Design Dialogue: The Visceral Hedonic Rhetoric Framework
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Introduction

This paper outlines and synthesizes existing conceptual design dialogue frameworks that emphasize various emotional cognition levels and aspects of initial consumer response to product design. The resulting, synthesized framework is then extended by the incorporation of the notion of "visceral hedonic rhetoric," evident in design research and distilled and explored in the author's 2011 study. Finally, the resultant new and comprehensive Visceral Hedonic Rhetoric Framework for design dialogue in product design is presented.

Emotion, Emotional Cognition, and Design

Psychological studies have suggested that 80% of an individual's life is consumed by emotion, while the other 20% is controlled by intellect.[1] Thus, emotions are implicated in all aspects of daily functioning, including moods, cognition, behavior, attention, perception, and memory, to name but a few.[2] They subsequently influence and affect aspects of everyday activities and the interactions between people, their environment, and the products and artifacts that surround them. Much of the research conducted in the area of emotional consumption lies in the disciplines of advertising, marketing, and branding and highlights the importance of emotion in product acceptance and interaction and, therefore, its importance in product design.

Consumers' emotions have a direct influence on a variety of cognitive responses.[3] They influence information processing, mediate responses to persuasive appeals, regulate the effects of marketing stimuli, and initiate goal setting. As a result, they have a significant effect on a broad array of consumption behaviors.[4] Marketing success, therefore, lies in giving consumers sought-after emotional states and in minimizing non-desired emotional states.[5]

While emotions have long been established as a field of research in the area of marketing, many of the investigations have used theories of emotion from the field of psychology. Relying heavily on another discipline, they have thus failed to incorporate marketing-specific characteristics to further these theories.[6] Luce,

1   Wade Lough, "Once More with Feeling" (paper presented at the MX Design Conference, Mexico City, 2005).

2   James Russell, "Core Affect and the Psychological Construction of Emotion," *Psychological Review* 110, no. 1 (2003): 145-72.

3   Elizabeth Hirschman and Barbara Stern, "The Roles of Emotion in Consumer Research," *Advances in Consumer Research* 26 (1999): 4-11.

4   Richard Mizerski and J. Dennis White, "Understanding and Using Emotions in Advertising," *The Journal of Consumer Marketing* 3, no. 4 (1986): 57. John O'Shaughnessy and Nicholas O'Shaughnessy, *The Marketing Power of Emotion* (Oxford: Oxford University Press, 2003).

5   Barry Babin, Laurie Babin, and William Darden, "Negative Emotions in Marketing Research," *Journal of Business Research* 42, no. 3 (1998): 271-85.

6   Ming-Hui Huang, "The Theory of Emotions in Marketing," *Journal of Business and Psychology* 16, no. 2 (2001): 239-47.

7   Mary Luce, James Bettman, and John Payne, *Emotional Decisions: Tradeoff Difficulty and Coping in Consumer Choice* (Chicago: University of Chicago Press, 2001).

8   Nathan Crilly, James Moultrie, and John Clarkson, "Seeing Things: Consumer Response to the Visual Domain in Product Design," *Design Studies* 25, no. 6 (2004): 547-77; Donald Norman, *Emotional Design: Why We Love (or Hate) Everyday Things* (New York: Basic Books, 2004); and Cara Wrigley, *Visceral Hedonic Rhetoric: Exploring the Design of Interactive Products* (Saarbrucken: VDM Publishers, 2011).

9   M. Helander and Halimahtun Khalid, "Customer Emotional Needs in Product Design," *Concurrent Engineering* 14, no. 3 (2006): 197-206; and Halimahtun Khalid, "Embracing Diversity in User Needs for Affective Design," *Applied Ergonomics* 37, no. 4 (2006): 409-18.

10 Ulric Neisser, "Cognitive Psychology," in *Grolier Multimedia Encyclopedia*, (East Norwalk, Appleton-Century-Crafts, April 2009).

11 Lev Vygotsky and Alex Kozulin, *Thought and Language* (Cambridge, MA: MIT Press, 1986).

12 Douglas Massey, "A Brief History of Human Society: The Origin and Role of Emotion in Social Life," *American Sociological Review* 67, no. 1 (2002): 1-29; P. Ellsworth and K. Scherer, "Appraisal Processes in Emotion," in *Handbook of Affective Sciences,* ed. Richard J. Davidson, Klaus R. Scherer, and H. Hill Goldsmith (Oxford: Oxford University Press, 2003), 572-95; Norbert Schwarz, "Emotion, Cognition, and Decision Making," *Cognition & Emotion* 14, no. 4 (2000): 433-40; K. Fiedler and H. Bless, "The Information of Beliefs at the Interface of Affective and Cognitive Processes," in *Emotions and Beliefs : How Feelings Influence Thoughts,* ed. Nico H. Frijda, A. S. R. Manstead, and Sacha Bem (Cambridge: Cambridge University Press, 2000), 144-71; Antonio Damasio, *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain* (Orlando, FL: Harcourt, 2004); L. A. Houghton et al., "Visceral Sensation and Emotion: A Study Using Hypnosis," *Gut* 51, no. 5 (2002):

Bettman, and Payne, for example, believe that the research area of emotional effects on purchase choices is a very important and understudied area of design research.[7] They promote the importance of future work in the area of emotional consumption and the implications emotional design might have for better meeting consumers' needs or desires.

