoyment model yields an $F_{(df=3, 83,}$ $R^2 = 0.033)$ of 0.89 ($p < 0.451$), while the sensory avoidance model yields an $F_{(df=3, 83,}$ $R^2 = 0.060)$ of 1.70 ($p < 0.175$). Both main effects for sensory enjoyment and gender are insignificant with $F_{(1, 83)} = 0.06$, $p < 0.810$ and ($F_{(1, 83)} = 2.03$, $p < 0.158$) respectively. Furthermore, the interaction between sensory enjoyment and gender also remains insignificant with F-value of 0.54 and 1 degree of freedom ($p < 0.464$). When comparing means across variables, high need for sensation individuals

(m = 2.15) and men (m = 2.30) achieve the highest number of correctly identified water samples. Examining the main effect for sensory avoidance also reflects insignificant findings ($F_{(1, 83)} = 0.44$, $p < 0.508$); however, gender depicts a significant main effect with an F-value of 3.41 with 1 degree of freedom ($p < 0.069$). Lastly, the interaction between sensory avoidance and gender is insignificant ($F_{(1, 83)} = 2.66$, $p < 0.107$). Similar to before, high need for sensory avoidance individuals (m = 2.25) and men (m = 2.40) reflect the highest number of accurately identified waters.

Table 4.26 - GLM: Number of Water Identified, Sensory Enjoyment, Sensory Avoidance, and Gender for Low Intensity Environments

				Number of Water Identified					
	df	F	Sig.	Mean		df	F	Sig.	Mean
Main Effects					**Main Effects**				
Sensory Enjoyment	1	0.06	0.810	2.09 (low)	Sensory Avoidance	1	0.44	0.508	2.08 (low)
				2.15 (high)					2.25 (high)
Gender	1	2.03	0.158	2.30 (♀)	Gender	1	3.41	0.069	2.40 (♀)
				1.94 (♂)					1.92 (♂)
Interaction					**Interaction**				
Sensory Enjoyment*Gender	1	0.54	0.464		Sensory Avoidance*Gender	1	2.66	0.107	

In line with results of hypothesis six, high need for sensation individuals reflect a higher accuracy of water identification in low intensity environments. However, while women scored higher on accuracy in high intensity environments, men achieved higher accuracy in low intensity environments. Future research should investigate the impact of age as a moderator to determine if differences across gender could be replicated for age groups.

Discussion

The purpose of this experiment is to examine how different environments and different levels of sensor stimulation can impact consumers. Specifically, consumers completed perceptual and cognitive tasks within high or low intensity of sensation surroundings. A total of four research questions provided guidance to develop and test six hypotheses.

The first research question focuses on high and low intensity of sensation environments and their influence on task completion as well as overall judgment of the experience. Hypothesis 1 centers on accuracy of task completion, utilitarian value, and completion time. Findings show that high intensity of sensation surroundings will lower a consumer's ability to accurately complete a perceptual task as more participants failed to accurately identify all four types of waters. Furthermore, consumers' cognitive capacity is also impacted since more participants expressed the tendency to go over the $20 budget and select wrong menu items in higher stimulating environments. While it did take participants longer to complete both tasks in these highly stimulating environments, the experience is not rated lower on utilitarian value. As stated by Babin, Darben, and Griffin (1994), utilitarian value reflects the impacted perceived functionality of an environment that can keep consumers from accomplishing their goals. As such, one possible explanation is that participants did not consciously perceived themselves as being impacted by the environment and thus did not express lower utilitarian values.

Another approach to evaluating the influence of intensity of sensation is to examine positive outcome variables. Therefore, participants were asked to rate their experience on hedonic value, overall satisfaction, and positive affect. As predicted,

individuals in high intensity of sensation environments expressed higher hedonic value associated with the experience. However, this relationship is not confirmed for satisfaction or positive affect. Nevertheless, achieving a greater perceived value for consumers leads to an overall better marketing performance and a more positive consumption experience. As such, a value-added consumption experience is provided to consumers.

Next, four different types of environments (indoor, outdoor, indoor/outdoor, and control) are examined with regard to correctly identifying water and hedonic value. In general, participants react differently in all four types of environments and report diverging results for accuracy and hedonic value. Particularly, the largest number of people correctly identified the four water types in the control condition, followed by the indoor environment. The lowest level of accuracy is reported in the outdoor condition. Interestingly, while most participants can accurately perform the perceptual task in the control environment, these participants also report the lowest level of hedonic value associated with the experience. Therefore, being able to function in an environment does not necessarily make it a rewarding experience. The highest hedonic value is reported in the indoor environment.

The second research question shifts towards the individual difference trait need for sensation. The same measures and tasks are examined while further investigating individual differences across consumers. The newly developed need for sensation scale is used to classify respondents as either high or low need for sensation (sensory enjoyment or sensory avoidance). Across all positive outcome measures, high need for sensation individuals report higher levels of hedonic value, satisfaction, and positive affect.

However, both measures of accuracy of water identification only reflected directional support; thus, high need for sensations participants only performed marginally worse during perceptual and cognitive tasks. Furthermore, need for sensation did not provide diverging levels of utilitarian value. Overall it seems that high need for sensation individuals gain more pleasure from a highly sensory stimulation experience, yet their performance is not negatively impacted by these environments. This finding suggests that consumers are still capable of focusing on their consumption goals while extracting greater value from the experience. In a time where businesses are more and more moving towards a sensational and experiential consumption experience, it is reassuring to know that utilitarian goals can still be accomplished during these enhanced experiences.

The newly introduced concept of focal and non-focal sensation is investigated in research question 2 and as part of the post hoc analysis. To examine if a difference between utilizing focal and non-focal sensation exist among high and low need for sensation individuals, focal sensation is conceptualized as the water ratings since the taste test was one of the major components in the experiment. While the results are not statistically supported, the direction of the relationships is consistent with the hypothesis. As such, low need for sensation individuals' base their judgment of the overall experience more on focal sensation without considering additional non-focal sensation. These findings are confirmed with a second conceptualization of focal and non-focal sensation: willingness to pay. Interestingly, high need for sensation individuals rely more on focal sensation when judging the overall experience based on utilitarian value scores. Thus, differences between high and low need for sensation individuals in utilizing focal vs. non-focal sensation is supported among multiple conceptualizations.

The final research question looks at the interaction of high intensity of sensation environments and high need for sensation individuals with regard to perceptual task completion. Tests provide directional support for this relationship as high need for sensation people did express the tendency to more accurately identify the four types of waters in high intensity sensation surroundings. Therefore, high intensity of sensation environments do not impact all consumers equally.

CHAPTER IV

CONCLUSION

The importance of sensory perception and sensory stimulation in creating pleasant consumption experiences has received increasing attention within recent years. Yet, while numerous studies investigate antecedents and consequences of sensory perception specific to a certain sense (vision, touch, audition, smell, and taste), limited research addresses sensation from a broader perspective by examining what constitutes "sensing" in sensations. This dissertation takes on an exhaustive investigation into the way sensory stimulations (sensations) contribute to value derived from consumption experiences. Multiple studies explore the totality of sensation rather than any sense specific sensation while framing sensational experiences within the long tradition of atmospherics research (Mehrabian and Russell 1974; Bitner 1992). This approach strives to combine sensory and atmospherics research to gain a deeper understanding of sensory elements contributing to value-added consumption experiences.

