Emotional Design in Web Icons

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Abstract

Emotional design is not a specific design field but a perspective that enables users to love and enjoy a product. Emotional design has a significant influence today and is used in many media industries.

Emotional design has three levels: visceral, behavioral and reflective. When applied to web icons, the icons should address the three levels. Web icons are part of the user experience of web design. Well-designed icons can improve user loyalty and attract more users. Icons can represent whole websites, such as brands or companies, and even whole countries and cultures. When users glance at an icon, they realize right away what a website is about.

Using primary and secondary research methods, this research investigates how emotional design can be applied to web icons. Using a survey as a primary research method, the researcher inquires about personal preferences regarding the visceral level—which includes basic design elements, weight, texture, dimension and shape— of three different web icons: search, home and cart. Through secondary research, the researcher discusses successful examples of specific brands and companies that incorporate emotional design at the reflective and behavioral levels.

Keywords: Emotional Design, Web Icons, User Experience, UX, Preferences

Table of Contents

List of figures and tables

Introduction

Emotional design has become very popular in a variety of different fields, especially in package design and industrial design. Emotional design, unlike indifferent design, such as the DOS commands that were used in the past, is a visual creative layer that designers can use to achieve their own purpose, to convey emotions, ideas and even culture. A user can deepen the impression of the brand and memory through such designs, establishing a link with the brand and forming brand awareness.

Figure 1: Apple Watch, an example of emotional design. (Apple Magazine, 2014)

Apple Watch (Figure 1) is a line of smartwatches that incorporate fitness tracking and health-oriented capabilities with iOS integration and other Apple products and services (Wikipedia, n.d.). To customers, Apple Watch is not only a watch but also a companion. The Apple Watch is well designed, which fits with the first level of emotional design, the visceral level. In addition, the interface of Apple Watch is user-friendly, so users can easily understand and use the functions; thus, it also meets the second level of emotional design, the behavioral level. Moreover, Apple has recently refocused Apple Watch marketing around health and fitness and it is no mystery as to why: With a heart-rate monitor built in and GPS, Apple Watch

makes for a compelling exercise and wellness companion (Ritchie, 2017). In other words, Apple Watch can keep users fit and can deliver more information and meaning, which meets the most important level of emotional design, the reflective level.

Emotional design can also be applied to interactive design such as in games and websites (Zhen, n.d.). Emotional feedback in games is reflected in all aspects. A mission guides a player through the world of the game, and each mission is neither boring nor complicated. Players are presented with intermediate goals, not immediate or distant, which are built upon a structure that keeps them continually engaged. A game is designed to provide players with emotional feedback throughout their engagement. For example, if a task is to collect 15 apples, game designers set a drop rate of 25% when the first 12 apples are collected, but for the last three will increase the drop rate by 50%. The reason is that speeding up gives pleasure and avoids the boredom caused by duplication of work.

Interestingly, games make good use of both positive and negative feedback mechanisms. Positive feedback continuously meets the psychological needs of users, who receive prizes and improve their levels and equipment; most people gain a sense of achievement. Negative feedback is often reflected in challenging game content. For example, Flappy Bird is a somewhat silly game that frequently makes people enthusiastic because they find it hard to accept that they have failed again and again in such a simple and casual setting (Town, 2014). Such mechanisms can often affect and influence the user experience.

As a part of the user experience, icons can provide positive and negative responses to users as well. Positive responses can appeal to users and bring a sense of pleasure from websites; however, negative responses might make users get tired of

the whole experience, reduce the frequency of their website visits and choose other options (Guo, 2016).

Statement of the Problem

Emotional needs are reflected in many technological aspects today, such as when users hope to receive more mission tips while playing a game or receive a gentle reminder to recharge their phone when the battery is low. This kind of artificial demand is due to human beings' natural inclination to prefer an intuitive interface—people do not like a cold machine such as the DOS command, but rather prefer a welcoming interface such as Windows or macOS.

The function of a product not only refers to the utility of its functions, but also includes its aesthetic functions. Designers use a product's unique form to express its different aesthetic characteristics and its value orientation, allowing users to emotionally resonate with the product, and therefore, provide a sense of pleasure and relieve users' pressure from daily life (Mux, 2012).

Emotional design can trigger a user's emotional response. When properly implemented, design details can play an integral role in creating products with more personality, which is welcomed by users and allows them to interact while generating positive emotional responses (Mux, 2012). This positive attitude effectively encourages users to actively spread and support these products.

An icon, a significant part of the user experience, can provide information to users when users are browsing websites (Guo, 2016). The visual rhetoric of icons plays a major role in establishing online identity. Icons give users a first impression and highlight the intended information even long before websites have been built their own identity (Weinberg, 2014).