In light of these considerations, this paper presents a new and more comprehensive design dialogue framework that synthesizes current work in the field of communication, emotion, emotional cognition, and product design dialogue. This framework is the outcome of: 1) realigning Shannon's basic communication model with designer–consumer dialogue; 2) incorporating Crilly, Moultrie, and Clarkson's existing design dialogue framework; 3) including Norman's notion of emotional cognition; and 4) applying the authors' concept of "visceral hedonic rhetoric," which has been articulated in earlier research.[8] The end result, and the contribution of this paper, is the new Visceral Hedonic Rhetoric Framework, which can further inform emotional design in the product design dialogue and process. As background to the development of the frameworks explored in the paper, we first must explore the literature on emotion and emotional cognition that informs them.

Emotion and Emotional Cognition

Many fields of research (i.e., psychology, cognitive science, neurology, sociology, marketing, consumer research, and design research) have studied and tried to quantify and define emotion and its mechanisms. Emotion was traditionally considered by the medical fraternity to be a biologically determined process: a complicated collection of chemical and neural responses that form a pattern. Many medical researchers have defined emotions as natural phenomena that are automatic and instinctive responses to external stimuli and controlled by biological mechanisms.[9]

Cognitive psychology has extended this understanding of the phenomenon of emotion. "Cognition," which is the scientific term for the process of thought, actually is used in various ways across different disciplines: Psychology and cognitive science use "cognition" to refer to an information processing view of an individual's psychological functions; other interpretations link cognition to the study of all human activity related to knowledge. These knowledge-related activities include attention, creativity, memory, perception, problem solving, thinking, and the use of language.[10] As early as 1986, Vygotsky argued that the relationship between emotion and cognition was well documented, but that this relationship had largely been dismissed by cognitive psychology. He argued that separating emotion from cognition was a major weakness of research in psychology and cognitive science.[11]

701-04; Norman, *Emotional Design;* Rosalind Picard, *Affective Computing* (Cambridge, MA: MIT Press, 1998); Lucy Suchman, *Figuring Personhood in Sciences of the Artificial* (Lancaster, UK: Department of Sociology, Lancaster University, 2004); Joseph LeDoux, *The Emotional Brain: The Mysterious Underpinnings of Emotional Life* (New York: Simon & Schuster, 2000); Joseph LeDoux, "Emotion: Clues from the Brain," *Annual Review of Psychology* 46, no. 1 (1995): 209-35; and Marvin Minsky, *The Emotion Machine: Commonsense Thinking, Artificial Intelligence, and the Future of the Human Mind* (New York: Simon & Schuster, 2006).

13   Eugenio Oliveira and Luis Sarmento, "Emotion: Emotional Advantage for Adaptability and Autonomy (paper presented at the 2nd International Joint Conference on Autonomous Agents and Multi Agent Systems: New York 2003).

14   Scott Brave and Clifford Nass, "Emotion in Human Computer Interaction," in *The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies, and Emerging Applications,* ed. Julie A. Jacko and Andrew Sears. (Mahwah, NJ: Lawrence Erlbaum Associates, 2003); Russell, "Core Affect and the Psychological Construction of Emotion."

15   Jeske Weerdesteijn, Pieter Desmet, and Mathieu Gielen, "Moving Design: To Design Emotion Through Movement," *The Design Journal* 8, no. 1 (2005): 28-40.

16   Antonio Damasio, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness* (New York: Harcourt, 1999); Minsky, *The Emotion Machine;* and Khalid, "Embracing Diversity in User Needs for Affective Design," 409-18.

17   Donald Norman, *Emotional Design,* 286-88.

18   Oya Demirbilek and Bahar Sener, "Product Design, Semantics and Emotional Response," *Ergonomics* 46, no. 13-14 (2003): 1346-60.

19   Richard Bagozzi, Mahesh Gopinath, and Prashanth Nyer, "The Role of Emotions in Marketing," *Journal of the Academy of Marketing Science* 27, no. 2 (1999): 184-206.

By 2003, however, various studies had gathered a substantial amount of empirical evidence about the sophisticated role of emotional mechanisms in high-level cognitive activities; these studies firmly posited emotion as central to the cognitive reasoning process, and as integral to the process of interaction with the physical world, the processing of sensory data, and consequent decision-making.[12] Collectively, these studies show that emotion and cognition conjointly contribute to the control of thought and behavior and that the two should not be treated separately.

Subsequent developments in the field of human–computer interaction (HCI), neurosciences, and psychology have determined that an individual's reflexes, feelings, moods, cognition, and behavior are influenced by human emotion. Software developers and digital designers Oliveira and Sarmento investigated the functional role of emotion in creating simulated worlds.[13] They correlated emotional phenomena with high-level cognitive capabilities and skills to show that emotional mechanisms serve a clear functional purpose in cognitive processing. In similar HCI studies, Brave and Nass and Russell concur that emotions are a fundamental link in a much wider chain of cognition.[14]

This review of the body of research on emotion reveals a general consensus that an individual reacts to the world through his or her emotions, and that stimuli evoke emotions in all individuals.[15] However, if one accepts emotion as central to the cognitive reasoning process, the question arises: How does emotional cognition differ from rational cognition or rational thought? As Damasio, Minsky, and Khalid variously explain, reason and emotion are inextricably integrated in rational thought and the cognitive process.[16] Norman defines the realm of emotional cognition as the level of cognitive thought that deals with emotive responses.[17] Thus, emotional cognition may be thought to be an inherently subjective but rational processing of day-to-day stimulus, experience, information, and knowledge that encompasses or allows decision-making, action, and response.

