

# A Study of How Products Contribute to the Emotional Aspects of Human Experience

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# **A Study of How Products Contribute to the Emotional Aspects of Human Experience**

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## **Abstract**

Studying the emotional aspects of products is of interest for any field concerned with human experience. The vast amount of research in the academic literature serves as a record of the many different approaches. Our earlier design research synthesized contributions from a number of disciplines and combined different perspectives into a unified framework applicable to design practice. The framework identified two levels of emotional expression (short and reflexive emotions, and sustained and reflective moods) and three ways that products function in constructing emotional experience (stimuli for new experience, extenders of current experience, and proxies for past experience).

In this paper, we extend our framework with new theoretical research and apply it in a study to understand what qualities of products construct an emotionally driven experience. We examined the experience of athletic activities, focusing on sports products used by females aged 21-57. We adopted a visual anthropology method to focus on participants' perceptions, attitudes, and beliefs about product interactions as well as their goals and moods at the time of interaction. We found that products support varying qualities of practical, intellectual, and emotional experience, and these qualities vary based on the nature and the complexity of the experience, the relationship between the intended experience (goal) and the realized experience, and the way that the product functions within the experience.

## **Keywords**

Experience, goals, emotion, function, products

## **Introduction**

An espresso maker. A pair of track shoes. A favorite cooking utensil. These products, and others like them, evoke a multitude of emotional responses and resounding emotional experiences. Some products evoke strong memories of the past. Others create new and compelling experiences. We know that products elicit a wide variety of emotional responses, ranging from pleasant to unpleasant, weak to strong, simple to complex. However, little is known about how particular criteria of these designed products — color, shape, size,

materials, aesthetics, functionality, and other qualities — affect the kinds of emotional experiences people have with them.

In this paper, we attempt to understand what qualities of products are most salient in creating particular kinds of emotional experience. We present a study that examined how sports products contribute to the functional and emotional aspects of the athletic experience for females aged 21-57. Data was collected using “visual stories,” an ethnographic method which focused on participants’ moods, perceptions, attitudes, and beliefs about the functional and aesthetic qualities of salient products. Data was analyzed using a theoretical framework to help understand what qualities of products construct an emotionally driven experience.

We found that products do contribute to the overall quality of an emotional experience. However, the contribution can vary, based on the nature and complexity of the experience, the role that the product plays at any given time, and the fit between one’s goal or intention and the actual experience. In some cases, the relationship between product and experience is direct, and in others, the relationship is complex, and no single product quality contributes significantly to the overall experience. We found that products support differentiations in types of experience, to include practical, intellectual, and emotional qualities.

### **Research Rationale**

Understanding how particular aspects of products affect human experience is of great interest to both researchers and practitioners of design. We chose sports products as an area of investigation for this study because of their combination of functional and aesthetic elements and their potential to contribute significantly to physical, emotional, and social experience.

Our specific study had three goals. The first was to understand how athletic products impact the emotional experience of women athletes, by understanding our subjects’ general attitudes about health and exercise, and the types of products they use everyday. The second was to understand what particular qualities of athletic products might be the most salient in emotional experience. The third goal was to build on and validate a theoretical framework for understanding experience and emotion.

### **Theoretical Framework**

From an earlier analysis and synthesis of perspectives on emotion and experience, we presented a framework for discovering and understanding emotional experiences (Forlizzi et al., 2003). The framework identifies two types of emotional response (short and reflexive emotions, and sustained and reflective moods), and defines an emotional experience as an

outcome that depends on the relationship between people and objects within the environment where it takes place. Additionally, the framework identifies product qualities that can contribute to emotional experience in three ways: as stimuli for new experience, extenders of current experience, and proxies for past experience.

We have built on this framework by adding differentiations in types of emotional experience. Figure 1 is a graphical representation of our framework. We have adopted John Dewey's three material qualities of human experience: intellectual, emotional, and practical (Dewey, 1934). According to Dewey, *intellectual experiences* involve drawing intellectual conclusions from *signs and symbols* that are inherent to a distinct experience. *Emotional experiences* are subjective and internally driven evaluations of the objective situation at hand. *Practical experiences* involve activities consistently completed within the confines of objective situations. A particular experience can vary in its amount of intellectual, practical and emotional qualities, coalescing to form an overall experience that may or may not be emotionally satisfying.