For example, social media apps such as Facebook and Instagram have their own icon styles. These apps use two very different design styles even though they are both social media platforms. People can distinguish these two websites just via their icons. Facebook's icons are vivid, clear and humanized, while Instagram's icons are minimalist and match its logo.

The aesthetic quality of icons significantly affects users' emotional responses. Good emotional responses and experiences can attract new users and improve user loyalty (Norman, 2007). Emotional design has become a powerful tool in creating exceptional user experiences for websites (Idler, 2013). Therefore, applying the concept of emotional design to web icons is significant.

Literature Review

This chapter discusses the definition of emotional design, the three levels of emotional design, website icons, design elements and brand recognition.

Emotional Design

According to the Merriam-Webster Dictionary, "emotion is a conscious mental reaction (such as anger or fear) subjectively experienced as a strong feeling usually directed toward a specific object and typically accompanied by physiological and behavioral changes in the body" (Merriam-Webster, 2018). Accompanied by the accelerating pace of life, the pursuit of high efficiency and advanced technology tends to ignore emotional appeal. Today, designers have to pay greater attention to humanistic values in design. William Morris, a British Arts and Crafts Movement representative, has put forward the idea that the apex of design is not the machine but the human. Human motivation is based on people seeking fulfillment and change through personal growth as stated in Maslow's hierarchy of needs, a psychological theory proposed by Abraham Maslow in his 1943 paper "A Theory of Human Motivation." Maslow's pyramid of "self-actualization" is a pattern that human motivations generally move through (Maslow, 1943). Emotional design can be similarly put on a pyramid that illustrates its importance.

The importance of emotional design stems from its philosophical status. Emotion has great significance in terms of both human existence and development; that is why the concept of product design is better served in this area of human service—emotional design has become one of the most important perspectives of product design.

As early as 100 years ago, Marx had a very wise opinion on emotional objects.

He believed that emotion could be externalized to the materials of objects and that the emotional relationship between humans and objects has a significant influence on the world.

Early industrial products in the first years of the 20th century were functional, but appearance was not considered. Then the designers of the Bauhaus explored how to beautify human life and advocated new design concepts and practices.

Their influence in this field is extremely far-reaching. For example, user-centered design (UCD) has been the focus of research in the computer industry and is mainly used in interface design. It can improve interactions with users to allow them to adapt to emotional activities through the user experience (Hou, 2011).

UCD comes from earlier studies that found plenty of errors in difficult-to-use controllers such as in computers, large machines and monitoring instrumentation. As early as 1994, a book written by A.R Damson Brain (US) explored the relationship between error, emotion and the human brain (Brain, 1994). Many psychologists began to devote themselves to the field of design. Since the 1990s, some German professors have tried to use motivation psychology to improve the usability design of machines. Meanwhile, many psychologists have tried to solve cognitive problems in user operation with cognitive psychology. In the long-term exploration, however, the relationship between usability and emotions was never discussed in user-centered design, only developed in their respective fields instead (Hou, 2011).

Emotional design is a concept and a method of product development that emerged in the late 1980s. In 1986, Norman published *User-Centered System Design*, which first proposed the UCD of a human-machine interface (HMI) in the United States. The book emphasizes the importance of research on human emotions,

advocating that design should focus on users' mental habits, so that they accept products naturally, rather than reconstructing a set of psychology model designers, user psychology models and systems (Norman, 1986). The author defines UCD for a human-machine interface design: design should be easy for users. It ensures that products are easy to understand, easy to set up, easy to use and easy to upgrade; meanwhile, it also needs to be attractive, intuitive and complete. For a wide range of designs, UCD is not only suitable for interface design but also worthy of reference for the humanistic thought that is proposed by industrial design (Norman, 1986).

Emotional design emerged as an effort to promote positive emotions (Norman, 2007) as well as pleasure in users (Jordan, 2002) by means of the design properties of products and services.

The Design of Everyday Things, written by Norman (1988), is about how design serves as a communication between object and user, and how that conduit of communication can be optimized in order to make the experience of using the object pleasurable. By 2004, Norman had already published four books about emotional design.

Norman expanded and refined his theory, later writing a three-level theory of emotional design, which includes the visceral level, behavioral level and reflective level.

The visceral level is subconscious, instantaneous and based on sensory information. It is related to what people see, hear, smell or touch, everything that forms the basis of first impressions. If something is sensuously pleasant, people start preferring it (Natalia, 2016). When it is applied to design, the visceral level refers to appearance (Norman, 2007).

The behavioral level is also subconscious and has to do with people's interactions with an object. Is it easy and effective to use? Does it do what people expect? If it does, this gives people a feeling of control and a sense of pleasure and satisfaction.

