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#MOMENT: CREATING MOMENTS OF TRUTH
THROUGH EXPERIENTIAL INTERIOR DESIGN

by

JENNIFER MCKUNE REFSNES

Under the Direction of Ryan Crooks, RA, IDEC

ABSTRACT

Interior Design is a multi-billion dollar industry that employs a variety of sensorial elements to shape perception and create positive Moments of Truth. Part science and part art, design practices must adapt as market demands shift. The influence of today's digital market exposes gaps whereby sensorial elements of space are overlooked, resulting in skewed Moments of Truth. This paper examines the aesthetic experience as part of a proposed business design equation wherein each sense and design element influences the holistic spatial experience. A presentation of research will follow, wherein application of the equation demonstrates a framework for how to develop interior space holistically to communicate the desired Moment of Truth. This examination of aesthetic perception and experiential actuality advances the science

behind design, and empowers industry players to understand how to design and communicate more effectively to better satisfy aesthetic demands while still meeting the needs of the human condition.

INDEX WORDS: Interior design, Sensorial design, Moments of truth, Digital design, Aesthetic experience, Design equation, Framework, Communication, Aesthetic perception

#MOMENT: CREATING MOMENTS OF TRUTH
THROUGH EXPERIENTIAL INTERIOR DESIGN

by

JENNIFER MCKUNE REFSNES

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Masters of Fine Arts

in the College of the Arts

Georgia State University

2018

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Jennifer Refsnes
2018

#MOMENT: CREATING MOMENTS OF TRUTH
THROUGH EXPERIENTIAL INTERIOR DESIGN

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May 2018

DEDICATION

This thesis is dedicated to my family and friends. Their patient and unconditional support throughout the process is forever appreciated.

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Thank you for the feedback, knowledge, and support of my thesis committee (Ryan Crooks, Carrie Brown, Dr. Dawn Haynie, and Dr. Leonard Jackson). I also express thanks to the leaders and instructors at the Georgia State University College of the Arts, who through their diverse backgrounds and insightful discussions led me to this thesis research.

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LIST OF ABBREVIATIONS / DEFINITIONS

Within the scope of research for this paper, the author references terms that are commonly used within the Information Technology, Business, and Interior Design industries typically without major deviations from their generally accepted meanings. Defined here are the terms as they are understood and applied to this research with any new or deviating information clarified for understanding and applicability.

Business Terms

While the terms below are generally understood and used within the business landscape, and in particular marketing, they are not frequently used in other market sectors or areas despite their applicability.

MoT: Moments of Truth

Definition: The moment of provider/customer service confrontation, wherein lies the idea that “any contact” with the business is an “opportunity for impression.”

Psychographics:

Definition: Part of an increasing sector of business and technology driven consumer profiling that involves the separation of consumers into marketable groups based on personality, morals/standards, outlooks and views. With a focus on emotional drivers and impacts, businesses that can identify audience prejudices will have the upper hand in creating design experiences that will yield the desired perception upon exposure in the real market.

Servicescapes:

Definition: Traditionally used within the business environment to define the physical structure of the areas in which service interactions take place between facility personnel and consumers, this term is defined here twice to clarify both the traditional application and the updated application with which it is applied to the research here (including digital application).

SMoT: Second Moment of Truth

Definition: The moment the consumer makes a commitment or purchase.

TMoT: Third Moment of Truth

Definition: The concept of the consumer experience process as no longer being marketer or “word of mouth” driven, but rather “world of mouth” as new consumers consider prior consumer feedback on a product or service.

WOM: World of Mouth

Definition: The concept of global information sharing and communication wherein the opinions of people around the world can be sought and consumed as information, not just the opinions of people residing in one’s community.

ZMoT: Zero Moment of Truth

Definition: The moment after consumer exposure to a product or service, when they begin research, but before they encounter it in person.

Information Technology Terms

The terms below are generally used to describe and direct the flow of data from collection to information within the Information Technology (IT) industry. Data is understood to be a collection of points in time (numbers, consumer surveys, dates, etc.), which hold no true applicability, or knowledge in their own right. Information is understood as the collection of those data points into actionable information from which conclusions can be drawn and decisions made.

Big Data:

Definition: This term is used to describe the extremely large data sets that are collected by organizations, in both structured and unstructured formats, on the day-to-day business functions and interactions in which they partake.

BI: Business Intelligence

Definition: Generally understood to be a two-part term, this refers to both the computational analysis conducted on big data to identify “patterns, trends, and associations,” and refers to the information that results from those computations in the form of reports, charts, summaries, etc. from which intelligence on the business is garnered to make day-to-day business decisions.

Data Set:

Definition: A collection of meaningful data points on which the business can run calculations or computations to produce intelligence. Data is collected during any business interaction or transaction, but the grouping of that data into a collection records produces a data set. For example, “Customer Name: Sam,” “Age: 45,” “Last Hotel Stay: 12/12/2014,” “Hotel: Aloft Miami-Dadeland” are all data points. Put together however, they become a data set or record on which analysis can be conducted and intelligence can be gleaned.

Mathematical Terms

In an effort to create actionable information within the Information Technology realm, it is often necessary to collate and extrapolate data using mathematical evaluation or run specific analyses based on proven methods of mathematical computation.

ANOVA: Analysis of Variance

Definition: One of multiple statistical methods for calculating differences/variances between a set of means. Used in this research as a one-way analysis of the multiple, independent data groups extrapolated from the provided hotel data, identifies statistical significance. However, additional ANOVA tests can be run during future research for various relationship evaluations of actual hotel data.

Best Subset Regression:

Definition: This form of regression compares all possible combinations of elements incrementally to determine which elements are the best fit for the particular model desired while identifying the point at which the additive effect of the elements results in little or no statistical change. It is the recommended model to reduce the possible combinations of sensorial elements applied in any given hospitality design from this research.

Extrapolation:

Definition: The estimation of values based on known sequence or set of available values. For this research, the means of the consumer satisfaction surveys in multiple categories were known from independent professional surveys. In order to run regression testing, numbers were generated using extrapolation of the means to create a larger data set.

Random Number Generation:

Definition: Unbiased generation of data points based on a provided data set or list of requirements that enables the creation of a larger, objective data set.

New Terminology

The equation and terms discussed below are the findings of the research contained within this paper. Not currently contained within the Business, nor Interior Design industries, the terms below forge new ground in their connection of the two industries in science-based conversation.

Aesthetic Experience:

Definition: While not newly created terms, the usage of aesthetic and experience in combination is a new discussion within the design industry. Used to define the Interior Design interaction as more than just the aesthetic encounter with which success or failure was traditionally defined, this term places equal weight on the experiential, sensorial elements that comprise that aesthetic encounter to create the whole. The combined term is used to represent the sensorial (touch, sound, taste, etc.) and the visual elements that contribute to a holistic spatial construct and their combined impact on the perceptions and behavior of participants.

BDE: Business Design Equation ($BDE = CaS (C(Se, k)) + DPE_1 + DPE_2 + DPE_3$)

Definition: A science-based framework that allows design and business areas to objectively apply the emotional drivers that establish a desired aesthetic encounter and experience to create a clearly articulated ZMoT, which is then substantiated by the industry or consumer generated TMoT.

Ca: Cultural Adaptation of Service

Definition: Acknowledge the servicescape requirements (such as land, security/laws, customs/traditions, etc.) and apply their limiting qualities to the design at hand.

S: Servicescapes

Definition: The “physical [or digital] environment of a service facility that influences behavior and perceptions.” This is the construct in which sensorial elements are implemented to create the consumer’s experiential interaction be it digitally via the self-service ZMoT or physically via the FMoT and SMoT. Applying sensorial elements to the servicescape structure expands the purely physical application to include the influence of interactions relating to personality, speech, and understanding. These elements are known to influence consumer responses, but expand beyond the physical environment.

Se: Sensorial Elements

Definition: The multitude of elements (e.g. Ego, Sight, Sound, Touch, etc.) by which people perceive and experience space; wherein the understanding is influenced by each element’s application and its congruence within the holistic spatial experience. The raised Se value to 2 represents the best subsets regression model (2^P) where Se is the number of predictors (traditionally noted as P) in a given data set. This model is modified slightly for the BDE to use the combination equation when not all P or Se will be applied in any given scenario. $C = \text{Combination}(Se, k) = \frac{Se!}{k!(Se-k)!}$. Formal regression software will

use this to then display the best fitting models from which the researcher will select the most applicable, reducing the number of combinations that must be processed by hand iteratively.

DPE: Design Principles and Elements

Definition: The generally accepted list of design principles and elements (e.g. Line, Shape/Form, Color, Texture, Proportion/Scale, etc.) which function as attributes of the sensorial experience that enhance the congruence or incongruence of the finished spatial construct to create a specific sensorial experience. While additional elements can be added as needed to the model, limiting the model to an initial three DPE enables the design team to focus on the impacts of DPE in the most influential positions.

1 INTRODUCTION

"Design is a tool to enhance our humanity; it's a frame for life." Ilse Crawford¹

As a multi-billion dollar industry, Interior Design creates a lasting impact on the way we encounter life. From a design perspective, the new digital economy necessitates the combination of traditionally additive and independent terms “aesthetic” and “experience” into a new format for Interior Design creation. As industry contributors work to construct spaces that meet digital aesthetic expectations, sensory elements are often overlooked, or trivialized - unless they have a direct and significant impact on the exhibition. Of interest in the public realm, and from the business perspective, this interruption of traditional meaning results in a weakened design equation and therefore less memorable impressions. When we take time to examine the “experience” side of the aesthetic equation, we begin to find an opportunity for new dialogue on the influence of individual sensorial elements and their cumulative impact on the resulting moments of truth experienced by the consumer.

In this paper, the research examines the creation of an aesthetic experience as the moment of truth and introduces a fundamental business design equation: $CaS (C(Se, k)) + DPE_1 + DPE_2 + DPE_3$, where the application thereof quantitatively defines the spatial construct. While other elements can certainly be added to the equation, the presented form is based on a statistical analysis of the basic divergent design drivers: aesthetics (physical construct), experience, and business moments of truth within Interior Design. Application of the equation defines a framework for how to develop interior space holistically based on quantitative data in order to communicate the desired moment of truth to the consumer. This examination of aesthetic perception and experiential actuality will help the design and business sectors understand how to

¹ Crawford, Ilse. *Ilse Crawford: Interior Design In Abstract: The Art of Design*. Sarina Roma, dir. Netflix. 2017. Digital.

design and communicate more effectively to create interior spaces that better satisfy experiential demands in an ever-changing market.

2 BACKGROUND

There are three areas of influence one must examine historically to understand how to communicate in today's market: Moments of Truth, Gestalt, and Architectural Phenomenology as it relates to experiential design. The first provides perspective on the business process and profit opportunities of consumer interaction. The second examines the design philosophies and practices that define successful spaces, a la Gestalt; and the last examines what drives spatial experiences based on the human condition.

2.1 Moments of Truth

The conversation around consumer "Moments of Truth" (MoT) gained popularity with Jan Carlzon's 1989 book *Moments of Truth*.² Today, there are between four and six defined MoT in the consumer experience process depending on your source.³ Richard Normann's initial definition of a MoT was defined as the moment of provider/customer service confrontation. In 1989, Carlzon expounded on this definition to state "any contact" with the business is an "opportunity for impression."⁴ This definition was quite broad in application, which made it difficult to define a process by which one could specifically define and manage those impressions. In 2005, A.G. Lafley of Proctor & Gamble improved the applicability of MoT by breaking down these moments into the specific, actionable experiences: First Moment of Truth (FMoT) and Second Moment of Truth (SMoT). He defined the FMoT as the initial interaction of the consumer with the product or service in person, and the SMoT as the moment the consumer

² Carlzon, Jan. *Moments of truth*. New York: Perennial Library, 1989.

³ Hyken, Shep. "The New Moment Of Truth In Business." *Forbes*. April 11, 2016. Accessed October 23, 2017. <https://www.forbes.com/sites/shephyken/2016/04/09/new-moment-of-truth-in-business/>.

⁴ Normann, Richard. *Service management: strategy and leadership in service business*. (Chichester, NY: Wiley, 1991), 17.

makes a commitment or purchase.⁵ Although the definition of these moments into actionable consumer events created concrete areas for consumer marketing and business goal specification, the successful implementation of a consumer experience required more than just service or marketing. What has followed since is a continued investigation into the consumer experience process.

With the advancement of the “Internet of Things” in the mid 2000s and early 2010s we saw the definition of terms three, four and five: the Third Moment of Truth (TMoT) in 2006 by Pete Blackshaw of Nestle, and the terms Stimulus and Zero Moment of Truth (ZMoT) by Jim Lecinski of Google in 2011. The first, TMoT, takes into consideration consumer feedback after his or her interaction with a product or service. In Lecinski’s work, the TMoT is not explicitly defined, but is rather grouped into the SMoT. (Figure 1) However, it is this moment on which Erik Qualman coined the term “Socialnomics” in 2009 to refer to the concept of the consumer experience process no longer being marketer or “word of mouth” driven, but rather “world of mouth.”⁶ World of Mouth refers to the concept of global information sharing and communication wherein the opinions of people around the world can be sought and consumed as information, not just the opinions of people residing in one’s community. This shift in the consumer experience paved the way for Lecinski’s research in 2011.

⁵ Lecinski, Jim. *Winning the Zero Moment of Truth: ZMOT*. (Unspecified: Vook, 2011). PDF.

⁶ Qualman, Erik. *Socialnomics: how social media transforms the way we live and do business*. Hoboken, NJ: Wiley, 2011.

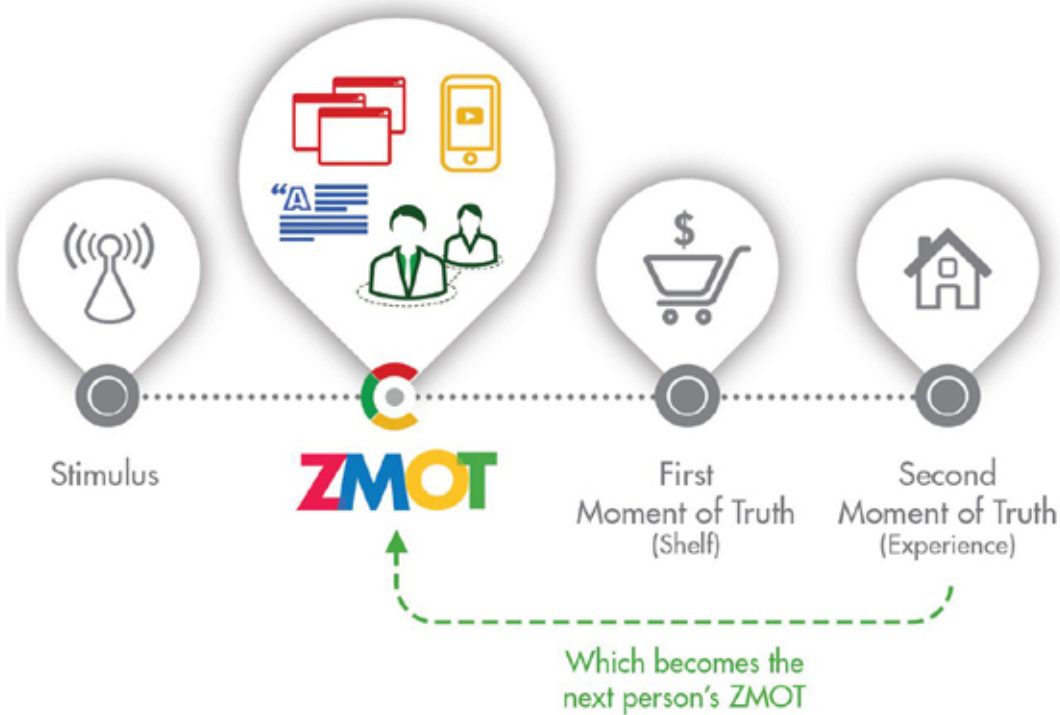


Figure 1. ZMoT Process Location
(Image by Jim Lecinski)⁷

As consumers utilize the vast and powerful strength of social media and the Internet to search, discuss, and evaluate the products and services they consume, the process by which we target consumers must also be reevaluated. This shift takes us to what Lecinski presents as the beginning of the experience process, the “Stimulus,” where consumers become aware of a product or service, followed by the ZMoT, or the moment after exposure, when they begin research, but before they encounter it in person. For decades these terms have been a part of product and service business development conversations among corporate executives and investors. However, the creative personnel involved in those processes have historically been uninformed of their importance and applicability. For example, in hospitality, a host of creative personnel are an integral part of creating the ZMoT that is presented to consumers, and greatly

⁷ Lecinski, *Winning*.

influence the consumer experience in latter portions of the process, thereby impacting the business brand and profitability at the SMoT and TMoT. Constructed of specific design elements and principles, as well as sensorial, experiential elements, Interior Designers create what hospitality executives frequently refer to as “Servicescapes.”^{8,9} A servicescape can be defined as the “physical environment of a service facility that influences behavior and perceptions.”¹⁰ While historically these servicescapes were presented during the FMoT and SMoT, today they are first perceived during the ZMoT. No longer just presented in magazines and formal marketing, Interior Design work today is thoroughly documented by both professionals and the end consumer. The visual aspects of a servicescape, as well as the consumer’s biased experience of it, are presented on a multitude of digital platforms for consumption by potential consumers long before the business is even aware of their interest. As a result, it is more important than ever for business executives, and their creative teams, to understand these MoT and work from a consistent development formula, which allows both sides to communicate effectively for servicescape success.

⁸ Bitner, Mary Jo. "Servicescapes: The Impact of Physical Surroundings on Customers and Employees." *Journal of Marketing* 56, no. 2 (April 1992): 57-71. Accessed October 2, 2017. doi:10.2307/1252042.

⁹ Namasivayam, Karthik, and Ingrid Y. Lin. "Chapter 2: The servicescape." In *Handbook of hospitality operations and IT*, 44-62. 1st ed. Elsevier Handbooks of Hospitality Management Series. (Amsterdam: Butterworth-Heinemann, 2008), 44.

Note: Servicescapes are defined as “the physical environment of an organization encompassing several different elements such as overall layout, design and decor. The servicescape also includes atmospherics such as lighting, colours and music.”

¹⁰ Fitzsimmons, James A., and Mona J. Fitzsimmons. *Service management: operations, strategy, and information technology*. 4th ed. Boston, MA: McGraw-Hill/Irwin, 2004. Pp.214-217.

2.2 Design Perception, Socialnomics, and Gestalt

Consumers are increasingly researching and investigating the spatial aspects of a hotel long before they decide whether or not to book a stay. Recent polls indicate upwards of 70-80% of consumers research a product or service online before visiting a storefront, inquiring, or purchasing.¹¹ With a plethora of options, consumers frequently begin with photographs – or the digital aesthetic experience – and then move on to the accompanying text and reviews, followed last by evaluating any special offers or pricing.

The use of social media (Instagram/Facebook/etc.) is among the primary sources for consumer information regarding products, services, and opinions.^{12,13} Where historically word of mouth and traditional advertising were the only sources for consumer information, today consumers can access the personal opinions of consumers worldwide and use their own discrepancy to determine the credibility of the source. This concept of “Socialnomics,” redefines the way businesses address consumer interest and concerns. Shifting away from the traditional advertising role, “companies that find success within social media tend to function more like entertainment companies than traditional advertisers.”¹⁴ As consumers increasingly use digital means to “brag” or “compete” in their attempt to portray the ideal life experience, companies must be proactive in managing the advertised experience to ensure accurate alignment with the actual, perceived consumer experience. The concept of aligning the consumer environment as closely as possible to consumer perception to create “memorable” personal encounters is what moves design from Services into Experiences. (Table 1)

¹¹ Lecinski, *Winning the Zero Moment*.

¹² Ibid, 33.

¹³ Qualman, *Socialnomics*, 5.

¹⁴ Ibid, 5.

Table 1. Economic Distinctions
(Table by Pine & Gilmore)¹⁵

Economic Distinctions				
Economic Offering	Commodities	Goods	Services	Experiences
Economy	Agrarian	Industrial	Service	Experience
Economic Function	Extract	Make	Deliver	Stage
Nature of Offering	Fungible	Tangible	Intangible	Memorable
Key Attribute	Natural	Standardized	Customized	Personal
Method of Supply	Stored in bulk	Inventoried after production	Delivered on demand	Revealed over a duration
Seller	Trader	Manufacturer	Provider	Stager
Buyer	Market	User	Client	Guest
Factors of Demand	Characteristics	Features	Benefits	Sensations

While no company can control the exact reaction that a consumer will have to their offering, they can influence consumers through strategic application of what consumers communicate as their preferences. Founded in 1910 by German psychologists, Gestalt theory reveals how various common visual elements are perceived and how the sum of those parts works to create a greater whole.¹⁶ Understanding and applying Gestalt theory is important for designers as they implement visual elements within their design. The fundamental groupings put forth by Gestalt are:

1. **Figure/Ground:** The consumer's perception of what is figure and what is background affects their perception of the importance of elements within a spatial construct.