Emotional Cognition: The Three Levels of Response
A consumer's psychological response to a product comprises both cognition and affect. Their interaction with a product elicits an emotional response, or "affect." Demirbilek and Sener describe "affect" as part of the "consumer's psychological response" to the sensory attributes or design message of a product.[18] Bagozzi, Gopinath, and Nyer earlier defined "affect" as an umbrella term for a more specific set of mental processes, including emotion, moods, and attitudes.[19]

Existing literature on the topic of emotional cognition in relation to design presents different approaches to essentially comparable concepts. Norman proposes a three-level hierarchy of

20 Donald Norman, *Emotional Design.* 125-62.

21 Donald Norman, Andrew Ortony, and Daniel Russell, "Affect and Machine Design: Lessons for the Development of Autonomous Machines," *IBM Systems Journal* 42, no. 1 (2003): 38-44.

22 Ray Crozier, *Manufactured Pleasures: Psychological Responses to Design* (Manchester, UK: Manchester University Press, 1994); G. Cupchik, "Emotion and Industrial Design: Reconciling Means and Feelings" (paper presented at the 1st International Conference on Design and Emotion, Delft, The Netherlands, 1999); Zdzislaw Lewalski, *Product Aesthetics: An Interpretation for Designer* (Carson City, NV: Design & Development Engineering Press, 1988); and Mike Baxter, *Product Design: A Practical Guide to Systematic Methods of New Product Development* (London: Chapman & Hall, 1995).

23 Nathan Crilly, James Moultrie, and John Clarkson, "Seeing Things;" and Donald Norman, *Emotional Design.* 547-77, 26-28.

24 Donald Norman, *Emotional Design,* 23-26.

25 Zdzislaw Lewalski, *Product Aesthetics;* Ray Crozier, *Manufactured Pleasures;* Mike Baxter, *Product Design;* And Gerry Cupchik, "Emotion and Industrial Design" 226-30, 63-79, 82.

26 Donald Norman, *Emotional Design.* Zdzislaw Lewalski, *Product Aesthetics.* Ray Crozier, *Manufactured Pleasures.* Mike Baxter, *Product Design.* Gerry Cupchik, "Emotion and Industrial Design." 26-42, 226-30, 63-79, 75-82.

27 Donald Norman, *Emotional Design,* 12-14.

28 Zdzislaw Lewalski, *Product Aesthetics.* Ray Crozier, *Manufactured Pleasures.* Mike Baxter, *Product Design.* Gerry Cupchik, "Emotion and Industrial Design," 226-30, 63-79, 75-82.

29 Donald Norman and Andrew Ortony, "Designers and Users."

affect or response in the process of emotional cognition: (1) visceral, (2) behavioral, and (3) reflective.[20] In earlier work with his peers, Ortony and Russell, he also proposes a three-level model where information flows among the levels.[21] These levels are (1) the reaction level, (2) the routine level, and (3) the reflection level. Comparative tri-level systems have also been proposed by Crozier, Cupchik, Lewalski, and Baxter.[22] Building on Crilly, Moultrie, and Clarkson's unification of existing works on cognitive levels, the authors have incorporated these varying three-level systems into Norman's corresponding levels and terminology.[23] This categorization, as the following sections explain, provides the most inclusive and most commonly accepted language of emotional cognition currently available.

- *The visceral level.* The visceral level responds to sensory perception or immediate effect. It makes rapid judgments of what is good or bad, safe or dangerous, attractive or unattractive, and sends signals to the muscles in the body to react and alert the rest of the brain.[24] This concept is related to Lewalski's visual "X-values," which express "the order of visual forms;" to Crozier's "response to form;" to Baxter's "intrinsic attractiveness;" and to Cupchik's "sensory/aesthetic response."[25] These rapid judgments are biologically determined and can be inhibited or enhanced by the environment within which they are perceived and by the influence of other levels of the cognitive process.

- *The behavioral level.* The behavioral level interprets the available sensory data to discern or make judgments about an object's function, mode of use, or qualities. Norman's behavioral level corresponds to Lewalski's visual "Y-values," which are "conducive to purposefulness and functionality," to Crozier's "response to function," to Baxter's "semantic attractiveness," and to Cupchik's "cognitive/behavioral response." Its action can be enhanced or inhibited by the reflective layer and, in turn, it can enhance or inhibit the visceral layer.[26]

- *The reflective level.* The most developed of the levels is that of reflective thought. Norman sees this level as "about one's thoughts afterwards, how [an object or product] makes one feel, the image it portrays, the message it conveys."[27] Norman's reflective level may be aligned with Lewalski's visual "Z-values," which "fulfil the need to belong and [the need] for self-esteem," with Crozier's "response to meaning," with Baxter's "symbolic attractiveness," and with Cupchik's "personal/symbolic response."[28] The reflective level does not have direct access either to sensory input or the control of behavior. Instead, it watches over, reflects upon, and tries to bias the behavioral level.[29]

These elements of response or emotional cognition are not presented as objective qualities of a product nor object. Rather, they are a cognitive interpretation of an object's qualities, driven both by the perception of tangible stimuli and by facts recalled from memory and emotion. This response affects facial muscles and the musculoskeletal frame, the viscera, and the internal milieu, as well as neurochemical responses in the brain itself, and it is part of the way in which the state of the body is modified by emotions.[30] Thus, although affect and cognition are to some degree neuroanatomically distinct systems, they are also deeply intertwined, with each system influencing the other.[31]

Processing at each of the three levels (i.e., visceral, behavioral, and reflective) serves two different functions: (1) evaluation or judgment of the world and things happening in it (affect) and (2) the interpretation of what is happening in the world (cognition). From a design perspective, this symbiotic nature of the three cognitive levels may be demonstrated as follows: The perceived functionality of a product (behavioral) might inform one's assessment of the elegance or aestheticism (visceral) of a product, as well as the social value or self-expression (reflective) connoted by the product.