The reflective level is the only conscious one. When people start thinking about their experience with an object, their rationalization kicks in. People begin to evaluate the functionality, purchase value and the benefits the product can bring to their lives. People create stories to tell their friends and develop emotional bonds with the object (Natalia, 2016).

To the designer, reflection is perhaps the most important of the processing levels. As mentioned before, reflection is conscious, and the emotions produced at this level are the most protracted: those that assign agency and cause. Reflective responses are part of memories. Memories last far longer than immediate experiences or the period of usage, which are the domains of the visceral and behavioral levels. It is reflection that drives users to recommend a product and to recommend that others use it—or perhaps avoid it (Norman, 2007).

Web Icons

An icon is a visual representation of a command or object. The function of icons is to express objects, actions and ideas (Babich, 2016). In other words, icons provide a visual connection for users in the form of functional affordances and signifiers. For example, a door handle would be considered an affordance to "pull" a door open, and a "pull" sign would be a signifier to indicate that the door needs to be pulled open.

Affordances refer to any object with utility. In other words, any object that offers interactions afford to use, such as buttons (Olson, 2017). Affordances heavily rely on signifiers.

Signifiers clarify affordances. Signifiers illustrate or describe the purpose of objects, such as labels and colors (Olson, 2017).

A good example of affordances and signifiers incorporated into an icon is a shopping cart. The affordance is the button that enables a user to click and then purchase; the signifier is the silhouette of the shopping cart itself, which lets the user easily understand the meaning of the button, indicating that he or she can check out after clicking.

Icons play a role in user experience, which determines how users feel when they use a product and even leads to user loyalty (Guo, 2016). However, most icons can be confusing for first-time users. For example, some icons are very abstract and cannot provide accurate information to users, so users feel uncomfortable and need to spend time figuring the icons out. This kind of user experience is bad for users and makes them tend to avoid designs that they do not understand; it is human nature to distrust the unknown (Babich, 2016).

A set of icons should be clean, consistent and easy to read and should visualize what they are meant to represent in order to reach their goal (Lawrence & Tavakol, 2007). Well-designed and correct icons can bring many benefits to websites, such as saving screen real estate and enhancing the aesthetic quality of websites (Babich, 2016). Icons create a first impression for users and highlight the intended information even before websites have built their own identity (Weinberg, 2014). Good icons should reflect the emotional attachment that companies intend their customers to have

with their brands. That means an icon should have a clear sense of personality (Peterson, n.d.), which also refers to brand visual identity.

Design Elements

Design elements are the basic units of any visual design that form its structure and convey visual messages. Painter and design theorist Graves (1902-1978), who attempted to create fundamental principles of aesthetic order in visual design, defines the elements of design as line, direction, texture, shape, proportion, value and color in his book *The Art of Color and Design*. He concludes that "these elements are the materials from which all designs are built" (Graves, 1951).

The definition of a line is a mark or path that can be of many shapes and sizes and defines shape position or direction (Jenkins, 2016). A line is a path of action, which is used to summarize the character and quality of forms with simplicity and with the utmost economy of means (Graves, 1951).

Texture is defined as the surface quality of an object (Jenkins, 2016). Texture is perceived by humans' fingers as rough or smooth, hard or soft. But texture can be visual as well as tactile (Graves, 1951). By associating visual experiences with tactile experiences, texture can be perceived by humans' eyes as well as by the sense of touch.

A series of lines in different directions defines a shape, such as triangular, round and so forth (Graves, 1951). A shape is a flat area bounded by a line, outline or color; it is a self-contained area that can be linear or organic (Jenkins, 2016). All shapes are two-dimensional, which means they only have length and width (Fussell, n.d.).

A comparison of size, measure or magnitude is defined as a ratio or proportion. Proportion is a designed ratio of magnitudes or of intervals of length and area (Graves, 1951). It is the overall mass of shapes, the sum of all parts or the shape as a whole (Jenkins, 2016)

Value is defined as the control of light intensity (Graves, 1951) and deals with the lightness or darkness of light. It is the key to the illusion of light (Fussell, n.d.).

According to physics, color is subjective and is a sensation produced by the excitation of the eye by visible radiant energy or light of a specific wavelength (Graves, 1951); it is a visual perception that enables people to differentiate otherwise identical objects. Color can be described in terms of hue, lightness and saturation (Merriam-Webster, 2018).

This study used the following categories to differentiate the evaluated icons:

- Line, termed "weight," referring to line thickness

- Texture, meaning the way a surface feels or is perceived to feel

- Proportion, termed "dimension," which references the scale and ratio of an object

- Shape, meaning the form or contour of an object

Value and color were separated in this study. The researcher found a reliable reference in which the results are consistent with Horton's statement that western adults prefer colors in order of: blue, red, green, purple, orange, and yellow" (Horton, 1994, p.170). The results indicate that there are positive relationships between individual color preferences and icon color preferences. Finally, this study suggests that using more widely preferred and acceptable colors (such as blue, green and red)

in icons, since individual color preferences affect icon color preferences significantly, influences user experience with a product (Guo, 2016).