¹⁵ Joseph Pine II and James H. Gilmore, "Welcome to the Experience Economy," Harvard Business Review, Vol 76, No 4, July/August 1998. p.98; table 1.

¹⁶ Behrens, Roy R. "Art, Design and Gestalt Theory." Leonardo On-Line: Art, Design and Gestalt Theory. November 17, 2004.

2. **Similarity:** The grouping of objects and creation of focal points affects how the consumer perceives elements to be related and their importance within the spatial construct.
3. **Closure:** Consumers will “fill in” seemingly missing elements from a design to create a holistic picture based on their bias. Leaving important gaps can lead to undesirable conclusions if a business is not careful.
4. **Continuity:** Certain design elements, such as line, hold a stronger connection for consumers than others when perceiving space.
5. **Proximity/Symmetry:** Closely related, these elements allow consumers to make sense of their environment by grouping related items and sorting out the visual order of the space. When combined with other visual cues, these elements instruct the consumer how to break down seemingly similar information.

The congruity of the above elements directly impacts the way a consumer experiences a space, be it positive or negative. When combined with additional sensorial input - such as sound, taste, touch, etc. - the consumer completes their personal spatial construct and creates their moment of truth.^{17, 18}

2.3 Architectural Phenomenology and Experiential Design

Architectural Phenomenology is the concept that the built environment involves a “manipulation of space, material, and light and shadow to create a memorable encounter through

¹⁷ Bradley, Steven. "Gestalt Principles: How Are Your Designs Perceived?" Vanseo Design. January 25, 2010.

¹⁸ Richards, Amy. "How Gestalt Theory is used in designing? And why it develops relationships, and affects human behavior? " Issuu. June 26, 2016. NOTE: Thesis - 24 February 2015

an impact on the human senses.”¹⁹ It is the responsibility of Interior Designers and Architects to consider the impacts of their selections on those who will be occupying a space. Understanding how to best address audience perception can be a challenge when, as Merleau-Ponty claims, experience is not “based on consciousness, but rather on widely held prejudice” as the audience uses their individual experiences to create their own perceived truth.^{20,21} It is this “truth” that the business team and Interior Designer aim to satisfy at an 80% minimum rate when creating a design scheme. This requires considerable understanding of sensory design elements, social psychology, and existing business data for the impact of each on the perceived whole.

It is commonly held knowledge that people have five primary senses: Sight, Sound, Smell, Taste, and Touch. (Figure 2) However, to base an experience on just these fundamental senses would be doing a disservice to the consumer in creating a memorable experience. In Experiential Interior Design (EID), designers focus the senses at a more detailed level when designing a space. Addressing the relationship of the senses on their lower levels allows the business and design teams to achieve a more granular level of input whereby they can more accurately influence the consumer’s perception toward a common goal.

¹⁹ Unspecified. Theory of Phenomenology: Analyzing Substance, Application, and Influence. PDF. Lawrence: The University of Kansas. Student of Chad Kraus

²⁰ Merleau-Ponty, Maurice. Phenomenology of perception. London: Routledge, 2002.

²¹ Marshall, George J. *A Guide to Merleau-Ponty's Phenomenology of Perception*. Milwaukee, WI: Marquette University Press, 2008.

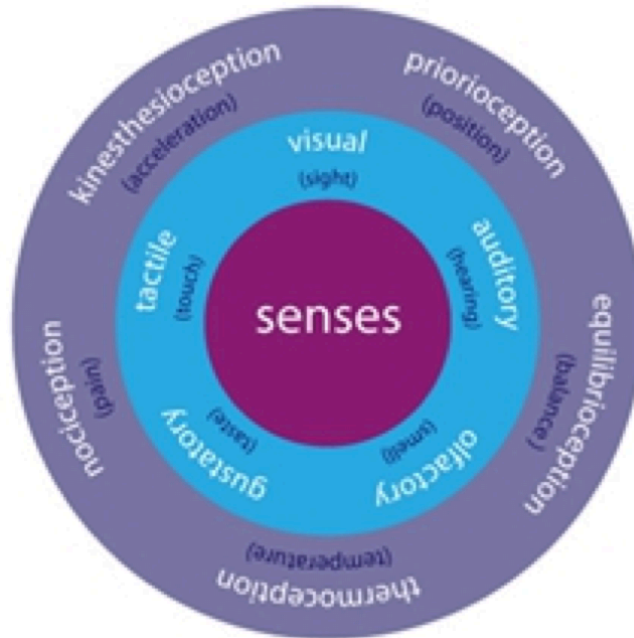


Figure 2. *Sensory Influence*
(Image by PULSE)²²

In 1921, Rudolf Steiner argued that people use no fewer than 12 senses.²³ Today, some scientists argue that people have as many as 21 senses, however some of those senses are derivative of others and should be evaluated for applicability accordingly. While not all senses should be weighted equally when creating interior space, it is important to understand the multitude of elements by which people perceive space. Then we can apply this understanding to the design requirements to emphasize the senses that will most influence the consumer in the direction of the business goal. Steiner categorized his senses into primarily those that affect the consumer in an inward fashion and an external fashion. (Figure 3) Beyond this basic grouping,

²² Hood, A.L., V.M. Becerra, and R.J. Craddock. "Using evolutionary techniques to improve the multisensor fusion of environmental measurements." Lecture, TSBE Engineering Doctorate Conference, UK, Reading, July 3, 2012. 2012.
https://www.reading.ac.uk/web/files/tsbe/Hood_TSBE_Conference_Paper_2012.pdf; figure 2.

²³ Steiner, Rudolf. "Man's Twelve Senses in their Relation to Imagination, Inspiration, Intuition." Translated by Steven Briault. *Anthroposophical Review* 3, no. 2 (1981): 12-19.

they can be further analyzed for their influence on the soul through Imagination, Inspiration, and Intuition.

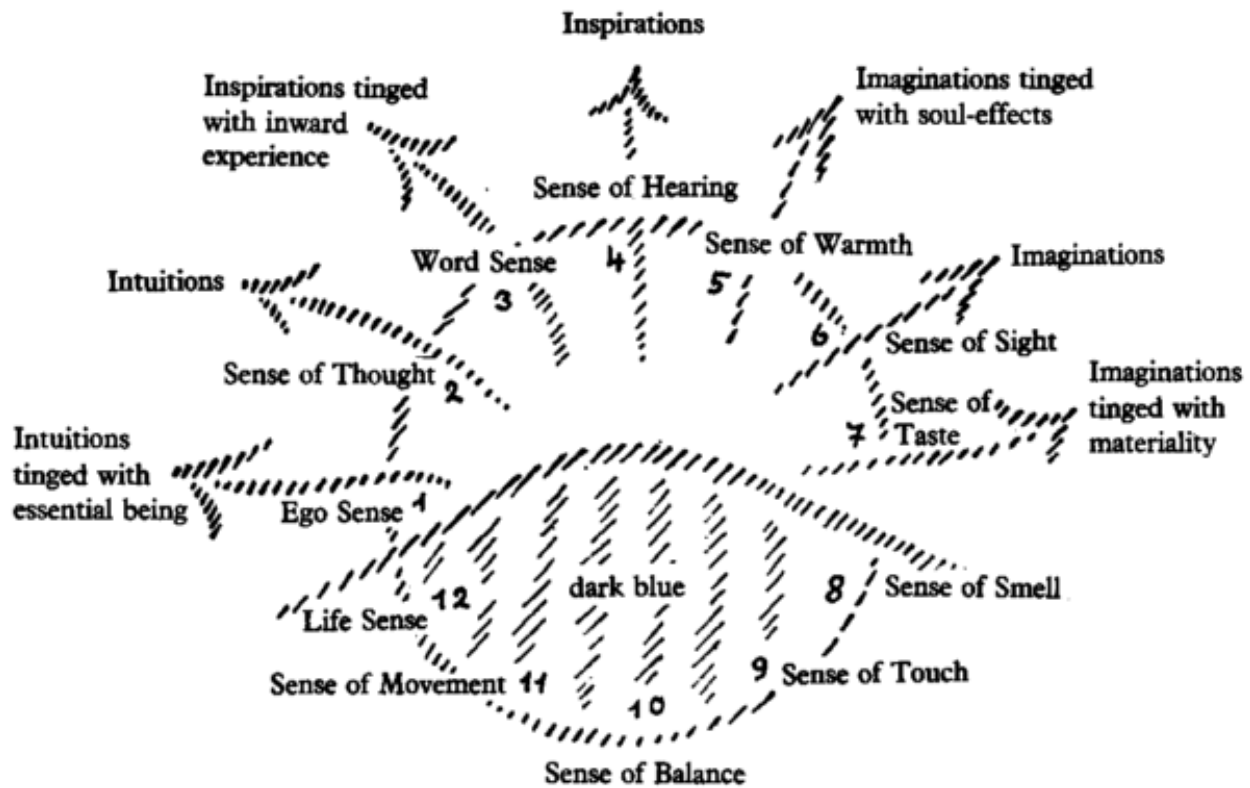


Figure 3. Steiner's Senses
(Image by Rudolf Steiner)²⁴

“Imaginations are tinged, touched here and there, by the material.”²⁵

It is in the imaginative realm that designers and businesses alike have the opportunity to influence consumers through the congruity or incongruity of the physical senses. Imagination is where Gestalt’s theories come into practice in a way that is unique for every consumer. The consumer will “complete” a picture to create the experience that they imagine is in front of them. Their own unique prejudices will come into play in a way that the designer cannot predict, but can work to mitigate the opportunities for misinterpretation. In creating the memorable consumer

²⁴ Ibid, p12; figure 3.

²⁵ Ibid, p14.

experience, designers must draw first on the Imagination in creating the ZMoT. Once a consumer has committed to the experience, the designer and business have an opportunity to inspire the consumer as part of the FMoT and SMoT as they experience the spatial construct. Unlike other physical perceptions, Inspiration is uniquely perceived through the Sense of Words/Speech. The words we hear, and the words we say surrounding a particular experience have a unique ability to affect both the inner and outer elements of our senses. As a result, this advancement toward perception and the TMoT is a progression that is filled with opportunities for impact and must be carefully planned, and managed by design, business, and servicescape participants.

The impact of sensory design combinations is both context dependent and impacted by the congruity of the sensory elements. While all multisensory stimuli are considered in EID, research indicates that certain senses create “an additive [, or detractive for incongruent,] effect” on the individual experiencing them. For example, if multiple stimuli are all perceived as positive, then the emotional response of the individual is positive, however, if one is negative and the others positive, the conflicting feedback typically results in a negative experience. Rarely does a combination result in a neutral experience, although it is possible when combining any other sense with the visual.²⁶ This congruence factor means it is critical for the experiential elements of a design to be considered holistically, not just become the visual result of a designed space.

To better understand this phenomenon, it is important to evaluate the senses themselves for their modality/range, levels of impact (static, array, additive, etc.), as well as triggers and

²⁶ Schreuder, Eliane, Jan Van Erp, Alexander Toet, and Victor L. Kallen. "Emotional Responses to Multisensory Environmental Stimuli." *SAGE Open* 6, no. 1 (January 25, 2016): 1-19. Accessed January 2017. doi:10.1177/2158244016630591.

cultural influences. Working with Steiner's senses as a basic grouping, with additions from Merleau-Ponty, we find the following elements of sensory influence:

1. ***Sense of Ego:*** This sense is observed through usage of other senses, such as sight, touch, and hearing. The internal reaction to the information collected via these other senses is where one determines the other's sense of personality/self called ego. Because this sense is perceived through the use of other senses, there is an array of feedback that completes the perception. This results in a tolerance grade above which the observer feels a positive emotional response, and below which discomfort, or negative responses ensue. This tolerance level will vary among individual personalities, but can be generally evaluated via the personality musings of researchers such as Carl Gustav Jung and Isabel Myers-Briggs.²⁷
2. ***Sense of Thought:*** The Sense of Thought is the combination of concepts that an individual has built over time to create their unique understanding and interpretation of the words being said around them and the intonation with which those words are communicated. This sense is frequently used to make sense of one's surroundings and yet is influenced by the internal/external fluctuation of input versus processing.
3. ***Word Sense:*** The Sense of Word or Speech is both auditory and physical in the way it influences an individual's perception and reaction. Triggered by either sound or visual cues, the initial reaction is typically instant but the emotional effect can be long lasting. Participating in a spatial experience comprised of angry interactions will yield a much different perception than that of harmonious

²⁷ Myers, Isabel Briggs, and Peter B. Myers. *Gifts Differing: Understanding Personality Type*. Palo Alto, CA: Davies-Black Pub, 2002.

interaction. The individual perceiving the interactions will not only experience emotional responses to the sounds they perceive, but will internalize the meanings of words spoken to create a complete experience. Word sense is also influenced by the visual construct of words in marketing, directional literature, signage, etc. whereby the visual cues combine with the understood word meaning to create a sensory reaction that can be built up to maximize or balanced to minimize.

4. ***Sense of Hearing:*** Hearing and Sound is a complex array of information composed of volume, pitch, and tone color. Each of these comprises the various sectors of sound such as life sounds, musical tones and octaves, and speech. The Sense of Hearing is both internal and external in its processing and ability to place one within space based on reflecting sound. The Sense of Ego can also be perceived with active listening as the tones and pitches that comprise varying states of emotion are easily discernable to the ear. Understood to be one of the most influential senses, hearing takes an external spatial experience and internalizes it for an emotional response to the human elements that exist within its construct. This internalization resonates with the individual in a way that senses such as sight alone cannot.²⁸
5. ***Sense of Warmth:*** Dealing with Temperature or thermoceptors, this sense has a physical array primarily focused in four receptor areas – innocuously hot or cold

²⁸ Juhani, Pallasmaa. *The eyes of the skin: architecture and the senses*. Chichester: Wiley, 2005. Pp. 49-51.

and painfully hot or cold.²⁹ The sensory impact is primarily observed through the skin and has a significant impact on the well-being and emotional response of an individual given its comparatively large set of receptors. However, it can also be sensed via other areas such as the cornea and tongue. It is important to note that because the central nervous system reacts to temperature, areas that influence memory also process this sense therefore generating a significant and lasting impact on perception.³⁰

6. ***Sense of Sight:*** Easily interpreted as the most important of the senses, Sight is often labeled as the sense wherein all interpretation, understanding, and pleasure take place. However, the Sense of Sight is merely the perception of an array of light creating color, shape, and shadow. These perceptions are influenced by the other senses and an individual's experiences of them, which can lead to misinterpretation of the visual information at hand. The perception of this array of light has strong emotional arousal levels, but is not the highest sense with regard to accuracy when used alone. Sight may work as the single most effectual purveyor of instant data during the first impression, but it is the other senses that support or resist our understanding of what we are seeing.
7. ***Sense of Taste:*** Involving the chemical reaction of receptors on the tongue, this sense works with the Sense of Smell and the Sense of Touch to create an observed response. The experience of taste has variable degrees of intensity that influence the individual's reaction and perception. Composed primarily of Sweet,

²⁹ Mckemy, David D. "The Molecular and Cellular Basis of Cold Sensation." ACS Chemical Neuroscience 4, no. 2 (November 20, 2012): 238-47. doi:10.1021/cn300193h.

³⁰ Tsui, Siu Lun., Phoon Ping. Chen, and Kwok Fu Jacobus. Ng. Pain Medicine: A Multidisciplinary Approach. Hong Kong: Hong Kong University Press, 2010.

Sour, Bitter, and Salty, yet also having reactions to Umami, Fat, and Fragrance from Smell input, Taste is a complex sense that, as long as it does not incite a pain response, can be moderated by conscious emotion based on social acceptability within the mature individual. Its ability to both influence and yet be controlled leaves it in a unique position wherein the influencing factors of the experience are moderated by the prejudices of the individual and are therefore highly individualized. However, research stipulates there are sensory “buckets” where the application can be reasonably certain across the majority population.³¹

8. ***Sense of Smell:*** The sense of Smell, and that of Taste, is a chemical reaction within the body to external stimuli. The sense takes discrete elements and combines them to create complex groupings of sensory information. Smell has a range wherein the individual can experience a powerful immediate impact, but it also allows for gradual build up of intensity. However, after prolonged exposure, the individual will hit a plateau and eventual decline in their sensitivity to the trigger, no longer experiencing a heightened perception and perhaps even no smell. Strongly linked to intrinsic judgment sensors, smell perception influences how an individual reacts to the circumstances around them. Experienced on a conscious and subconscious level, the body stores scent memory which then advises the conscious on repeat exposure with the appropriate response.
9. ***Sense of Touch:*** As a sense, Touch is understood primarily through the pressure or itch reaction of the body to external stimuli. This is binary sense by which either touch exists or it does not. However, pressure becomes the influencing

³¹ "Sensory & Consumer Insights." Tastepoint by IFF. Accessed January 29, 2018.
<http://www.tastepoint.com/services/sensory-and-consumer-insights>

array of touch's impact - the touch itself is either taking place or it is not. The influence of the sensory nerve receptors in an individual's skin identifies where they, as a being, end and where something external begins.

10. ***Sense of Balance:*** Also discussed as Equilibrioception, this sense involves the intrinsic reaction of an individual to environmental elements such as balance, acceleration, direction, and gravity. This vestibular perception is influenced by internal factors such as illness, trauma, etc. and also external factors. Working with proprioception (body location) and sight, the vestibular system collates environmental data from multiple sources to correct musculoskeletal responses and remain upright. This could be described as a series of binary inputs working together to achieve bodily control under degrees of variation.³²
11. ***Sense of Movement:*** Working with the Sense of Balance, this sense also evaluates muscle tension/usage and proprioception to determine where the body is and how it exists in space (be it static or dynamic motion). These senses present as a physical array and provide feedback to the individual as they experience the environment surrounding them.
12. ***Life Sense:*** This somewhat vaguely named sense involves the elements necessary to keep one alive. Sensory elements such as thirst and hunger reside here. The primary driver with this sense is typically pain. When the body has a "need," it is this sense that triggers the individual to seek the element that will

³² Cardaioli, Matteo, Marina Scattolin, and Patrizia Bisiacchi. "Equilibrioception: A Method To Evaluate The Sense Of Balance." Lecture, CHItaly - Towards the Mediterranean, Italy, Cagliari, September 18, 2017. August 25, 2017. Accessed January 31, 2018. <http://ceur-ws.org/Vol-1910/paper0210.pdf>.

“fix” the need (food, water, medical care, rest, etc.). There are varying levels of intensity with which this sense is experienced in relation to time.

13. ***Sense of Time:*** This sense is presented by Merleau-Ponty and relates to the individual’s perception of the passage of time. It is in this space of perception, memory, and imagination that the individual places time, and the passage thereof, in context to what s/he is currently experiencing. Collated from historical experience via other senses, and the current offering, the individual can perceive not only the passage of time in the present, but also whether the experience itself is historical, present, or imagined. It is in the observations and experiences of one’s surroundings that time is presented.³³

The array of sensory information with which an individual processes his or her environment to create the perception with which they continue forward in their experience of the spatial construct is what must be understood and considered within each architectural and design endeavor.^{34, 35} When more closely examined, not only the sense itself, but the congruence or lack thereof, of design elements maps quite efficiently to a bell curve through which experiential factors can be evaluated for their potential impacts on the individual’s emotional response.

(Figure 4)

³³ Kelly, Michael R. "Phenomenology and Time-Consciousness." The Internet Encyclopedia of Philosophy, ISSN 2161-0002. Accessed January 12, 2018.
<http://www.iep.utm.edu/phe-time/#H4>

³⁴ Crooks, Ryan. Sensory Modality Research. October 16, 2017. Raw data. Atlanta, GA.

³⁵ Van Gelder, Tom. Observing with twelve senses. Leonardo da Vinci Project. Phenomenology - Tom van Gelder. July 07, 2008.