Distinct yet complementary contributions span across all research approaches and studies of the dissertation. A qualitative assessment of consumer responses towards sensory cues in consumption experiences identifies different sources of sensation, such as atmospheric, social, and product/service related. In addition, some sensations appear to be more influential than others; for example, smell is often a deciding factor for making a

purchase even for non-fragrance products. Findings reveal that consumers develop sensory expectations for different consumption environments, which alters their tolerance for sensory stimulation. The example of outdoor farmers markets is exemplary since consumers not only welcome, but expect a higher intensity of sensation in this setting in comparison to traditional supermarkets. Overall, input from focus group interviews guides the scale development and experimental design in the successive essays.

The fundamental contribution of the second essay hinges on the conceptualization of need for sensation and the corresponding scale development. As previously discussed, need for sensation reflects an individual characteristic trait representing the tendency of consumers to utilize sensory stimulation to extract value from a consumption experience. The need for sensation scale encompasses two dimensions: sensory enjoyment and sensory avoidance. While sensory enjoyment represents consumers' pleasurable and hedonic responses to sensory stimulation, sensory avoidance expresses a tendency to refrain from or prefer low sensory stimulation in certain environments. Interestingly, sensory enjoyment and sensory avoidance are relatively unrelated, thus individuals can be high or low on both dimensions simultaneously. In other words, a consumer can experience sensory enjoyment in a consumption experience, even if the environment is not conducive to completing anticipate goals. This assumption is confirmed in the final essay.

The experimental design implemented in the third essay provides an opportunity to measure consumers' responses to sensory stimulation in actual environments. Furthermore, the experiment expands research that focuses on environmental influences shaping consumer behaviors. Findings support the notion that different environments

provide diverging benefits. While environments void of intense sensory stimulation can facilitate in task completion, these environments do not enhance the experience through higher hedonic value or satisfaction. Considering the extensive literature on restorative environments, results of this study confirm that some environments can restore individuals through hedonic value and satisfaction even when this restoration does not necessarily lead to better performance. As such, restoration appears to be more experiential than cognitive. Furthermore, individuals in high sensation intensity environments perform worse on perceptual and cognitive tasks. This finding demonstrates the hindering effect of sensory overload and contributes to the limited literature on this construct. Findings provide practitioners with guidance on how to maximize sensory stimulation without decreasing the sensational experience (Krishna 2012). Finally, differences among low and high need for sensation individuals provide support for the developed scale. For example, high need for sensation individuals extract higher hedonic value, satisfaction, and positive affect from consumption experiences.

Overall, the current research contributes to marketing theory and practice in numerous ways. As reflected throughout the dissertation, the totality, rather than sense specific sensations, is examined which allows for a broader perspective of sensational experiences within an atmospheric and sensory marketing context. Thus, the current study moves away from traditional research that investigates isolated sensory responses (Krishna 2009) and instead employs a holistic design to assess the interplay of sensory atmospheric elements and sensory input obtained by physically handling products. In summary, this dissertation provides a starting point for an extensive stream of research

bridging atmospheric and sensory research with a multitude of potential publication outlets.

Theoretical Contributions

Theoretical contributions are anchored in the conceptualization of need for sensation within sensory marketing theory. Instead of associating need for sensation with risky behavior (Zuckerman 1979), the new constructs incorporates multisensory sensation and focal/non-focal sensation experienced by consumers. As such, sensation is now associated with incidental or every day sensation that individuals encounter during their daily routine. In contrast to being categorized as risky behavior that is actively sought out, sensation is more automatic and subconscious since individuals don't always deliberately utilize their senses. For example, simply entering consumption environments stimulates multiple senses, such as visual appearance, haptic sensation of temperature, obligatory cues, and auditory background music. However, consumers refrain from consciously activating their senses prior to entering new environments. Just as humans don't consciously think about breathing, we do not consciously think about engaging our senses. We might be able to focus on a particular sensation, but incidental sensation occurs continuously. Furthermore, this research introduces the new concept of focal and non-focal sensation. In accordance with prior research urging studies to integrate a holistic perspective of sensory stimulation of environments, this new differentiation incorporates sensations consumers experience through the environment and well as through interaction with products. The new conceptualizations goes beyond the scope of

traditional theoretical premises of atmospheric, services, and sensory marketing research by treating sensation holistically from all possible sources.

This theoretical advancement is solidified by the creation of a new scale capturing a consumer's need for sensation. The need for sensation scale consists of two dimensions: sensory enjoyment and sensory avoidance. In accordance with prior research incorporating individual difference traits, need for sensation can be used to categorize consumers as either high or low need for sensation individuals. As supported by the experimental validation of the scale, high need for sensation individuals extract more hedonic value, satisfaction, and positive affect from highly stimulating consumption experiences. Further, the differentiation between focal and non-focal sensations offers a deeper understanding of how different consumers extract value from consumption experiences.

Limitations and Future Research

The current study possesses several limitations and future research venues. The first limitation pertains to samples utilized for focus group interviews and the experiment. The use of student sample limits the possibility to investigate differences in intensity of sensation and need for sensation based on age. Prior research establishes a link between sensation as well as arousal seeking and age since these tendencies appear to decline with increase of age (e.g., Zuckerman 1994; Zuckerman 2005). The student samples utilized in Essay 1 and Essay 2 limits the age range; thus, effects based on age could not be analyzed. Future research should address this limitation by including a sample with a

greater spread of age to identify potential differences driven by this demographic variable.

Another limitation is context of French café in the experiment. While prior research provides support for individuals associating cafés with pleasant environments that are often sought out as a third place to escape daily routines and challenges (Korpela and Hartig 1996; Rosenbaum, Sweeney, and Windhorst 2009), the specific setting could have influenced participants' responses or task performance beyond what is controlled for in this experiment. Furthermore, the environment is artificially designed and not a real restaurant to maximize control for manipulations; however, simulated environments can be perceived as unreal or inconsistent with café schemas. As such, this study should be replicated by utilizing a different environment including different retail environments and actual coffee shops. While real establishments might not allow for the maximum level of manipulation control, findings will further the investigation of the proposed research questions.

The utilitarian value measure reflects reliability issues in the experimental design. Therefore, findings involving utilitarian value are rather exploratory at the moment. Upon reviewing the items, a potential wording issue might exist. For example, "I accomplished just what I wanted to during my visit to the café" and "I probably will go somewhere else right after to get something else to eat and drink" can be challenging to respond to. Since students were not really provided with meals, the possibility of frequenting a dining location after completion of the experiment does prevail. However, getting something to eat after the experiment does not necessarily reflect that students would not have liked the offered food at the fictional café, but rather that students are hungry. As a result, future

studies should further investigate utilitarian value for sensational experiences in high sensation intensity environments.

Lastly, the regression analysis for hypothesis 5 did not provide conclusive statistical results. One possible limitation could be the conceptualization of focal sensation as the water rating of participants. Post hoc analysis utilizes willingness to pay as the focal sensation and findings support the notion that low need for sensation individuals rely more heavily on focal sensation. Nevertheless, this differentiation of sensation is still in its infant state, future research is necessary to more clearly define, measure, and enhance the construct. More research is needed to further elaborate on whether high need for sensation consumers extract more value and input from multiple sensory sources.

In spite of the aforementioned limitations, the present study provides an optimal starting point to further examine the impact of sensory stimulation environments on consumers cognitive, behavioral, and affective responses. One interesting theme that emerged throughout this dissertation is how different sensory expectations are tied to certain consumption environments, which in turn drive the consumer's sensory stimulation tolerance. Here, outdoor environments are particularly of interest due to their highly sensory attributes and corresponding sensation expectations. Future research is further examining the sensational component of outdoor environments by developing a scale that reflects the tendency to extract value from outdoor sensations. In addition, the type of outdoor environment, such as restaurant or farmers market, will be examined to identify sensory expectations and unique attributes that encourage consumers to seek out these environments.