Emotional Design Frameworks: Exploration and Synthesis
All the evidence already outlined suggests that emotional satisfaction from product interaction can be achieved only if the product is designed so as to collaborate with the user in the user's emotional experience. The concept of "emotional design," therefore, deals with how a designer elicits emotions through the manipulation of a product's sensory qualities.[32] The concept of experience, where the subject and object meet and merge, becomes in turn a key issue in designing emotionally meaningful products.[33]

Unless a product is custom-made, however, a product's consumer and designer generally have access to each other only through the product with which they each interact. A designer or design team, in some cases, generates ideas and makes decisions about a product's form and the message its aesthetics should convey in isolation from consumer feedback. Consumers then interpret the attributes of a product through their interaction with the product, through their experience with similar products, and within a particular context. What is needed, therefore, is a design dialogue in the product design process that addresses the issue of emotional design.

The challenge, as Veryzer comments, is that progress in developing an understanding of consumer response to product design has been greatly impeded by the lack of a conceptual framework.[34] As stated previously, the purpose of this paper is to explore current frameworks and to address any perceived shortcomings in their representation.

30   Antonio Damasio, "Some Notes on Brain, Imagination and Creativity," in *The Origins of Creativity,* ed. K. H. Pfenninger and V. R. Shibik (Oxford: Oxford University Press, 2001)

31   Gregory Ashby, Alice Isen, and A. Turken, "A Neuropsychological Theory of Positive Affect and Its Influence on Cognition," *Psychological Review* 106, no. 3 (1999): 529-50; Donald Norman, *The Design of Everyday Things* (New York: Basic Books, 2002); Norman, Ortony, and Russell, "Affect and Machine Design;" Coates, *Watches Tell More Than Time;* Crilly, Moultrie, and Clarkson, "Seeing Things."

32   Heidi Jacobs, "How to Teach, Design, Produce and Sell Product Related Emotions" (paper presented at the 1st International Conference on Design and Emotion, Delft, The Netherlands, 1999); William Gaver, "Irrational Aspects of Technology: Anecdotal Evidence" (paper presented at the 1st International Conference on Design and Emotion, Delft, The Netherlands, 1999).

33   Aren Kurtgozu, "From Function to Emotion: A Critical Essay on the History of Design Arguments," *The Design Journal* 6, no. 2 (2003): 49-59.

34   Robert Veryzer, "Aesthetic Response and the Influence of Design Principles on Product Preferences," *Advances in Consumer Research* 20 (1993): 224-28.
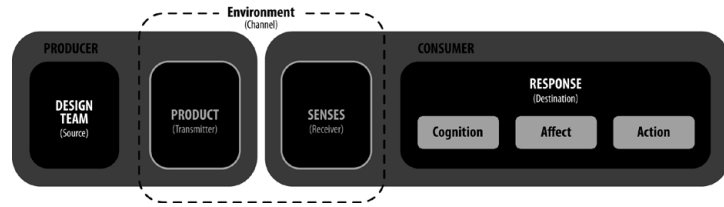
Shannon and Monö's Model

Monö applies Shannon's basic model of communication to the study of product design to create a useful framework within which to discuss and examine the dialogue between design team and consumer.[35] In Monö's model, the design team is the source of the communication. Its members transmit their message through the physical attributes and characteristics of the product they design; thus, the product becomes the transmitter of the design intent. The environment within which the consumer and product interact becomes the channel of Shannon's communication model or the medium by which the message is transferred from source to receiver. Attributes of the product are appraised by the consumer using sensory information; thus, the consumer's sensory perception can be considered to be the receiver of the design message, much like a radio receives radio waves that are then converted into sound. Continuing the analogy, interpretation of radio waves to produce sound can be likened to the consumer's faculty for response: to the ability to interpret sensory information and to process and act in response to the product. Much like the production of sound, the consumer's response can be considered the destination of Shannon's communication model. Studies into consumer behavior further discriminate in this response between "cognition" and "affect" and a corresponding and outwardly observable "behavior" or action.[36] This realignment of Shannon's communication model with designer-consumer dialogue can be represented as shown in Figure 1.[37]

Crilly, Moultrie, and Clarkson's (2004) Model

Crilly, Moultrie, and Clarkson's model of the components of the design dialogue and a consumer's emotional response draws together disparate and wide-ranging works on the topic. It unifies concepts from psychology, marketing, engineering, computer science, design, and fine art to present a cohesive model within which to understand and further explore the consumer-product relationship.[38] It evolves from Shannon and Monö's model of communication between designer and consumer to encompass and define each aspect of the design dialogue: from the design team and conceptualization of a product, to the interaction between the consumer and product, to the consumer's consequential cognitive interpretation and affect or judgment of a product's attributes, and finally, to the consumer's responsive action toward or away from the product.