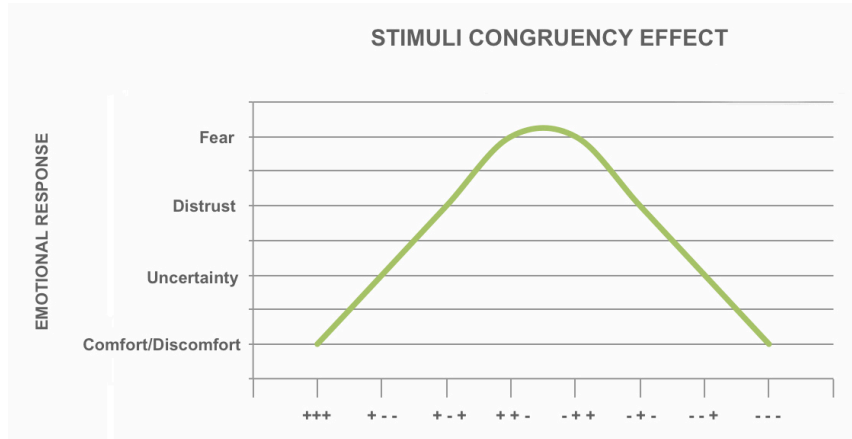


Figure 4. Congruency Curve
(Chart by Jennifer Refsnes)³⁶

The model in Figure 4 is based on a triad of experiential elements, but can be expanded to include additional senses, and can be summarized as follows. For the purposes of this discussion we will use three senses. The purpose being that beyond three sensory inputs, the overall impact of the sense begins to diminish. When all three elements are positive or negative the perceived impact is more likely to be holistic which results in comfort or discomfort, as the experiencer understands the stimuli in a congruent manner – even if they do not like it. However, as one moves up the curve where elements are incongruent, one begins to find that not only the elemental input matters – the positive or negative, but that the sense from which they are experienced matters as well. Each sensory element has a different impact on the participant. Understanding the “order of influence” for different senses allows them to be ranked and managed by order of impact for the most appropriate stimulated response.

³⁶ Refsnes, Jennifer. “Experiential Design,” Georgia State University, April, 2017; figure

2.4 Design Principles and Elements

The list of Interior Design Principles and Elements (DPE) is one that can be debated in its composition and completeness depending on market sector, style, industry, etc. However, while some principles and elements may overlap, and others stand out strongly, there is a generally accepted list that most designers inherently employ as they generate a design (Figure 5) and is briefly described below.³⁷

1. **Line:** Vertical, horizontal, diagonal, and curved planes that define, stretch, or shrink a space visually.
2. **Shape/Form:** Combined lines to create spatial constructs that affect how one perceives space (e.g. rectangular, square, triangular, circular, and angled) with the shape's structure creating form (e.g. pyramid, H, ladder, sphere, etc.).
3. **Color/Value:** The effect of light understood as hue, value and intensity when visible surfaces reflect or absorb light back to the viewer. Can be further evaluated in terms of its harmony as monochromatic, analogous, triad, complementary, and neutral. One of the strongest visual influencers of emotion.
4. **Texture:** The tactile experience of a physical surface or the visual experience of an object or space and its relation to the surface memory of prior interaction.
5. **Space/Perspective:** The overall construct or “envelope” within which the design elements and principles are contained and arranged, and the volume of the constructed space or elements therein.
6. **Pattern:** Combinations of lines and shapes to create categorized (structural, naturalistic, stylized, geometric, and abstract) visual movement for the participant.

³⁷ Cheever, Ellen. Design principles: color, form, styles. Hackettstown, NJ: NKBA, National Kitchen & Bath Association, 2006.

7. ***Rhythm/Movement:*** These elements move the eye around a room via repetition, alternation, progression, and domination, while still defining points of rest through forms and lines at “understandable intervals.”
8. ***Proportion/Scale:*** The relationship of design objects and elements as they pertain to each other, or themselves, within the spatial construct (parts of a whole), and how the elements relate to objects of interaction such as the human form or the spatial envelope.
9. ***Balance:*** Creating space that is visually equal when perceived by the eye and includes adjusting the “weight” of the room’s elements from left to right (based on a center point) and from top to bottom. For example, a sense of order typically indicates that “heavier” items should be lower, while “lighter” items are higher. Balance can be attained symmetrically (mirrored format), asymmetrically (equal weight even if not equal objects), or in radial (emanating from a central point) formats.
10. ***Unity:*** The coordination of spatial elements to create a cohesive and easily understood space that is perceived as complete.
11. ***Emphasis:*** A central point to which the eye is drawn within a spatial construct. Most often discussed in terms of the dominant focal point, emphasis anchors a room with all other elements seemingly arranged around it. Additional emphasis points can be instituted in the form of sub-dominant and subordinate points as well, providing movement and definition throughout the spatial construct.

Each of the design elements above is merely an attribute of the sensorial experience the designer is looking to create and should be evaluated for its congruent or incongruent status toward the finished spatial construct and on the participating consumer.

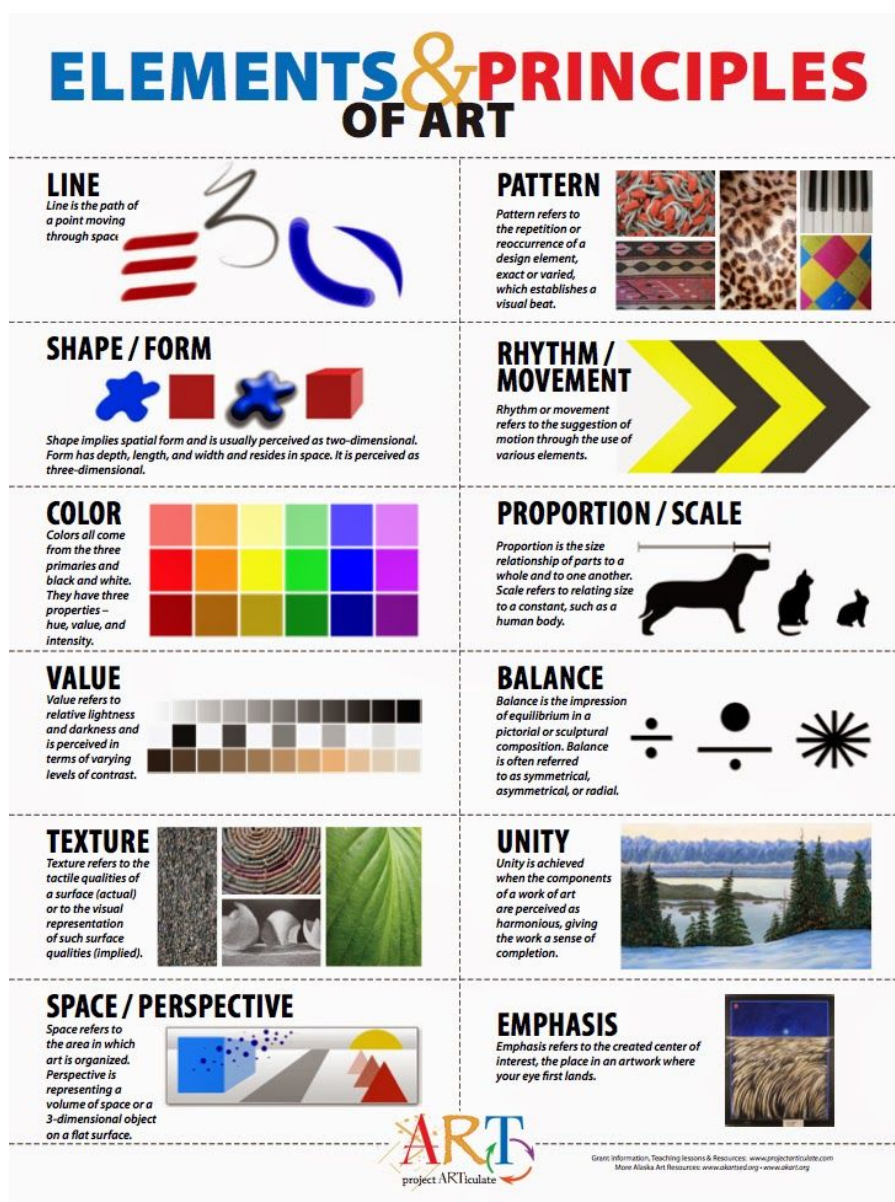


Figure 5. Elements and Principles of Art & Design
(Image by projectARTiculate)³⁸

³⁸ ProjectARTiculate. "Elements & Principles of Art." Digital image. Juneau Douglas High School Visual Arts. January 2015. Accessed October 29, 2017 <http://jdhsarts.blogspot.com/2015/01/the-elements-and-principles-of-design.html>; figure 5.

Each of the DPE has its place in design as part of long held research on the psychological impacts of human preferences for the elements and their combinations. For example, symmetric design is preferable to asymmetric design with one possible reason being the ease with which one can identify objects on varying planes and in varying locales (even those atypical) if it follows a familiar pattern. Color has also long been held as a strong influencer on the emotions of the observer and is frequently used in combination with lighting to generate specific “moods” or incite specific responses in consumers. (Table 2)

Table 2. Color Meaning in Western Culture
(Chart by R.D. Chin and Gerald Warfield)³⁹

Hue	Pure	Tint	Shade	Tone
Red	Danger	Romance	Wealth	Earthy
	Passion	Femininity	Papal	Elegant
	Love	Innocence		
Orange	Healthy	Cheery	Autumnal	Rustic
	Warning	Friendly		Early
	Active	Enthusiasm		
Yellow	Sunny	Delicate	Wealth	Somber
	Expansive	Cheerful	Gold	
	Optimistic	Pleasant		
Green	Nature	Springtime	Forest	Drab
	Serenity	Renewal	Plants	Army
	Soothing			
Blue	Traditional	Baby blue	Contemplative	Conservative
	Stable	Refreshing		
		Cool		
Violet	Spiritual	Delicate	Royal	Mystical
	Creative	Nostalgic	Valuable	
	Insanity	Sensual	Insanity	

³⁹ Chin, R. D., and Gerald Warfield. *Feng Shui Revealed*. New York: Clarkson Potter Publishers, 1998, **quoted in** Slotkis, Susan J. *Foundations of interior design*. New York: Fairchild, 2010. P. 51; table 2.

Lines and curvature have also long held their place among human influencers – from art to architecture to living beings. To expound on the element of line, term line is used to define the curve of a chair, a delineating point on the ground or wall indicating a change, break, or behavioral marker, and even to define the act of waiting in line. Each of these has sensorial implications to the consumer as both a participant and as an observer. The use of lines can break up a space and create areas of respite, or create anxiety if it results in a pattern that is too busy for the intended use. The resulting rhythm of lines within a spatial construct can provide predictability and stability for the consumer as pattern, directional information, or delineation. Conversely, the addition of seemingly incongruent, asymmetric lines can add to the excitement of a space as it introduces an uncertainty that incites arousal in the participant.⁴⁰ Understanding and examining each DPE for psychological impact and behavioral influence allows Interior Designers, Marketing teams, and Business Shareholders alike to apply design elements strategically within spatial constructs to achieve specific experiential results.

⁴⁰ Ramsøy, Thomas Z., et al. "Effects of perceptual uncertainty on arousal and preference across different visual domains." *Journal Of Neuroscience, Psychology, And Economics* 5, no. 4 (November 2012): 212-226.

3 METHODOLOGY

Where the research in social and behavioral sciences, design, and technology have traditionally excelled in providing professional guidance for human behavior and influence within their subject areas, they have not been widely discussed in conjunction with each other for their interplay and influence within the greater market. This research paper evaluates the individual areas of scholarship and practical application and then brings them together in a way that benefits each, and consumers as a whole, through the creation of a quantitative design model for communication and design development.

In many ways, Interior Design often feels like the “last big frontier” when comes to big data and technology within the scope of services. What an Interior Designer does to create a spatial construct that incites a specific spatial experience often seems subjective with its success or failure based on a “feeling” the designer has about the whole. The articulation of this “whole” through examination of the sum of the parts is where the power of the BDE lies. The design profession over time has graduated from the work of the “social elite” to a teachable profession. This ability to teach opens the door for big data and technology to take the profession through the next logical step of quantitative, science-based action and use that data as information in the objective decision-making and communication of spatial constructs. As the influence of today’s digital market increases within the physical spatial experience, the need for Interior Designers to understand the implications of data on design and business revenues, and the consumer MoT, necessitates a design approach that increasingly moves beyond the aesthetic and into the experiential realm. The development and application of an quantitative equation aids this effort and expands the educational component for future designers.

In an effort to retain objectivity throughout the research and development process, industry research from business, design, psychology, and neuroscience was combined with statistical regression practices to reverse engineer existing data summaries using random number generators to extrapolate data on which regression could be run. While traditional statistical evaluation would have employed detailed review of the Cp statistic and the adjusted R^2 , additional studies will need to be conducted to further quantify the results on a larger scale since the detailed, record level survey data was unavailable for the purposes of regressive analysis. Furthermore, multivariate factor analysis on those larger data sets may yield somewhat different results from those contained herein and should be evaluated for their effect on the overall equation. Regardless, there is a statistical level of confidence in the data that was used for theory evaluation within this research.

The sensory and design elements that comprise the equation and are applied to any given project will also fluctuate with the independent needs presented as part of the business case at a given hospitality project based on the data available. The extrapolated test herein looks at one popular brand within the upscale market of consumer lodging services as a basis for equation evaluation. Yet, the equation itself can be applied to multiple design constructs and would benefit from additional testing across hospitality constructs and in other design arenas. For future evaluation, data collected through hospitality marketing and consumer research or from the data mining of publicly presented reviews and consumer feedback will provide a more granular level of quantitative insight.

3.1 Business Design Equation

The Business Design Equation (BDE) is a science-based framework that allows design and business areas to objectively evaluate and apply the sensorial emotional drivers that establish a

desired aesthetic encounter and experience to create a clearly articulated ZMoT, which is then substantiated by the industry or consumer generated TMoT. This approach to communicating the reasoning behind many seemingly subjective decisions using a statistically relevant BDE aids the profession in communicating the design role as part of larger business investment and returns.

Each sensorial or design element contributes to the overall design success or failure, but does not exist in a vacuum. As the industry evolves, and “living services” becomes more of a market standard, the critical elements that comprise this equation will also evolve, adding and removing as the market or the individual client’s data demands. Living Services is the concept that as technologies advance the services we receive become not only more digitized, but also instantly tailored to our needs and preferences as individuals. For example, technologies such as Alexa, Google Home, and Nest all “learn” our individual patterns and preferences. These “services” then make intelligent changes or suggestions based on what they “know” about us. No longer just in the home, living services is being found in the hospitality setting as well in intelligent lighting, sound, and even Aloft Hotel’s new robotic butler.⁴¹

Interior Designers work with the elements that comprise the BDE every day and they make decisions regarding the relevancy of each element subconsciously as they work through the details of any given design. Applying the concrete equation with mathematical confidence defined herein allows the otherwise artistic and observantly subjective process to function more predictably.

Statistical regression modeling of business activities takes place on a regular basis to help businesses manage costs, growth, wages, etc. In the realm of Experiential Interior Design it can also be a powerful tool for communicating the value add of a design scenario to business

⁴¹ Fjord, and AccentureDigital. *The Era of Living Services*. PDF. AccentureDigital, September 2015.

partners, investors, and financial departments – in business terms. Furthermore, the mathematical evaluation of quantitative and qualitative data empowers designers to more closely align consumer desires with business goals. The BDE introduced here provides a way for the Sensorial Elements (Se) and Design Principles and Elements (DPE) to use Best Subset Regression within a Servicescape (S) to determine the subset of elements to apply to a project based on the business' ROI goals and Cultural Adaptations of Service (Ca). This application then creates the spatial construct that stimulates the desired consumer experience.

The initial equation is based around the fundamental elements common to all hospitality design projects.

- Cultural Adaptations of Service (Ca)
- Servicescapes (S)
- Sensorial Elements (Se): 13 Elements
- Design Principles & Elements (DPE): 11 Fundamental Principles and Elements

Each of these elements is weighted, seemingly subjectively, by the designer and by the business to create the project's ideal mix. However, when the project's specifications are combined with business consumer satisfaction data around the psychological, phenomenological, and anthropomorphic implications of those specifications a much more objective calculation of project influence and outcome can be obtained.

Working backwards, the BDE is intended to achieve a specific ZMoT, or spatial experience, which is then substantiated by the industry or consumer generated TMoT. Understanding the statistical application of the emotional drivers behind the design process to product the spatial construct and experience is where the BDE comes into play. While additional research needs to be conducted to determine whether there is a global regressive line of fit and the margin of error,

a generally applied equation based on a specific business example is sufficient for the purposes of this research. Regression statistics typically considers a .05 (5%) or .10 (10%) margin of error acceptable when evaluating a data set for the support of a statistical theory. The BDE therefore, presents the recommended format for achieving this confidence level in the selection of design elements for a variety of Interior Design hospitality projects and allows the business and design teams to assume a certain level of controlled success for a given design scenario. Given the wide variation of specification elements that are related to any given project, it is important to note that the BDE introduced in this research is constructed under the assumption that it is being applied in the upscale sector within the United States hospitality market. However, it does hold the flexibility to be adapted for other markets when controlled for Cultural Adaptations of Service (Ca). These Ca acknowledge the cultural servicescape requirements (such as land, security/laws, customs/traditions, etc.) and apply their limiting qualities to the design at hand. Ca is not a new concept and is already applied, albeit in different terms, to many businesses worldwide as they adjust their corporate franchised specification for reuse and application worldwide without sacrificing brand recognition or consumer expectations.

The sensorial elements that comprise the equation can, and should, be adapted to meet the needs of the particular industry sector for which one is designing. In this case, the research focuses on the Hospitality industry, particularly that of the hotel experience (as opposed to restaurants or other public service spaces). As a result, the discussion focuses primarily on the sensorial elements required to create the proper balance in the hospitality environment, with reference discussions surrounding why these sensorial elements were selected, and how the equation may be adapted for other market sectors. For example, a restaurant focus may involve a greater focus on the sensorial elements that reinforce ambience and the gustatory experience.

Since the primary purpose of this research is to connect the business and creative drivers in effective, objective, and clear communication with each other, the equation must acknowledge the driving force of the customer when creating the design specification, which in hospitality is often driven by the business team's analysis of the target market. Design does not exist in a creative vacuum, despite our occasional tendencies toward that realm, and therefore must be considered holistically, as part of a larger construct.

Complicated regressive modeling using a formula such as the one in Figure 6 for the Cp statistic will yield a highly accurate result for any given project. If large data sets are available, it will present which Sensory Elements are most influential within a given hospitality construct, and where the level of diminishing returns lies for the Design Principles. Data collected from the client regarding consumer desires and the corresponding consumer feedback data can be input into this best subsets model to determine areas of influence.⁴² However, when detailed data is unavailable a sample data set can be extrapolated from a researched small sample mean by reverse engineering the publicly available mean for hospitality service areas using Excel's random generator to create hypothetical numeric survey data and employing Excel's data analysis toolkit to run F-tests and compute P values. A simple regressive statistical F-test on the extrapolated data in this study indicated that one can reject the null hypothesis that all Sensorial Elements are equal and move forward on the statistical significance (>90-95%) of at least two areas (Physical Appearance and Personal Amenities) having collective influence over consumer perception when interacting with a spatial construct.

⁴² Unknown. "Chapter 15: Model Building." Lecture. 2015. Accessed December 3, 2017. <http://slideplayer.com/slide/5369785/>.

The C_p Statistic

$$C_p = \frac{(1 - R_k^2)(n - T)}{1 - R_T^2} - (n - 2(k + 1))$$

Where k = number of independent variables included in a particular regression model

T = total number of parameters to be estimated in the full regression model

R_k^2 = coefficient of multiple determination for model with k independent variables

R_T^2 = coefficient of multiple determination for full model with all " T " estimated parameters

Figure 6. Best subset
(Image by Unknown)⁴³

To perform the statistical analysis in this research, N = Sensorial Elements and k = Possible combinations of Elements was used to determine the corresponding F-value. The analysis assumed that the order of the elements did not matter and they were evaluated as independent variables. The F-test demonstrated statistical significance with F values within the range of confidence, while low P-values indicated strong evidence against the null hypothesis. (Appendix C – Extrapolated Test Data for Aloft Hotels) With the rejection of the null hypothesis in which all elements hold equal weight in the design equation, one can begin to narrow the design focus to elements that influence design before statistical decline using a combination of the Best Subsets model and the BDE.^{44, 45, 46, 47} While this method of test data generation leaves

⁴³ Unknown. *Chapter 15: Model Building*; Figure 6.

⁴⁴ "Proper Subset." Proper Subset - Definition, Symbol, Formula & Examples | MathCaptain.com. 2015.

⁴⁵ "Lesson 2: ANOVA Foundations | STAT 502. Accessed December 1, 2017. <https://onlinecourses.science.psu.edu/stat502/node/140>.