In line with prior research focusing on differences in consumer behavior across simulated and actual environments (e.g., Kjellgren and Buhrkall 2010), a future study should extend the current research by replicating the experiment into a survey design. Pictures of the actual environmental conditions designed in this experiment can be used to examine if responses to consumption experiences are different in a simulated environment. The direct comparison between simulated and actual experience in the same environments will contribute to the literature on sensory imaging and further the understanding of how accurately researchers assess sensory responses in survey studies.

Another future research stream will further conceptualize and validate the differentiation between focal and non-focal sensation. Specifically, differences regarding non-focal sensation associated with product or service interaction and atmospheric cues need to be identified and analyzed. The interplay, sequence, and influence of focal and non-focal sensation are yet to be clearly conceptualized. Here, studies within bodily and grounded cognition can provide a solid theoretical premise for future research.

Figure 5.1 outlines future research possibilities and potential publication outlets. The diagram is not all absolute, yet provides guidance for additional research opportunities with relation to need for sensation, intensity of sensation, focal and non-focal sensation, diverging consumption environments, and holistic approach to creating a sensational value-added consumption experience.

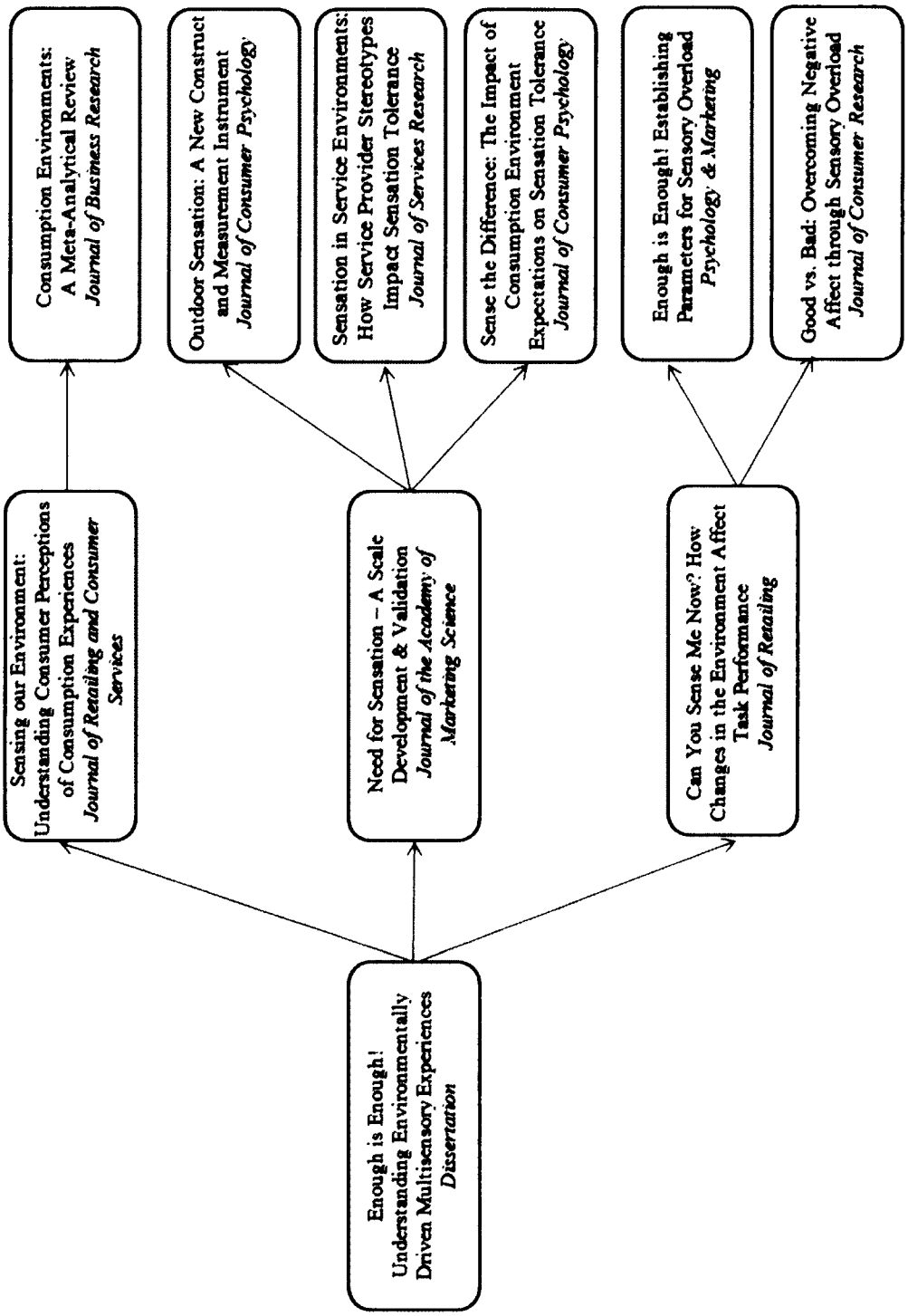

Figure 5.1 - Future Research Stream

APPENDIX A

HUMAN USE APPROVAL LETTER (HUC 1331)

LOUISIANA TECH
UNIVERSITY

MEMORANDUM

OFFICE OF UNIVERSITY RESEARCH

TO: Dr. Barry Babin and Ms. Nina Krey

FROM: Dr. Stan Napper, Vice President Research & Development

SUBJECT: HUMAN USE COMMITTEE REVIEW

DATE: June 17, 2015

In order to facilitate your project, an EXPEDITED REVIEW has been done for your proposed study entitled:

"Enough is Enough! Understanding Evironmentally Driven Multi-Sensory Experiences"

HUC 1331

The proposed study's revised procedures were found to provide reasonable and adequate safeguards against possible risks involving human subjects. The information to be collected may be personal in nature or implication. Therefore, diligent care needs to be taken to protect the privacy of the participants and to assure that the data are kept confidential. Informed consent is a critical part of the research process. The subjects must be informed that their participation is voluntary. It is important that consent materials be presented in a language understandable to every participant. If you have participants in your study whose first language is not English, be sure that informed consent materials are adequately explained or translated. Since your reviewed project appears to do no damage to the participants, the Human Use Committee grants approval of the involvement of human subjects as outlined.

Projects should be renewed annually. ***This approval was finalized on June 17, 2015 and this project will need to receive a continuation review by the IRB if the project, including data analysis, continues beyond June 17, 2016.*** Any discrepancies in procedure or changes that have been made including approved changes should be noted in the review application. Projects involving NIH funds require annual education training to be documented. For more information regarding this, contact the Office of University Research.

You are requested to maintain written records of your procedures, data collected, and subjects involved. These records will need to be available upon request during the conduct of the study and retained by the university for three years after the conclusion of the study. If changes occur in recruiting of subjects, informed consent process or in your research protocol, or if unanticipated problems should arise it is the Researchers responsibility to notify the Office of Research or IRB in writing. The project should be discontinued until modifications can be reviewed and approved.

If you have any questions, please contact Dr. Dr. Mary Livingston at 257-2292 or 257-5066.

LOUISIANA TECH
UNIVERSITY

OFFICE OF UNIVERSITY RESEARCH

MEMORANDUM

TO: Ms. Nina Krey and Dr. Barry Babin

FROM: Dr. Stan Napper, Vice President of Research & Development

SUBJECT: Human Use Committee Review

DATE: June 28, 2016

RE: Approved Continuation of Study HUC 1331

TITLE: **"Enough is Enough! Understanding Environmentally Driven Multi-sensory Experiences"**

HUC 1331

The above referenced study has been approved as of June 28, 2016 as a continuation of the original study that received approval on April 8, 2015. **This project will need to receive a continuation review by the IRB if the project, including collecting or analyzing data, continues beyond June 28, 2017.** Any discrepancies in procedure or changes that have been made including approved changes should be noted in the review application. Projects involving NIH funds require annual education training to be documented. For more information regarding this, contact the Office of University Research.

