QUALITIES THAT DEFINE A WELL-DESIGNED PRODUCT

A Senior Scholars Thesis

by

MARJORIE MANNING PIRICS

Submitted to the Office of the Undergraduate Research
Texas A&M University
In partial fulfillment of the requirements for the designation as

UNDERGRADUATE RESEARCH SCHOLAR

April 2011

Major: Environmental Design

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Approved by:

Research Advisor: Rodney Hill
Director for Honors and Undergraduate Research: Sumana Datta

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ABSTRACT

Qualities that Define a Well-Designed Product. (April 2011)

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The primary objective of this research is to identify the defining characteristics of "good design" as applied to Industrial Design and to determine what specific qualities it possesses. I assessed what qualities in a product serve as attractors; are they design traits like function, form, colors, ergonomics, or materials, or will form be chosen over function? Finally, I sifted through these identified qualities in search of dominant themes to provide myself and other industrial designers with a list of considerations for designing more desirable products. This requires researching the product design theory, the relation between the consumer and the product, and the role an industrial designer plays in the entire process. The findings of my literary review were tested by comparing products with similar functions but differing designs (e.g. different types of chairs). These products were then compiled into a survey and a collection of 180 people ranging in a wide spectrum of age, gender, and background were asked what they thought of the products. The survey asked participants to answer questions about what qualities in the

products make them appealing or unattractive and ranked them from most to least important. Based on literature reviews, product comparison surveys, and customer opinions, I developed a list of considerations that can be consulted when attempting to design products that are more marketable to the average consumer. This codex can be utilized to develop a personal design identity with a workable context. As a tool, this process will give myself and other young industrial designers a starting platform for their own designs. My hope is that my research project can play a small, yet significant role in the paradigm shift and perhaps allow me and fellow students to maximize opportunities to influence the future of Industrial Design.

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CHAPTER I

INTRODUCTION

The primary objective of this research is to identify the defining characteristics of "good design" as applied to Industrial Design and to determine what specific qualities it possesses. Based on literary reviews, product comparison surveys, and customer opinions, I will develop a list of considerations that can be consulted when attempting to design products that are more marketable to the average consumer. This codex can then be utilized to develop a personal design identity with a workable context. As a tool this process will give myself and other young industrial designers a starting platform for their own designs.

The primary objective of this research will be to answer the question of what qualities define a well-designed product and in turn, find out what characteristics of design makes a product more or less appealing to the everyday person. This will require researching product design theory, the relation between the consumer and the product, and the role an industrial designer plays in the entire process. I hope to determine what qualities in a product serve as attractors; are they design traits like function, form, colors, ergonomics, or materials? Or will form be chosen over function? Finally, I will sift through these identified qualities in search of dominant themes to provide myself and other industrial designers with a list of considerations for designing better products. I believe that the final result will show that products

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This thesis follows the style and format of the *Design Studies Journal*.

with an “eye-catching” characteristic or specific design quality will be preferred by the general consumer public, though they may not understand they are choosing form over function.

In order to answer my research questions I will be employing multiple methods. The first method is a literature review using three main themes of emotional design, Industrial Design in Modern America, and case study on Karim Rashid. The findings of my literature review will be tested by comparing multiple chairs with similar functions but differing designs. These chairs will then be compiled into a survey and a collection of at least 100 people ranging in a wide spectrum of age, gender, and background will be asked what they think of the products. This survey will ask participants to answer questions about what qualities in the chairs make them appealing or unattractive in their opinion.

What sets a product apart? Perhaps it is form, functionality, color, or a reference to a past design era. On the other hand it could be material, texture, ergonomics, or uniqueness. Is their instinctual choice changed after consideration? The combination of product comparison surveys and the opinions of participants with the knowledge collected from prior research will provide me with enough information to evaluate and compile a list of qualities possessed by good design. These qualities will form a starting platform that will be used to design and build a chair of my own, similar in function to the chairs surveyed to ensure that the

resulting product will be a combination of all of the desirable qualities, creating the "best" design for that product. After completing my chair I will get feedback on my "well-designed" product. The response that I receive from this feedback will help me to adjust and reorganize the formula and design of the product. The final built product and resulting formula will answer my original research question of what qualities define a well-designed product and in turn, what it is about designs that make products more or less appealing to the everyday person. This will result in the creation of a process that can be used in my future as an industrial designer, or by other workers in the field.

The limitations for my project include making sure that my research and topic are focused enough to produce measurable results. Careful attention to ensure my surveys are not open-ended and overly general should help in finding correlation in responses. Also, chairs that are selected to be included on the survey will have similar intended-uses but differing designs. This will allow my data collection to focus on certain design qualities that make chairs more appealing, instead of having the alternative variable of function thrown in. An extensive literature review and an early action plan for potential problems will help verify my project's originality and validity.

The outcome of my research will result in the establishment of a list of design considerations for the creation of appealing products in the field of Industrial

Design. The preliminary research I have done on the subject shows that the industry is moving towards a paradigm where designers are able to place a higher importance on aesthetically pleasing products than ever before. My hope is that my research project can play a small, yet significant role in the paradigm shift and perhaps allow me and fellow students to maximize opportunities to influence the future of Industrial Design.