35 Rune Mono, *Design for Product Understanding: The Aesthetics of Design from a Semiotic Approach* (Sweden: Liber, 1997); C. Shannon, "A Mathematical Theory of Communication," *Bell System Technical Journal* 27, no. 3 (1948): 379-423.

36 Peter Bloch, "Seeking the Ideal Form: Product Design and Consumer Response," *The Journal of Marketing* 59, no. 3 (1995): 16-29; and John O'Shaughnessy, *Explaining Buyer Behavior: Central Concepts and Philosophy of Science Issues* (Oxford: Oxford University Press, 1992).
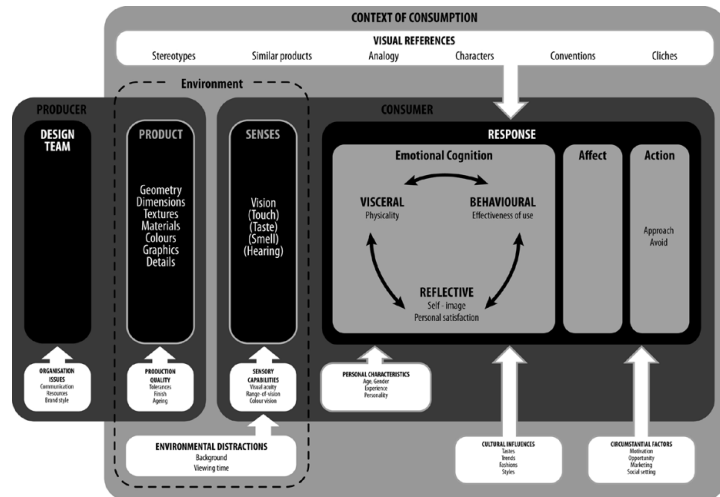
37 Nathan Crilly, James Moultrie, and John Clarkson, "Seeing Things." Bloch, "Seeking the Ideal Form." 547-77, 16-29.

38 Nathan Crilly, James Moultrie, and John Clarkson, "Seeing Things," 547-77.

The Design Dialogue Framework

The author's Design Dialogue Framework (see Figure 2)[39] draws heavily on Crilly et al.'s representation, but it departs from it by using Norman's terminology.[40] Preference of Norman's terms for the levels of cognition to those used by Crilly et al., because their study delved further into the area of the visceral—into gut reactions and their effect on consumer-product relationships.[41] The term "visceral" is a more inclusive term than "aesthetic" because it is widely used in general psychological and medical findings, as well as in discussions of fine art and design, and it refers to the wider range of corporeal human sensory systems. Crilly, Moultrie, and Clarkson use the term "aesthetic impression" because it relies more heavily on the purely visual realm of sensory perception, while our investigation included other forms of sensory information.[42] Although the Design Dialogue Framework shows a division between the cognitive and affective phases, this division is merely a standard pictorial representation; considerable interdependence actually exists between the two phases of emotional response. Similarly, the symbiotic relationship or interactions between the three levels of cognition are highlighted by the use of double-headed, circular arrows connecting each aspect.

When consumers respond to a product, their culture, background, and experiences influence their response.[43] Because the designers and consumers of a particular product are rarely the same, and the two are usually separated by time and place, the context of consumption has significant consequences. No guarantee exists that a designer's interpretation resembles a consumer's understanding. In Figure 2, the consumer's context is depicted as encompassing the environment within which the consumer and product interact, as well as all aspects of the consumer's interpretation of and response to that process of consumer-product interaction. This context is where the design of a product is

39   Modified from Nathan Crilly, James Moultrie, and John Clarkson, "Seeing Things," and Donald Norman, *Emotional Design*, 547-77, 36-42.
40   Nathan Crilly, James Moultrie, and John Clarkson, "Seeing Things," 547-77.
41   Cara Wrigley, *Visceral Hedonic Rhetoric,* 16-27.
42   Nathan Crilly, James Moultrie, and John Clarkson, "Seeing Things," 547-77.
43   Peter Bloch, "Seeking the Ideal Form"; Del Coates, *Watches Tell More Than Time: Product Design, Information, and the Quest for Elegance* (New York: McGraw-Hill, 2003); and Mono, *Design for Product Understanding,* 16-29, 215-23, 267.

interpreted by the consumer and where external influences affect this interpretation. These influences and interferences are explored in the following section.

External Influences and Interferences in the Design Dialogue
The complexity and the variety of human experience are often neglected by design theory.[44] Emotions are a biologically and experientially determined process, and although rough correspondence can be made between a class of emotion inducer and the resulting emotion, the composition and dynamics of emotional responses vary from person to person. An individual's stage of development, knowledge, environment, and culture are just some of the influencing factors that alter the expression of emotions and their meaning. These influences shape what constitutes an adequate inducer of a particular emotion, some aspects of the expression of the emotion, and the cognition and behavior that follow the emotional expression.

Influences on the Design Team and Message
The relationship between a product and its consumer has created a great amount of interest; every object is significant in its own way to each individual through different memories and experiences. Thus, designers must develop their designs to meet and empathize with the specific user (group) targeted by the product and its design message. However, designers also generally work in a space that is constrained by a number of outside variables, such as cost, time to market, brand identity or style, internal organizational communication issues, and resources. All of these influences moderate the effectiveness of the consequent design in transmitting its intended messages.

Influences on Production Quality
Information is lacking on the relationship between design features and the emotional responses they elicit. The production quality of these design features can greatly affect a consumer's response. Poor manufacturing and construction standards, for example, might create the appearance of an inferior or faulty product when the intended design message was one of luxury and high quality.