You are requested to maintain written records of your procedures, data collected, and subjects involved. These records will need to be available upon request during the conduct of the study and retained by the university for three years after the conclusion of the study. If changes occur in recruiting of subjects, informed consent process or in your research protocol, or if unanticipated problems should arise it is the Researchers responsibility to notify the Office of Research or IRB in writing. The project should be discontinued until modifications can be reviewed and approved.

If you have any questions, please contact Dr. Mary Livingston at 257-5066.

HUMAN SUBJECTS CONSENT FORM

(Students)

The following is a brief summary of the project in which you are asked to participate. Please read this information before signing the statement below.

TITLE OF PROJECT: Enough is Enough! Understanding Environmentally Driven Multi-Sensory Experiences

PURPOSE OF STUDY/PROJECT: The purpose of the study is to develop a scale to assess how people respond to sensory elements in the environment.

PROCEDURE: You will be asked to respond to questions about sensory elements in the environment and your attitudes towards the experience. Demographic information will be asked as well. Participation in answering the questions will take approximately 15-20 minutes.

INSTRUMENTS: The survey includes general demographic questions and specific questions about attitudes and beliefs concerning shopping experiences and retail environments. Only the researchers will have access to the data.

RISKS/ALTERNATIVE TREATMENTS: The participant understands that Louisiana Tech is not able to offer financial compensation nor to absorb the costs of medical treatment should you be injured as a result of participating in this research.
The following disclosure applies to all participants using online survey tools: This server may collect information and your IP address indirectly and automatically via "cookies".

BENEFITS/COMPENSATION: Students may receive extra credit if it is deemed appropriate by their respective professors. If extra credit is offered to students participating in research, an alternative extra credit that requires a similar investment of time and energy will be offered to those students who do not choose to volunteer as research subjects.

I attest that I am 18 years of age or older and that I have read and understood the following description of the study, "Enough is Enough! Understanding Environmentally Driven Multi-Sensory Experiences", and its purposes and methods. I understand that my participation in this research is strictly voluntary and my participation or refusal to participate in this study will not affect my relationship with Louisiana Tech University or my grades in any way. Further, I understand that I may withdraw at any time or refuse to answer any questions without penalty. Upon completion of the study, I understand that the results will be freely available to me upon request. I understand that the results of my survey will be confidential, accessible only to the principal investigators, myself, or a legally appointed representative. I have not been requested to waive nor do I waive any of my rights related to participating in this study.

CONTACT INFORMATION: The principal experimenters listed below may be reached to answer questions about the research, subjects' rights, or related matters.
Nina Krey – (318) 257-4012
Barry Babin – (318) 257-4012

Members of the Human Use Committee of Louisiana Tech University may also be contacted if a problem cannot be discussed with the experimenters:
Dr. Stan Napper (257-3056)
Dr. Mary M. Livingston (257-2292 or 257-5066)

_____ Yes, I consent to participate in the study.
_____ No, I do not consent to participate in the study.

HUMAN SUBJECTS CONSENT FORM

(Qualtrics)

The following is a brief summary of the project in which you are asked to participate. Please read this information before signing the statement below.

TITLE OF PROJECT: Enough is Enough! Understanding Environmentally Driven Multi-Sensory Experiences

PURPOSE OF STUDY/PROJECT: The purpose of the study is to develop a scale to assess how people respond to sensory elements in the environment.

PROCEDURE: You will be asked to respond to questions about sensory elements in the environment and your attitudes towards the experience. Demographic information will be asked as well. Participation in answering the questions will take approximately 15-20 minutes.

INSTRUMENTS: The survey includes general demographic questions and specific questions about attitudes and beliefs concerning shopping experiences and retail environments. Only the researchers will have access to the data.

RISKS/ALTERNATIVE TREATMENTS: The participant understands that Louisiana Tech is not able to offer financial compensation nor to absorb the costs of medical treatment should you be injured as a result of participating in this research.
The following disclosure applies to all participants using online survey tools: This server may collect information and your IP address indirectly and automatically via "cookies".

BENEFITS/COMPENSATION: Participants will receive monetary compensation paid directly by Qualtrics and according to Qualtrics policies.

I attest that I am 18 years of age or older and that I have read and understood the following description of the study, "Enough is Enough! Understanding Environmentally Driven Multi-Sensory Experiences", and its purposes and methods. I understand that my participation in this research is strictly voluntary and my participation or refusal to participate in this study will not affect my relationship with Louisiana Tech University. Further, I understand that I may withdraw at any time or refuse to answer any questions without penalty. Upon completion of the study, I understand that the results will be freely available to me upon request. I understand that the results of my survey will be confidential, accessible only to the principal investigators, myself, or a legally appointed representative. I have not been requested to waive nor do I waive any of my rights related to participating in this study.

CONTACT INFORMATION: The principal experimenters listed below may be reached to answer questions about the research, subjects' rights, or related matters.
Nina Krey – (318) 257-4012
Barry Babin – (318) 257-4012

Members of the Human Use Committee of Louisiana Tech University may also be contacted if a problem cannot be discussed with the experimenters:
Dr. Stan Napper (257-3056)
Dr. Mary M. Livingston (257-2292 or 257-5066)

_____ Yes, I consent to participate in the study.
_____ No, I do not consent to participate in the study.

HUMAN SUBJECTS CONSENT FORM

(mTurk)

The following is a brief summary of the project in which you are asked to participate. Please read this information before signing the statement below.

TITLE OF PROJECT: Enough is Enough! Understanding Environmentally Driven Multi-Sensory Experiences

PURPOSE OF STUDY/PROJECT: The purpose of the study is to develop a scale to assess how people respond to sensory elements in the environment.

PROCEDURE: You will be asked to respond to questions about sensory elements in the environment and your attitudes towards the experience. Demographic information will be asked as well. Participation in answering the questions will take approximately 15-20 minutes.

INSTRUMENTS: The survey includes general demographic questions and specific questions about attitudes and beliefs concerning shopping experiences and retail environments. Only the researchers will have access to the data.

RISKS/ALTERNATIVE TREATMENTS: The participant understands that Louisiana Tech is not able to offer financial compensation nor to absorb the costs of medical treatment should you be injured as a result of participating in this research.
The following disclosure applies to all participants using online survey tools: This server may collect information and your IP address indirectly and automatically via "cookies".

BENEFITS/COMPENSATION: Participants will receive monetary compensation in the amount of $0.75 per completed survey.

I attest that I am 18 years of age or older and that I have read and understood the following description of the study, "Enough is Enough! Understanding Environmentally Driven Multi-Sensory Experiences", and its purposes and methods. I understand that my participation in this research is strictly voluntary and my participation or refusal to participate in this study will not affect my relationship with Louisiana Tech University. Further, I understand that I may withdraw at any time or refuse to answer any questions without penalty. Upon completion of the study, I understand that the results will be freely available to me upon request. I understand that the results of my survey will be confidential, accessible only to the principal investigators, myself, or a legally appointed representative. I have not been requested to waive nor do I waive any of my rights related to participating in this study.