Brand Recognition

Today more and more commercial software companies have eliminated boring and bland designs, making an attempt to create artistic beauty and mobilize the user's emotions. They have built their own brand recognition through their wonderful emotional design, deepened the impressions made on customers and achieved great success in the world.

Emotion has great significance both in terms of human existence and development, which is why the concept of product design is better served in this area of human service; emotional design has become one of the most important aspects of product design. As early as 100 years ago, Marx had a very wise opinion about emotional objects. He believed that emotion could be externalized to the materials of objects; the emotional relationship between humans and objects has significant influence on the world.

Utilitarian designs that are simply functional and feature-rich do not please people. Today utilitarian designs can no longer satisfy customers; usability is already a function that a product must have. However, designers are pursuing a higher level satisfaction through the aesthetic and emotional aspects of designs.

Early emotional designs were applied to various fields successfully. Braun, a very successful design and manufacturing company founded nearly 100 years ago in Germany, was a very early leader in emotional design. It was influenced by the Bauhaus period, and its concept was combining function and appearance at the same time. The minimalist and elegant designs of Braun attracted many consumers. They

were not only functional but also simple, refined, good-looking and consequently a joy to use (Philips, n.d.).

Steve Jobs had the brilliant insight earlier than most that design is emotional. In 1998, the translucent, candy-colored iMacs were released. The arrival of those iMacs signaled more than a renaissance for Apple; it sparked a significant industrial design revolution (Philips, n.d.). In 2002, Apple released a sleek-looking and elegant device called the iPod, which was a small digital music player weighing only 6.5 ounces but able to hold about 1,000 songs (Walker, 2003). According to Bruce Claxton, the current president of the Industrial Designers Society of America and a senior designer at Motorola, the device symbolized transition products that are "an antidote to the hyper lifestyle"—in other words, products that users seek out that are not just simple to use but a joy to use (Clazton, n.d.). The examples mentioned above are emotional designs that are favored by users today.

Blackberry and Nokia have already become history because of the emergence of Apple and Samsung mobile phones, which meet customers' modern needs. Smartphones of the new generation are smooth, slick, functional, attractive and joyful; they have emotional designs (Philips, n.d.).

Moreover, more and more apps tend to have a "personality," or seem "alive," such as by using interactions and animated designs. This is because the world is in motion, flowing and fluid. Animated user interfaces mimic the real world, allowing users to form a more humanized relationship with digital products. They are thus more fluid, "alive" and animated (Philips, n.d.).

Conclusion

This literature review began with an overview of the origins of emotional design

and briefly introduced its three levels. Next, it defined web icons and illustrated the importance of applying emotional design to them. Then, the researcher discussed the design elements that are used in this study and gave each design element a clear definition. Finally, the researcher provided some famous case studies that successfully apply the concept of emotional design and illustrated the importance of emotional design that enhances brand recognition today.

Methodology

The objective of this study is to investigate user preference for the design of an icon, or what icon design they choose based on intuition. The results may be used to assist icon designers to create icons that are preferred by users and can potentially improve user experience and brand recognition.

Color, which is one of the basic design elements, was separated from this study, because the researcher found a reliable reference about users' preferences for different colors. Therefore, the design elements implemented in this study were weight, texture, dimension and shape.

Primary Research

Primary research focused on the creation of a survey that would encompass the different elements of emotional design. After investigating different websites and web icons, the researcher incorporated basic icon characteristics and analyzed the relevance between the following variables: shape, weight, texture, proportion and space, which is referred to as dimension. The researcher then designed an icon system that served as the content of the survey. The survey was administered to a convenience sample population of college students. Data from the survey was then recorded and analyzed.

The study was an online icon preference study. The icons that the researcher chose were Search, Home and Cart, which are commonly used icons in website design. The researcher created four sections based on the four design elements, which were Weight, Texture, Dimension and Shape. In each section, participants were asked to rank their preferences for the four design elements and the three different icons. Because all choices were based on participants' intuition, the researcher mixed the

order of the icons so that the original order would not influence the results.

Based on the profound effect of Bauhaus and minimalism, the hypothesis of this study was that participants would prefer clear, light and sharp icons.