⁴⁶ Dranove, David. *Mgmt 469: Model Specification: Choosing the Right Variables for the Right Hand Side*. PDF. Kellogg Northwestern University.

significant room for additional research using formal statistical software, as well as the statistical determination of whether or not the order of sensory elements affects influence, the conceptual evaluation holds enough significance for the use and further investigation of the BDE as a sensory application theory. As a result of the research, there is a high confidence level that further statistical analysis on real data sets would demonstrate statistically significant relationships between subsets of elemental applications based on business needs.

For the purposes of this research and initial field application, the BDE simplifies the regression model to the equation below for application to hospitality projects at the design and business levels. An applied study can be found in the next section on Starwood Hotels and Resorts Aloft brand.

$$\text{BDE} = \text{CaS} (C(\text{Se}, k)) + \text{DPE}_1 + \text{DPE}_2 + \text{DPE}_3$$

Cultural Adaptations of Service (Ca) and Servicescapes (S) must be applied as limiters to every project. Within the elements themselves however, there is room for adjustment. There are 8,192 possible statistical combinations of Sensorial Elements (Se) impacting hospitality consumer perception, based on the list of 13 Sensorial Elements outlined in the previous section. Based on research indicating that the order of sensory introduction impacts its level of perceived importance and therefore a lessened ability to perceive independent influence, this research reduces the $2^{\text{Se}} = 2^{13} = 8,192$ combinations of the 13 elements to four where research shows

<https://www.kellogg.northwestern.edu/faculty/dranove/htm/dranove/coursepages/Mgmt%20469/choosing%20variables.pdf>

⁴⁷ Pardoe, Iain, Laura Simon, and Derek Young. "10.3 - Best Subsets Regression, Adjusted R-Sq, Mallows Cp." Stat 501 - Regression Methods. Accessed February 28, 2018. <https://onlinecourses.science.psu.edu/stat501/node/330>.

independent sensory perception declines. This restriction changes the equation from 2^{Se} which would be evaluating combinations of all 13 elements to $C(Se, k)$ or $C(13, 4) = 715$. Additional analysis of design requirements and specifications allows designers to apply congruent or incongruent stimuli at a further reduced level thereby limiting the practical design discussion to possibly $C(6, 4) = 10$ distinct combinations of sensorial elements and their relative influence on the design scenario at hand. The influence/elimination process is then driven by the statistical weight of the applicable consumer feedback and the way the Ca interacts with the Se to determine if the Se in question improves the overall experiential fit, or potentially detracts from it. In evaluating this congruity, the designer works backward from all 13 elemental combinations to four, adjusting one at a time to find the optimal subset of elements.

Once the Se are identified, the DPE, which use varying degrees of psychology around emotional and physical response to design elements, can be applied to the final sensorial elements to determine the positive or negative influence on the overall arousal response in the consumer toward achieving the emotional response desired based on the application of the Se.⁴⁸ This arousal response to performance or perception has been long studied and reinforced by noted psychologists such as Daniel Berlyne and Wilhelm Wundt (Appendix A.1 – Berlyne / Wundt), Robert Yerkes and John Dodson (Appendix A.2 – Hebbian Yerkes-Dodson Law), H.I. Day (Appendix A.3 – Day Zone of Curiosity), Easterbrook (Appendix A.4 – Easterbrook’s Cue Utilisation Theory (Visual Depiction)), William James and Carl Lange (Appendix A.5 – James-Lange Theory), and James Russell and Lisa Feldman Barrett (Appendix A.6 – Russell Barrett Core Affect). It is within the emotional reactions to the perceived physical stimuli that perception lies. These responses are triggered by our environmental circumstances, past and present, which

⁴⁸ *Schreuder*, “Emotional Responses.”

have been influenced by interior spaces in the built environment.^{49, 50, 51, 52, 53, 54, 55, 56, 57} Shown as a positive in the equation, elements can also be negative (for example, the addition of an incongruent color, line, or object) and would therefore be represented as plus a negative value.

While Interior Design departments are customarily focused mainly on the consumer experience, a large part of their work in the hospitality environment and from a business perspective is in creating a ZMoT that results in the expected and desired TMoT. It is in these two moments that design is both perceived and presented back. Understanding how the consumer market accesses the data for their ZMoT and what elements generate a successful TMoT during the FMoT and SMoT, allows the designer to create an accurate BDE that the business can support, and creative and service teams can implement.

⁴⁹ Berlyne, Daniel E. *Studies in the new experimental aesthetics: steps toward an objective psychology of aesthetic appreciation*. Univ. Microfilms Internat., 1994; Appendix A.1.

⁵⁰ Diamond, David M., et al. "The Temporal Dynamics Model of Emotional Memory Processing: A Synthesis on the Neurobiological Basis of Stress-Induced Amnesia, Flashbulb and Traumatic Memories, and the Yerkes-Dodson Law." *Neural Plasticity*, vol. 2007, 2007, pp. 1–33., doi:10.1155/2007/60803; Appendix A.2.

⁵¹ Day, H. I. "Curiosity and the interested explorer." *Performance & Instruction*, vol. 21, no. 4, 1982, pp. 19–22., doi:10.1002/pfi.4170210410; Appendix A.3.

⁵² Landers, Daniel M. "The Arousal-Performance Relationship Revisited." *Research Quarterly for Exercise and Sport*, vol. 51, no. 1, 1980, pp. 77–90., doi:10.1080/02701367.1980.10609276.

⁵³ Easterbrook, J. A. "The effect of emotion on cue utilization and the organization of behavior." *Psychological Review* 66, no. 3 (May 1959): 183-201. *PsycARTICLES*, EBSCOhost (accessed February 20, 2018); Appendix A.4.

⁵⁴ Lang, Peter J. "The varieties of emotional experience: A meditation on James-Lange theory." *Psychological Review* 101, no. 2 (April 1994): 211-221; Appendix A.5.

⁵⁵ James, William. "Discussion: The physical basis of emotion." *Psychological Review* 1, no. 5 (September 1894): 516-529; Appendix A.5.

⁵⁶ Darrow, Chester W. "Electrical and circulatory responses to brief sensory and ideational stimuli." *Journal Of Experimental Psychology* 12, no. 4 (August 1929): 267-300.

⁵⁷ Russell, James A., and Lisa Feldman Barrett. "Core affect, prototypical emotional episodes, and other things called emotion: Dissecting the elephant." *Journal Of Personality And Social Psychology* 76, no. 5 (May 1999): 805-819; Appendix A.6.

3.2 Understanding Culture and Servicescapes

In the creation of hospitality servicescapes, the “physical environment of a service facility that influences behavior and perceptions,” we begin to define how consumers will interact and move through space.⁵⁸ As we apply the aesthetic principles and the sensorial elements that were researched and deemed appropriate to create our final MoT, we also weigh the cultural adaptations necessary to meet the needs of the population where the project is taking place. The ZMoT is essentially a self-service servicescape that occurs before the customer even reaches the decision to commit to a venue or product. Since this moment is increasingly taking place in the digital realm, the importance of designers’ understanding the way the final space will be used in marketing is also on the rise.

Consumers expect brand consistency from first interaction to final experience, and in the self-service field it is important for consumers to easily find the information they are looking for, but also find psychological comfort in the relationship between interactive elements. To sufficiently meet the cultural needs of a locale, designers must consider how their designs meet the local expectations while still communicating brand consistency. A quick look at international companies such as IKEA or Marriott shows a familiar but distinctly different representation of products, textures, layout, and focus based on the factors of importance in any given country of representation. (Figure 7 and Figure 8) The consumer subconsciously evaluates a presented image within seconds of viewing and while differences in spatial representations may seem subtle the acceptance or rejection of the spatial composition is critical for the business to move on to the first and second moments of truth.

⁵⁸ Fitzsimmons, *Service Management*.

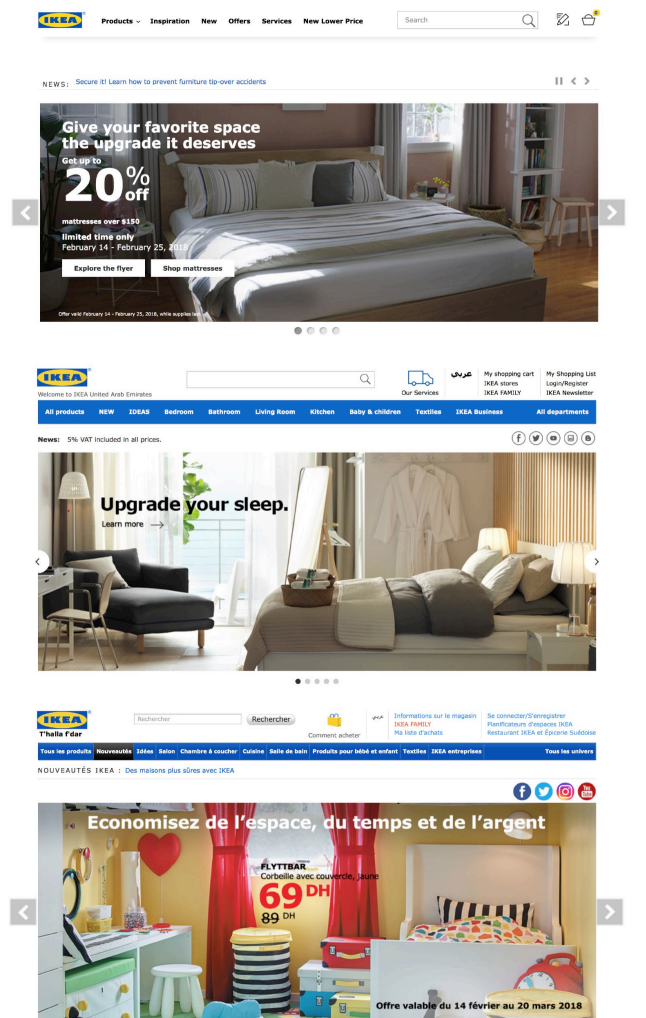


Figure 7. IKEA Home Page in US, UAE, & Morocco
(Image by IKEA US, IKEA UAE, IKEA Morocco)^{59, 60, 61}

⁵⁹ "Home furnishings, kitchens, appliances, sofas, beds, mattresses - IKEA." IKEA.com – International homepage – IKEA. Accessed February 21, 2018. <http://www.ikea.com/us/en/>; figure 7.

⁶⁰ تصفح. المنزل أثاث من مميزة مجموعة المتحدة العربية الإمارات في ايكي متجر يقدم " [The IKEA store in the UAE offers a selection of home furnishings. Browse the catalog online for modern and contemporary furniture products] ايكي - المتحدة العربية الإمارات ايكي [IKEA United Arab Emirates – IKEA] Accessed February 21, 2018. <http://ar.ikea.com/ae/ar/>; figure 7.

⁶¹ "IKEA avec des meubles et accessoires au style scandinave moderne." IKEA Maroc | Mobilier pour la maison et le bureau au Maroc | Mobilier pour la maison au Maroc - IKEA. Accessed February 21, 2018. <http://fr.ikea.com/ma/fr/>; figure 7.

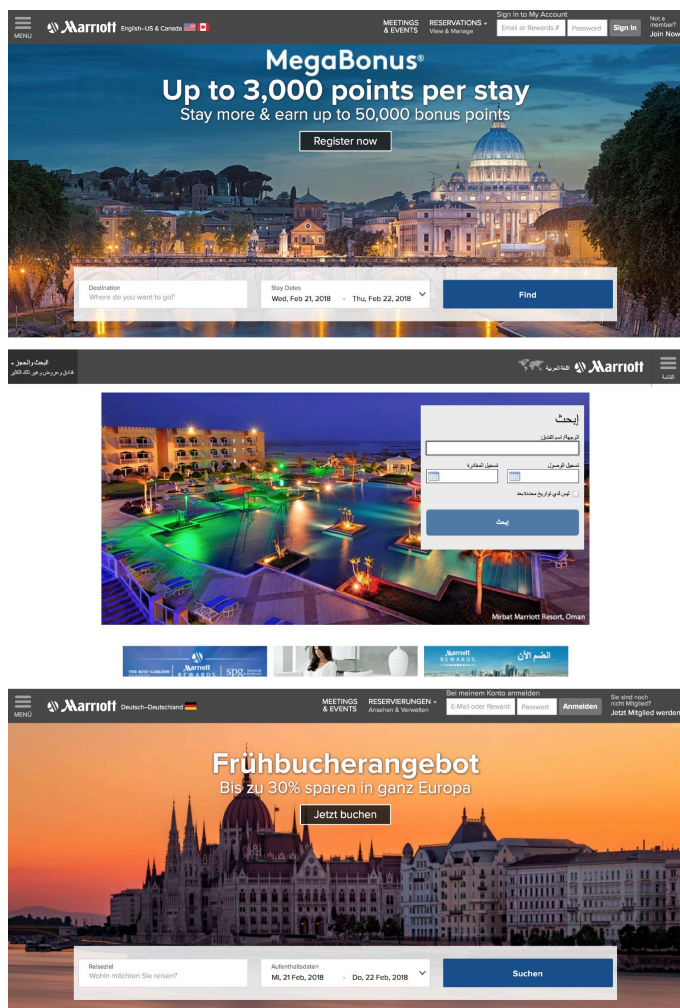


Figure 8. Marriott Home Page in US, UAE, & Denmark
(Image by Marriott US, Marriott UAE, and Marriot Denmark) ^{62, 63, 64}

In the hospitality construct, consumers must be targeted not only on the experience of the hotel space itself, but the idea of what the locale offers as well. Presented with both high arousal and low arousal conditions depending on whether they are participating in a public or private

⁶² "Marriott International, Inc." Hotels & Resorts | Book your Hotel directly with Marriott. Accessed February 21, 2018. <http://www.marriott.com/default.mi>; figure 8.

⁶³ "الرئيسية - الفنادق - الماريوت فنادق". [Marriott Hotels – Home] Marriott. Accessed February 21, 2018. <http://www.arabic.marriott.com/default.mi>; figure 8.

⁶⁴ "Marriott International, Inc." Hotels & Resorts | Buchen Sie Ihr Hotel direkt bei Marriott. Accessed February 21, 2018. <http://www.marriott.de/default.mi>; figure 8.

space, consumers are typically looking for a combination of arousal states that will meet the expectations surrounding their purpose of travel. It is important for a designer to understand the impact of each servicescape on the psyche and create opportunities for participation and escapism. If a hotel customer needs respite but cannot find it (e.g. noisy rooms, busy and bright common spaces, etc.) they will begin to develop a negative association with the hotel. In the same vein, a customer who is seeking interaction and excitement may find a quiet lobby constricting and, if incongruent with the expectation set in the initial ZMoT, will also develop negative associations. It is common knowledge that negative experiences hold greater psychological influence, and memory longevity, than positive ones. As a result, it is important to create opportunities for positive interaction within a servicescape, while acknowledging and mitigating the effects of possible negative interactions.⁶⁵

This is where the concept of Living Services is playing an increasing role in the hospitality landscape. Defined as adaptive technology that takes into account the physical and psychological effects of design and environment to create ever adapting spatial experiences, Living Services can be seen in the interactions of consumers with their digital devices and those devices role in how consumers experience the physical construct around them. With over 60% of consumers preferring to use handheld digital devices to desktop computers, the presentation and consumption of the ZMoT becomes increasingly fluid.⁶⁶ Ironically, “human-level” interaction will still be demanded as part of the digital and physical landscape. While many transactions take place in the digital realm, younger consumers still opt to make final experiential decisions in

⁶⁵ Fitzsimmons, *Service management*.

⁶⁶ Fjord, *The Era of Living Services*.

person.^{67, 68} In these moments of consumer interaction we discover if the intended ZMoT was met. Consumers are increasingly providing feedback to businesses on a very intimate level. Information and experiences are no longer simply pushed to consumers, but rather successful businesses participate in an ongoing conversation regarding user needs, wants, and experiences. Looking to social media, we find the TMoT at its most honest. It is this hash-tagged, 140 character, sound-byte of uncontrolled media where we find out if the controlled message the business put forth in their own ZMoT matches what came back from the end consumer in the TMoT. Consumer provided TMoT mix with the business generated ZMoT to create a new ZMoT that is more widely distributed than any marketing media the business could have created (Figure 9) and is more openly received as an “honest interpretation” of the business than the controlled data.⁶⁹ As Living Services increases, design feedback, and therefore experiential adjustments, can prove to be instantaneous as biosensors within the consumer’s possession communicate far more personal data than businesses have been able to traditionally collect. While this may seem disturbingly invasive, many consumers have already opted into feedback loops based on sensory data with their use of items such as the Apple Watch and the Fit Bit. Some studies show that the number of general devices per capita worldwide will average 6.6 by 2020. These sheer amounts of data capture capability and opportunity for consumer interaction will continue to reshape the design servicescape equation.

⁶⁷ Singh, Daljit. "The Moment of Truth for Brands." Fjord. The Design & Innovation consultancy. June 14, 2016. Accessed October 12, 2017. <https://www.fjordnet.com/conversations/the-moment-of-truth-for-brands-breathing-life-into-digital-services/>.

⁶⁸ Skrovan, Sandy. "Why researching online, shopping offline is the new norm." Retail Dive. May 17, 2017. Accessed October 12, 2017. <http://www.retaildive.com/news/why-researching-online-shopping-offline-is-the-new-norm/442754/>.

⁶⁹ Blue Chip Innovation, LTD. Blue Chip Innovation Designing Emotional Experiences. PDF. Uxbridge, UK: Blue Chip Innovation, LTD. Accessed: October 18, 2017. <http://www.bluechipinnovation.com>

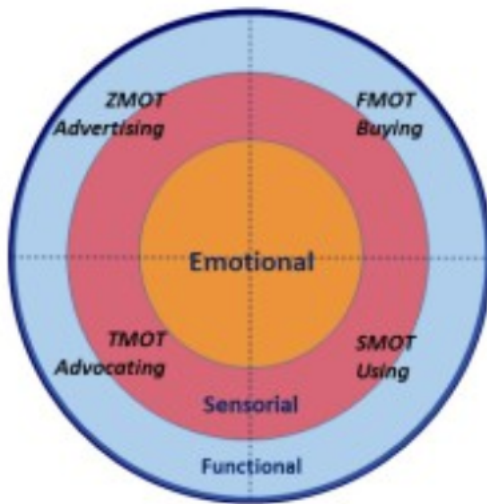


Figure 9. Translating Technology (Blue Chip Technology)
(Image by Blue Chip Technology)⁷⁰

3.3 Applying the Senses to Experiential Design

As consumers become increasingly aware of what is available to them from a service perspective in the market, it is the “sense of well-being” evoked by thoughtful facility design that is garnering increased attention in today’s design market. Designers like Ilse Crawford, of London based Studio Ilse, are not new to this concept and have built thriving careers around the concept of “enhancing the human experience” through design instead of simply focusing on visual pleasure.

As previously discussed, research shows that while continuing to evolve, there is a somewhat finite set of sensorial elements that we use to perceive the world around us. Each element has a differing level of impact on the perception of space and the emotional response that we have towards that space. In the BDE, this research proposes evaluating/regressing

⁷⁰ Ibid; figure 9.

combinations of four of the currently identified senses for emphasis in the final design. Ilse Crawford, a British designer who focuses on experiential design in the commercial and luxury realm primarily, emphasizes the importance of understanding the physical and emotional impacts of a design, not just the aesthetic as a mode of design empathy and interrogation. Understanding how each selected product, as well as the proposed layout, affects the participant on a physical and emotional level is critical to generating a space that is not just aesthetically pleasing, but meets the requirements of well being for the basic human condition.⁷¹

Through this purposeful effort, as opposed to a by-product of the visual, a designer can ensure that the intended effect of the space is attained. For hospitality, the branded experience is one scenario where the visual combination of other senses has a profound impact or influence.⁷² With additional sensory stimulation comes the continued expansion or detracting from the sensory and emotional experience. For example, adding texture/temperature to an already positive audio-olfactory experience can result in continued calm or an increase in stress. Think, sandpaper vs. Egyptian cotton, or 63-degree room versus 73-degrees. Research has shown that even blind persons with “no visual receptors” can perceive changes in light which thereby influence emotion through the “suprachiasmatic nucleus (SCN – our main body clock) and the pineal gland which regulates hormones and temperature.”⁷³

As designers work through the sensorial elements available to them, they can begin with those that hold the strongest influence as they can be perceived passively and cannot be easily

⁷¹ Roma, Sarina, dir. "Ilse Crawford: Interior Design." In Abstract: The Art of Design. Netflix. February 10, 2017.