CONTACT INFORMATION: The principal experimenters listed below may be reached to answer questions about the research, subjects' rights, or related matters.
Nina Krey – (318) 257-4012
Barry Babin – (318) 257-4012

Members of the Human Use Committee of Louisiana Tech University may also be contacted if a problem cannot be discussed with the experimenters:
Dr. Stan Napper (257-3056)
Dr. Mary M. Livingston (257-2292 or 257-5066)

_____ **Yes, I consent to participate in the study.**
_____ **No, I do not consent to participate in the study.**

APPENDIX B

HUMAN USE APPROVAL LETTER (HUC 1353)

LOUISIANA TECH
UNIVERSITY

MEMORANDUM

OFFICE OF UNIVERSITY RESEARCH

TO: Ms. Nina Krey and Dr. Barry Babin

FROM: Dr. Stan Napper, Vice President Research & Development

SUBJECT: HUMAN USE COMMITTEE REVIEW

DATE: October 29, 2015

In order to facilitate your project, an EXPEDITED REVIEW has been done for your proposed study entitled:

"The Influence of Environmental Cues on Consumption Experiences"

HUC 1353

The proposed study's revised procedures were found to provide reasonable and adequate safeguards against possible risks involving human subjects. The information to be collected may be personal in nature or implication. Therefore, diligent care needs to be taken to protect the privacy of the participants and to assure that the data are kept confidential. Informed consent is a critical part of the research process. The subjects must be informed that their participation is voluntary. It is important that consent materials be presented in a language understandable to every participant. If you have participants in your study whose first language is not English, be sure that informed consent materials are adequately explained or translated. Since your reviewed project appears to do no damage to the participants, the Human Use Committee grants approval of the involvement of human subjects as outlined.

Projects should be renewed annually. ***This approval was finalized on October 29, 2015 and this project will need to receive a continuation review by the IRB if the project, including data analysis, continues beyond October 29, 2016.*** Any discrepancies in procedure or changes that have been made including approved changes should be noted in the review application. Projects involving NIH funds require annual education training to be documented. For more information regarding this, contact the Office of University Research.

You are requested to maintain written records of your procedures, data collected, and subjects involved. These records will need to be available upon request during the conduct of the study and retained by the university for three years after the conclusion of the study. If changes occur in recruiting of subjects, informed consent process or in your research protocol, or if unanticipated problems should arise it is the Researchers responsibility to notify the Office of Research or IRB in writing. The project should be discontinued until modifications can be reviewed and approved.

If you have any questions, please contact Dr. Dr. Mary Livingston at 257-2292 or 257-5066.

HUMAN SUBJECTS CONSENT FORM
(Students)

The following is a brief summary of the project in which you are asked to participate. Please read this information before signing the statement below.

TITLE OF PROJECT: The Influence of Environmental Cues on Consumption Experiences

PURPOSE OF STUDY/PROJECT: The purpose of the study is to examine how different sensory and environmental cues influence consumption experiences.

PROCEDURE: You will be asked to complete a provided task and to respond to questions about sensory elements in the environment and your attitudes towards the experience. Demographic information will be asked as well. Participation in answering the questions will take approximately 15-25 minutes.

INSTRUMENTS: The survey includes general demographic questions and specific questions about attitudes and beliefs concerning shopping experiences and retail environments. Only the researchers will have access to the data.

RISKS/ALTERNATIVE TREATMENTS: The participant understands that Louisiana Tech is not able to offer financial compensation nor to absorb the costs of medical treatment should you be injured as a result of participating in this research. The following disclosure applies to all participants using online survey tools: This server may collect information and your IP address indirectly and automatically via "cookies".
The experiment might include the consumption of a small portion of candy. Please disclose any health reasons why you should not consume the candy.

Do you have any dietary allergies? ____ **Yes** ____ **No**
Are you a diabetic? ____ **Yes** ____ **No**

BENEFITS/COMPENSATION: Students may receive extra credit if it is deemed appropriate by their respective professors. If extra credit is offered to students participating in research, an alternative extra credit that requires a similar investment of time and energy will be offered to those students who do not choose to volunteer as research subjects. In addition, every participant will be entered into a drawing of two $50.00 Starbucks gift cards.

I attest that I am 18 years of age or older and that I have read and understood the following description of the study, "The Influence of Environmental Cues on Consumption Experiences", and its purposes and methods. I understand that my participation in this research is strictly voluntary and my participation or refusal to participate in this study will not affect my relationship with Louisiana Tech University or my grades in any way. Further, I understand that I may withdraw at any time or refuse to answer any questions without penalty. Upon completion of the study, I understand that the results will be freely available to me upon request. I understand that the results of my survey will be confidential, accessible only to the principal investigators, myself, or a legally appointed representative. I have not been requested to waive nor do I waive any of my rights related to participating in this study.

CONTACT INFORMATION: The principal experimenters listed below may be reached to answer questions about the research, subjects' rights, or related matters.
Nina Krey – (318) 257-4012
Barry Babin – (318) 257-4012

Members of the Human Use Committee of Louisiana Tech University may also be contacted if a problem cannot be discussed with the experimenters:
Dr. Stan Napper (257-3056)
Dr. Mary M. Livingston (257-2292 or 257-5066)

_____ **Yes, I consent to participate in the study.**
_____ **No, I do not consent to participate in the study.**

HUMAN SUBJECTS CONSENT FORM
(Non-Students)

The following is a brief summary of the project in which you are asked to participate. Please read this information before signing the statement below.

TITLE OF PROJECT: The Influence of Environmental Cues on Consumption Experiences

PURPOSE OF STUDY/PROJECT: The purpose of the study is to examine how different sensory and environmental cues influence consumption experiences.

PROCEDURE: You will be asked to complete a provided task and to respond to questions about sensory elements in the environment and your attitudes towards the experience. Demographic information will be asked as well. Participation in answering the questions will take approximately 15-25 minutes.

INSTRUMENTS: The survey includes general demographic questions and specific questions about attitudes and beliefs concerning shopping experiences and retail environments. Only the researchers will have access to the data.

RISKS/ALTERNATIVE TREATMENTS: The participant understands that Louisiana Tech is not able to offer financial compensation nor to absorb the costs of medical treatment should you be injured as a result of participating in this research. The following disclosure applies to all participants using online survey tools: This server may collect information and your IP address indirectly and automatically via "cookies".
The experiment might include the consumption of a small portion of candy. Please disclose any health reasons why you should not consume the candy.

Do you have any dietary allergies? ____ **Yes** ____ **No**
Are you a diabetic? ____ **Yes** ____ **No**

BENEFITS/COMPENSATION: Participants will be entered into a drawing of two $50.00 Starbucks gift cards.

I attest that I am 18 years of age or older and that I have read and understood the following description of the study, " The Influence of Environmental Cues on Consumption Experiences", and its purposes and methods. I understand that my participation in this research is strictly voluntary and my participation or refusal to participate in this study will not affect my relationship with Louisiana Tech University. Further, I understand that I may withdraw at any time or refuse to answer any questions without penalty. Upon completion of the study, I understand that the results will be freely available to me upon request. I understand that the results of my survey will be confidential, accessible only to the principal investigators, myself, or a legally appointed representative. I have not been requested to waive nor do I waive any of my rights related to participating in this study.

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_____ **Yes, I consent to participate in the study.**
_____ **No, I do not consent to participate in the study.**

APPENDIX C

FOCUS GROUP SURVEY AND INTERVIEW OUTLINE

FOCUS GROUP SURVEY

Please answer the following questions:

What is your gender? _____ Male _____ Female

How old are you? _____

What is your undergraduate major? _____

What country were you born in? _____

Please write down your responses to the following scenarios:

1. When you enter a store, what do you notice first?

2. If you want to look at/evaluate a product, what do you do first?

3. When you go shopping, in what ways can the store environment affect you?

FOCUS GROUP INTERVIEW OUTLINE

Please complete the provided survey.