Icon Design

The researcher created an icon system for the survey based on the basic design elements. The researcher chose three basic but different icons—Search, Cart and Home—then created four variations of each design element, as shown in Figure 2. The designs were then incorporated into the survey.
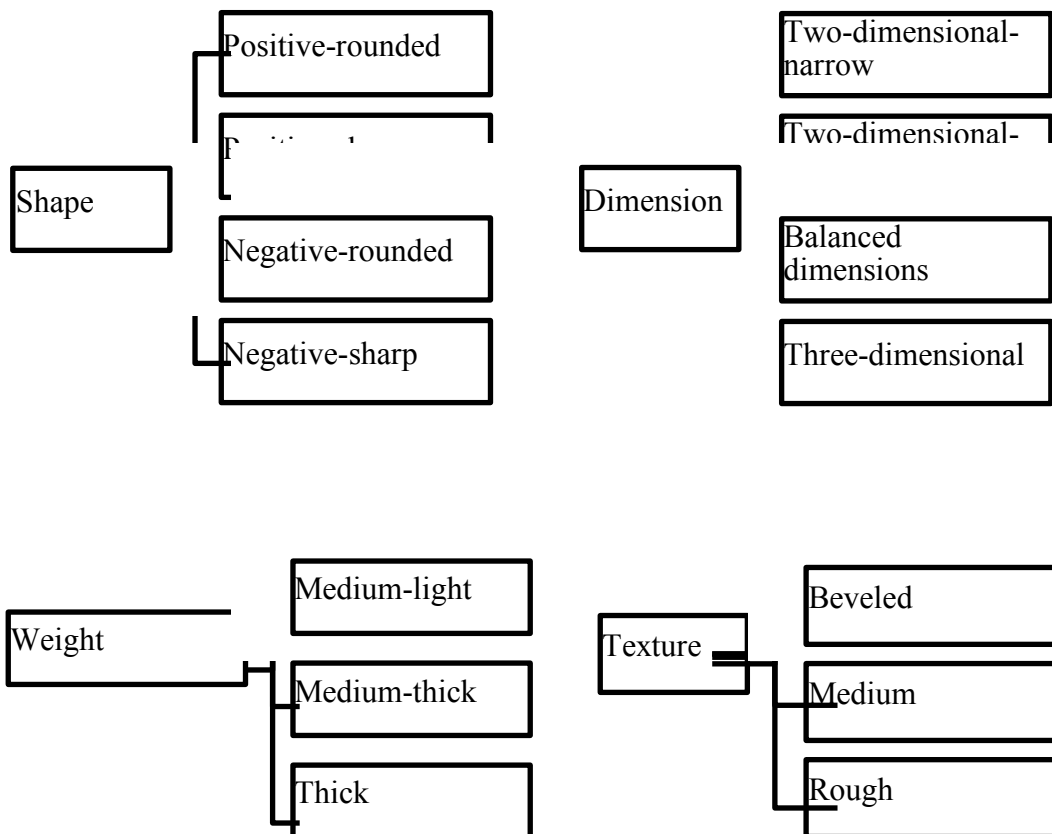
Figure 2: Four variations of each design element

Survey

The online surveys were created on Qualtrics, which is an online survey platform. Before the survey started, all survey materials were reviewed and approved by the Human Subjects Research Office at the Rochester Institute of Technology. For participants, the first step was to read the informed consent form, which introduced the purpose, estimated duration, question types, benefits, risks and confidentiality of this study. Participants could choose whether to participate in this study or not.

Questions were asked about personal preferences of icon characteristics for the following variables: weight, texture, dimension and shape. The participants in the survey were Rochester Institute of Technology college students. The content of the survey was based on the icon design system designed by the researcher. Meanwhile, the researcher disrupted the order of the original icon ranking so the order would not influence the final results.

Data from the surveys was recorded and analyzed based on participants' personal preferences, which related to the basic level of emotional design, the visceral level. The evaluation of positive and negative responses gave valuable insight and conclusions.

Secondary Research

Secondary research served as the foundation for the study. Fifty different websites were chosen based on the Wikipedia (2017) page for the most popular websites. Readings were used to obtain accurate information to understand theories of emotional design and know how to implement them. Case studies were implemented in the final document. The case studies discussed concerned successful examples of

specific brands or companies that incorporate the reflective level, because the

reflective level is the most important portion of emotional design.

Results

The survey was distributed to faculty, staff and students at the Rochester Institute of Technology. The survey was open for 25 days and there were 125 respondents.

Participant Demographics

All the participants in the survey were Rochester Institute of Technology students, with 28.46% male students, 65.85% female students and 5.69% gender-neutral students. The participants were composed of 70.73% undergraduate students, 26.02% graduate students and 3.25% faculty and staff. Participants' ages varied; 84.55% were from 18 to 24 years old, 12.20% were 25 to 34 years old, and nearly 3% were over 35 years old. Among all the participants, 75.61% were native English speakers, and the rest of them identified "other" for their primary language.

Icon Preferences

The survey was divided into four sections of icons, each with three questions, one question for each icon. Below are the results from each section.