⁷² Leone, Catherine Warren. Come To Your Senses. PDF. Chicago: IIDA - Perspective, March 2008. <http://www.iida.org/content.cfm/come-to-your-senses>

⁷³ Cornelissen, Sijf, and Martine Knoop. "Lighting Design: Creating A Less Intimidating Hospital Experience." *World Health Design* 1, no. 2 (July 2008): 63-67. Accessed January 2017. <http://www.worldhealthdesign.com/lighting-design.aspx>.

dismissed from the subconscious, such as sight and sound, and travel down the list of sensorial elements applying their influence and attributes to the spatial construct or materiality of the product at hand. This process becomes further educated when designers integrate consumer driven feedback on perceptual reactions to implemented elements. For example, in our ocular-centric society, Sight has an uncontested place in its influence over our perceptions of space with its ability to provide such a significant amount of data (distance, size, symmetry, etc.) at once.⁷⁴ However, studies show that sight is also strongly influenced by senses such as sound based on the internal emotions it triggers. The consumer's perception of an image can thereby be influenced, to some extent, by the soundtrack that accompanies the image.^{75, 76}

Beyond initial visual and auditory influence, the designer needs to be concerned with the influence of the consumer's interactions with the spatial construct and servicescape in the FMoT and SMoT. The data collected from other senses, completes the "picture" for the consumer. For example, the vestibular system used in balance and spatial perception is directly affected by surfaces, angles, and finishes specified by designers and can therefore have a significant impact on the perceived well-being of the consumer. Uneven floors, blinding lighting, abnormally loud sounds – particularly of a certain pitch and decibel – all trigger pain responses that cause the consumer to recoil. Senses such as warmth, touch, and time directly play into the emotional perceptions presented in Russell-Barrett's Core Affect chart and should be carefully considered by designers for their influence on the responses of consumers. These senses do not only relate to airflow and interaction, but should be considered carefully within the intimate spaces of hospitality design where the consumer is influenced by their physical interactions with products

⁷⁴ Juhani, *The eyes of the skin*.

⁷⁵ Hanser, W.E, and R.E. Mark. "Music influences ratings of the affect of visual stimuli." *Psychological Topics* 22, no. 2 (May 2013): 305-24. May 2013.

⁷⁶ Schreuder, *Emotional Responses*.

and spatial constructs. For example, guest rooms offer an abundance of opportunity for “winning” or “losing” the consumer. If the consumer cannot control the temperature in the room to suit his or her needs, pain responses immediately inflict negative reactions in the body and mind. Similarly, furnishings that are too hard or soft, or even a toilet seat that is unstable, can result in an uncomfortable interaction wherein the consumer tries to escape the spatial construct instead of revel in the experience of it. In a similar vein, the business team must consider the influence of personalities, or ego, within the hospitality servicescape as an important element when constructing the overall servicescape. If consumers are left uncomfortable from their interactions with personnel due to the physical construct or the personality of the serviceperson, there will be a negative emotion cast on the space as a whole.

While individual elements are important in the initial evaluation of the constructed spatial experience, it is the compiled whole that creates the complete spatial experience for the consumer. Designing for the experience is about understanding the target demographic and/or psychographic and designing for it based on two things: first, is the ability of the product or service experience to align in a congruous manner with the expected personality of the targeted consumer, and second, is the ability of the designed experience to impart the perception of congruence based on the *desired* personality of the participating consumer.⁷⁷ Considering how the experiential elements of each design decision combine to create the spatial construct empowers designers to create spaces that consumers gravitate toward based on intrinsic identification instead of simply external attraction.

⁷⁷ Spielmann, Nathalie, Michel Laroche, and Adilson Borges. "How service seasons the experience: Measuring hospitality servicescapes." *International Journal of Hospitality Management* 31, no. 2 (June 2012): 360-68. Accessed October 2, 2017. doi:10.1016/j.ijhm.2011.06.001.

3.4 Applying Design Principles and Elements

As the demands of the space emerge, designers typically focus on applying the elements and principles in such a way as to guide their spatial influence. For the purposes of this discussion around Hospitality Interior Design, and the BDE, the addition of the DPE at the end addresses the addition of congruent elements in a holistic design until the appropriate BDE is achieved. In the same vein, incongruent elements may be intentionally added to encourage specific responses to space. Design Principles and Elements are the physical means by which the sensory experience is achieved and imparted.

To determine the congruence, the designer must consider whether the emotional response of the consumer will likely be positive or negative within the construct of the holistic spatial experience. To use line as an example, the application of lines within the spatial construct can create a positive or negative response. Long lines of people waiting to check in can be visually stressful and can also impede flow within a servicescape, creating frustration in those trying to move about the space. The line of a chair can immediately affect the position that an individual takes when using it. If the chair is sharp-angled and straight backed the user will be more inclined to perch stiffly on the edge than to recline as they would in a gently sloped, curved back or soft chair that follows the line of the human spine at rest. The line created with walls, changes in paint color, or pattern can define individual spaces within an open plan to direct consumers and advise on the functional changes of each area. While these types of considerations are standard during the design process, attaching a formal additive or detractive designation to them during consideration helps communicate their influence and place within the overall design plan and business goals, hence the BDE.

In using the BDE, it is important to understand the spatial experience or ZMoT that is driving the completed design. It is within the experiential drivers that the designer understands how the BDE principles or elements should be applied to generate the desired spatial construct and achieve the desired arousal state within the consumer. As consumers participate in a completed space, they perceive these aesthetic details in conjunction with the sensory data. It is this combination that then creates their individual MoT. The congruence of the sensory elements of a design is visualized in these principles and elements. It is only when one understands the sensory demands of the design that they can effectively manipulate the aesthetic encounter to generate the expected and preferred outcome.

Perhaps the simplest way to evaluate preference of the DPE would be the “approach-avoidance” method suggested by Scarinzi wherein the cognitive evaluation of these elements as a verbal response to preference is removed, and instead observing the “unconditioned reflexes” of participants in response to suggested stimuli or design elements. Designers often do this subconsciously as they present clients with this-or-that options from which to make selections for spatial constructs. Be it the hotelier as client or the end consumer, using a more educated cognitive evaluation of the client’s feedback will enable the design team to better apply the DPE to meet the subconscious expectations of the end consumer.⁷⁸

Research in cognitive neuroscience further underlines the importance of “‘resonance’ between imagery and observation” that directly correlates to the importance of the DPE in creating lasting and congruent memory responses in consumers that directly translate to their perceived relationship between ZMoT and TMoT.⁷⁹ As a result, it is important to carefully

⁷⁸ Scarinzi, Alfonsina. *Embodied aesthetics: proceedings of the 1st International Conference on Aesthetics and the Embodied Mind, 26th-28th August 2013*. Brill, 2014.

⁷⁹ Ibid, 27.

consider the additive or detractive effect of a specific DPE within the BDE and modify the delivery or strength as needed to create the best cognitive perceptual fit. A more sensory example, based on the congruency chart in the previous section (20), is the combination of a calming sound with a sour smell and a rough surface that may result in confusion as the experiencer is unsure what to make of the combination. However, a calming sound, combined with a sour smell, and a soft, cozy surface results in distrust as the historical context by which there would be a calming effect of the first and last is disrupted by the second. Lastly, a calming sound, sweet smell, and rough texture – or vice versa, an alarm sound combined with a sweet smell and soft texture, results in a fearful experience wherein the experiencer has a stronger reaction to the incongruence of the elements than the positive influence can overcome.

While the information overload and demands for rapid processing prevalent in today's society have increased the capacity of the human mind to process a surprising amount of data at one time, the fundamental way in which the human brain works requires it to categorize and assign priority to that data in order to glean actionable information. It is through this affect prioritization that research indicates the opportunity for predicting consumer decisions based on the presentation of elements and their perceived affect on the experiential outcome.^{80, 81}

Successful retail and hospitality designers understand the interplay between the use of DPE and their effect on affective choice. Seasonal music, focus lighting, and ambient scent have all been long understood to improve the mood of shoppers and increase sales activity. Applying knowledge such as this in a systematic fashion using the BDE allows for clearer communication

⁸⁰ Suri, Gaurav, Gal Sheppes, and James J. Gross. "Predicting affective choice." *Journal Of Experimental Psychology: General* 142, no. 3 (August 2013): 627-632. *PsycARTICLES*, EBSCOhost (accessed February 20, 2018).

⁸¹ Aart, J. v., Salem, B., Rauterberg, M., Bartneck, C., & Hu, J. (2008). Designing for Experience: Arousing Boredom to Evoke Predefined User Behaviour. *Proceedings of the Design and Emotion Conference*, Hong Kong.

of the design intent, while eliminating less successful elements based on an individual business' BDE model.

4 EXTRAPOLATED EVALUATION: STARWOOD ALOFT HOTELS

In 2006, Starwood Hotels created and opened a new sub-brand, Aloft Hotels in the digital realm using 3D modeling. The first of its kind, the digital hotel was then hailed as “innovative” and the company itself claimed the strategy would reduce long term costs through better product-consumer alignment. Based on Aloft Hotel’s franchise model, emphasis on attracting both upcoming and older generations of consumers, as well as their strong experiential offerings within the travel hospitality market, Aloft was selected to serve as the applicability focus for this research. The evaluation that follows examines the way the Starwood Hotels and Resorts/Marriott Hotel Group has addressed design demands for their Aloft Hotels based on the targeted psychographic/demographic and the ways in which they apply the sensory and design elements discussed in previous sections to create a specific aesthetic experience.

4.1 Defining Aloft

When Starwood Hotels and Resorts introduced Aloft in 2006, the ultimate goal was to create a new, streamlined hotel that would fill the market void of “stylish, yet affordable” hotels and attract “hip, youthful, tech-savvy” consumers.⁸² In an effort to meet this goal, Starwood utilized psychographics and demographics in their efforts to identify Aloft’s target consumer and their desires when searching for a hotel experience.⁸³ Psychographics is part of an increasing sector of technology driven profiling that involves the “segmentation of consumers by personality, values, attitudes, and opinions.”⁸⁴ With a focus on emotional drivers and impacts,

⁸² Jana, Reena. Starwood Hotels Explore Second Life First. PDF. Businessweek, August 23, 2006.

⁸³ Berger, Brandon B., and Donald J. Chiofaro. "Select-service hotels : a guide to understanding the lodging industry and one of its most attractive segments." Master's thesis, Massachusetts Institute of Technology, 2007. September 2007. p.49.

⁸⁴ Solomon, Michael R., Lisa Duke Cornell, and Amit Nizan. Launch! advertising and promotion in real time. Irvington, NY: Flatworld Knowledge, 2009. p.179

businesses that can identify audience prejudices will have the upper hand in creating design experiences that will yield the desired perception upon exposure in the real market. While it may seem exclusionary, segmentation, otherwise known as niche marketing, is important to the success of business today. It is in this segmentation that a business can become a mile deep instead of a mile wide and truly create the experiential design the consumer craves.

In the creation of Aloft Hotels, Starwood aimed to not only target the consumer who is young and currently self-identifies as “hip and tech-savvy,” but also anyone who desires to personify that experience himself or herself. While Starwood/Aloft considers a specific demographic and psychographic profile for marketing purposes, they also understand the variation necessary to meet specific geographic idiosyncrasies and demands and are very active in the digital realm. The Aloft Hotel of Dubai, UAE may bear many of the same characteristics of the larger hotel chain, but will still have marked differences from that of say, Atlanta, Georgia, USA that meet the demands of the local region. Furthermore, they continue to evolve as market demands and desires shift year over year, but remain true to the original Aloft concept.

With Aloft, Starwood Hotels became an early adopter of technology driven self-service lodging. While most hotels were focused on amenities and the “luxury” concept, Starwood saw value in growing the upscale hotel sector by identifying and focusing on the desires and demands of the, then upcoming, Generation X, and subsequently, the Millennial market. These desires lie in an affordable, personally identifiable hotel experience where amenities fit into existing lifestyle choices of the consumer. (Figure 10) By focusing on the individual collective, Starwood

was able to create a hotel that personified the juxtaposition of the old ways of hoteling with the new, technological experience.⁸⁵

DISTINCTIVE & COMPELLING EXPERIENCES								
								
Beyond expectation	The Destination Authority	Insider access to a world of wow	A new perspective	For a better you	The world's gathering place	Urban cool in unexpected places	Space to live your life	Travel the way you like
INSPIRED BY								
								
THE CONNOISSEUR	GLOBAL EXPLORERS	TREND-SETTERS	CREATIVE MINDS	ACHIEVER	SOCIAL TRAVELER	SELF-EXPRESSERS	HEALTHY ACTIVES	SELF-SUFFICIENTS
Well-educated Worldly Discerning	Well-traveled International Sophisticated	Looking for what's new, what's hot & what's next	Curious Open-minded Original	Accomplished in work and life Seeks healthy work/life balance	Successful & optimistic Luxury without pretense	Seeking tuned-in, tuned-on experiences	Balance is a way of life	Relaxed Confident Sensible

Figure 10. Starwood Experience/Guest Profiling
(Image by Jason Koval)⁸⁶

With a tagline of “Different. By. Design.” Aloft offers guests a concept that is reminiscent of the open concept, technologically advanced spaces that their target psychographic is used to moving within.⁸⁷ The multiuse space on the first floor typically operates as a lounge,

⁸⁵ EY Global Real Estate, Hospitality & Construction Sector. *Global Hospitality Insights: Top 10 thoughts for 2016*. New York, NY: Ernst & Young, 2015. September 30, 2015.

⁸⁶ Koval, Jason. "Starwood Hotels and Resorts Investors Presentation." Address, Raymond James 33rd Institutional Investors Conference, Florida, Orlando, March 5, 2012. March 5, 2012. Accessed November 25, 2017. <https://s1.q4cdn.com/483583335/files/2012-03-05-HOT-RJF-Presentation-Final.pdf>; figure 10.

⁸⁷ Starwood Hotels & Resorts Worldwide, Inc. Investor Relations. "A Better Way to Experience the World: 2015 Proxy Statement & 2014 Annual Report." News release, April 17, 2015. Starwood Hotels & Resorts Worldwide, Inc.

bar, living room, dining space, and check in/check out locale. There are not delineating walls and the eating space is more like a collective kitchen than a formal dining option. Additional living spaces are presented on other floors in the form of outdoor gathering spaces, private rooms, and amenities that feel more like a friend's home than hotel chain. This use of space is also consistent with research that indicates a preference for spaces that provide "complexity, coherence, naturalness, mystery, and enclosure."⁸⁸ In 2006, the chain targeted opening 500 hotels by 2012. In 2016 they had 113 properties worldwide but still performed in the number two spot behind Westin for all their hotel brands.^{89, 90, 91} With the 2016 merger with Marriott, it remains to be seen what direction Marriott will take the brand, but they are currently continuing to operate the Starwood hotels independently.

While it is not news that technology is at the forefront of consumer interaction in today's market, it has not traditionally been at the forefront of the hospitality interaction where personal customer service has reined supreme. Aloft incorporates technology at every turn in order to accurately fill the unique space in the upscale market. The brand successfully triangulated their target consumer through 1) traditional research and construction of the hotel test space in the real market, 2) digital research and feedback solicitation through interaction and 3D implementation of the forthcoming Aloft hotel on the web, and 3) through ongoing study and solicitation of consumer preferences and habits in the hospitality market. By using data collected from multiple arenas, the brand has been able to consistently anticipate what their target market is looking for

⁸⁸ Garling, Tommy, and Gary W. Evans. *Environment, Cognition and Action: Integrative Multidisciplinary Approach*. Oxf. U.P. (N.Y.), 1992. P. 5

⁸⁹ Berger, "Select Service Hotels".

⁹⁰ Starwood Hotels, "A Better Way".

⁹¹ Starwood Hotels & Resorts Worldwide, Inc. Investor Relations. "Starwood Reports Second Quarter 2016 Results." News release, July 26, 2016. Starwood Hotels & Resorts Worldwide, Inc.

and work to implement it as early adopters in order to maintain market share and grow their position amongst global travelers. In a competitive industry where there are an ever-increasing number of players within each niche, this early adoption is critical.

4.2 Design Intent and Experience

Through analysis of the branded imagery and text put forth by the hotel group in combination with that put forth by consumers themselves, this research offers a proposed BDE and an evaluation of the effectiveness and accuracy of the group's BDE in generating an accurate ZMoT. By comparing controlled versus uncontrolled imagery for the group via appropriate social media platforms, particularly Instagram and Facebook, utilized by the target consumer, one can determine if the ZMoT generated matches with the intended moment in order to create a circular and self validating TMoT, or if there is work to be done to better align these through a reordering and re-application of the BDE.

When looking to identify the Aloft Hotel target demographic, research indicates that the company focuses more on the psychographic of their consumers. In other words, they focus on a specific set of attitudes, preferences, and life spaces that constitutes their ideal market. Aloft's focus has consistently been on emerging markets of travelers – from Generation X, to Millennials and now the aging population who is rediscovering travel as a means of connection and rediscovery during life changes. The resulting psychographic is “self-driven, early adopters who are tech-savvy and social--a lot like entrepreneurs.”⁹² However, Aloft is not alone in their pursuit of this psychographic. As Chekitan Dev, a professor and hospitality author, reminds us that there a host of brands, such as AC, Moxy, Indigo, Tru, GLo, citizenM, and Yotel, who are

⁹² Glusac, Elaine. "This Brand of Design-Savvy Hotels Is Built for Entrepreneurs." Online Magazine Editorial. September 2014. Entrepreneur Magazine.

now competing in this once-niche market.⁹³ As hoteliers work to maintain or grow market share within this psychographic, it is important for them to acknowledge both the lifestyle and psychological implications of their decisions on the memory perception of their consumers. A repeat customer is an inexpensive customer.

With the Aloft design, the concept is very transparent: what you see is what you get, with a handful of technological surprises that keep you coming back. To continually delight their psychographic they create experiences through strategic sponsorships and partnerships within entertainment arenas (such as MTV and local events). Internally, Aloft offers what has been called “Live at Aloft.” This is a series of live music events at varying hotels worldwide. Much like music-oriented consumers seek out concerts at local venues or even travel to participate in a musical performance of interest, Aloft bolsters their position as an experience hotel by bringing concerts in-house and providing exclusive opportunities for guests to enjoy performances as a “VIP” if they are staying in the hotel. The performances range from smaller, unknown performers, to larger acoustic performances by known artists, and even partnerships with MTV to bring large artists to major international venues. Furthermore, Aloft remains subtly top-of-mind with its intended psychographic through acting as the host venue for a variety of social events such as:

- Fashionably Connected Networking Event – Austin, TX
- The Society of Single Professionals Mixer – San Francisco, CA
- Grand Opening Parties – Miami/Santa Clara/etc.
- Aloft on Sunday Day Parties – Orlando, FL
- Refuel on Wheels Catering – Kuala Lumpur

⁹³ Trejos, Nancy. "Aloft Hotels target "gap year" travelers." Online News Editorial. April 15, 2016. USA Today.

- FEN Social Networking Event – Orlando, FL
- Mercy Children’s Clinic Wine Benefit – Nashville, TN
- UAB Medicine “The Pink Party” for Cancer Awareness – Birmingham, AL
- Kalospectra Art & Sports Bash – Glen Allen, VA
- Women’s Lifestyle Tradeshow/Local Women Entrepreneurs – Calgary
- American Lung Association Trivia Night – Tampa, FL
- Live in the Vineyard – Napa Valley, CA
- Moogfest – Asheville, NC
- Brew at the Zoo – Jacksonville, FL
- Holi Party Sponsor – Bengaluru, India
- And more...

For a psychographic that enjoys participating in events, being photographed, and socializing, Aloft’s involvement in community events brings potential customers together and keeps Aloft top of mind for future travel endeavors.

Their unique rewards program also expands on the black and white points-for-dollars system to allow individualized experiences beyond the free bottle of water. Starwood Hotels has taken the aesthetic experience of a hotel stay to heart and incorporated sensory elements in new and personal ways. Where consumers once were only able to redeem points for additional stays in the hotel chain of receipt, Starwood has taken a note from the American Express Rewards program in their offering of experiential redemptions such as air tickets, concerts, and special events in addition to the standard free night.