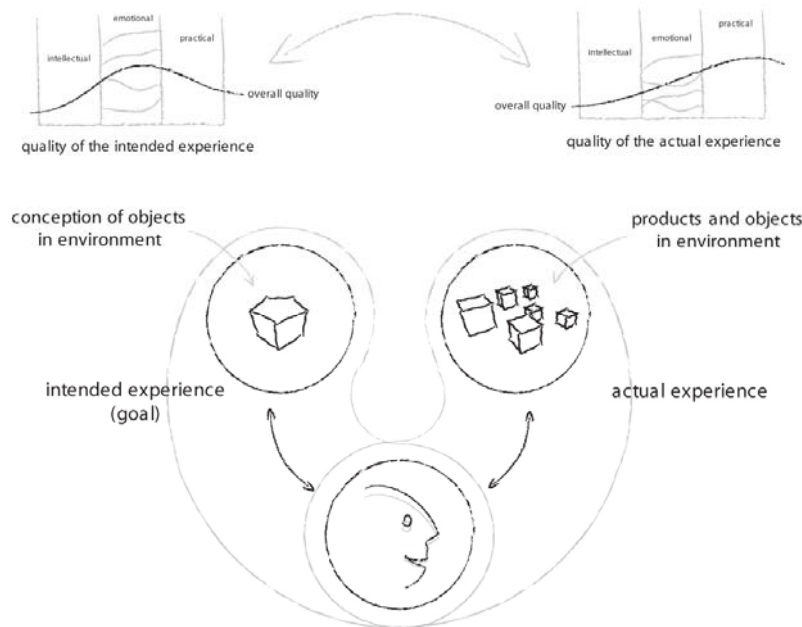


Figure 1, A framework of emotional experience. Past experiences as well as intentions (goals) play a role in the creation of experience, as well as intellectual, practical, and emotional experiences.

Another factor that shapes the emotional aspects of a particular experience is how well a realized experience correlates with an intended experience (a person's goal) at any given

time. Goals are cognitive constructions of the structure and quality of experience that one intends to realize (Carlson, 1997). Objects in the environment, such as products and social interactions, help to construct these goals. Therefore, products play a significant role in the construction of goals and resulting experiences as they unfold in the environment.

### **Data Collection Mechanism**

We chose self-documentation exercises as a method for understanding the emotional experiences that surround athletic products. This method allows participants to freely document experience over the course of several days, providing detailed data in the absence of an experimenter. Self-documentation exercises are good for collecting self-reports about emotional state rather than asking for a verbal evaluation. They provide empathic understanding, images, and narratives of participants in the context of their home or work. They can also be particularly useful for creative or inspirational information (Sanders and Williams, 2001), or when the design focus of a project is open (Jääskö and Mattelmäki, 2003).

Visual stories or visual diaries use disposable cameras and logbooks or audio recorders to allow participants to record data. By seeing what participants choose to describe as important in their diaries, researchers are able to learn about the daily experience and product choice of participants. Visual stories have also been valuable in identifying new product opportunity areas (Gaver and Dunne, 1999; McCormack and Forlizzi, 2000).

We chose visual stories as a data collection mechanism for our study for three reasons. First, this method provides detailed data without requiring a researcher to be present to facilitate data collection. Second, it provides detailed information about user-product interactions and descriptions of products. Finally, this method can be used to gain valuable descriptions of the implicit moods of users.

### **Participants**

Eight women athletes in the Pittsburgh and Boston area participated in the study. They ranged in age from 21 to 57. Each exercised, alone or in combination with others, three times a week or more. Each was asked to chronicle their athletic experiences over a two-week period. They were paid for their participation in the study.

## **Method**

Participants were given a disposable camera and a diary, and asked to document particular aspects of their day-to-day athletic experience. Specifically, subjects were asked to record images of workout experiences and associated products and to fill out an accompanying sheet in the diary to correspond with each image.

Each diary entry asked participants to record the location, date, and time; their mood ranking (positive mood or negative mood, and high energy or low energy); how long they had been in that mood; their goal at the time; the specific tasks they were engaged with; who was present; what products were around them that were related to the task; and three characteristics of the products that they were using.

## **Results and Discussion**

A total of 119 experiences were recorded. Each was coded for location, date, and time, mood rating and length, products cited, and described product qualities. Agreement among coders ranged at about 80%. Based on our theoretical framework, we also coded for whether products created the potential for a new experience, extended a current experience, or recalled a past experience, and whether the experience that resulted from interacting with a product had intellectual, practical, or emotional qualities.

Our findings were used to address the following two questions: 1) How do athletic products contribute to emotional experience? and 2) What qualities of products are most salient in emotional experience?