Literature review

This literature review is going to focus on three main themes. It delves into the topics of emotional design, Industrial Design in Modern America, and a case study on the prominent Industrial Designer Karim Rashid. Studying these topics will help support and develop my research topic of 'what qualities define a well-designed product'. According to Matt Mattus, modern-day designers "have a job that goes far beyond discovering trends or blazing paths for new ones. Today's designers must validate why their ideas are right. Gone are the days when one can simply sit behind a monitor and scroll through color palettes randomly selecting colors because they feel right. Intuition is not a spirit inside you; it is fed by real exposure to content, and one must consume immense quantities of content to make an informed, intuitive decision" (Mattus, 2008). A strong background on the subject is crucial to understand where my research project is starting and where I can take it. It quickly shows who the prominent designers are in the field, along with important authors that have looked into similar experiments and topics as the one I am

exploring. Mattus stresses the importance of a strong background; “Equally important, though, is a study of the current design leaders. These contemporaries are crafting original expressions in an over-designed world. How can anyone know what is original if he is unable to establish context?” (Mattus, 2008). A strong literature review will better support my understanding of my topic as well as my readers’. It creates a starting platform for the continuation of my research in the experimental stage and to help with my own designs later.

Emotional design

The first topic that I covered in my literature review is emotional design. I looked into prior research that has tried to determine what consumers generally preferred and why. One of the most important authors on this subject is Donald A. Norman. He is the co-founder of The Nielsen Norman Group, serves as an Executive of Hewlett Packard, was one of the founders of the Cognitive Science Society, and served as the Vice President of the Advanced Technology Group at Apple. He has also been a professor at Harvard University, Northwestern University, and the University of California San Diego. In addition he is the author of 12 books, most of which deal with issues of human-centered product design. “He is a well-known advocate of human-centered design who helps companies make products that appeal to the emotions as well as to reason” (BusinessWeek, 2010) . In his book *Emotional Design: Why We Love (or Hate) Everyday Things*, he discusses why products that look better seem to work better. This goes into the psychology of why

people are attracted to certain products and how they need to not only be functional, but also pleasurable and fun. He first shows that people select products based on emotional decisions, and without emotions your decision-making ability would be impaired. He discusses the study done by Neuroscientist Antonio Damasio who conducted a study on subjects who were normal in every way except for brain injuries that impaired their emotions. The result was that the subjects knew how they *should* have been functioning, but were unable to decide how to live and what products to buy. "This finding contradicts the common belief that decision making is at the heart of rational, logical, thought" (Norman, 2004). My research is based on this idea that emotions are at the heart of decision-making for all people. People may have never thought about it before, but one or some of the design qualities in every product attracts a consumer to it, and I am trying to find out what those qualities are. "The visceral level is pre-conscious, pre-thought. This is where appearance matters and first impressions are formed. Visceral design is about the initial impact of a product, about its appearance, touch, and feel…because visceral design is about initial reactions, it can be studied quite simply by putting people in front of a design and waiting for reactions" (Norman, 2004). Norman goes on to explain the three levels of design and how they can be mapped to product characteristics. Visceral design can be attributed to appearance, behavioral design, the pleasure and effectiveness of use, and reflective design to self-image, personal satisfaction, and memories. Finding the perfect combination of these three design levels is something that industrial designers have struggled with for decades.

How can they make products that appeal to everyone? Donald Norman says that we need to keep in mind that we cannot satisfy everyone with our designs. This is important to keep in mind for my research. I need to realize that I cannot produce a product that appeals to everyone, but hopefully the result will be a set of criteria that at least starts to appeal to a significant amount of people. Norman states that "we build attractive things, cute things, colorful things. However important these attributes, they are not what drive people in their everyday lives. We like attractive things because of the way they make us feel" (Norman, 2004). One of the main points of this book is to explain this exact thought. Norman believes that if a design in itself is elegant, beautiful, playful, or fun, then the buyer reacts positively to the product. The customer then attributes their pleasure to the product, so they praise it, and become emotionally attached to it. Norman discusses an analysis by Khaslavsky and Shedroff that shows what qualities make products successful. The first quality is that the product must entice the buyer by diverting their attention. It must also deliver surprising novelty by being intriguing and interesting. The product must also go beyond the obvious needs and expectations, and must go on to become something else entirely. It must create an instinctive response in the user such as curiosity. They state that it should espouse values or connections to personal goals, such as saying something about the buyer as well as the designer, and must also promise to fulfill these personal goals. The product should lead the everyday person to experience something extraordinary in itself, and it must remind the user of all of these qualities every time it is used (Norman, 2004).

Another important author on this subject is Patrick W. Jordan. In his book *Designing Pleasurable Products: An Introduction to the New Human Factors*, he states that industrial designers "are increasingly expected to have an awareness of human-factors issues and to put them at the centre of the design process" (Jordan, 2000). He goes into different concepts that can be used by designers to create products that are more appealing to consumers, and describes the different aspects of product design. The first section of Jordan's book goes into the hierarchy of consumer needs by Abraham Maslow. Level one is functionality and how a product is useless without it. Level two is usability and shows that once people acclimate to functionality, they want the product to be easy to use. The third level deals with pleasure and how after people "become used to useable products, it seems inevitable that people will soon want something more: products that offer something extra; products that are not merely tools but "living objects" that people can relate to; products that bring not only functional benefits but also emotional ones" (Jordan, 2000). Jordan goes on to describe the elements of product design: color, form, product graphics, materials, sound, and interaction design. Color evokes strong emotions, influences mood, and is associated with social belonging and ideology. "Manufacturers often see use of colour as a way of increasing customer base through increased choice" (Jordan, 2000). Product graphics show how the product works, give it a particular look or feel, to advertise the product's functionality, or to help give the product a particular style. Materials add status to a product, can change its perception with texture, or with an "unusual and