Weight

Participants were asked to rank their preferences for four different weights, or line thicknesses.

According to the Qualtrics record (Table 1), 32% of participants preferred the medium-light line weight for the Search icon. The least-preferred line weight was thick, with only 13% of participants preferring it.

Weight	1	2	3	4
	32.33%	37.50%	20.83%	8.33%
	26.67%	27.50%	34.17%	11.67%
	26.67%	21.67%	25.00%	26.67%
	13.33%	13.33%	20.00%	53.33%

Table 1: Results of weight preference for the Search icon

For the Home icon, the Qualtrics record (Table 2) indicated that participants tended to regard medium-light weight as their favorite and extreme-thick weight as their least favorite. This time, more participants chose extreme-light weight as their secondary favorite, but it was also the second most disliked weight among the data.

	Weight	1	2	3	4
		52.50%	37.50%	7.50%	2.50%
		34.71%	32.50%	22.50%	10.83%
		10.83%	24.17%	58.33%	6.67%
		2.50%	5.83%	11.67%	80.00%

Table 2: Results of weight preference for the Home icon

According to the Qualtrics' record (Table 3), the way participants ranked the four weights for the Cart icon was similar to the results for the Home icon. Participants ranked medium-light and extreme-light weight as their favorite; extreme-heavy, still, was their least favorite. Among all the data, extreme-light weight was the participants' second most disliked weight.

	Weight	1	2	3	4
		50.83%	42.50%	4.17%	2.50%
		30.83%	35.83%	21.67%	11.67%
		14.17%	17.50%	62.50%	5.83%
		4.17%	4.17%	11.67%	80.00%

Table 3: Results of weight preference for the Cart icon

Texture

The researcher asked participants to rank their preferences for four different textures in each question. The researcher designed four kinds of texture: rough, medium rough, beveled and glossy.

For the Search icon, according to the Qualtrics record (Table 4), most of the participants chose glossy as their favorite texture and rough as their least favorite

texture. In addition, participants preferred beveled to rough.

	Texture	1	2	3	4
		56.67%	26.67%	11.67%	5.00%
		32.50%	40.00%	18.33%	9.17%
		7.50%	24.17%	56.67%	11.67%
		3.33%	9.17%	13.33%	74.17%

Table 4: Results of texture preferences for the Search icon

For the texture of the Home icon, according to the Qualtrics record (Table 5), more participants preferred the beveled texture among the four types of textures. The majority of participants regarded glossy texture as their second favorite. Rough was still their least favorite texture. Surprisingly, glossy was also ranked as the participants' second most disliked texture.

	Texture	1	2	3	4
		52.50%	26.67%	10.00%	10.83%
		30.00%	35.83%	20.00%	14.17%
		13.33%	28.33%	47.50%	10.83%
		4.17%	9.17%	22.50%	64.17%

Table 5: Results of texture preferences for the Home icon

For the texture of Cart, according to the Qualtrics record (Table 6), more than half of the participants chose the glossy texture as their favorite, and rough as their least favorite. Though the beveled texture was their second favorite texture, it was also the second most disliked texture.

	Texture	1	2	3	4
		64.17%	27.50%	5.83%	2.50%
		19.17%	34.17%	20.83%	25.83%
		12.50%	31.67%	48.33%	7.50%
		4.17%	6.67%	25.00%	64.17%

Table 6: Results of texture preferences for the Cart icon

Dimension

The participants were asked to rank four dimensions: flat, narrow, medium and three-dimensional.

The Qualtrics record (Table 7) indicated that 68.64% of the participants regarded the medium dimension as their favorite dimension for Search and three-dimensional as their least favorite. Compared to the narrow dimension, more participants chose flat as their favorite, but more also chose flat as their least favorite. The majority of participants ranked narrow and flat as their second

favorite or second most disliked.

	Dimension	1	2	3	4
		68.64%	22.03%	5.93%	3.39%
		14.41%	27.12%	43.22%	15.25%
		11.86%	42.37%	38.14%	7.63%
		5.08%	8.47%	12.71%	73.73%

Table 7: Results of dimension preferences for the Search icon

The Qualtrics record (Table 8) indicated that nearly 90% of the participants chose the medium dimension as their favorite for the Home icon and three-dimensional as their least favorite. As shown in Table 8, 28.81% of the participants also ranked flat as their least favorite. More than half of the participants regarded narrow as their second favorite dimension.

	Dimension	1	2	3	4
		88.14%	8.47%	1.69%	1.69%
		6.78%	55.93%	30.51%	6.78%
		3.39%	11.86%	22.03%	62.71%
		1.69%	23.73%	45.76%	28.81%

Table 8: Results of dimension preferences for the Home icon

The Qualtrics record (Table 9) indicated that the four ranks remained consistent for the Cart icon. The majority of participants chose medium as their favorite; flat as their second favorite; narrow as their third choice; and three-dimensional, still, as their least favorite.