Influences on Sensory Capabilities
Like cognition, emotion is an internal, thoroughly individual phenomenon.[45] A consumer's sensory perception can be moderated by personal impairments that might detract from product presentation. Sensory capabilities, such as color vision, range of vision, and visual acuity, or lack of vision are all of particular interest when considering the visual domain in design. For example, people who are color blind perceive products in a way not anticipated by the designer.

44 Aušra Burns, "Emotion and Urban Experience: Implications for Design," *Design Issues* 16, no. 3 (2000): 67-79.
45 Donald Norman, *Emotional Design;* and Rafael Gomez, Vesna Popovic, and Sam Bucolo, "Emotional Driving Experiences," in *Design & Emotion Moves,* ed. Pieter M. A. Desmet, Jeroen van Erp, and MariAnne Karlsson (Newcastle, UK: Cambridge Scholars, 2008), 141-64.

Environmental Distractions
The environment in which the product is viewed has a considerable effect on the transmitted design message, which could be received in an unexpected way. Influencing factors include the background setting and the allowable viewing time of the product. For example, if the product's backdrop or environment is too distracting, the consumer cannot focus fully on the product and might not receive the complete design message. Similarly, the time available to view a product in the environment determines the amount of information the consumer receives.[46]

Personal Characteristics
Consumer research studies ascertain that a consumer's personal characteristics, such as age, gender, experience, and personality, greatly influence a person's preferences for certain design attributes and variations in the importance of those preferences. For example, some people place more value on the appearance of products than others.

Cultural Influences
A consumer's response is heavily moderated by cultural influences. In particular, cultural preconceptions contribute to how a design is interpreted and to what extent it is accepted by the consumer. Cultural influences can be even more significant if the designer and consumer are from different cultures, making consumers' responses difficult to anticipate.

Circumstantial Factors
The personal situation of consumers at the time they view a product potentially influences their response. For example, their financial situation might dictate the products they can consider, or their emotional state can influence various aspects of information processing and therefore their response to a product.

The Influence of Visual References
The visual references from which consumers might draw conclusions are defined by their prior personal experiences and are based on sources external to the product. Crilly, Moultrie, and Clarkson state that these visual references influence a consumer's understanding by "reflecting generic designs, alluding to other concepts, or evoking comparison with living things."[47] Semantic interpretations might be reinforced by allowing the consumers to classify the product with ease, comparing it to products or concepts with which they are already familiar.[48] Visual references might also influence the symbolic associations a product elicits by consolidating it with other objects that are already seen to hold some social

46 Abraham Andre Moles, *Information Theory and Esthetic Perception* (Urbana, IL: Illinois University Press, 1966).
47 Nathan Crilly, James Moultrie, and John Clarkson, "Seeing Things," 565.
48 M. McCoy, "Defining a New Functionalism in Design," *Innovation* 3, no. 2 (1984): 16-19.

value.[49] Visual references are presented in the Design Dialogue Framework (Figure 2) in the "context of consumption" that influences consumer responses.

The Missing Link in the Emotional Design Dialogue: Visceral Hedonic Rhetoric

Thus far, this paper has explored the literature on emotion and emotional cognition and has established their importance to the field of emotional design. It has synthesized these findings to create the Design Dialogue Framework in Figure 2, which has been designed to inform the emotional design process. As detailed in this exploration, considerable research and knowledge explain the behavioral and reflective levels of cognition and their consequent influence on affect and consumer behavior or action. Liu adds a further dimension to the discussion by positing that designers' implicit understanding of perception and visual composition, along with their experience and skills, informs their intuitive judgment in producing a consumer's "hedonic visceral" impression of a product.[50] However, the dearth of quantitative or qualitative research in this particular area highlights the urgent need to further identify and explore the concept of *visceral hedonic responses* and to incorporate this concept into a new design dialogue framework.

The Visceral Hedonic Literature

Norman concludes that the visceral level of cognition holds the most value and consistency across people and cultures and that it therefore presents the best opportunity to establish a set of core design principles.[51] Damasio further observes that the visceral or immediate, instinctual response to sensory information always strongly influences the secondary information acquired when further and subsequent behavioral and reflective cognitive interaction occurs.[52]

Some studies have tried to categorize certain product attributes and identify their corresponding visceral response. Lim, Donaldson, Jung, Kunz, Royer, Ramlingingam, Thirmaran, and Stolterman were successful in demonstrating that some direct correlations exist between certain qualities and certain emotional responses.[53] However, their study asked participants to provide examples of products they either liked or disliked; these products were then matched to a series of descriptive words belonging to each level of cognition. The issue with this approach is that visceral response is inherently fleeting; it is an instantaneous and momentary judgment that cannot be reproduced at a later stage in an interview.

Other studies have targeted the relationship between *hedonic consumer judgments* and the production of these judgments in response to product attributes. Creusen and Snelders requested

49 Virginia Postrel, *The Substance of Style: How the Rise of Aesthetic Value Is Remaking Commerce, Culture, and Consciousness* (New York: HarperCollins, 2003).

50 Yili Liu, "Engineering Aesthetics and Aesthetic Ergonomics: Theoretical Foundations and a Dual-Process Research Methodology," *Ergonomics* 46, no. 13-14 (2003): 1273-92.