imaginative use… can make products particularly attention grabbing and make them particularly interesting to experience" (Jordan, 2000). Jordan then goes on to define what pleasurable products are and the three types of benefits associated with them: practical, emotional and hedonic. He defines the practical benefits of pleasurable products as "those that accrue from the outcomes of tasks for which the product is used." The emotional benefits "[pertain] to how a product affects a person's mood", and goes into how using a product can be exciting, fun, or satisfying to a user (Jordan, 2000). Hedonic benefits pertain "to the sensory and aesthetic pleasures associated with products. For example, a person might recognize a product as an object of beauty or may enjoy the physical sensation of touching or holding a particular product….A well-designed chair, for example, may be physically comfortable to sit on and may also be an objet d'art worthy of aesthetic appreciation" (Jordan, 2000). Jordan states that product design should incorporate all three benefits of pleasure to produce the most successful product. The next section of Jordan's book goes on to describe the different methods used in production-creation. The methods I thought that could be useful to my project were reaction checklists, which are a list of potential reactions that a person may have to a product. The participants are asked to mark reactions they had or believe they would have about a product or product concept (Jordan, 2000). The four categories of reactions could be classified as physiological pleasure, psychological pleasure, sociological pleasure, and ideological pleasure. "Another possible extension to the reaction checklist is to combine the checklist with a list of product properties –

including functional, aesthetic and interaction style features. The participant is then asked to check the aspects of a product that he or she particularly likes or dislikes. It is then possible to make links between reactions and product properties" (Jordan, 2000). Advantages of this type of experiment are that it is cheap and provides a pretty successful overview of a person's response to a product. Disadvantages are not being able to determine why people react positively or negatively to a product. One reason that I think that this type of experiment would be beneficial to me is because Jordan states that this experiment is not as successful for a product that is to be redesigned, but works better for the design of a future product – which is what I will be doing as a result of my experiment. Another method that could be used in my experiment is questionnaires. There are two categories: fixed response and open-ended questionnaires. Jordan states that open-ended questions "can be particularly useful in situations where the investigator does not know what the important issues are likely to be with respect to a design's pleasurability…[It is] more suitable for the early stages of design, before important pleasurability issues have been clearly identified" (Jordan, 2000). The last, and possibly most interesting method discussed by Jordan that can be applied to my research is the SEQUAM method. This method "involves analyzing a product or prototype in terms of the formal properties of its aesthetic elements and then, through empirical trialing, involving structured interviews, linking these properties with product benefits" (Jordan, 2000). The first step of the SEQUAM method would be to list the desired benefits of the product, and what properties in the product that could be

manipulated to obtain these benefits. The next step would be to obtain a selection of the product you are testing and to rank them in terms of the properties that could be manipulated. After this, the researcher takes measurements of people's subjective responses to each product by having them mark a scale to indicate the extent to how they felt each product delivered each benefit. It would then be possible to calculate a mean rating for each product with respect to which it was perceived as delivering the specified benefits. Now the researcher can investigate associations between the formal properties and the specified benefits, and therefore apply them to future designs of the same product (Jordan, 2000).

Another one of the most beneficial books related to my research was in *Pleasure with Products: Beyond Usability* – a collection of studies, essays, and articles about how pleasure should affect design and the new approach to human factors in product design (Green & Jordan, 2002). In the section on *The Basis of Product Emotions* they discuss that "it might seem difficult, if not impossible, to find general relationships between product appearance and emotional responses because emotions are essentially personal. Nevertheless, although people differ in their emotional responses to products, general rules can be identified in the underlying process of emotion eliciting" (Desmet & Hekkert, 2002). These general rules that they speak of are what I am trying to discover as a result of my experiment. In the article *Product Appearance and Consumer Pleasure*, the authors Marielle Creusen and Dirk Snelders were trying to answer the question "'how does product appearance appeal to consumers and how does it affect consumer evaluations of the

product?'" They found that taking hedonic product value into account will help product designs be more attentive to the wishes of the consumer, which will maximize their pleasure in the product (Creusen & Snelders, 2002). They also found that "many consumers derive pleasure from the form or appearance of a product. Furthermore, it was found that a large part of these judgments was made with the use of holistic information processing, and that they were based on abstract attributes" (Creusen & Snelders, 2002). Mirja Kalviainen discusses product taste and how it relates to design in her essay *Product Design for Consumer Taste*. "The way to express a pleasurable product relationship is to exclaim: 'This is just like me!' In identity building, products present gender, self-reflexivity, mysterious self-qualities, uniqueness, high quality, status aspirations, metaphors of self, self humour or spirituality" (Kalvianien, 2002). She explains that a persons' taste has a lot of say in what products they chose, and in our society today, people value uniqueness and what they think the product says about their personality. In the section entitled *Designing Experience: Whether to Measure Pleasure or Just Tune In?* Jane Fulton Suri is trying to figure out what the characteristics are that make one product more enjoyable or attractive than another. In her research she references Raymond Loewy who is regarded in America as the father of industrial design and his interest in what he called the "psycho-physiological science" (Suri, 2002). He thought this science could offer an understanding of how color and form affect people in their perceptions and attitudes towards products. She states that "even today there is little emerging from

the science of psychology that can provide the kind of direction that Loewy hoped for…the goal of the activities here is to discover what qualities and contextual elements currently contribute to the positive aspects of people's experience. Such qualities represent opportunities for design to preserve or enhance them. Additionally, it is important to uncover negative aspects of the existing experience, both in terms of what is missing and elements to avoid in the future" (Suri, 2002).

Industrial design in modern America

The second topic in my literary research dealt with Industrial Design in Modern America. I wanted to look into the industrial designer's career, why companies hire them, and what the effect of a design reputation can do for a company. I also thought it was important to look into the importance of product design in society today, what kind of an effect it has on our culture, along with what the current and proposed future trends of product designs are.