	Dimension	1	2	3	4
		89.83%	6.78%	1.69%	1.69%
		5.08%	44.92%	38.14%	11.86%
		3.39%	33.05%	40.68%	22.88%
		1.69%	15.25%	19.49%	63.56%

Table 9: Results of dimension preferences for the Cart icon

Shape

The researcher asked participants to rank their preferences for different shapes. In this study, the shapes were differentiated as positive-round, positive-sharp, negative-round and negative-sharp.

The Qualtrics record (Table 10) indicated that more participants chose the positive-sharp icon as their favorite shape for Search and negative-round as their least favorite. It seems participants choose sharp over round and positive over negative.

	Shape	1	2	3	4
		41.03%	28.21%	17.95%	12.82%
		28.21%	23.93%	21.37%	26.50%
		23.08%	24.79%	25.64%	26.50%
		7.69%	23.08%	35.04%	34.19%

Table 10: Results of shape preference for the Search icon

According to the Qualtrics record (Table 11), the Home icon had very similar results as the Search icon. More participants tended to regard sharp as the most appropriate shape and round as the least appropriate one. They preferred positive shapes to negative shapes.

	Shape	1	2	3	4
	🏠	36.75%	29.06%	20.51%	13.68%
	🏠	26.50%	25.64%	28.21%	19.66%
	🏠	18.80%	28.21%	20.51%	32.48%
	🏠	17.95%	17.09%	30.77%	34.19%

Table 11: Results of shape preference for the Home icon

According to the Qualtrics record (Table 12), the results for the preferred shape of Cart were similar as those for the Search and Home icons. The majority of the participants regarded the positive-sharp shape as their favorite, negative-sharp as their second favorite, positive-round as their third favorite and negative-round as their least favorite.

	Shape	1	2	3	4
		61.54%	31.62%	5.98%	0.85%
		24.79%	47.86%	20.51%	6.84%
		9.40%	17.95%	47.86%	24.79%
		4.27%	2.58%	25.64%	67.52%

Table 12: Results of shape preference for the Cart icon

Conclusion

The survey contained four sections, which referred to the basic design elements of weight, texture, dimension and shape. Each section had three different icons; participants were asked to rank the icons in order of preference. The whole survey took around five minutes. The data from the survey results is consistent even though the researcher disrupted the order in which the options were given.

Weight

The results indicate that medium-light icons are the top choice among all three icons, and extreme-thick are the least preferred icons. Extreme-light icons sometimes are popular but sometimes are not. Medium-thick icons are always the third or second favorite for most of the participants, which is a safe choice for icons. In conclusion, based on intuition, most participants prefer a medium weight to an extreme weight and a light weight to a thick.

Texture

The results show that more participants prefer a smooth texture than a rough texture. The beveled texture has mixed preferences; some participants prefer beveled but some rank it lowest. Because of this, a glossy texture can be determined to be the most reliable smooth texture choice based on the results.

Dimension

Participants prefer an icon with balanced dimensions and dislike three-dimensional icons compared to two-dimensional icons. It can be concluded that participants prefer medium and two-dimensional icons.

37

Shape

The majority of participants prefer positive shapes over negative shapes and sharp shapes over rounded shapes.

Discussion

The survey was based on the participants' intuition for ranking the icons. It referred to the first level of emotional design, the visceral level. The visceral level is deeply rooted, unconscious, subjective and automatic (Komninos, 2018). It refers to the first impression of a design, both in terms of how the user perceives a product and how it makes the user feel. The behavioral level refers to the experience of using a product. The reflective level refers to the user's reflections about the product before, during and after use. The three levels combine to form the entire product experience (Norman, 2007). When applied to icons, design elements form the appearance of icons, which refers to the visceral level; the usability and identification of the icons refers to the behavioral level; and the connection between the icons and users or the brand recognition from the icons refers to the reflective level.

At the visceral level, most participants prefer smooth, medium, two-dimensional, positive, sharp icons, based on their intuition. This matches the minimalist and flattened design trends of today. The simplicity of minimalism is easy to incorporate into other styles and trends; it applies to and emphasizes many different types of content. Minimalist design can be identified by an essentially simple framework and contains only the necessary functional elements. But this trend is not brand new; minimalism is almost as old as design itself. Minimalism is a technology that is gradually disappearing and flowing, but still maintains one of its classic styles, making it a design choice that will almost always work in different areas (Cousins,

2015).