4.3 Aloft BDE Application and Results

The application of the BDE is particularly relevant in the case of Starwood Hotels Aloft brand given their use of the franchise model to expand locations. With 137 hotels across 20 countries, and more in the works, it is critical that the fundamentals of the Aloft experience remain the same across venues. While this can be largely accounted for with detailed design specifications, the BDE plays a role in ensuring that the experiential takeaways of an Aloft stay result in the correct TMoT for a successful consumer generated ZMoT.⁹⁴

Aloft hotels does not offer in-room dining, and has a simple room design, which encourages guests to make use of the public spaces. This use facilitates interaction among guests, while the layout and adjustable daily lighting signals the intended use of spaces from morning to night. For example, mornings are brightly lit and quiet, which encourages business use of the seating arrangements, and worktables. Meal times show an increase in activity around the “kitchen” area and encourage guests to join others for a meal or just pass through to grab a snack. Evenings however, reflect a higher arousal state despite the lowered lights, with active music and the activation of the entertainment zones with pulsating music, pool tables, and a bar. The consistent use of visual and sound cues informs customers of shifts in spatial composition and performance which allows them to anticipate their desire to either participate or retreat based on their personal needs each day.⁹⁵

The location of Aloft hotels also plays a role in the perception of the interior spatial construct and the overall aesthetic experience. When consumers are evaluating the ZMoT, today’s technology aids them in their research of the complete experience for a given locale. It is not just about the flashy website, or pretty pictures. Technological advances such as Google

⁹⁴ Marriott internal database. "Aloft." Aloft : Marriott Hotel Development. Fall 2017.

⁹⁵ Fitzsimmons, “Service Management.” P.217

Maps/Earth allow a potential consumer to all but physically visit a site in the digital realm. They can “stand” in front of the hotel and “look” to see if the surrounding environment is what they expect from the “experience” they are being sold via controlled and uncontrolled materials. A 360-degree view may yield parks, easy access to public transportation, and outdoor cafes, or it could show bars on the surrounding building windows and “sketchy” surroundings. Aloft branding portfolios explicitly indicate their desire to position themselves as an “expert” on their surrounding locale. While these elements may be beyond the control of the Interior Designer, they must be considered as part of the consumer experience when the business is investing in a location and when the designer is creating the interior space. Spatial elements that are completely at odds with the presented locale can create distrust in the consumer and must be addressed as part of the full servicescape. Aloft acknowledges the potential for incongruent information through their positioning as an urban hotel for world travelers. The brand does its best to present the positive aspects of their hotel experience, while also providing a positive spin on what could be perceived as less advantageous elements.⁹⁶

Specifically examining the BDE, Aloft focuses on the following elements within their design equation.⁹⁷

- ***Smell/Taste:*** Through a focus on presenting a continually stocked “kitchen” area from which guests can collect snacks or meals, their appeal to the basic human need of food creates a welcoming environment for rest. The company also employs an “aroma system” wherein they use an ambient scent system to create memorable impressions as guests move through their hotel.

⁹⁶ Fitzsimmons, “Service Management.” Pp. 218-219.

⁹⁷ Berger, “Select Service Hotels.” p.53-54

- ***Sound:*** Consumer influence through music is a large focus at Aloft properties.

The hotel company uses a corporate managed soundtrack to create brand consistency while adjusting for seasonal elements and special events at any given hotel. Managing sound elements centrally enables the company to provide a consistent auditory theme for customers. In addition to the music that is specially programmed for specific positive arousal responses, design elements allow for the interaction of guest conversations, hotel activities, and environmental feedback to intermingle in the consumer's ears to create a complete brand image. Rooms are appropriately devoid of ambient sound to allow for guest-generated content.

- ***Sight/Lighting:*** The company's third primary focus is on the lighting elements of their hotel common spaces. Their auto-adjusting light programs work to create focus spaces and accommodate the energy levels of any given daily activity. The open plan with large windows allows for significant daylight, while focus lighting creates gathering areas as daylight decreases and invites consumers to continue their participation in the public realm, albeit more intimately. Specialty lighting over areas such as the registration desk, kitchen island, and behind the bar also aid in wayfinding for the consumer as they process the open space and break it down into more manageable areas.

- ***Time:*** Each of the above elements also contributes to the consumer's understanding of time and the passing thereof. The use of technology within Aloft's design scheme provides a tightly controlled experience that can be easily replicated across locales. Furthermore, Aloft aims to improve the consumer's perception of "time waste" by implementing technological advances such as

digital check-in with keyless room entry (Figure 10), robotic butlers (BOTLR) (Figure 11), and Emoji room service (TiGi) (Figure 12), and a voice-activated room.



Figure 11. Aloft Hotel's Keyless Check-in & Entry
(Image by Hotel Space Online and Extreme Tech) ^{98, 99}

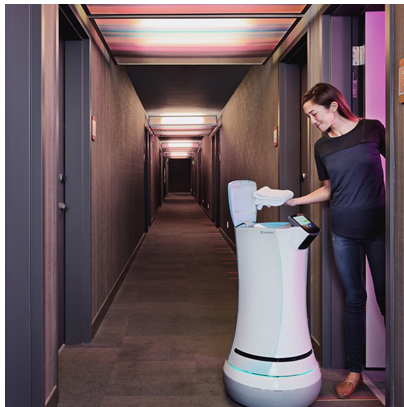


Figure 12. Aloft Hotel's BOTLR Robotic Butler
(Image by Starwood Hotels & Resorts) ¹⁰⁰

⁹⁸ Starwood Hotels & Resorts. Apple Watch Keyless Check in. Digital image. Hotel Space Online. Accessed February 23, 2018. <http://hotelspaceonline.com/products/keyless-check-in-through-the-spg-app-for-apple-watch/>; figure 11.

⁹⁹ Starwood Hotels & Resorts. Phone App Keyless Entry. Digital image. Extreme Tech. Accessed February 23, 2018. <https://www.extremetech.com/extreme/193450-you-can-now-open-hotel-rooms-with-just-your-smartphone-and-bypass-check-in-too>; figure 11.



Figure 13. Aloft Hotel's TiGi (Text It. Get It.) App
(Image by Starwood Hotels & Resorts) ¹⁰¹

While not controlled for data accuracy, we can apply the research above to generate the following BDE to review Aloft's customer satisfaction scores as they relate to the above sensorial elements.¹⁰² To determine the success or failure of a particular BDE application at Aloft we first lay out the equation as it pertains to specific S, Se, and DPE values deemed relevant via the business specification and goals. For Aloft, this looks like the following:

$$\mathbf{BDE} = Ca_{(CTR)}S_{(LKG)} (C(6_{Se}, 4_k)) + DPE_1 + DPE_2 + DPE_3$$

$$Ca = \text{Climate} + \text{Tradition} + \text{Adaptive Reuse}$$

¹⁰⁰ Starwood Hotels & Resorts. Aloft BOTLR Robotic Butler. Digital image. Aloft Hotels. Accessed February 23, 2018. <https://aloft-hotels.starwoodhotels.com/hotel-technology/>; figure 12.

¹⁰¹ Starwood Hotels & Resorts. Aloft Hotel's TiGi. Digital image. Skift. Accessed February 23, 2018. <https://skift.com/2015/10/22/aloft-tries-to-speak-millennial-with-new-emoji-room-service-ordering/>; figure 13.

¹⁰² "Unique & Unlike Any Other: Distinct Aloft Hotels." SPG Weekend Channel. Accessed February 27, 2018. <http://www.spgweekends.com/brands/aloft/unique-aloft-hotels-unlike-anything-else>.

$S = \text{Lobby} + \text{"Kitchen"} + \text{Guest Rooms}$

$C (Se, k) = \text{Smell/Taste} + \text{Sound} + \text{Sight/Lighting} (+ \text{Time})^*$

$DPE_1 = \text{Color}$

$DPE_2 = \text{Space/Perspective}$

$DPE_3 = \text{Rhythm/Movement}$

*Time is in parenthesis here because while it is relevant within the Aloft consumer experience, and is directly influenced by their business technology focus, it is not specifically called out as an element to be addressed within the business design spec. Whenever customer service is part of an experience it will be important to note the design implications of time, but it does not necessarily need to be included from a regression perspective since the concept of time is very subjective and its accuracy of perception varies with consumer age.¹⁰³

Based on a combination of high value rankings in survey results from the JD Power 2017 Survey of Upscale Hotels (Appendix B.1 – J.D. Power 2017 North America Hotel Guest Satisfaction Study) and an independent survey conducted by Business Travel News (BTN) (Appendix B.2 – 2017 BTN Hotel Survey Report) the research reveals that Aloft hotels has successfully applied the elements above to the customer experience to create a TMoT that is consistent with consumer expectations during the ZMoT that is created via the BDE.^{104, 105} This analysis is based on the statistical significance of survey results such as Personal Amenities and

¹⁰³ Hornik, Jacob. "Subjective vs. Objective Time Measures: A Note on the Perception of Time in Consumer Behavior." *Journal of Consumer Research* 11, no. 1 (June 1984): 615-18. doi:10.1086/208998.

¹⁰⁴ Rayadmin. "Pcr study." J.D. Power. July 12, 2017. Accessed February 26, 2018. <http://www.jdpower.com/ratings/study/North-America-Hotel-Guest-Satisfaction-Study/2572ENG/Upscale/1438>.

¹⁰⁵ Sickel, Julie. "Hyatt Hotels Corp. Sweeps Both Upscale Segments with Hyatt Regency & Hyatt Place." Business Travel News. September 04, 2017. Accessed February 26, 2018. <http://www.businesstravelnews.com/Research/Hotel-Survey-Report/2017/Hyatt-Hotels-Corp-Sweeps-Both-Upscale-Segments-with-Hyatt-Regency-Hyatt-Place>.

Physical Appearance combined with above average scores in Food & Beverage, Hotel Services & Facilities, and Guest Rooms.¹⁰⁶ This success is also represented visually in the consistency between the images presented by Aloft marketing (controlled) versus those presented by consumers (uncontrolled) in their reviews of varying properties. This experience sharing on media outlets such as Instagram, Facebook, and Trip Advisor confirms the brand's ability to relay their intended experience to their targeted psychographic. The Figures on the left are those presented by Aloft hotels as part of their company image on Instagram or via their corporate and franchised websites. The Figures on the right are those added by consumers to represent their experience and interpretation of Aloft's images using the #AloftHotel hashtag on Instagram or via consumer comments on the company's Facebook page.

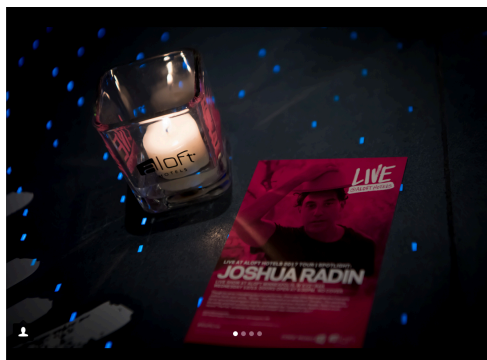


Figure 14. Aloft Image 1
(Photo by @alofthotels)¹⁰⁷



Figure 15. Consumer Image
(Photo by @e_o__l)¹⁰⁸

¹⁰⁶ NOTE: See Appendix A for full statistical analysis and survey results.

¹⁰⁷ @alofthotels. Live at Aloft Hotels Tour 2017. *Instagram*, Dec 14, 2017. Accessed Mar 2, 2018. <https://www.instagram.com/p/BcsJVyzArxY/?hl=en>

¹⁰⁸ @e_o__l. Live at Aloft Event Photo. *Instagram*, Mar 2, 2018. Accessed Mar 2, 2018. <https://www.instagram.com/p/Bf0XEeEBwLD/?hl=en>



Figure 16. Aloft Image 2
(Photo by Aloft Bangkok Sukhumvit) ¹⁰⁹

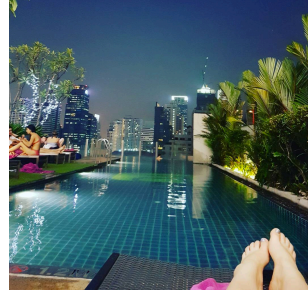


Figure 17. Consumer Image 2
(Photo by @teeekohler) ¹¹⁰

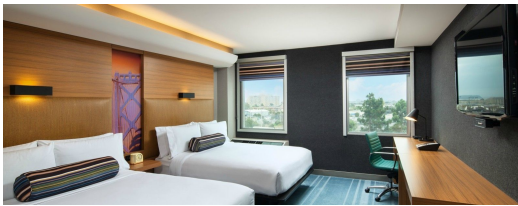


Figure 18. Aloft Image 3
(Photo by Aloft San Francisco Airport) ¹¹¹

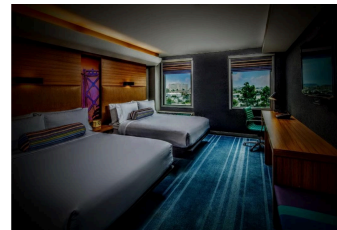


Figure 19. Consumer Image 3
(Photo by @bnchau19) ¹¹²

¹⁰⁹ “Splash Pool.” Digital Image. Aloft Bangkok Sukhumvit. Accessed Mar 2, 2018.
<http://www.aloftbangkoksukhumvit11.com/Splash-pool>

¹¹⁰ @teeekohler. Aloft Bangkok Rooftop Pool. *Instagram*, Jan 22, 2018. Accessed Mar 2, 2018. <https://www.instagram.com/p/BeQC0iXHsUU>

¹¹¹ “Double Queen Guest Room.” Digital Image. Aloft San Francisco Airport. Accessed Mar 2, 2018. <http://www.aloftsanfranciscoairport.com/en/rooms/double-queen>

¹¹² @bnchau19. My Favorite #Bedroom. *Instagram*, Jan 21, 2018. Accessed Mar 2, 2018.
<https://www.instagram.com/p/BePT0C9FJEx>



Figure 20. Aloft Image 4
(Photo by @aloftstuttgart) ¹¹³



Figure 21. Consumer Image 4
(Photo by @annaxsommer) ¹¹⁴

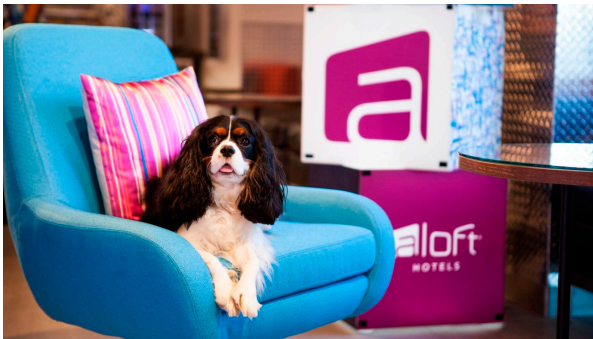


Figure 22. Aloft Image 5
(Photo by Aloft Miami-Dadeland) ¹¹⁵

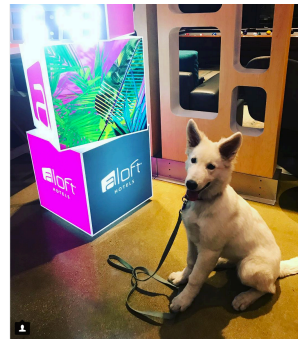


Figure 23. Consumer Image 5
(Photo by @thebergerblancsuisse) ¹¹⁶

As demonstrated by the above images, the designers who currently work with the Aloft business development teams seem to inherently understand the target psychographic and are adept at aligning the Aloft experience with the consumer expectation. In reality, it is likely

¹¹³ @aloftstuttgart. Weeeeeekend vibes. *Instagram*, Oct 13, 2017. Accessed Mar 2, 2017. <https://www.instagram.com/p/BaMaGyZFoEA>

¹¹⁴ @annaxsommer. Thursday-feelings. *Instagram*, Oct 19, 2017. Accessed Mar 2, 2018. <https://www.instagram.com/p/BabWiixAHbM>

¹¹⁵ Re-Mix Lounge Pet-Friendly. Digital image. Aloft Miami-Dadeland. Accessed Mar 2, 2018. <http://www.aloftmiamidadeland.com/pet-friendly-hotels-miami>

¹¹⁶ @thebergerblancsuisse. Party at Aloft Hotel. *Instagram*, Feb 25, 2018. Accessed Mar 2, 2018. <https://www.instagram.com/p/BfmkjMQDcVJ>

continued research on the part of the business and design teams alike to understand the “lived experiences” of the target psychographic and continuous adjustment to the way they apply the BDE to create unique and ever evolving successful aesthetic experiences for their customers.¹¹⁷ For example, the image below demonstrates where the Aloft franchise in downtown Tampa, Florida missed the mark (ZMoT did not align with the SMoT) in the pool amenities. The consumer stated, “For the most part I love the brand. But, [...] I watched people struggle all day with your lounge chairs. Only very small people or children can use these and the [...] chairs were hot to the touch.”¹¹⁸



Figure 24. Aloft Image 6

(Photo by Aloft Tampa Downtown)¹¹⁹



Figure 25. Consumer Image 6

(Photo by Cheryl Mitchell)¹²⁰

In this case, the hotel branded image presented during the ZMoT and FMoT (Figure 24), did not align with the consumer SMoT except that it was metal and mesh (Figure 25). This resulted in a

¹¹⁷ Poldma, Tiiu. "Transforming Interior Spaces: Enriching Subjective Experiences Through Design Research." *Journal of Research Practice* 6, no. 2 (February 16, 2011): 141-55. Accessed September 5, 2017. <http://jrp.icaap.org/index.php/jrp/article/view/198/199>

¹¹⁸ Cheryl Piscitelli Mitchell's on Aloft Hotel's Facebook Page. Accessed Mar, 2018, https://www.facebook.com/alofthotels/posts_to_page/

¹¹⁹ "Backyard Patio." Digital Image. Aloft Tampa Downtown. Accessed Mar 7, 2018. <http://www.alofttampadowntown.com/en/gallery/backyard-patio>

¹²⁰ Cheryl Piscitelli Mitchell. Pool Furniture. *Facebook*. Sept 27, 2017. Accessed Mar 7, 2018. https://www.facebook.com/alofthotels/posts_to_page/

negative consumer TMoT that was then communicated publicly by the consumer on Aloft's Facebook page, ready to be discovered by future consumers. It is important for designers and business teams alike to carefully consider the impacts of things like product substitution within the design equation. While the sensorial and visual elements of the substituted product were very similar to those of the marketed product (mesh, metal, sleek), the experience of the substituted product was very different (leaning, disproportionate to adult dimensions, hot to the touch). However, by focusing carefully on the experiential details and incorporating unique elements into every hotel experience, Aloft and its designers can to continually delight consumers and stay relevant in an ever-changing market.

5 CONCLUSION

In summary, decades of neuroscience and psychological research support the concept that the built environment influences consumer behavior, and arousal conditions are stimulated by the sensorial elements therein. Whilst traditional design has typically focused on the aesthetic spatial construct of the Interior Design practice, shifting focus to the experiential compilation of the aesthetic dimensions will yield a much more accurate design environment and consumer experience in the future.

The BDE introduced in this paper provides a quantitative way of evaluating and applying these experiential elements within the design and business constructs. The increasingly digital society we occupy, which consists of design consumption and feedback on both the 2D and 3D planes, affects the design and business sectors by increasing the need for congruence across elements in order to present the consumer experience in a successful manner. The ability of each area to communicate in a clear and objective manner regarding design intentions, investment demands, and consumer desires using the BDE will result in a living service that continues to

evolve with the demands of consumers and technology markets, without sacrificing the aesthetic, nor the experience. Forging new ground through combining diverse areas of research with the large data sets available in to business surrounding consumer preferences, the BDE provides a new theory for driving consumer affective choice in a positive and profitable direction.

Continued application of scientific research surrounding consumer choice allows designers and business personnel to understand consumer drivers at a greater depth than even the consumers themselves can explain. Applying business intelligence tools to make use of the data available to designers and business personnel, companies can more precisely define the sensorial elements driving consumer perception within the design experience, tailor the design principles and elements used to achieve those sensory affects and employ a precise BDE by which they can communicate and implement servicescapes with the greatest ZMoT to TMoT congruence for the aesthetic experience.