Describe your ideal shopping environment:

a. Can you think about a store in town that you particularly like/dislike? What influences your opinion about the store?
b.

Imagine you are trying to decide if you want to buy a certain product:

a. Do you prefer a plain i.e. quiet environment?
b. Can you think of influences in the store that would make it difficult for you to make this decision?

Have you ever been to big open-air market? If not, how would you imagine it to be like?

a. Temperature: hot, cold
b. Scent: produce, flowers, cheese, fish, bread
c. Visual: different types of stands, people
d. Touch: people touching you, you touching products
e. Sound: vendors talking, people talking, food preparation, music
f. Does that sound like an appealing environment to shop in to you?

What kind of information do you use when trying to make a purchase decision?

a. Do you ever consider how the product smells, feels, sounds, tastes?

Do you prefer purchasing products online?

a. What are some factors that you do not like about making online purchases?
b. Would you rather avoid the physical sensations of shopping?
c. Do you find it challenging to make a decision without physically evaluating the product (touch, smell, etc.)?

When you have to study or need to focus on adding up total cost of a product, what type of environment do you prefer?

a. Would you be able to focus in a crowded and loud environment?
b. What would you do in order to help you focus?

Has the smell of a product every influenced your purchase decision (not a scented product such as air freshener)?

a. If so, did you buy it? Why/Why not?
b. What was the product (type of product)?

How sensitive are you towards sensory stimulation?

a. How important is it for you to assess a product with your hands, eyes, nose, and ears?
b. You are trying to decide which of 3 chocolates/cell phones to buy, how would you decide?
c. Think about different contexts, does that change your answer:
    a. Touch: clothes, bedding
    b. Smell: perfume, produce, fish
    c. Visual: food (if it looks nice, does it taste better)
    d. Taste: food

How would you say you use your senses when making a purchase decision?

a. Has the smell, sound, taste, scent every influenced you?
b. If so, can you think of different products where these factors might be important?

Can you think of someone that makes purchase decisions rather differently from you?

APPENDIX D

MULTI-ITEM MEASURES

HEDONIC AND UTILITARIAN VALUE (Babin, Darden, and Griffin 1994)*

1. I enjoyed the experience for its own sake, not just for things I ate and drank.
2. The experience would truly be a joy.
3. I accomplished just what I wanted to during my visit to the café.
4. I was able to forget my problems during the experience in the café.
5. I probably will go somewhere else right after to get something else to eat and drink.
6. Eating at this café truly feels like an escape.
7. At the café, I found something good for lunch.
8. I lingered around, not because I had to, but because I wanted to.
9. Compared to other things I could have done, the time spent during this experience was truly enjoyable.
10. I enjoyed being immersed in this experience.
11. I felt like I could act on the "spur-of-a-moment."
12. During this experience, I felt a sense of adventure.
13. This experience was not a very nice time out.

*Scale was adjusted to fit the context of the study.

PLEASURE-AROUSAL-DOMINANCE (Mehrabian and Russell 1974)

1. Happy – Unhappy
2. Pleased – Annoyed
3. Satisfied – Unsatisfied
4. Contended – Melancholic
5. Hopeful – Despairing
6. Relaxed – Bored
7. Stimulated – Relaxed
8. Excited – Calm
9. Frenzied – Sluggish
10. Jittery – Dull
11. Wide-awake – Sleepy
12. Aroused – Unaroused
13. Controlling – Controlled
14. Influential – Influenced
15. In control – Cared-for
16. Important – Awed
17. Dominant – Submissive
18. Autonomous – Guided

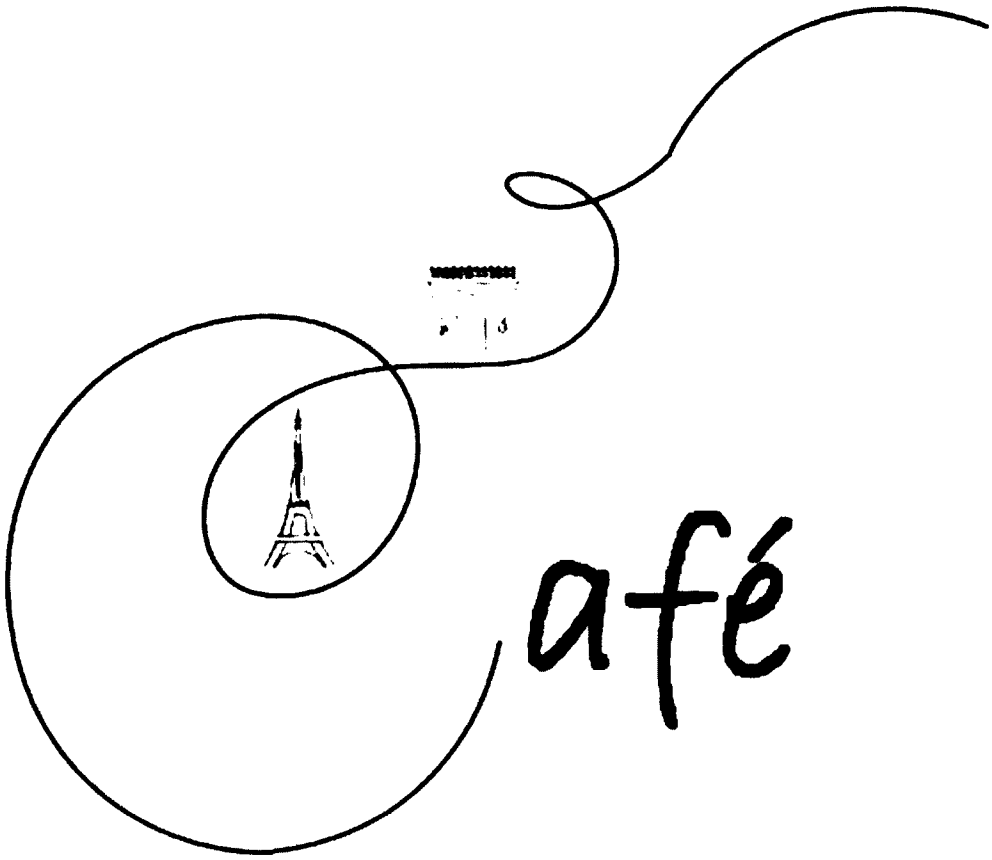
NEED FOR SENSATION

1. An experience that engages all my senses is more fun than work.
2. I enjoy using all my senses when evaluating a product.
3. I prefer environments that stimulate all my senses rather than pleasing only one sensation.
4. I enjoy the "feel" of a stimulating environment, even if I don't intent to make a purchase.
5. I like all my senses to be highly stimulating when exploring consumption alternatives.
6. Browsing is enjoyable when it engages all my senses.
7. I will leave a service environment if it is too stimulating.
8. An extremely stimulating environment makes it difficult for me to focus on making a purchase.
9. I avoid stores with strong scents.

APPENDIX E

EXPERIMENT QUESTIONNNAIRE

Le Petite Paris



Le Petite Paris ~75 Rue de Seine 75 ~ Paris, France 75006

Welcome to *Il Petite Paris*. For the duration of this study, imagine you are at a café in Paris. Your experience today will consist of three parts: 1) taste test, 2) selection task, and 3) a brief survey.

In front of you are four glasses that contain four different types of drinking water. Each glass of water is labeled with a letter ranging from A-D. You are asked to taste all four waters one at a time and match the following four types of waters to each glass:

1) Tap Water, 2) Sparkling Water, 3) Bottled Purified Water, and 4) Bottled Spring Water

Please pick up each glass, then take small sips of the water and taste it carefully. There is no time limit for this task and you can re-try each water as much as you need to. Feel free to snack on a few crackers between sampling the different water types. These types of crackers often are provided as snacks in the café.