To find this information, I started with defining exactly what Industrial Design is and its history; where it started, and how far it has come. According to the Bureau of Labor Statistics "Industrial Designers combine the fields of art, business, and engineering to design the products people use every day. In fact, these designers are responsible for the style, function, quality, and safety of almost every manufactured good" (Commercial and Industrial Designers, 2009). Product Design can be described as an ambiguous term that crosses the boundaries between specialist

design fields of lighting, graphic, furniture, fashion, and industrial design (Slack, 2006). "Both 'product design' and 'industrial design' are terms that have evolved over time. As a consequence, they mean different (and sometimes conflicting) things to different people. Broadly speaking, product design might be concerned with the efficient and effective generation and development of ideas through a process that leads to new products; whilst industrial design might be concerned with the aspect of that process that brings the sort of artistic form and usability usually associated with craft design to that of mass produced goods" (Morris, 2009). Design can be traced back as far as to the early civilizations of man. They created products that served a functional purpose, and slowly began personalizing them to increase their revenue with trading. Industrial design appeared as a result of the Industrial Revolution in the 1920s and 30s (Slack, 2006). The need for a professional designer came about with the improved product output and creation of new jobs. The Bauhaus school created the new ideal of industrial design being as much about art as it was about technology. The next major innovation came toward the end of World War II when all things needed to become more affordable and able to be mass produced (Slack, 2006). The 1950s saw a consumer boom and a move towards functionalism and practical and economical design. The 1960s was characterized by the appearance of humor, interesting use of materials, and new techniques and forms of expression (Slack, 2006). "Since the late 1980's, and throughout the 1990's, corporate America experienced an enormous flux. Looking back, this period seemed relatively lucid and smooth from a growth perspective,

but viewed from the early twenty-first century, we can see it was actually a transitional time of silent changes that no one noticed at the time, but which now appear to have led to our present drive for innovation" (Mattus, 2008). Products used to be produced in mass quantities and limited choices. In the past decade manufacturing processes have become more advanced, allowing for quicker production and more variations in designs. "As the century draws to a close, however, manufacturing is on the cusp of a new era. Thanks to sophisticated computer technologies, smart materials, and innovative fabrication techniques, it is now possible to reengineer our approach to mass production, transcend the economics that have bankrupted much of what is designed, and develop goods that can be expressive and individual…for the first time since the Industrial Revolution, the aesthetic concerns of the design, the particular needs of the user, and the economic dictates of the business are converging. This confluence of disparate requirements has the potential to restore industrial design to an empathetic and integral position in relation to the user. It also presents new realms of profitability for business" (Rashid, 2001).

Modern industrial designers are in higher demand than they ever have been before. "Company after company elevates their most visually articulate to new lead positions that allow them to direct the appearance of product and design from newly invented roles we never could have dreamed of even ten years ago. Casting lead positions like chief creative officer and visual strategist has become a

necessary move for savvy competitive companies that realize the value design brings" (Mattus, 2008). Robert Brunner and Stewart Emery talk about design in companies and the importance of good design for the success of your company. They say that in the last ten years in America, "a public understanding of design has emerged. People have become more interested in and discerning about how things are, how they work, how they look, and how they behave. This starts to move companies to invest in design. More companies are spending money and time on design – although many of them are still not doing it well. The trend continues to grow" (Brunner, Emery, & Hall, 2009).

Current day Industrial design trends seem to be focusing on a few different themes. One of the main ones results from living in an age where we can feel so small with the rise of technology, people call for uniqueness. This can be seen in "an increasing consumer demand for varied ranges and the rapid turnover of fashion and products. It is also evident in the process of selecting products or brands that we feel will help to define us" (Morris, 2009). This call for individuality can be seen in the rise of product customization. Karim Rashid describes it perfectly: "as we exist in a more and more virtual world, our physical world is developing a new importance. The furnishings around us are becoming special considerations, more beautiful, and more diverse, and more personal…[In the future] everything will be unique…Companies will market individualization to address smaller and smaller markets, tribes, cultures, and specific "specialized" groups, just as the Internet is

affording us today. Cars will be completely customized down to the body-shape; fragrance will be totally individual, as will running shoes, or even body parts. Manufacturers will utilize new 4-dimensional computer-numeric machinery, tool-less product, and other sophisticated methods for mass-production cycles of one-off individually specified products" (Rashid, 2004).

Another trend deals with meeting buyers 'needs' not 'wants'. Designers are creating more around form and not function, and people go into stores and buy things just because they 'look nice' even if they do not need it. Don Norman quotes a woman who was discussing this phenomenon: "I remember deciding to buy Apollinaris, a German mineral water, simply because I thought it would look so good on my shelves. As it turned out, it was very good water. But I think I could have bought it even though it was not all that great" (Norman, 2004). How often do you catch yourself walking into a store and saying 'I want it!" Most of the time you don't need the product, but something about its design and aesthetic appeals to you and makes you desire it – no matter how much you may not actually *need* it. Organic forms and products are another current design movement. "The trend for smooth, curving organic shapes is in some cases a reaction and shift away from the clean, symmetrical designs of earlier years. In other ways, it mirrors nature and natural forms, where few straight edges can be found. Organic lines can give products a more natural aesthetic and feel to them and computer-aided surface and

solid modeling, coupled with advances in manufacturing techniques, has facilitated this trend" (Morris, 2009).

One of the ways that the design market is moving is towards more sustainable and environmentally friendly products. The state of the environment has been a concern since the 1950s, but it has mainly been since 2007 from findings at the Intergovernmental Panel on Climate Change Report that people have widely accepted the fact that the human race is having a negative effect on the planet (Morris, 2009). Scares of oil depletion, global warming, deforestation, extinction, etc. have seemed to make everyone more aware of their contribution to these problems. "This late agreement has meant environmentally friendly products have been quite slow to appear on the market, but there is now a trend towards creating 'greener' products. New ideas and technologies are emerging to help designers make the necessary breakthroughs in producing more environmentally friendly products" (Morris, 2009). Sustainable architecture, products, and innovations have been on the rise and products that find a way to conserve, protect, or consider the environment are predicted to only grow over the coming years.