51 Donald Norman, *Emotional Design,* 16-27.

52 Antonio Damasio, *The Feeling of What Happens,* 126-38.

53 Youn-kyung Lim, et al., "Emotional Experience and Interaction Design," in *Affect and Emotion in Human-Computer Interaction* (Berlin: Springer-Verlag, 2008), 116-29.

that participants use a hedonic scale to self-report their emotional response in the choice between two products.[54] They found that consumers derive pleasure from the form or appearance of a product and that if pleasurable aspects were not clearly enunciated by the consumers in the appearance of a product, they were unable to describe the pleasurable aspects in specific terms. From this study might come the deduction that at least some hedonic attributes must be credited as a visceral response (rather than a general hedonic emotional response) in that they arise from sensory information. However, whether this self-reported response constituted a visceral hedonic response or a general hedonic emotional response is unknown because Creusen and Snelders did not separate and measure responses to each of the three cognitive levels; rather, a general hedonic emotional response was recorded. The need to separate and measure each response against the others remained a significant gap in the research.[55]

The Research Gap
Based on this visceral hedonics literature, the pinnacle of good design would be a product that is immediately appealing enough in its physical manifestation to draw a consumer into further interaction and investigation, that reveals a functional and user-friendly interface, and that predicts emerging needs in its potential market. Successful production of such an object could potentially result in a guaranteed product purchase as a result of immediate consumer attachment, and in increased product use and prolonged product life as consumer attachment is maintained. However, no designed product is without *rhetorical content.* Buchanan's decree emphasizes that design rhetoric, like all good speeches, only comes to life when it is delivered correctly through affective physical embodiment of the design message.[56] In other words, the successful product provides the "stories" (options) available for consumer choice. The delivery of a hedonic message accessed through visceral interpretation, therefore, may not be as successful in the absence of a *visceral hedonic rhetoric* to assist and inform the design process.

By combining all the research gaps found in the literature on visceral design, consumer hedonics, and product rhetoric—the three main areas of literature reviewed in the authors' 2011 study—one large gap in knowledge emerged: this combined area of "visceral hedonic rhetoric."[57] Within the context of this study, "visceral hedonic rhetoric" was defined as "properties of a product that persuasively elicit the pursuit of pleasure through an instinctual level of cognition." In this definition, in turn, "properties of a product" refers to a product's physical attributes, such as size, material, color, smell, form, or other distinguishing features.

54 Marielle Creusen and Dirk Snelders, "Product Appearance and Consumer Pleasure," in *Pleasure with Products: Beyond Usability,* ed. W. S. Green and Patrick W. Jordan (London: Taylor & Francis, 2002).

55 Marielle Creusen and Dirk Snelders, "Product Appearance and Consumer Pleasure."

56 Richard Buchanan, "Design and the New Rhetoric: Productive Arts in the Philosophy of Culture," *Philosophy & Rhetoric* 34, no. 3 (2001): 183-206.

57 Cara Wrigley, *Visceral Hedonic Rhetoric,* 47-54.

Figure 3
The Placement of Visceral Hedonic Rhetoric in the Design Dialogue Framework.
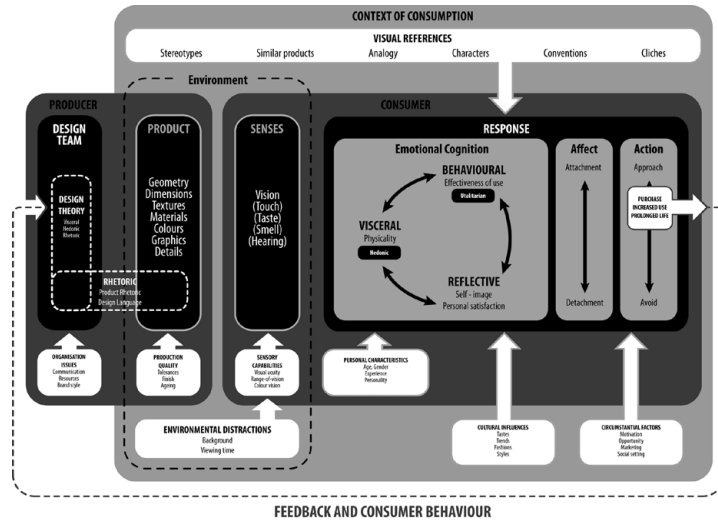
The visceral design, consumer hedonics, and product rhetoric categories need to be studied in combination because their convergence provides the missing link in creating the ultimate product: the product presenting a successfully visceral hedonic form sufficient to attract and engage a consumer and to offer the opportunity to reveal its functionality and reflective value. Investigating and gaining more empirical knowledge of visceral hedonic rhetoric is necessary to help designers in developing new products. It is also necessary to explore how visceral hedonic rhetoric might be transferable to other design domains.

The Visceral Hedonic Rhetoric Design Framework
By superimposing the elements of this newly defined "visceral hedonic rhetoric" on the Design Dialogue Framework in Figure 2, we see in Figure 3 how the context and position of this paper's focus are more clearly illustrated. The levels of cognition have been rotated to emphasize the sequential order of cognitive response, with *visceral* taking the most immediate place. *Hedonic* interpretation is highlighted as a subset of the immediate visceral processing, and utilitarian interpretation is aligned with behavioral cognition. *Rhetoric* is shown as bridging the gap between the design team and its translation of a design message into a product.