### **How do athletic products contribute to emotional experience?**

We found that products contribute in several ways to the emotional experience of athleticism. Products are chosen for practical functions that enable athletes to remain motivated, have more effective workouts, and develop fluency with products, possibly entering “the flow state” (Csikszentmihalyi, 1991). Products are chosen for emotional and intellectual aesthetic qualities that motivate, scintillate, and help to reinforce values that assert one’s identity as an athlete. Sometimes choosing and using a particular athletic product motivates others to own the same kind of product, in order to support values and affirm membership in a particular culture (in this case, the culture of athletes) (Kälviäinen, 2000).

From our data, it appears that athletic products most commonly extend the current experience of the user. Our analysis showed that products most frequently served the role of extenders of

current experiences (n=106), followed by stimuli for new experiences (n=25), and finally proxies for past experiences (n=23).

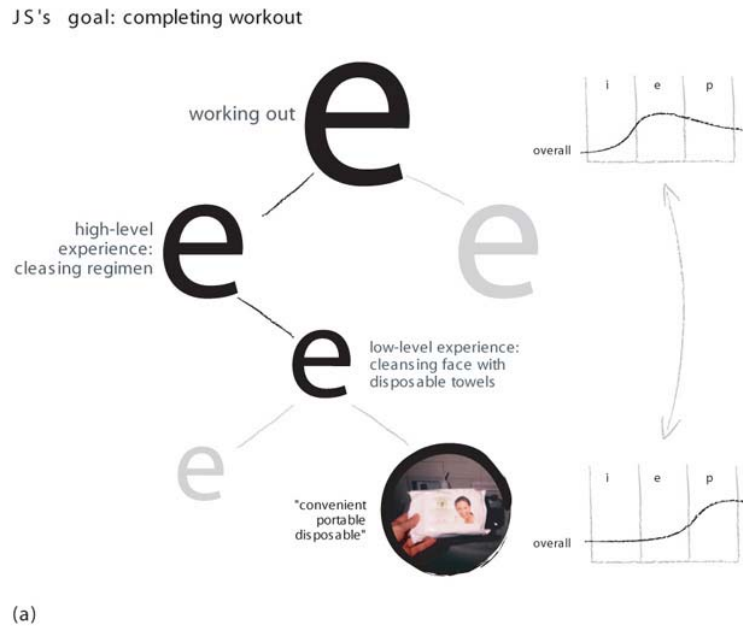
Most references to current experience involved being active and present with a product. Current experiences evoked a range of socially constructed emotions, including happiness related to athletic excellence, envy related to competition, and disgust related to laziness. Most references to future experience involved continuing a preferred experiential or emotional state, for example through understanding performance levels or maintaining motivation. Future experiences evoked emotions such as anticipation and challenge. Most references to past experience involved experiences that are comfortable and desirable to repeat, such as routine warm-ups in a boxing gym. These experiences also referenced past memories. For example, the smell of a leather saddle evoked past memories of going horseback riding. Past experiences evoked a range of emotions, including happiness, nostalgia, and even sadness.

From our data, it would appear that athletic products most often contribute to private and solitary experiences. Of the 119 recorded experiences, 75 or 63% took place in a private location (most frequently, the home) and 44 or 37% took place in a public place (for example, outdoors, the gym, the locker room, or a friend's house); 91 or 76% of the experiences recorded were solitary, and 28 or 24% of the experiences recorded were collaborative, or co-experiences (Battarbee, 2003). The high number of private and solitary experiences may be an artifact of the data collection mechanism. Participants may be unwilling or uncomfortable using the diary in social contexts. However, it is more likely that many of the momentary experiences with, and emotional responses to, athletic products occur on an individual basis. It may also show that a different data collection mechanism may be more sufficient for accessing data about how reactions to products were discussed, shared, or contextualized.

### **What qualities of products are most salient in emotional experience?**

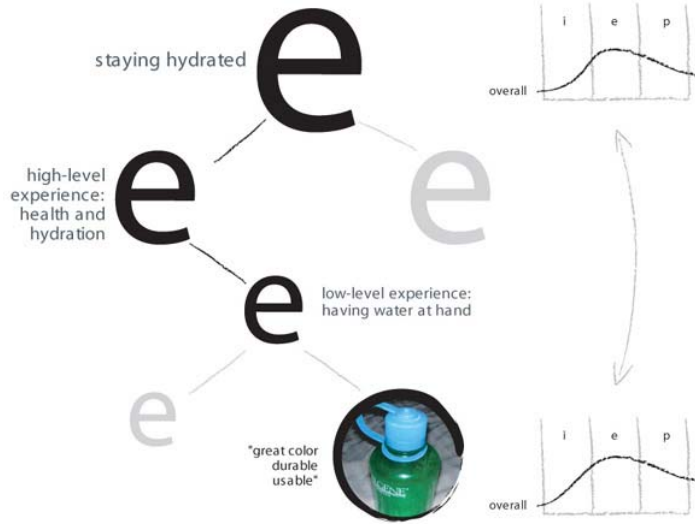
We found that products do contribute to the overall quality of an emotional experience. However, the contribution can vary, based on the nature and complexity of the experience, the role that the product plays at any given time, and the fit between one's goal or intention and the actual experience. In some cases, the relationship between product and experience is direct, and in others, the relationship is complex, and no single product quality contributes significantly to the overall emotional experience.