Case study of Karim Rashid

It makes sense that researching and looking into the designs of a flourishing and well-known industrial designer should start to give you an understanding of what makes their products so successful. I have been interested in Karim Rashid's work

since before I knew what Industrial Design was, and that I was interested in pursuing it as a career. I was attracted to the collections in his books – full of his colorful and whacky designs, thoughts, and creations. For this research project I have been looking into the works of Karim Rashid to see if any definite design qualities or decisions can be determined and as a result, influence my own list of qualities of 'good design.'

Karim's creative life started from an early age. He was born in Egypt to an Egyptian abstract artist and an English-born mother. After settling down in Canada, Karim's father worked as a TV set designer and taught his children about art and creating things. After receiving a Bachelor's Degree in Industrial Design, Karim went on to start his own company. "His life and achievements cannot be understood without considering his constant physical travel between different cultures, traditions and creative hubs. Rashid has been constantly on the road globally for a decade now, in a white or pink suit. Seeking new experiences and the limelight, he speaks to thousands at congresses, universities, events. He leads a public show life in the business world, a globalized life with 160 days airborne, something that has honed his perception and given it an ultimate edge. As a professional jet-set figure, Karim has become an internationally acclaimed style creator with a Messianic belief in beautification" (Biography). He has over 3000 designs in production, creating furniture, interior architecture, lights, packaging, art, fashion, and other beautifully designed products (Bio, 2010). Rashid has been

presented over 300 awards and has work displayed in 35 countries, including 20 permanent collections in the Museum of Modern Art and San Francisco Museum of Modern Art (Bio, 2010). Along with traveling all over the world, Rashid is currently the author of seven books, two CDs, and enjoys DJing at his own exhibitions on self-designed DJ tables.

Karim's work is easily recognizable due to its bright colors and innovative designs. David Shearer says that his work is "highly recognizable but somehow defies definition" (Rashid, 2001). In Karim's book *Evolution,* Peter Stathis write that Karim Rashid's designs can be formally described as "futuristic, structurally they are unabashedly contemporary, residing unapologetically in a Jamesonian perpetual-present within the fashion system in which they operate like haute couture – evanescent and ephemeral yet knowing of what they speak" (Rashid, 2004). He goes on to say that "Karim's designs are not only solid objects, they also represent new systems of communication in a seamlessly homogenous and technologically sophisticated world…Karim moves the design project to a glossy formal language, eliminating any specific cultural or social inflection: a global language of poly-sexual forms, disorienting digital hues, employing a multivalent symbolic vocabulary widely and equally understood as much for its soft spiritualism as for its hard mathematics" (Rashid, 2004). In Rashid's book *I Want to Change the World*, Gilda Bojardi describes Karim's designs as being:

> colorful, sinuous, sensual objects, but at the same time fresh, light, and new, both in their concepts and their forms, not uncoincidentally realized in materials nearly extraneous to the sector of furniture and product design, and made with the most advanced industrial technologies and computer design methods…[they have a] semantic capacity to sum up the symbols of a metropolitan and increasingly cosmopolitan culture, projected into the future of the digital era. For this reason it would be reductive to interpret the work of Karim Rashid in terms of organicism. In his objects – whether they are chairs, vases, lamps, or bags – the use of curved, sensual lines dominates, but they are neither organic forms of the evolved artifacts developed in the 1950's, nor those of botanical or zoological origin found in the works of many contemporary designs. If we must find a term with which to interpret this work, I would say it is "physical." Or, to put it better, it displays a natural tendency to rethink the physical-compositional conception of objects, combining the simplicity and sensuality of the sign with an utterly contemporary expression of immanence and reliability (Rashid, 2001).

Karim himself defines his work as "Sensual Minimalism, or Sensualism, in which objects communicate, engage, and inspire, yet remain minimal. They can speak simply and directly, without being superfluous. [His] work is a marriage of organic and pure geometry, of technology and materials. Soft, friendly organic forms

communicate tactility and express a strong visual comfort and pleasure" (Rashid, 2001).

As one of the most successful designers of our time, Karim Rashid has several strategies that he thinks helps to develop successful products:

- Design objects that meet all the criteria, not just one: beauty, performance, meaning, cost, seamless production, no manual labor, ease of assembly, smart material, recyclable, spatial, human, behavioral, democratic and simple.
- Make companies aware of the humanism of our products – the human connection and condition are key to successful objects.
- Show companies that quality creates higher margins and greater brand loyalty.
- Subtract SKU's (stock-keeping units) that are complex, confusing, non-communicative, labor-intensive, made from too many parts, high-maintenance and culturally irrelevant.
- Design flexible, extensive, relaxed, modular, interchangeable, reconfigurable, multi-functional products.
- Remove collateral, streamline distribution, manufacture on demand, drop-ship, manufacture locally, use global positioning, etc.
- Promote, educate, and disseminate a direct, simple philosophy – design experiences versus objects, form follows subject.

- Design creates its own market.
- The OBJECT is the brand (Rashid, 2004).

Cristina Morozzi describes Karim's projects as being successful because they are "simple and spontaneous, because they don't require decoding. They are variants repeated ad nauseam of an uninhibited sign, nourished by popular culture, streamlining, psychedelic colors, and a good dose of kitsch…His objects are invasive but it is a peaceful invasion, because they are conciliatory, instinctive, and beneficial. Beneficial because they help us gain confidence in a design that, at times, is still a little frightening" (Rashid, Evolution, 2004). Karim states that good design" is a combination of six elements: relevant intelligent ideas, functionality, expressiveness (semiotic relevance and aesthetic originality), appropriate use of technology and materials, impact on the environment (the product's full cycle), and quality (including maintenance and durability)" (Rashid, Evolution, 2004).