BIBLIOGRAPHY

- @aloft-hotels. Live at Aloft Hotels Tour 2017. *Instagram*, Dec 14, 2017. Accessed Mar 2, 2018.
<https://www.instagram.com/p/BcsJVyzArxY/?hl=en>
- @aloftstuttgart. Weeeeekend vibes. *Instagram*, Oct 13, 2017. Accessed Mar 2, 2017.
<https://www.instagram.com/p/BaMaGyZFoEA>
- @annaxsommer. Thursday-feelings. *Instagram*, Oct 19, 2017. Accessed Mar 2, 2018.
<https://www.instagram.com/p/BabWiixAHbM>
- @bnchau19. My Favorite #Bedroom. *Instagram*, Jan 21, 2018. Accessed Mar 2, 2018.
<https://www.instagram.com/p/BePT0C9FJEx>
- @e_o__l. Live at Aloft Event Photo. *Instagram*, Mar 2, 2018. Accessed Mar 2, 2018.
<https://www.instagram.com/p/Bf0XEeEBwLD/?hl=en>
- @teeekohler. Aloft Bangkok Rooftop Pool. *Instagram*, Jan 22, 2018. Accessed Mar 2, 2018.
<https://www.instagram.com/p/BeQC0iXHsUU>
- @thebergerblancsuisse. Party at Aloft Hotel. *Instagram*, Feb 25, 2018. Accessed Mar 2, 2018.
<https://www.instagram.com/p/BfmkjMQDcVJ>
- Aart, J. v., Salem, B., Rauterberg, M., Bartneck, C., & Hu, J. (2008). Designing for Experience: Arousing Boredom to Evoke Predefined User Behaviour. *Proceedings of the Design and Emotion Conference*, Hong Kong.
- “Backyard Patio.” Digital Image. Aloft Tampa Downtown. Accessed Mar 7, 2018.
<http://www.alofttampadowntown.com/en/gallery/backyard-patio>
- Behrens, Roy R. "Art, Design and Gestalt Theory." Leonardo On-Line: Art, Design and Gestalt Theory. November 17, 2004. Accessed January 15, 2018.
<https://www.leonardo.info/isast/articles/behrens.html>.
- Berger, Brandon B., and Donald J. Chiofaro. "Select-service hotels: a guide to understanding the lodging industry and one of its most attractive segments." Master's thesis, Massachusetts Institute of Technology, 2007. September 2007. Accessed November 25, 2017.
<http://hdl.handle.net/1721.1/42012>.
- Berlyne, Daniel E. *Studies in the new experimental aesthetics: steps toward an objective psychology of aesthetic appreciation*. Univ. Microfilms Internat., 1994.
- Bitner, Mary Jo. "Servicescapes: The Impact of Physical Surroundings on Customers and Employees." *Journal of Marketing* 56, no. 2 (April 1992): 57-71. Accessed October 2, 2017. doi:10.2307/1252042.

- Blue Chip Innovation, LTD. Blue Chip Innovation Designing Emotional Experiences. PDF. Uxbridge, UK: Blue Chip Innovation, LTD. Accessed: October 18, 2017. <http://www.bluechipinnovation.com>
- Bradley, Steven. "Gestalt Principles: How Are Your Designs Perceived?" Vanseo Design. January 25, 2010. Accessed January 15, 2018. <http://vanseodesign.com/web-design/gestalt-principles-of-perception/>.
- Cardaioli, Matteo, Marina Scattolin, and Patrizia Bisiacchi. "Equilibrioception: A Method To Evaluate The Sense Of Balance." Lecture, CHIItaly - Towards the Mediterranean, Italy, Cagliari, September 18, 2017. August 25, 2017. Accessed January 31, 2018. <http://ceur-ws.org/Vol-1910/paper0210.pdf>.
- Carlzon, Jan. *Moments of truth*. New York: Perennial Library, 1989
- Cheever, Ellen. Design principles: color, form, styles. Hackettstown, NJ: NKBA, National Kitchen & Bath Association, 2006
- Cheryl Piscitelli Mitchell. Pool Furniture. Facebook. Sept 27, 2017. Accessed Mar 7, 2018. https://www.facebook.com/alofthotels/posts_to_page/
- Chin, R. D., and Gerald Warfield. *Feng Shui Revealed*. New York: Clarkson Potter Publishers, 1998
- Cornelissen, Sijf, and Martine Knoop. "Lighting Design: Creating A Less Intimidating Hospital Experience." *World Health Design* 1, no. 2 (July 2008): 63-67. Accessed January 2017. <http://www.worldhealthdesign.com/lighting-design.aspx>.
- Crooks, Ryan. Sensory Modality Research. October 16, 2017. Raw data. Atlanta, GA. URL: <http://designenvironment.org/senses>
- Darrow, Chester W. "Electrical and circulatory responses to brief sensory and ideational stimuli." *Journal Of Experimental Psychology* 12, no. 4 (August 1929): 267-300. *PsycARTICLES*, EBSCOhost (accessed February 20, 2018).
- Day, H. I. "Curiosity and the interested explorer." *Performance & Instruction*, vol. 21, no. 4, 1982, pp. 19-22., doi:10.1002/pfi.4170210410.
- Diamond, David M., et al. "The Temporal Dynamics Model of Emotional Memory Processing: A Synthesis on the Neurobiological Basis of Stress-Induced Amnesia, Flashbulb and Traumatic Memories, and the Yerkes-Dodson Law." *Neural Plasticity*, vol. 2007, 2007, pp. 1-33., doi:10.1155/2007/60803.
- "Double Queen Guest Room." Digital Image. Aloft San Francisco Airport. Accessed Mar 2, 2018. <http://www.aloftsanfranciscoairport.com/en/rooms/double-queen>

- Dranove, David. *Mgmt 469: Model Specification: Choosing the Right Variables for the Right Hand Side*. PDF. Kellogg Northwestern University.
<https://www.kellogg.northwestern.edu/faculty/dranove/htm/dranove/coursepages/Mgmt%20469/choosing%20variables.pdf>
- Easterbrook, J. A. "The effect of emotion on cue utilization and the organization of behavior." *Psychological Review* 66, no. 3 (May 1959): 183-201. *PsycARTICLES*, EBSCOhost (accessed February 20, 2018).
- EY Global Real Estate, Hospitality & Construction Sector. *Global Hospitality Insights: Top 10 thoughts for 2016*. New York, NY: Ernst & Young, 2015. September 30, 2015. Accessed November 26, 2017. [http://www.ey.com/Publication/vwLUAssets/EY-global-hospitality-insights/\\$FILE/EY-global-hospitality-insights-2016.pdf](http://www.ey.com/Publication/vwLUAssets/EY-global-hospitality-insights/$FILE/EY-global-hospitality-insights-2016.pdf).
- Fitzsimmons, James A., and Mona J. Fitzsimmons. *Service management: operations, strategy, and information technology*. 4th ed. Boston, MA: McGraw-Hill/Irwin, 2004.
- Fjord, and AccentureDigital. *The Era of Living Services*. PDF. AccentureDigital, September 2015.
- Garling, Tommy, and Gary W. Evans. *Environment, Cognition and Action: Integrative Multidisciplinary Approach*. Oxf. U.P. (N.Y.), 1992.
- Glusac, Elaine. "This Brand of Design-Savvy Hotels Is Built for Entrepreneurs." Online Magazine Editorial. September 2014. Entrepreneur Magazine. Accessed November 30, 2017. <https://www.entrepreneur.com/article/236313>.
- Hanser, W.E, and R.E. Mark. "Music influences ratings of the affect of visual stimuli." *Psychological Topics* 22, no. 2 (May 2013): 305-24. May 2013. Accessed February 7, 2018. <http://www.persistent-identifier.nl/?identifier=urn:nbn:nl:ui:12-5919229>.
- "Home furnishings, kitchens, appliances, sofas, beds, mattresses - IKEA." IKEA.com – International homepage – IKEA. Accessed February 21, 2018.
<http://www.ikea.com/us/en/>
- Hood, A.L., V.M. Becerra, and R.J. Craddock. "Using evolutionary techniques to improve the multisensor fusion of environmental measurements." Lecture, TSBE Engineering Doctorate Conference, UK, Reading, July 3, 2012. 2012. Accessed January 24, 2018.
https://www.reading.ac.uk/web/files/tsbe/Hood_TSBE_Conference_Paper_2012.pdf.
- Hornik, Jacob. "Subjective vs. Objective Time Measures: A Note on the Perception of Time in Consumer Behavior." *Journal of Consumer Research* 11, no. 1 (June 1984): 615-18. doi:10.1086/208998.

- Hyken, Shep. "The New Moment Of Truth In Business." *Forbes*. April 11, 2016. Accessed October 23, 2017. <https://www.forbes.com/sites/shephyken/2016/04/09/new-moment-of-truth-in-business/>.
- "IKEA avec des meubles et accessoires au style scandinave moderne." IKEA Maroc | Mobilier pour la maison et le bureau au Maroc | Mobilier pour la maison au Maroc - IKEA. Accessed February 21, 2018. <http://fr.ikea.com/ma/fr/>
- IKEA. "المنزل أثاث من مميزة مجموعة المتحدة العربية الإمارات في ايكيا متجر يقدم." [The IKEA store in the UAE offers a selection of home furnishings. Browse the catalog online for modern and contemporary furniture products] ايكيا - المتحدة العربية الإمارات ايكيا [IKEA United Arab Emirates – IKEA] Accessed February 21, 2018. <http://ar.ikea.com/ae/ar/>
- James, William. "Discussion: The physical basis of emotion." *Psychological Review* 1, no. 5 (September 1894): 516-529. *PsycARTICLES*, EBSCOhost (accessed February 20, 2018).
- Jana, Reena. Starwood Hotels Explore Second Life First. PDF. Businessweek, August 23, 2006. <http://miami.lgrace.com/documents/Starwood%20Hotels%20Explore%20Second%20Life%20First.pdf>
- Joseph Pine II and James H. Gilmore, "Welcome to the Experience Economy," *Harvard Business Review*, Vol 76, No 4, July/August 1998, p.98.
- Juhani, Pallasmaa. *The eyes of the skin: architecture and the senses*. Chichester: Wiley, 2005.
- Kelly, Michael R. "Phenomenology and Time-Consciousness." *The Internet Encyclopedia of Philosophy*, ISSN 2161-0002. Accessed January 12, 2018. <http://www.iep.utm.edu/phe-time/#H4>
- Koval, Jason. "Starwood Hotels and Resorts Investors Presentation." Address, Raymond James 33rd Institutional Investors Conference, Florida, Orlando, March 5, 2012. March 5, 2012. Accessed November 25, 2017. <https://s1.q4cdn.com/483583335/files/2012-03-05-HOT-RJF-Presentation-Final.pdf>.
- Landers, Daniel M. "The Arousal-Performance Relationship Revisited." *Research Quarterly for Exercise and Sport*, vol. 51, no. 1, 1980, pp. 77–90., doi:10.1080/02701367.1980.10609276.
- Lang, Peter J. "The varieties of emotional experience: A meditation on James-Lange theory." *Psychological Review* 101, no. 2 (April 1994): 211-221. *PsycARTICLES*, EBSCOhost (accessed February 20, 2018).
- Lecinski, Jim. *Winning the Zero Moment of Truth: ZMOT*. (Unspecified: Vook, 2011). PDF.

- Leone, Catherine Warren. Come To Your Senses. PDF. Chicago: IIDA - Perspective, March 2008. <http://www.iida.org/content.cfm/come-to-your-senses>
- "Lesson 2: ANOVA Foundations | STAT 502. Accessed December 1, 2017. <https://onlinecourses.science.psu.edu/stat502/node/14>
- Marriott. "الرئيسية الصفحة - الماريوت فنادق". [Marriott Hotels – Home] Marriott. Accessed February 21, 2018. <http://www.arabic.marriott.com/default.mi>.
- Marriott internal database. "Aloft." Aloft: Marriott Hotel Development. Fall 2017. Accessed November 30, 2017. <https://hotel-development.marriott.com/brands/aloft/>.
- "Marriott International, Inc." Hotels & Resorts | Book your Hotel directly with Marriott. Accessed February 21, 2018. <http://www.marriott.com/default.mi>.
- "Marriott International, Inc." Hotels & Resorts | Buchen Sie Ihr Hotel direkt bei Marriott. Accessed February 21, 2018. <http://www.marriott.de/default.mi>.
- Marshall, George J. *A Guide to Merleau-Ponty's Phenomenology of Perception*. Milwaukee, WI: Marquette University Press, 2008.
- Mckemy, David D. "The Molecular and Cellular Basis of Cold Sensation." *ACS Chemical Neuroscience* 4, no. 2 (November 20, 2012): 238-47. doi:10.1021/cn300193h.
- Merleau-Ponty, Maurice. *Phenomenology of perception*. London: Routledge, 2002.
- Myers, Isabel Briggs, and Peter B. Myers. *Gifts Differing: Understanding Personality Type*. Palo Alto, CA: Davies-Black Pub, 2002.
- Namasivayam, Karthik, and Ingrid Y. Lin. "Chapter 2: The servicescape." In *Handbook of hospitality operations and IT*, 44-62. 1st ed. Elsevier Handbooks of Hospitality Management Series. Amsterdam: Butterworth-Heinemann, 2008.
- Normann, Richard. *Service management: strategy and leadership in service business*. Chichester, NY: Wiley, 1991.
- Pardoe, Iain, Laura Simon, and Derek Young. "10.3 - Best Subsets Regression, Adjusted R-Sq, Mallows Cp." *Stat 501 - Regression Methods*. Accessed February 28, 2018. <https://onlinecourses.science.psu.edu/stat501/node/330>.
- Poldma, Tiiu. "Transforming Interior Spaces: Enriching Subjective Experiences Through Design Research." *Journal of Research Practice* 6, no. 2 (February 16, 2011): 141-55. Accessed September 5, 2017. <http://jrp.icaap.org/index.php/jrp/article/view/198/199>

ProjectARTiculate. "Elements & Principles of Art." Digital image. Juneau Douglas High School Visual Arts. January 2015. Accessed October 29, 2017.
<http://jdhsarts.blogspot.com/2015/01/the-elements-and-principles-of-design.html>.

"Proper Subset." Proper Subset - Definition, Symbol, Formula & Examples | MathCaptain.com. 2015. Accessed November 30, 2017. <http://www.mathcaptain.com/algebra/proper-subset.html>.

Qualman, Erik. *Socialnomics: how social media transforms the way we live and do business*. Hoboken, NJ: Wiley, 2011.

Ramsøy, Thomas Z., et al. "Effects of perceptual uncertainty on arousal and preference across different visual domains." *Journal Of Neuroscience, Psychology, And Economics* 5, no. 4 (November 2012): 212-226. *PsycARTICLES*, EBSCOhost (accessed February 20, 2018).

Rayadmin. "Pcr study." J.D. Power. July 12, 2017. Accessed February 26, 2018.
<http://www.jdpower.com/ratings/study/North-America-Hotel-Guest-Satisfaction-Study/2572ENG/Upscale/1438>.

Refsnes, Jennifer. "Experiential Design," Georgia State University, April, 2017.

Re-Mix Lounge Pet-Friendly. Digital image. Aloft Miami-Dadeland. Accessed Mar 2, 2018.
<http://www.aloftmiamidadeland.com/pet-friendly-hotels-miami>

Richards, Amy. "How Gestalt Theory is used in designing? And why it develops relationships, and affects human behavior." Issuu. June 26, 2016. Accessed January 15, 2018. https://issuu.com/amyrichards12/docs/gestalt_theory_thesis.

Thesis - 24 February 2015

Roma, Sarina, dir. "Ilse Crawford: Interior Design." In *Abstract: The Art of Design*. Netflix. February 10, 2017.

Russell, James A., and Lisa Feldman Barrett. "Core affect, prototypical emotional episodes, and other things called emotion: Dissecting the elephant." *Journal Of Personality And Social Psychology* 76, no. 5 (May 1999): 805-819. *PsycARTICLES*, EBSCOhost (accessed February 20, 2018).

Scarinzi, Alfonsina. *Embodied aesthetics: proceedings of the 1st International Conference on Aesthetics and the Embodied Mind, 26th-28th August 2013*. Brill, 2014.

Schreuder, Eliane, Jan Van Erp, Alexander Toet, and Victor L. Kallen. "Emotional Responses to Multisensory Environmental Stimuli." *SAGE Open* 6, no. 1 (January 25, 2016): 1-19. Accessed January 2017. doi:10.1177/2158244016630591.

"Sensory & Consumer Insights." Tastepoint by IFF. Accessed January 29, 2018.
<http://www.tastepoint.com/services/sensory-and-consumer-insights>

- Sickel, Julie. "Hyatt Hotels Corp. Sweeps Both Upscale Segments with Hyatt Regency & Hyatt Place." Business Travel News. September 04, 2017. Accessed February 26, 2018. <http://www.businesstravelnews.com/Research/Hotel-Survey-Report/2017/Hyatt-Hotels-Corp-Sweeps-Both-Upscale-Segments-with-Hyatt-Regency-Hyatt-Place>.
- Singh, Daljit. "The Moment of Truth for Brands." Fjord. The Design & Innovation consultancy. June 14, 2016. Accessed October 12, 2017. <https://www.fjordnet.com/conversations/the-moment-of-truth-for-brands-breathing-life-into-digital-services/>.
- Skrovan, Sandy. "Why researching online, shopping offline is the new norm." Retail Dive. May 17, 2017. Accessed October 12, 2017. <http://www.retaildive.com/news/why-researching-online-shopping-offline-is-the-new-norm/442754/>.
- Slotkis, Susan J. Foundations of interior design. New York: Fairchild, 2010. P. 51
- Solomon, Michael R., Lisa Duke Cornell, and Amit Nizan. Launch! Advertising and promotion in real time. Irvington, NY: Flatworld Knowledge, 2009. Accessed November 26, 2017. <https://www.saylor.org/site/textbooks/Launch!%20Advertising%20and%20Promotion%20in%20Real%20Time.pdf>.
- Spielmann, Nathalie, Michel Laroche, and Adilson Borges. "How service seasons the experience: Measuring hospitality servicescapes." *International Journal of Hospitality Management* 31, no. 2 (June 2012): 360-68. Accessed October 2, 2017. doi:10.1016/j.ijhm.2011.06.001.
- "Splash Pool." Digital Image. Aloft Bangkok Sukhumvit. Accessed Mar 2, 2018. <http://www.aloftbangkoksukhumvit11.com/Splash-pool>
- Starwood Hotels & Resorts. Aloft BOTLR Robotic Butler. Digital image. Aloft Hotels. Accessed February 23, 2018. <https://aloft-hotels.starwoodhotels.com/hotel-technology/>.
- Starwood Hotels & Resorts. Aloft Hotel's TiGi. Digital image. Skift. Accessed February 23, 2018. <https://skift.com/2015/10/22/aloft-tries-to-speak-millennial-with-new-emoji-room-service-ordering/>.
- Starwood Hotels & Resorts. Apple Watch Keyless Check in. Digital image. Hotel Space Online. Accessed February 23, 2018. <http://hotelspaceonline.com/products/keyless-check-in-through-the-spg-app-for-apple-watch/>.
- Starwood Hotels & Resorts. Phone App Keyless Entry. Digital image. Extreme Tech. Accessed February 23, 2018. <https://www.extremetech.com/extreme/193450-you-can-now-open-hotel-rooms-with-just-your-smartphone-and-bypass-check-in-too>.
- Starwood Hotels & Resorts Worldwide, Inc. Investor Relations. "A Better Way to Experience the World: 2015 Proxy Statement & 2014 Annual Report." News release, April 17, 2015.

Starwood Hotels & Resorts Worldwide, Inc. Accessed November 26, 2017.
https://s1.q4cdn.com/483583335/files/doc_financials/annual/2015/HOT-FY14-Annual-Report-Color-Final_v001_r614aa.pdf.

Starwood Hotels & Resorts Worldwide, Inc. Investor Relations. "Starwood Reports Second Quarter 2016 Results." News release, July 26, 2016. Starwood Hotels & Resorts Worldwide, Inc. Accessed November 26, 2017.
https://s1.q4cdn.com/483583335/files/doc_financials/quarterly/2016/2016-2Q-HOT-Earnings-Release-Final.pdf.

Steiner, Rudolf. "Man's Twelve Senses in their Relation to Imagination, Inspiration, Intuition." Translated by Steven Briault. *Anthroposophical Review* 3, no. 2 (1981): 12-19.
<http://www.waldorflibrary.org/rudolf-steiner-resources/articles-by-rudolf-steiner/725-mans-twelve-senses-in-their-relation-to-imagination-inspiration-and-intuition>.

Suri, Gaurav, Gal Sheppes, and James J. Gross. "Predicting affective choice." *Journal Of Experimental Psychology: General* 142, no. 3 (August 2013): 627-632. *PsycARTICLES*, EBSCOhost (accessed February 20, 2018).

Trejos, Nancy. "Aloft Hotels target "gap year" travelers." Online News Editorial. April 15, 2016. USA Today. Accessed November 30, 2017.
<https://www.usatoday.com/story/travel/roadwarriorvoices/2016/04/15/aloft-hotels-target-gap-year-travelers/83088024/>.

Tsui, Siu Lun., Phoon Ping. Chen, and Kwok Fu Jacobus. Ng. Pain Medicine: A Multidisciplinary Approach. Hong Kong: Hong Kong University Press, 2010.

"Unique & Unlike Any Other: Distinct Aloft Hotels." SPG Weekend Channel. Accessed February 27, 2018. <http://www.spgweekends.com/brands/aloft/unique-aloft-hotels-unlike-anything-else>.