If you need more water at any point in time, please let me know.

Once you have tried all four waters and can match up each water type, please complete the questions below.

---

1) How knowledgeable are you about drinking water?
Mark your response with an "X" at the corresponding value ranging from 1 = "No Knowledge" to 10 = "Expert Knowledge".

1 _____ 5 _____ 10

2) After sampling the four different types of waters, please match each water to the corresponding letter (A, B, C, or D):

_____ Tap Water
_____ Sparkling Water
_____ Bottled Purified Water
_____ Bottled Spring Water

3) How confident are you that you correctly guessed each of the four water types?
Please rate your confidence from 1 = "Not At All Confident" to 7 = "Extremely Confident" by circling the corresponding value.

Confident 1 2 3 4 5 6 7

4) Please rate each water sample according to the following attributes:
Mark your response by circling the corresponding value.

Water Sample A									
Taste	Bad	1	2	3	4	5	6	7	Good
Deliciousness	Bad	1	2	3	4	5	6	7	Good
Quality	High	1	2	3	4	5	6	7	Low
Visual Appearance	Bad	1	2	3	4	5	6	7	Good
Temperature	Bad	1	2	3	4	5	6	7	Good
Clarity	High	1	2	3	4	5	6	7	Low
Feel in your mouth	Bad	1	2	3	4	5	6	7	Good
Feel during swallowing	Bad	1	2	3	4	5	6	7	Good

Water Sample B

Taste	Bad	1	2	3	4	5	6	7	Good
Deliciousness	Bad	1	2	3	4	5	6	7	Good
Quality	High	1	2	3	4	5	6	7	Low
Visual Appearance	Bad	1	2	3	4	5	6	7	Good
Temperature	Bad	1	2	3	4	5	6	7	Good
Clarity	High	1	2	3	4	5	6	7	Low
Feel in your mouth	Bad	1	2	3	4	5	6	7	Good
Feel during swallowing	Bad	1	2	3	4	5	6	7	Good

Water Sample C

Taste	Bad	1	2	3	4	5	6	7	Good
Deliciousness	Bad	1	2	3	4	5	6	7	Good
Quality	High	1	2	3	4	5	6	7	Low
Visual Appearance	Bad	1	2	3	4	5	6	7	Good
Temperature	Bad	1	2	3	4	5	6	7	Good
Clarity	High	1	2	3	4	5	6	7	Low
Feel in your mouth	Bad	1	2	3	4	5	6	7	Good
Feel during swallowing	Bad	1	2	3	4	5	6	7	Good

Water Sample D

Taste	Bad	1	2	3	4	5	6	7	Good
Deliciousness	Bad	1	2	3	4	5	6	7	Good
Quality	High	1	2	3	4	5	6	7	Low
Visual Appearance	Bad	1	2	3	4	5	6	7	Good
Temperature	Bad	1	2	3	4	5	6	7	Good
Clarity	High	1	2	3	4	5	6	7	Low
Feel in your mouth	Bad	1	2	3	4	5	6	7	Good
Feel during swallowing	Bad	1	2	3	4	5	6	7	Good

5) How much did you like the feel of the container the water was in?

Mark your response with an "X" at the corresponding value ranging from 1 = "Did Not Like At All" to 10 = "Liked Very Much".

1 _____ 5 _____ 10

6) Which one of the sampled waters would you order in the current environment you are in? Please enter the corresponding letter (A, B, C, or D) on the line: _____

7) What type of water do you drink most often? (select one)

- o Tap Water
- o Filtered Tap Water
- o Bottled Purified Water
- o Bottled Spring Water
- o Sparkling Water

8) Estimate the number of bottles of water (20 oz.) you buy every week: _____

9) How does the water you liked the best during your taste test compare with your favorite water you usually consume?
Mark your response by circling the corresponding value.

Definitely Worse Tasting	1	2	3	4	5	6	7	Definitely Better Tasting
Definitely More Refreshing	1	2	3	4	5	6	7	Definitely Less Refreshing

10) How much would you be willing to pay for each of the sampled waters? In an environment such as this one, other waters cost anywhere from $1.50 to $4.00 per 500 ml (16.9 oz.) bottle, but you can select any price you would be willing to pay.

For Water Sample A, I would be willing to pay _____ $

For Water Sample B, I would be willing to pay _____ $

For Water Sample C, I would be willing to pay _____ $

For Water Sample D, I would be willing to pay _____ $

Now that you have completed the taste test, please review the menu on the next page and complete the following questions.

La Petite Cuisine

Le Petite Dejeuner

Pain au Chocolat - *Croissant with Chocolate Center*	2,45 €
Croissant basket - *Assorted Croissants*	3,00 €
Tartine - *Small Baguette with Butter and Jam*	3,00 €
Crêpe aux Fruits – with whipped cream cheese	4,50 €
Pain Perdu - *Croissant French Toast*	7,95 €
Oeufs en Casserole	
Two eggs baked with your choice of:	9,95 €
- Roasted Red Peppers & Tomatoes	
- Ham and Potato with grated gruyere and Herbs de Provence	

Les Croques, Panini, Croutes

Croque Monsieur	8,50 €
Grilled Sandwich with Ham & Gruyere topped with Béchamel & grated Cheese	
Croque Provencale	8,95 €
Grilled Sandwich with Ham, Gruyere, Roasted Red Peppers, Tomato, Béchamel & grated Cheese	
Panino Venezia	9,95 €
Tomato, Sun dried Tomatoes, Basil Pesto, Chèvre & Mozzarella Cheese, on a baguette	

Le Dejeuner

Quiche Lorraine	11,95 €
Bacon and Swiss Cheese	
Quiche au Saumon	11,95 €
Smoked Salmon & Leek; comes with a small Salade de la Maison	

Les Salades

Salade de la Maison	6,95 €
Field Greens, French Feta, Black Olives	
Assiette de Fromages et de Fruits	11,95 €
Four Cheeses with Seasonal Fruit	
Salade au Poulet comme Dijon	12,95 €
Field Greens, French Feta, Tomato, Black Olives, Grilled Free Range Chicken, Dijon Mustard, Mayonnaise	

Les Desserts

Crêpe Au Chocolat	4,95 €
Crêpe Normandie	6,95 €
Sautéed Apples, caramel sauce	
Crêpe Pralinée	7,50 €
Toasted Almonds, Caramel sauce & vanilla ice cream	
Mousse au chocolate	5,95 €
Chocolate mousse from three types of chocolate (dark, milk, white)	

Imagine you are having lunch at the *Il Petite Café*. **Your budget for your lunch is $20.00.** With this money, you want to order a main course and a dessert. Since you are health conscious, you want to select the most nutritious option available for the cheapest price. Note that the menu features prices in Euro, which you will need to convert to US dollars to stay within your budget. **The current exchange rate is $1.00 = 0.91 EUR.**

1) Please state the menu items you have selected for your lunch, their prices, and estimated calories in the appropriate space below.

	Name	Estimated Calories	Price (EUR)
Food Item 1			
Food Item 2			
	Total		(EUR)

2) Given the prices you've seen on the menu, please indicate the level of <u>fairness</u> you associated with these prices.
Mark your response by circling the corresponding value.

Unfair	1	2	3	4	5	6	7	Fair
Unreasonable	1	2	3	4	5	6	7	Very Reasonable
Unjust	1	2	3	4	5	6	7	Just

3) Thinking about the menu items and their prices, what is the value you would get in this environment?
Mark your response by circling the corresponding value.