Point of departure

Through the study and analysis of the themes of emotional design, industrial design in modern America, and a case study of Karim Rashid, you can start to build a platform of understanding of my thesis topic. My research draws from the literature review several ideas that form a point of departure for my study. Through my analysis of literature related to this topic, I have been able to list several design qualities and the analysis of why consumers are attracted to certain products. I have

also looked into different methods of testing for my experiment, and the benefits and drawbacks to each. And finally, I have completed a thorough analysis of the works and designs of Karim Rashid that I can compare and contrast with the findings of my own design survey of successful design qualities, and for use in the creation of my own products. The information learned from the literature review will prove useful when proceeding to the next stages of experimentation and design. The following chapter goes into the materials and methods of my experiment.

CHAPTER II

METHODS

To produce the results necessary to answer my research questions, I employed several methods. The first step was gaining knowledge and understanding of my topic and on similar studies done, through an extensive literary review. One of the reasons I chose to embark on a research project about Industrial Design was to learn more about the field and if I could see myself in this line of work for the next 40-50 years. Along with helping me gain a greater understanding and appreciation of this subject, the literary review allowed me to more effectively carry out my research and understand what I wanted to accomplish, and the most effective way to do so. The results of my literary review showed me that based on my situation, time frame, and resources, the best way to complete my experiment and data collection would be through consumer surveys. Also, after researching a wide range of products, I decided that I would conduct my survey using different types of chairs and their designs.

After deciding on the survey method of data collection, I started figuring out what my options were. Originally, I wanted to have the physical chairs in the presence of the participants so they could experience the chair in a more realistic setting, as they would while shopping in a store, for instance. The problem with this idea was being able to acquire the kinds of chairs I wanted to test, and being able to acquire enough of them to get an adequate sampling for testing. After a lot of deliberation, I

decided that I did not have the resources to collect multiple designer chairs and find a proper location to store and test them in. In the end I decided to change my surveys to be conducted online, and to use images of chairs from the internet and other sources to question participants. This ended up being more beneficial to me and my research since it allowed me to access and test any chairs virtually in all existence, and enabled me to use chairs that would be unobtainable for me otherwise, due to price or limited production issues. Online surveys also allowed me to gain access to a larger sampling pool, and made it easier for participants to obtain access to the survey no matter where their location. It enabled both them and me to send out the survey to more people than if the survey had taken place in the architecture building on the Texas A&M campus.

I signed up for the "select subscription plan" on the survey creator website www.surveymonkey.com, which qualified me to the use of unlimited questions, 1,000 responses per month, allowed me to create a custom survey design and URLs, included advanced question creation options, and enabled me to obtain my results in more useful and effective formats. To create my survey, I first thought about my original question and what kind of information I wanted to acquire as a result of my survey. The main goal of my experiment was to try and figure out what qualities consumers like most in chairs. I wanted to see if there was any correlation between the responses of the different participants tested, and if these agreed-upon qualities could then be applied to my own design of a chair. The main

design qualities that defined the chairs I wanted to test on were: color, form, and material. I used these three criteria as the basis of the organization of the questions in my survey. I first asked demographic information that would confirm if I was getting a diverse collection of survey takers, and had participants read a short description of what I was researching and what I was hoping to accomplish from them taking my survey. This section also explained that since I was asking them about pictures of chairs, that I would not be asking them about the physical qualities of those chairs (such as actual comfort), but would only be going into the visual aspects and qualities. This method means that I am focusing more on people's initial reaction to a product before they have a chance to test its success in function, and I asked participants to keep this in mind while they were taking my survey. If they accepted the terms, and agreed for me to use their results, they were sent to the first question. I first asked participants from an appearance point of view only, what design quality did they think was the most important when they looked at a chair. This would allow me to get an idea of what people *think* they consider as the most important factor, which I can then compare to the results of the survey to see what people *actually* consider as the most important design quality based on their answers on later questions. The next question shows a range of just colored circles and starts the color portion of the survey as shown in Figure 1. I asked the participant to randomly select a color out of the group

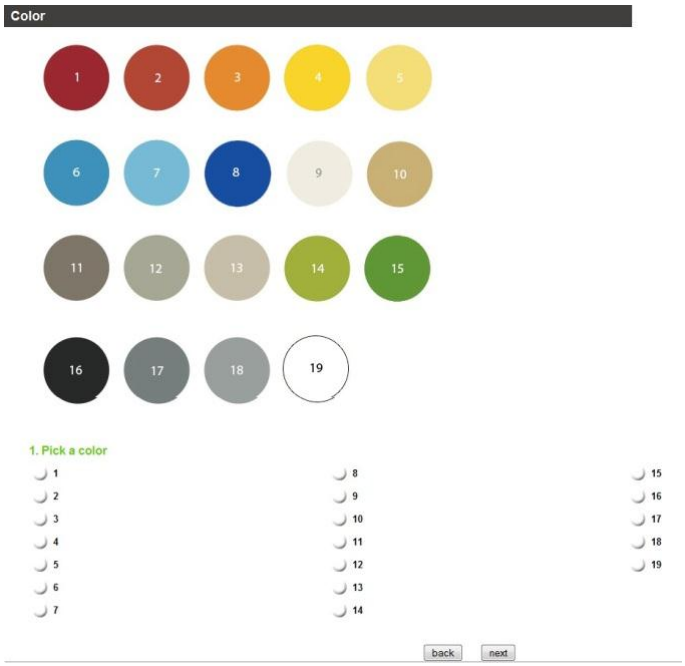

Figure 1. Initial color question from online survey.