Unknown. "Chapter 15: Model Building." Lecture. 2015. Accessed December 3, 2017.
<http://slideplayer.com/slide/5369785/>.

Unspecified. Theory of Phenomenology: Analyzing Substance, Application, and Influence. PDF. Lawrence: The University of Kansas. Student of Chad Kraus

Van Gelder, Tom. Observing with twelve senses. Leonardo da Vinci Project. Phenomenology - Tom van Gelder. July 07, 2008. Accessed December 19, 2017.
<http://tomvangelder.antrovista.com/pdf/observing.pdf>.
 Copyright: Louis Bolk Instituut Driebergen, 2004

APPENDICES

Appendix A – Stimuli as Perception

This section contains a collection of figures that represent the professional psychological research conducted on emotional reactions to the perceived physical stimuli wherein perception lies.

Appendix A.1 – Berlyne / Wundt

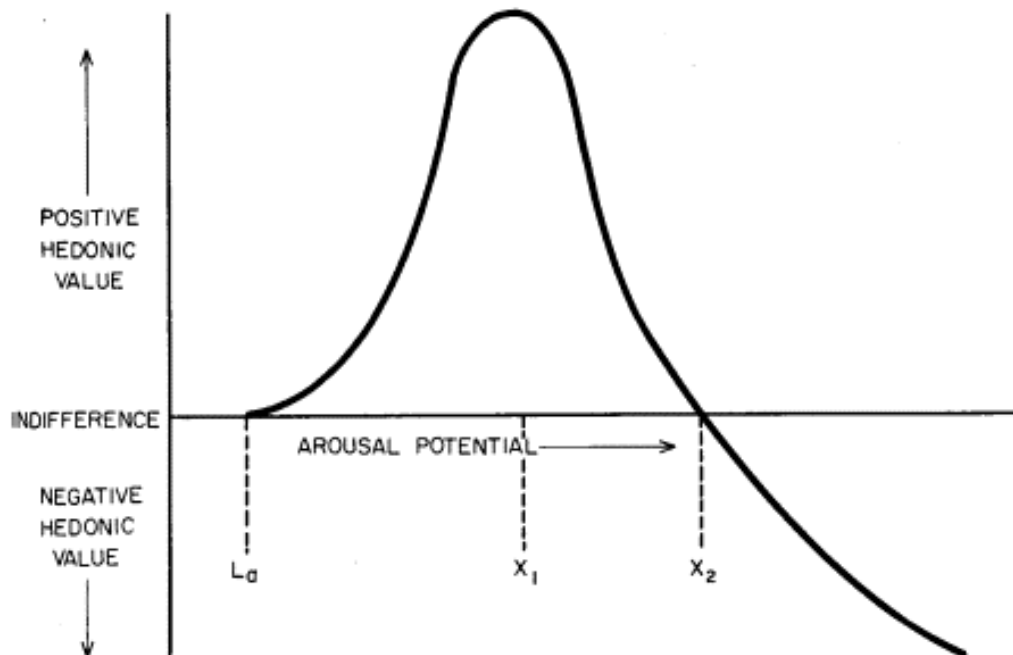
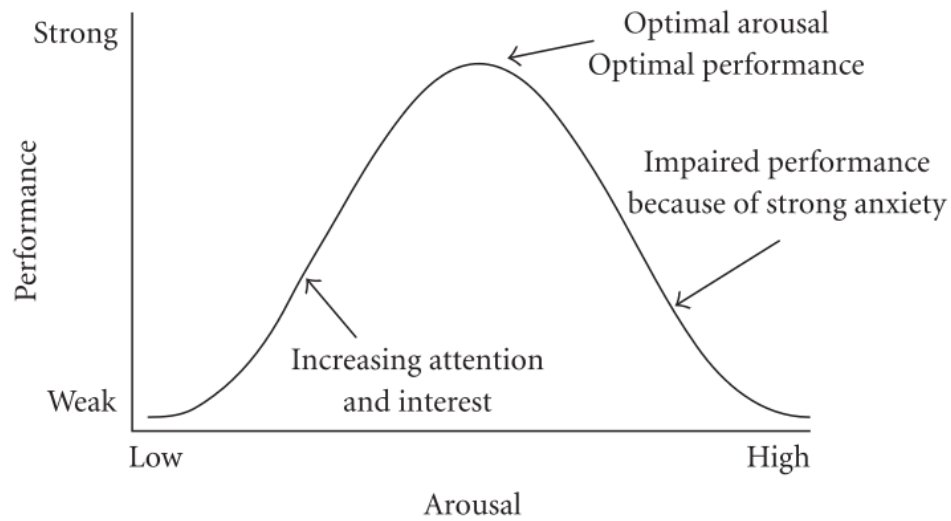


Figure 8-4 The Wundt curve, resulting from the algebraic summation of the two curves in Fig. 8-3. (Adapted from Wundt, 1874; and Berlyne, 1960, 1967).

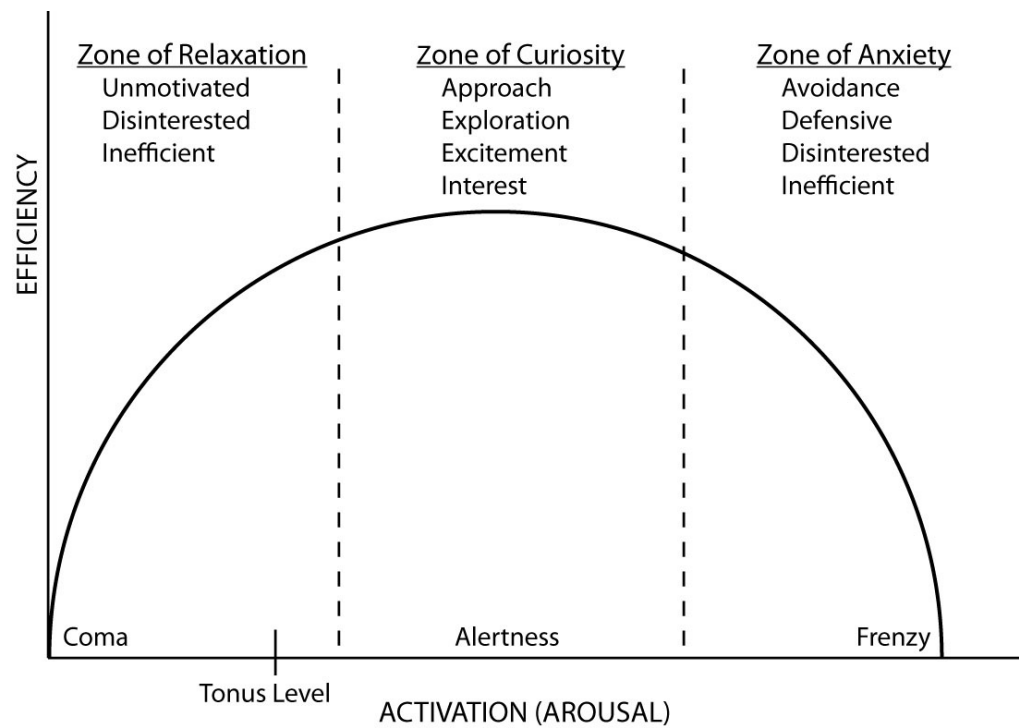
(Source: Daniel Berlyne (49))

Appendix A.2 – Hebbian Yerkes-Dodson Law



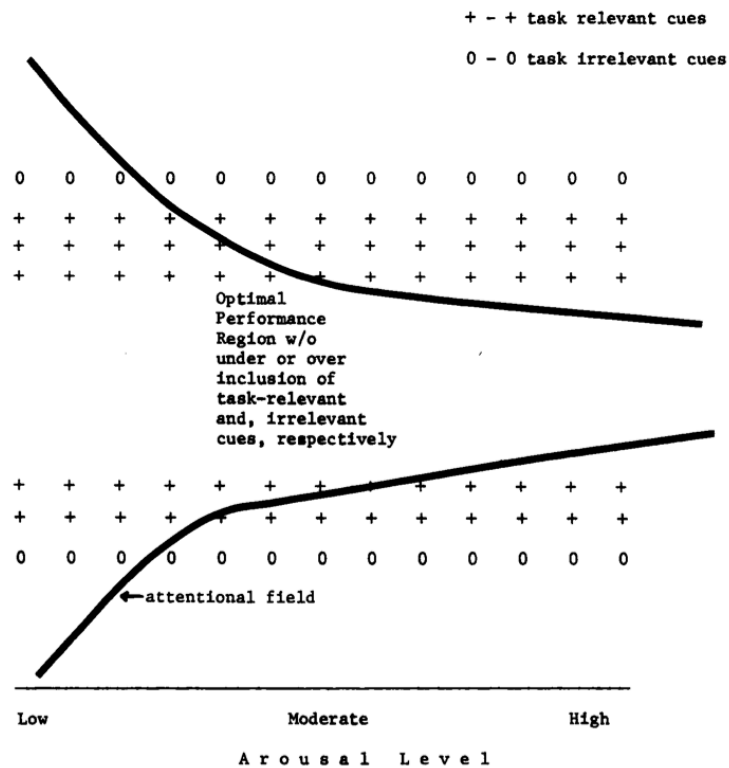
(Source: David Diamond (50))

Appendix A.3 – Day Zone of Curiosity



(Source: H.I. Day (51))

Appendix A.4 – Easterbrook's Cue Utilisation Theory (Visual Depiction)



(Source: J.A. Easterbrook (53))

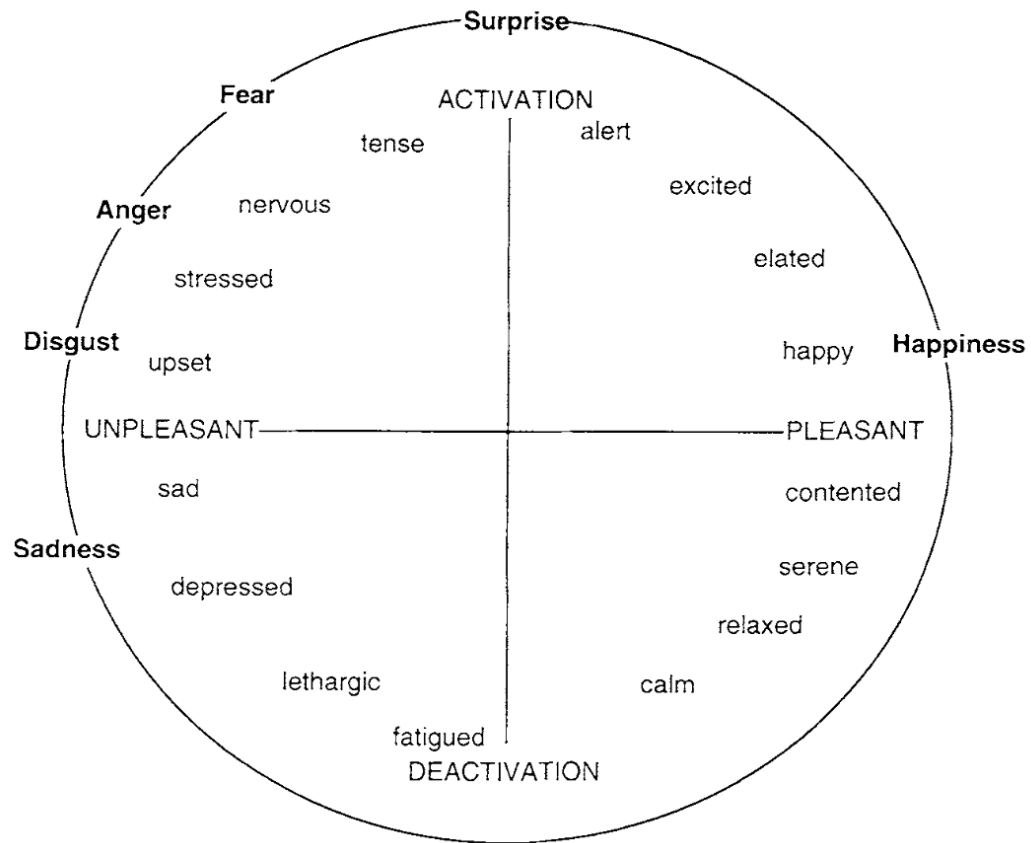
Appendix A.5 – James-Lange Theory

EVENT \longrightarrow AROUSAL \longrightarrow INTERPRETATION \longrightarrow EMOTION

(Source: Peter Lang (54))

Appendix A.6 – Russell Barrett Core Affect

RUSSELL AND FELDMAN BARRETT



(Source: Russell Barrett (57))

Appendix B – Test Means for Regression Testing

This section contains the reviews, ratings, and averages from formally conducted market guest surveys for Aloft hotels which were used to then extrapolate the data found in the next section.

Appendix B.1 – J.D. Power 2017 North America Hotel Guest Satisfaction Study

RATINGS & AWARDS
HOTEL
SEGMENT

Upscale

RATINGS FACTORS

	Overall Satisfaction	Reservation	Check-In/Check-Out	Guest Room	Food & Beverage	Hotel Services	Hotel Facilities	Cost & Fees
	?	?	?	?	?	?	?	?
	▲	▲	▲	▲	▲	▲	▲	▲
AWARD RECIPIENT: Hilton Garden Inn	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
Aloft	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
Hyatt Place	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
Springhill Suites	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
Courtyard	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
DoubleTree by Hilton	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
Hotel Indigo	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
Crowne Plaza Hotels & Resorts	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
Four Points by Sheraton	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
Radisson	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●

Please note that J.D. Power Ratings may not include all information used to determine J.D. Power awards.
Learn more about how J.D. Power Ratings are calculated.

Power Circle Scoring Legend:

AMONG THE BEST

BETTER THAN MOST

ABOUT AVERAGE

THE REST

●●●●●

●●●●●

●●●●●

●●●●●

*Please note that JDPower.com Power Circle Ratings may not include all information used to determine J.D. Power awards.
Learn more about how J.D. Power Ratings are calculated.

Source: JD Power (104)

Appendix B.2 – 2017 BTN Hotel Survey Report

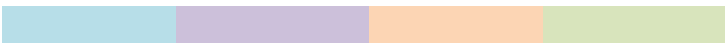
UPSCALE	HYATT PLACE	Aloft	Double-Tree	Hilton Garden Inn	Courtyard	SpringHill Suites	Crowne Plaza	Wyndham	Avg.
Sales Staff	4.83	4.52	4.5	4.52	4.53	4.52	4.42	4.55	4.55
Consistency	4.9	4.39	4.43	4.51	4.49	4.37	4.14	4.28	4.44
Negotiating Group Travel/Meetings	4.52	4.27	4.5	4.36	4.32	4.39	4.37	4.42	4.39
Meeting Facilities	4.32	4.17	4.38	4.12	3.92	4	4.32	4.3	4.19
Corporate Rate Programs	4.74	4.45	4.59	4.52	4.29	4.32	4.53	4.5	4.49
Data Quality	4.8	4.39	4.49	4.28	4.35	4.44	4.34	4.44	4.44
Helpful & Courteous Service	4.77	4.54	4.67	4.51	4.54	4.4	4.43	4.41	4.53
Physical Appearance	4.63	4.64	4.54	4.42	4.4	4.45	4.3	4.23	4.45
Public Business Amenities	4.58	4.47	4.46	4.45	4.43	4.37	4.31	4.14	4.4
In-Room Business Amenities	4.44	4.59	4.41	4.23	4.35	4.32	4.29	4.19	4.35
Personal Amenities	4.52	4.74	4.34	4.3	4.26	4.26	4.27	4.11	4.35
Price/Value Relationship	4.64	4.61	4.46	4.45	4.49	4.45	4.47	4.26	4.48
Traveler Satisfaction	4.64	4.58	4.44	4.43	4.45	4.33	4.21	4.1	4.4
TOTAL	4.64	4.49	4.48	4.39	4.37	4.36	4.34	4.3	—

Source: BTN (105)

Appendix C – Extrapolated Test Data for Aloft Hotels

Appendix C.1 – Extrapolated Data based on Means

The un-highlighted data contained in the table below are extrapolated numbers produced using a random number generator. Using the means provided from the industry surveys in Appendix B, the data below was generated to yield the same mean (average) value as if individual survey data was available. While these numbers are not market data, they are representative of what the review data could look like.



Extrapolated Review	Personal Amenities	Physical Appearance	Helpful & Courteous Service	Total Satisfaction
1	5	4.78	4.54	5.00
2	5	4.65	5.00	4.25
3	4	4.40	5.00	4.00
4	4.2	5.00	5.00	4.40
5	4.23	3.77	3.50	5.00
6	4.44	3.90	4.60	5.00
7	5	3.95	5.00	5.00
8	5	4.22	5.00	5.00
9	3.67	4.86	3.50	4.65
10	5	4.12	5.00	5.00
11	5	3.30	5.00	4.55
12	5	4.50	1.25	4.26
13	4.5	4.65	4.50	3.78
14	4.9	5.00	4.30	4.33
15	5	4.75	3.90	4.67
16	5	5.00	4.54	5.00
17	4.75	4.90	2.75	3.75
18	4.8	4.00	3.80	5.00
19	5	4.56	4.62	4.20
20	4.9	4.00	4.00	4.70
21	4.5	3.95	5.00	4.96
22	5	4.70	5.00	4.67
23	4.7	5.90	3.50	5.00
24	4.6	5.00	2.90	4.00

Extrapolated Review	Personal Amenities	Physical Appearance	Helpful & Courteous Service	Total Satisfaction
25	4.21	4.00	5.00	4.38
26	4.2	5.00	4.50	3.95
27	4.92	5.00	4.80	5.00
28	4.77	5.00	4.20	5.00
29	5	4.80	5.00	3.78
30	4.62	3.90	5.00	4.30
31	3.79	5.00	5.00	4.50
32	5	5.00	5.00	3.77
33	4.5	5.00	5.00	2.75
34	4.9	5.00	4.65	5.00
35	4.78	5.00	5.00	5.00
36	4.2	5.00	4.65	5.00
37	5	5.00	4.55	4.60
38	5	4.56	5.00	4.75
39	5	5.00	5.00	3.76
40	5	4.80	4.95	4.50
41	4.5	4.67	4.60	5.00
42	4.82	5.00	4.50	5.00
43	5	4.54	4.75	5.00
44	5	4.00	5.00	4.50
45	5	4.77	5.00	4.79
46	5	4.20	4.65	5.00
47	4.6	4.90	5.00	5.00
48	5	5.00	5.00	4.50
49	5	5.00	5.00	5.00
50	5	5.00	5.00	5.00
Mean	4.74	4.64	4.54	4.58

Appendix C.2 – ANOVA F-Test Statistical Variance (Large Sample)

The standard ANOVA F-Test below uses the 50 extrapolated reviews above to determine if there is a 95% statistical significance between the two variables “Personal Amenities” and “Physical Appearance.” While the F itself is somewhat uncertain, the closer the P is to zero, the

greater the statistical probability of significance in the data set as a whole. Given that the data has been extrapolated, this test has been included for statistical relevancy and these variables should be further evaluated using actual review data once available.

F-Test Two-Sample for
Variances

	<i>PE</i>	<i>PA</i>
Mean	4.74	4.64
Variance	0.125114286	0.230955102
Observations	50	50
df	49	49
F	0.541725576	
P(F<=f) one-tail	0.01707545	
F Critical one-tail	0.622165468	

Appendix C.3 – ANOVA F-Test Statistical Variance (Small Sample)

The ANOVA F-Test below uses the small sample set of 5 extrapolated reviews around “Personal Amenities” and “Physical Appearance” to examine the probability of statistical significance at the 90% and 95% probability significance levels based on the actual data means indication that review sets were small. In both instances, the F and P values showed marked significance. Furthermore, in best subset regression testing the Observation and df values are would be smaller. Without formal statistical evaluation, this data set is meant to represent what a Best Subset regression test may look like.

Small Data Sample

	Personal Amenities	Physical Appearance
1	5	4.78
2	5	4.65
3	4	4.40
4	5	4.57
5	4.7	4.80

F-Test Two-Sample for Variances (.05)

	<i>PE</i>	<i>PA</i>
Mean	4.74	4.64
Variance	0.188	0.02695
Observations	5	5
df	4	4
F	6.98	
P(F<=f) one-tail	0.04	
F Critical one-tail	6.39	

F-Test Two-Sample for Variances (.10)

	<i>PE</i>	<i>PA</i>
Mean	4.74	4.64
Variance	0.188	0.02695
Observations	5	5
df	4	4
F	6.98	
P(F<=f) one-tail	0.04	
F Critical one-tail	4.11	