Attachment and detachment affective responses are included to signpost the consumer's path toward an approach or avoidance action. Formation of a consumer attachment would carry through to approach actions, such as purchase, increased frequency of use, and prolonged product life. While these actions are observable and measureable in their occurrence in everyday consumption behavior, theoretical feedback can also be gathered through a methodology specifically formulated to isolate visceral hedonic responses. In the combination of both sets of feedback, design theory is developed for the design team's use.
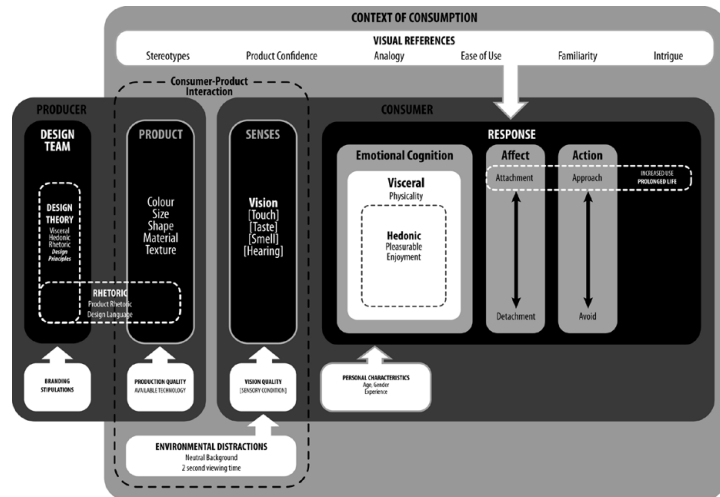
The design dialogue in the product design process needs to address the emotional interaction between product and consumer. A framework for this dialogue was first presented by Crilly, Moultrie, and Clarkson (Figure 2), modified by the visceral hedonic rhetoric (see Figure 3),[58] and redeveloped with the incorporation of the authors' findings (see Figure 4).[59] Embedding the new components, of the visceral hedonic rhetoric design dialogue into the framework, results in the development of the framework into the comprehensive Visceral Hedonic Rhetoric Design Dialogue Framework, thus providing an original contribution to design knowledge.

The branding stipulations influencing a product, a finding of the author's 2011 study, are presented as an external influence (on the design team) at the beginning of the design dialogue.[60] Another external influence on the product is the production quality and available technology, shown through the findings involving quality, novelty, and relationship longevity. The environmental distractions have been included to encompass the neutral viewing environment and a two-second viewing time (as specified by the 2011 study's methodology). The visual reference criteria are modified to draw on the relationship findings, such as ease of use, confidence, stereotypes, and familiarity, as well as on the visceral hedonic responses, such as intrigue and analogy. Product attributes have been regenerated from the visceral hedonic responses and include color, size, shape, material, and texture.

Within the emotional cognition levels, the visceral level was the focus of the author's 2011 study; thus, the reflective and behavioral levels have been removed from the diagram. Personal characteristics, such as gender, age, and experience of the consumer, also have an influence over a consumer's visceral hedonic response and are incorporated into the diagram.[61] The active response of the

58 Synthesized from Nathan Crilly, James Moultrie, and John Clarkson, "Seeing Things," Donald Norman, *Emotional Design,* and Cara Wrigley, *Visceral Hedonic Rhetoric.*

59 Nathan Crilly, James Moultrie, and John Clarkson, "Seeing Things;" and Cara Wrigley, *Visceral Hedonic Rhetoric,* 547-77, 25-36.

60 Cara Wrigley, *Visceral Hedonic Rhetoric,* 132-157.

61 Ibid.

consumer to visceral hedonic rhetoric attributes has been established through the literature as potentially including the purchase, increased use, and prolonged life of the product.

Conclusion

The need for retailers to appeal to consumers' desires is paramount.[62] The purchase decisions consumers make are a direct result of consumer choice, behavior, and responses.[63] By targeting consumers' positive purchase emotions and by harnessing the consumer-product relationship generated by visceral hedonic rhetoric, positive, longer lasting consumer attachments to interactive products might result. Emotional design, which seeks to address these issues, is becoming increasingly popular as a research field and industry focus.

As shown earlier, the visceral hedonic rhetorical elements of a product play a significant role in determining consumer responses. A judgment made by consumers at an instinctual level of cognition affects the commercial success of the consumer-product relationship and thus the product's continuing use and lifespan. A better understanding of these elements of the response and their conceptualization as part of the extended design dialogue framework presented in Figure 3 can help in further attempts to understand the emotional domain in the product design field. Thus, this understanding of visceral hedonic rhetoric not only significantly contributes to design considerations of the future, but also provides new knowledge and insights into consumer-product attachment.

This paper constitutes a synthesis of work to date in the area of design and emotion and provides a basis for future work in the area, as well as in other domains, such as advertising and marketing. The Visceral Hedonic Rhetoric Design Dialogue Framework (Figure 4) is a comprehensive representation of current theories of emotional cognition as applied to the design dialogue in the product design process. It makes a significant contribution to new knowledge in the emerging field of visceral hedonic rhetoric by allowing designers to better consider the overall design elements of a product and what effects these elements have on a consumer's immediate visceral response. It has the potential to advance the design of products toward an enhancement of hedonic content, and in turn, a positive consumer mindset.

62 Paco Underhill, *Why We Buy: The Science of Shopping* (New York: Simon and Schuster. 1999).
63 L. Clarke, *Consumer Behaviour: The Dynamics of Consumer Reaction* (New York: New York University Press, 1996).