A product can support varying practical, intellectual, and emotional qualities of experience. Practical qualities of experience may reference the functional and usable aspects of products. Emotional qualities of experience may reference the aesthetic aspects of products, as well as the meanings that we make in referencing past and future experiences (for examples, see Csikszentmihalyi and Rochberg-Halton, 1981). Intellectual qualities of experience may reference the social, cultural, and value-based reasons that we use products. Products that support intellectual qualities of experience may be used to differentiate high-status and low-status activities, or to confer high and low value on the products used (Douglas and Isherwood, 1979). For example, maintaining a membership to a local museum might satisfy the intellectual desire to sustain art and culture in one's local environment, and to assert one's identity as a member of a high-status community.



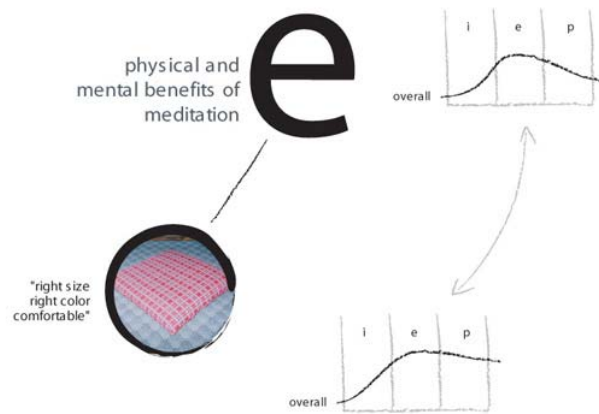


DR's goal: staying hydrated



(b)

MC's goal: meditation



(c)

Figure 2, (a), (b), and (c), the framework of emotional experience augmented with examples from the study.

Figure 2 shows how products contribute to emotional experience. Their contributions vary, based on the direct role that the product plays in an experience at any given time, and how the practical, emotional, and intellectual qualities of experience vary for each product.

*Products that contribute indirectly to emotional experience*

JS, a 37-year old woman, documented the disposable facial cleansing towels that she used after her workout. This product was stored in her gym bag and carried from location to location, so it would always be on hand. JS described this product as being a necessary part of her athletic experience — maintenance of clean skin after she was done exercising. She used the terms “convenient, portable, and disposable” to describe this product.

JS’s cleansing towels were cited for their practical benefit. They did not figure greatly into her actual workout, but contributed to her overall athletic experience as a part of her cleansing regimen that followed exercise. The towels functioned as a low-level experience within the overall athletic experience, and served primarily practical goals.

DR, a 23-year old woman, documented a popular brand of water bottle (Nalgene) that she relied on every day. This product was used to support the overall goal of staying hydrated, which in turn affected DR’s athletic ability throughout her workouts and the rest of her day. DR described this product as being a “great color (green), durable, and usable.”

DR’s Nalgene bottle was praised for its ability to meet the goal of staying hydrated not only during workouts, but at other times of the day. The product was praised for its color, durability, and usability. The bottle functioned as a low-level experience within the overall athletic experience, and served practical, as well as emotional and intellectual goals.

*Products that contribute directly to emotional experience*

MC, a 57-year old woman, documented a meditation pillow that she used during guided meditation. This product was used to support the goal of sitting comfortably and facilitating a positive meditation experience. MC described this product as “just the right size for me, color-coded to match my workout room, and comfortable.”

MC’s meditation pillow was praised for its functional benefit in allowing her to sit comfortably for an extended meditation. She also enjoyed the fact that it matched the aesthetics of her workout room. The pillow functioned as a direct experience within the overall athletic experience, and served practical, as well as emotional and intellectual goals.