I decided this would be an interesting way to if there was a correlation of if the majority of people are attracted to a particular color. I could then take the results of this question and compare it with the results of the other color questions in this section to see if people's color attraction remains the same when applied to furniture. The rest of the questions I designed to show the same chair in multiple colors and asked people to rank them from the most appealing to the least appealing. I either found chairs that came in multiple colors, or photo-shopped a chair I liked to come in multiple colors, so that form and material would not be considered in their answer, only color. The last question in the color section (shown in Figure 2) took the same colors as in the original color question and applied them to the same chair, to see if there truly is a correlation between color when it is absent of form, and when it is applied to a chair.

Figure 2. Final question from the color portion of the online survey.

The next section shows just a simple circle and a simple square and introduces the section on form as shown in Figure 3. I showed these two geometries to represent the two categories of form – curvilinear and angular, and asked the participants just to select one.

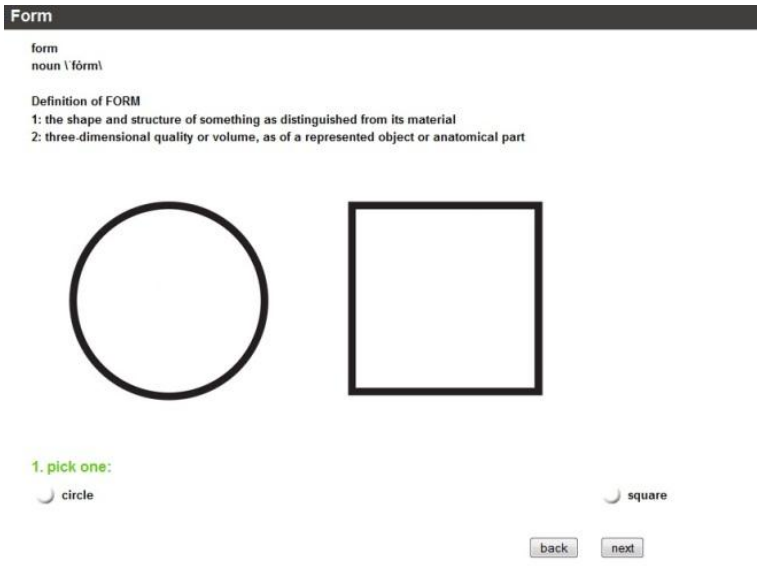

Figure 3. Initial question from the form portion of the online survey.

Similar to the color swatch question at the beginning of the color section, this was just to get an idea of which form people are attracted to without any thought. This question takes you away from chair design, and shows an interesting perspective to human's subconscious appeal to form. After this question comes multiple questions asking which of the above four chairs is your favorite. Each set of questions says that any of the shown chairs can come in any color, and asks for the participant to try and not think about how comfortable each chair looks. I made each set of four chairs shown in black and white to keep color attraction out of the decision making.

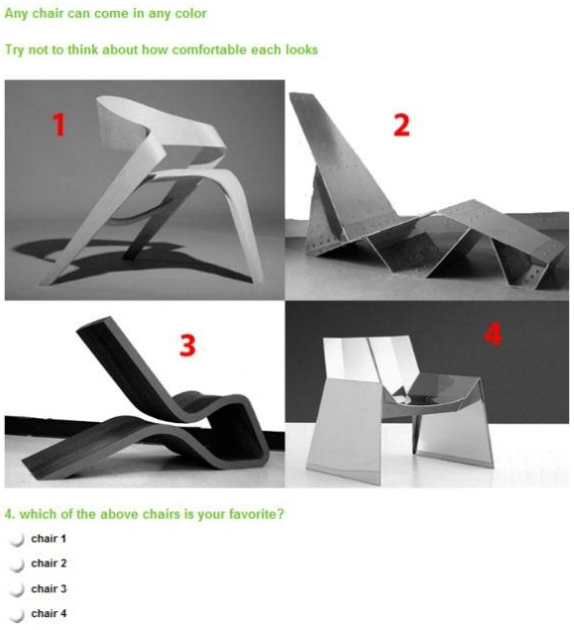

Figure 4. Example question from the form portion of the online survey.

To tie back into the original form question with the circle and square, I made two of the chairs in each set curvilinear in form and two of the chairs angular to see if there is any correlation in the simple shape question and when the forms are

applied to chairs. An example of this type of question can be seen in Figure 4 on the preceding page. Also similar to the color section, the last question (Figure 5) in the form section takes all of the chairs (still shown in black and white) that are shown in the previous questions and asks you to rank your top three, and then explain why this was your favorite. I decided that this was a way to see if there was any correlation in what people prefer when not limited to just four chair options, and would also be a way to find out what qualities people are attracted to in products they like.

Figure 5. Final question from the form portion of the online survey.

The last section in my online survey asks about consumer's preference in materials. As I did in the previous two sections, I started it off with a general question of 'what material do you think of most appealing in a chair?' which would require

people to answer what they *think* they are attracted to, without having seen different chair materials to really think it over. I gave participants the option of selecting a favorite of either wood, metal, plastic, fabric, renewable/recycle/eco-friendly chair materials, or specifying another that was not listed. The next question is similar to the color questions, in which it show chairs similar in form, but varying in material. I then asked them to choose which material out of the nine listed they preferred. The next few questions show chairs of varying materials and forms and asks people to select one. To make sure that form did not hinder decision making, I cropped or zoomed in on a section of each chair in question, to where you could see the material being asked about, but were unable to decipher the chair's actual form. Keeping in line with the other sections of my survey, the last question in the survey (Figure 6 below) combines all of the chair material fragments and asks the participant to decide which of all the chairs they like more for just its material.