Prices for coffee	Low	1	2	3	4	5	6	7	High
Prices for foods and other beverages	Low	1	2	3	4	5	6	7	High
Overall value for money	Bad	1	2	3	4	5	6	7	Good

The final questions pertain to your experience of being at the *Il Petite Café* in general.

4) Now that you've experienced the atmosphere, imagine you just dined at the café. Please indicate to what extent you agree with the following statements with respect to how well they describe your experience. The scale ranges from 1 = "Strongly Disagree" to 7 = "Strongly Agree".
Mark your response by circling the corresponding number.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree/ Disagree	Somewhat Agree	Agree	Strongly Agree
I enjoyed the experience for its own sake, not just for things I ate and drank.	1	2	3	4	5	6	7
The experience would truly be a joy.	1	2	3	4	5	6	7
I accomplished just what I wanted to during my visit to the café.	1	2	3	4	5	6	7
I was able to forget my problems during the experience in the café.	1	2	3	4	5	6	7
I probably will go somewhere else right after to get something else to eat and drink.	1	2	3	4	5	6	7
Eating at this café truly feels like an escape.	1	2	3	4	5	6	7
At the café, I found something good for lunch.	1	2	3	4	5	6	7
I lingered around, not because I had to, but because I wanted to.	1	2	3	4	5	6	7
Compared to other things I could have done, the time spent during this experience was truly enjoyable.	1	2	3	4	5	6	7
I enjoyed being immersed in this experience.	1	2	3	4	5	6	7
I felt like I could act on the "spur-of-a-moment."	1	2	3	4	5	6	7
During this experience, I felt a sense of adventure.	1	2	3	4	5	6	7
This experience was not a very nice time out.	1	2	3	4	5	6	7

5) How does the environment you are in make you feel?
Mark your response by circling the corresponding value.

Unhappy	1	2	3	4	5	6	7	Happy
Relaxed	1	2	3	4	5	6	7	Stimulated
Controlled	1	2	3	4	5	6	7	Controlling
Pleased	1	2	3	4	5	6	7	Annoyed
Calm	1	2	3	4	5	6	7	Excited
Influenced	1	2	3	4	5	6	7	Influential
Satisfied	1	2	3	4	5	6	7	Unsatisfied
Cared-for	1	2	3	4	5	6	7	In Control
Melancholic	1	2	3	4	5	6	7	Contended
Dull	1	2	3	4	5	6	7	Jittery
Awed	1	2	3	4	5	6	7	Important
Despairing	1	2	3	4	5	6	7	Hopeful
Sleepy	1	2	3	4	5	6	7	Wide-Awake
Submissive	1	2	3	4	5	6	7	Dominant
Relaxed	1	2	3	4	5	6	7	Bored
Unaroused	1	2	3	4	5	6	7	Aroused
Guided	1	2	3	4	5	6	7	Autonomous
Sluggish	1	2	3	4	5	6	7	Frenzied

When you are done with this section, please let us know and we will guide you to your final stage of this experience.

1) Imagine you actually purchased and consumed the items you chose from the menu along with a bottle of water, which of the following choices best describes the level of satisfaction you experienced at *Il Petite Café*? (select one)

- O Extreme Satisfaction
- O Very much Satisfaction
- O Satisfaction
- O Some Satisfaction
- O No Satisfaction

2) Consumer experiences can be shaped by numerous physical senses (taste, smell, feel, sound, sight). The items below concern how sensitive you, as a typical consumer, are to various sensory elements when shopping, being served, or when consuming some product.

When responding to the items below, think about how you respond to differing sensations during a shopping/service/consumption experience relative to other consumers.

Please indicate the level to which each statement fits you and the things you believe as a consumer ranging from 1= "Does Not Describe Me At All" to 7 = "Describes Me Perfectly."
Mark your response by circling the corresponding value.

	Doesn't describe me at all						**Describes me perfectly**
An experience that engages all my senses is more fun than work.	1	2	3	4	5	6	7
The sights, sounds, smells, and feeling of an outdoor market make me a better shopper.	1	2	3	4	5	6	7
I enjoy using all my senses when evaluating a product.	1	2	3	4	5	6	7
I will leave a service environment if it is too stimulating.	1	2	3	4	5	6	7
I prefer environments that stimulate all my senses rather than pleasing only one sensation.	1	2	3	4	5	6	7
When I buy summer clothes, I prefer shopping in a store that is bright and warm to reflect the summer season.	1	2	3	4	5	6	7
I enjoy the "feel" of a stimulating environment, even if I don't intent to make a purchase.	1	2	3	4	5	6	7
I know if French bread will taste good by the sound it makes when cutting into it.	1	2	3	4	5	6	7
As a consumer, I am aware of all my senses.	1	2	3	4	5	6	7
An extremely stimulating environment makes it difficult for me to focus on making a purchase.	1	2	3	4	5	6	7
I prefer environments with new and exciting sensations over more familiar sensations.	1	2	3	4	5	6	7

I need a quiet environment to make an accurate purchase decision.	1	2	3	4	5	6	7
The sights, sounds, smells, and feeling of an outdoor market make shopping better than in a store where the environment is controlled.	1	2	3	4	5	6	7
I like to smell products when I take them out of a box.	1	2	3	4	5	6	7
At Christmas time, the sound of Christmas music in a store makes shopping better.	1	2	3	4	5	6	7
I avoid stores with strong scents.	1	2	3	4	5	6	7
Browsing engages all my senses.	1	2	3	4	5	6	7
Service/shopping environments that are very colorful are better than ones with simple colors.	1	2	3	4	5	6	7
I make better choices when I can touch, see, smell, hear and taste products.	1	2	3	4	5	6	7
I find that the smells of a grocery store encourage me to quickly get what I need and leave.	1	2	3	4	5	6	7
I like all my senses to be highly stimulating when exploring consumption alternatives.	1	2	3	4	5	6	7
I am very sensitive towards sensory stimulation in a shopping environment.	1	2	3	4	5	6	7
I will leave a service environment if it is too stimulating.	1	2	3	4	5	6	7
I enjoy eating outside because of the sights, sounds, smell, and feeling of the outdoors.	1	2	3	4	5	6	7
I prefer an environment that stimulates all my senses.	1	2	3	4	5	6	7
	Doesn't describe me at all						**Describes me perfectly**

5) Please rate the <u>temperature of the water samples</u> you consumed today:
Mark your response by circling the corresponding value.

Very Warm 1 2 3 4 5 6 7 Very Cold

6) Please rate the <u>temperature of the room</u> you were just in:
Mark your response by circling the corresponding value.

Warm 1 2 3 4 5 6 7 Cold

7) Please rate the lighting of the room you were just in:
Mark your response by circling the corresponding value.

Artificial	1	2	3	4	5	6	7	Natural

8) With regard to the environment you were just in, please answer the following questions:
Mark your response by circling the corresponding response.

Do you recall a distinct scent in the room?	Yes	No
Was background music playing?	Yes	No
Did the environment seem like you were outside?	Yes	No

What is your sex?

- O Male
- O Female

What is your age? _____

What city do you consider your home? _____

Have you ever traveled abroad?

- O Yes
- O No

If you have selected "yes," please list the last 3 places you have visited:

1. _____
2. _____
3. _____

Are you currently a student?

- O Yes
- O No

If you are a student, what is your major field of study? _____

What is your classification?

- O Freshman
- O Sophomore
- O Junior
- O Senior
- O Graduate

What is your racial background?

- O White/Caucasian
- O African American
- O Hispanic
- O Asian/Pacific Islander
- O Middle Eastern
- O Other (please specify)_____

Can you guess the purpose of this study:_____

_____

_____

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