These examples, and others from our data, show that product qualities contribute to emotional experience in a variety of ways. Different product qualities can be important at any given time. They can relate directly or marginally to an emotional experience. They can be more or less salient depending on one's goal, context, and mood at any given time, and they can be valued for their effect on practical, emotional, and intellectual qualities of experience.

### **Implications for Designers**

Our study has shown that products contribute to emotional experience in a variety of ways. In addition, product qualities can have a wide range of effects on a particular emotional experience, ranging from practical to emotional to intellectual. Sometimes a product can directly influence the quality of an emotional experience, and sometimes it has only an indirect relationship to the overall experience. Although these seem to be unwieldy findings, we can still draw out the following implications for the design of products that support emotional experiences.

*Products can support varying qualities of practical, emotional, and intellectual experience.*

Designers need to consider not only the distinct functional and aesthetic aspects of a product, but how they will come together to create an entire experience. For example, when the Apple iPod, is powered on, the MP3 player begins where the last song was stopped when the device was powered off. When the iPod is powered on while connected to a computer, it updates the playlists on the device. A better user experience would be to finish playing the song on the computer while updating the playlists.

*The environment will affect how salient a particular product quality is, and what kind of emotional experience unfolds.*

In this context, we define the environment as the local ecology containing people, products, and the medium to create intentions and carry out interactions and actual experiences. A complex environment may have the effect of making product qualities less salient. For example, when taking a whirlwind European tour by bus, one may not notice how well-designed the door handle of the bus might be. A product that is less relevant to the experience at hand may be less salient. For example, if one owns one product with Bluetooth service, the product and service may be quite irrelevant in realizing a particular experience. Finally, product associations may make a product more or less salient in an actual experience. Eating dinner with utensils used every day as opposed to the family's heirloom silverware will have an effect on how salient the product is in contributing to an emotional experience.

*Product qualities that directly support goals evoke positive emotions, and contribute to practical, emotional, and intellectual qualities of experience. However, negative emotions can work to support goals, too.*

In our study with sport products, we encountered many instances where well-designed products supported goals, and evoked positive emotions and supported a fluent relationship with products. However, in some instances, the immediate quality of the experience may be negative (for example, a broken lace on a boot), but the overall outcome of the experience may be positive.

### **Conclusions and Next Steps**

Design and related disciplines seek to understand the emotional experiences that we have with artifacts, environments, services and systems. In this paper, we have presented a theoretical framework that attempts to clarify what product criteria affect different kinds of emotional experiences. We have tested the framework in a study that examined athletic products. The results of this study have highlighted the complex emotional relationships that products play in our lives, and have generated several implications for designers.

Many challenges remain for understanding emotional experience and how, or even whether, we can design to support one. We hope that our framework will make a contribution to understanding the form that emotional experience takes, as well as creating practical next steps for design practice. As work continues in this area, we look forward to discovering a deeper understanding of the relationship between emotion and design, and new theoretical and practical applications.

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### *Jodi Forlizzi*

Jodi Forlizzi is an Assistant Professor of Design and Human-Computer Interaction at Carnegie Mellon University. She is an interaction designer contributing to design research focused on the intersection between assistive, aesthetic, and social products. Her current research relates to inclusive design and the design of new categories of products and services, such as service robots. She is also researching and designing interfaces (small, mobile, and ubiquitous) that support the limits of human attention.

Jodi was trained as an illustrator and communication designer at Philadelphia College of Arts, and as an interaction designer at the School of Design, Carnegie Mellon University. Prior to joining the faculty at CMU, Jodi was an Innovator and Project Manager at E-Lab, LLC. She is a member of the AIGA, UPA, CPSR, and ACM SIG CHI.

### *Bilge Mutlu*

Bilge Mutlu is a doctoral student at Carnegie Mellon University's Human-Computer Interaction Institute. His primary research interests consist of building frameworks for the interaction between people and robots and other intelligent/interactive systems, as well as designing, building, and evaluating these systems. He is also interested in Philosophy of Science and Design, specifically the bilateral use of scientific and intuitive methods in Design, and the establishment of a formal research framework for the field of Design.

Bilge is a former Fulbright Scholar with a background in New Product Development. He holds a BID from Middle East Technical University, an MS in Product Design from Istanbul Technical University, and an MDes in Interaction Design from Carnegie Mellon University. Bilge practiced New Product Development at Arcelik-Beko Corp. in Istanbul, where he worked on designing domestic technology and developing company's in-house product design and development process.

### *Carl DiSalvo*

Carl DiSalvo is a PhD candidate in the School of Design at Carnegie Mellon University. His doctoral research is concerned with issues of agency in design.

**Word count:** 3,009 words including all sections.