Suggestions for Further Research

Further research can focus on specific case studies that have successfully applied emotional design incorporating the other two levels of emotional design: behavioral and reflective. In this study, the researcher concentrated on the visceral level of icons and only mentioned the other two levels.

Moreover, more qualitative research where participants are interviewed about their icon preferences would allow for deeper insights into their preferences. Meanwhile, the three levels can be incorporated to ask users for their favorite and most representative icons from specific brands or websites.

This survey was taken mostly by design students, and their background could have influenced their responses. It could be administered to a wider survey audience, including participants with different cultures and different careers.

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APPENDIX

Q19

The Title of Study:
Emotional Design in Web Icons

Description:
You are invited to participate in a research study on exploring the preference of the shape of web icon. You will be asked to choose your favorite icon for each question.

The Involvement:
Your participation will take approximately 5 to 10 minutes.
Some participants completed the survey in 5 minutes, others may take more time depending on how quickly they choose their preferred icon.

Risks and Benefits:
Your responses are confidential and there is no obligation for you to participate in the study. We cannot and do not guarantee or promise that you will receive any benefits from this study, aside from assisting the researcher and possibly contributing to the advancement of knowledge in this domain.

Confidentiality
Your answers will be kept confidential. Individual responses will not be limited to personal information. Only the researchers will have access to the records. All data will be reported in aggregate form only.

Participant's Rights:
If you have decided to participate in the study after reading this form, please understand that your participation is voluntary and you have the right to withdraw your consent and stop the experiment at any time without penalty.

Results
The results of this study will be used for the primary researchers capture study as a partial fulfillment to obtain a MS degree and may be presented at a scientific or professional meeting or published in scientific journals. A executive summary of the results can be provided to you once the research has been completed.

Contact Information:
If you have any questions, concerns or suggestions about this research, and its procedures, please contact Hanqing Jin: School of Media Sciences,
Rochester Institute of Technology, 69 Lomb Memorial Drive, Rochester, NY 14623-5604; phone: 585-500-0778; email: hxj6433@g.rit.edu. If you have questions about your rights as a participant in the research, please contact the Human Subjects Resource Office at RIT, 585-475-7673.

Statement of Consent:

Clicking on the "Agree - I am willing to participate in the survey" button below, indicates that:

· You have read the above information
· You voluntarily agree to participate
· You are at least 18 years of age

○ Agree - I am willing to participate in the survey.

○ I do not wish to participate in the survey.

Condition: I do not wish to participat... Is Selected. Skip To: End of Survey.

Add Block

▼ Default Question Block   Block Options ∨

Q1   How old are you?

⚙   ○ 18-24
         ○ 25-34
✱   ○ 35-44
         ○ 45-54
         ○ 55-64
         ○ 65-74
         ○ 75 and older

Q2   What's your gender?

⚙   ○ Male
         ○ Female
✱   ○ Gender Neutral

Q3   You are currently a __ in RIT.

⚙   ○ Undergraduate student
         ○ Graduate student
✱   ○ Faculty and staff

Q4   What's your first language?

⚙   ○ English
         ○ Other, Please specify language [   ] ⌟
✱

Add Block

▼ Weight   Block Options ∨

44

☐ Q5   Drag and drop to rank. Rank the following icons in order of preference (most preferred item at the top)

1

2

3

4

☐ Q6   Drag and drop to rank. Rank the following icons in order of preference (most preferred item at the top)

1

2

3

4

☐ Q7   Drag and drop to rank. Rank the following icons in order of preference (most preferred item at the top)

1

2

3

4

Add Block

- Texture   Block Options ˅

☐ Q8   Drag and drop to rank. Rank the following icons in order of preference (most preferred item at
        the top)

1

2

3

4

☐ Q9   Drag and drop to rank. Rank the following icons in order of preference (most preferred item at
        the top)

1

2

3

4

46

Q10   Drag and drop to rank. Rank the following icons in order of preference (most preferred item at the top)

Add Block

▾ Demension   Block Options ▾

Q11   Drag and drop to rank. Rank the following icons in order of preference (most preferred item at the top)

47

Q12 Drag and drop to rank. Rank the following icons in order of preference (most preferred item at the top)

Q15 Drag and drop to rank. Rank the following icons in order of preference (most preferred item at the top)

Add Block

Shape   Block Options

48

Q16 Drag and drop to rank. Rank the following icons in order of preference (most preferred item at the top)

1

2

3

4

Q17 Drag and drop to rank. Rank the following icons in order of preference (most preferred item at the top)

1

2

3

4

49

Q18   Drag and drop to rank. Rank the following icons in order of preference (most preferred item at the top)

1

2

3

4

Add Block

▾ Block 6   Block Options ∨

Q20   Do you have anything else you want to add regarding your preference in icon designs?

Add Block

⚠ End of Survey   Survey Termination Options...

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