5. Which of the above chairs do you like more for its material?

- Chair 1: Wool on Metal Frame
- Chair 2: Cork
- Chair 3: Fabric Made from Recycled Aluminum
- Chair 4: Plastic
- Chair 5: Plastic Bottles
- Chair 6: Foam
- Chair 7: Knives, Forks, and Spoons
- Chair 8: Wrapped Electroluminescent Wires
- Chair 9: White Leaves
- Chair 10: Steel Plates
- Chair 11: Aluminum wire
- Chair 12: Extruded Plastic

6. why?

Figure 6. Final question from the material portion of the online survey.

I can compare the results of these sections to see if there is an agreed upon material that most people select as their favorite and why.

After gaining as many responses as I could in the two month process, I analyzed the results of the surveys to find the necessary information that would be useful for my research. I was looking in the data for any correlation of design qualities in chairs that all or the majority of consumers are attracted to. Through the design and logic of my questions, I was able to tell what color, what types of forms, and which material(s) people are most attracted to. I then used these determined qualities and features as program and inspiration for my own design of a chair, which in theory should appeal to the majority of consumers. These design qualities can also be applied to other products, which I tested through the creation of a different type of product other than a chair. After designing and building my own chair, I asked participants who completed my first survey for design and appeal feedback on the chair I designed and other product. The results from this survey will be used to see if my research and survey were successful in finding a list of design qualities that can be applied to chair design and/or other products that appeal to the average consumer.

The next chapter goes into the results of my survey and final design process.

CHAPTER III

SURVEY RESULTS

To complete and find accurate results for my experiment, I conducted an online survey. The intention of the survey was to help gain an understanding of what design qualities consumers find to be the most appealing in chairs. I wanted to see if there was any correlation between the participants' responses, and if these agreed-upon qualities could then be formed into a design formula, and then applied to a chair design of my own. This resulting chair would then in theory appeal to a large majority of the population if I incorporated their responses and selections into the design process.

Demographics and initial reactions

I was originally projecting for 100 people to participate in my survey. I ended the survey with 180 responses, which I think really helped my end results and with collecting a wide range of data. Of the 180 people that partook in my survey, almost 81% fell in the category of being 18 to 22 years of age. While I did get responses from every age group, the other categories were nowhere near as well-represented as this college-aged range. As for gender, 47.2% ended up being males and 52.8% were females.

Towards the beginning of my online survey, I asked participants for initial design feedback -"from an appearance point of view only, what design quality do you think is most important when you are looking at a chair?" As shown in Figure 7, I

found that the majority of consumers think that the form or shape of a chair is the most important quality they look for in chairs, followed closely by how comfortable it looks.

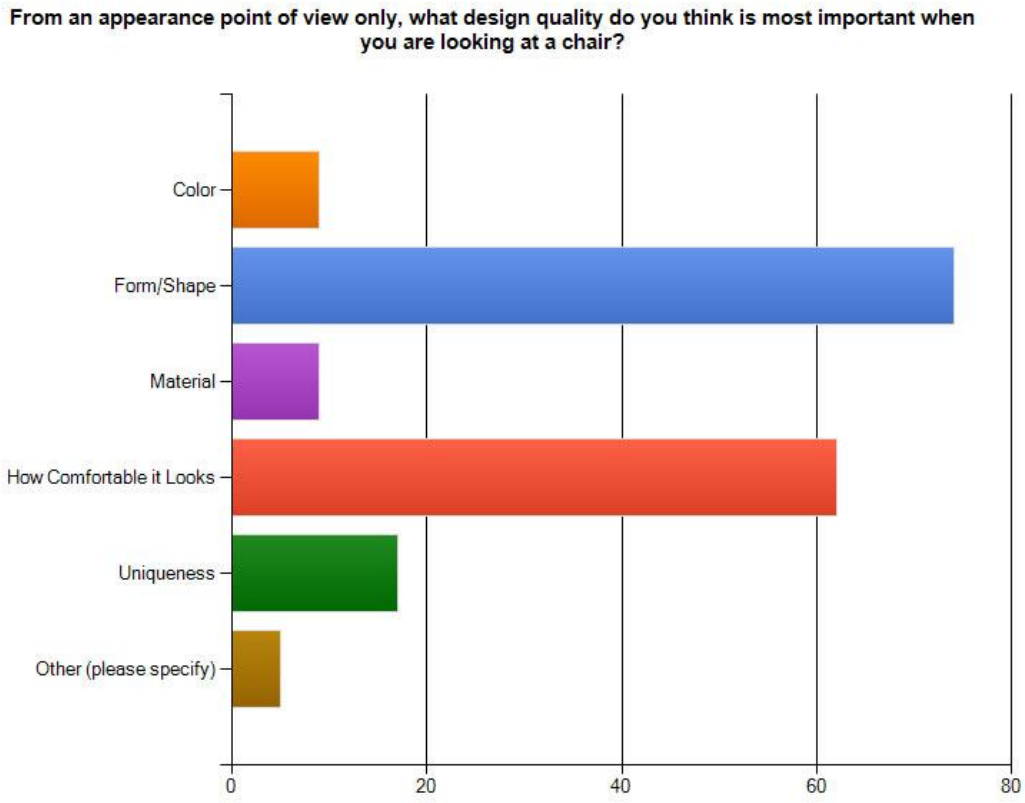

Figure 7. Bar graph of what consumers believe to be the most important quality in chair design.

Color

The next section of questions asks participants about a series of color related questions. The first asks to randomly select a color from one of the 19 given, to

find out if there is a correlation between what color consumers are attracted to in general, and if there is a correlation between this color and when color is applied to the design of a chair. As shown below in Figure 8, the result of this question was that most people picked the color red, followed almost by a tie with the color black (14.6% and 14%).

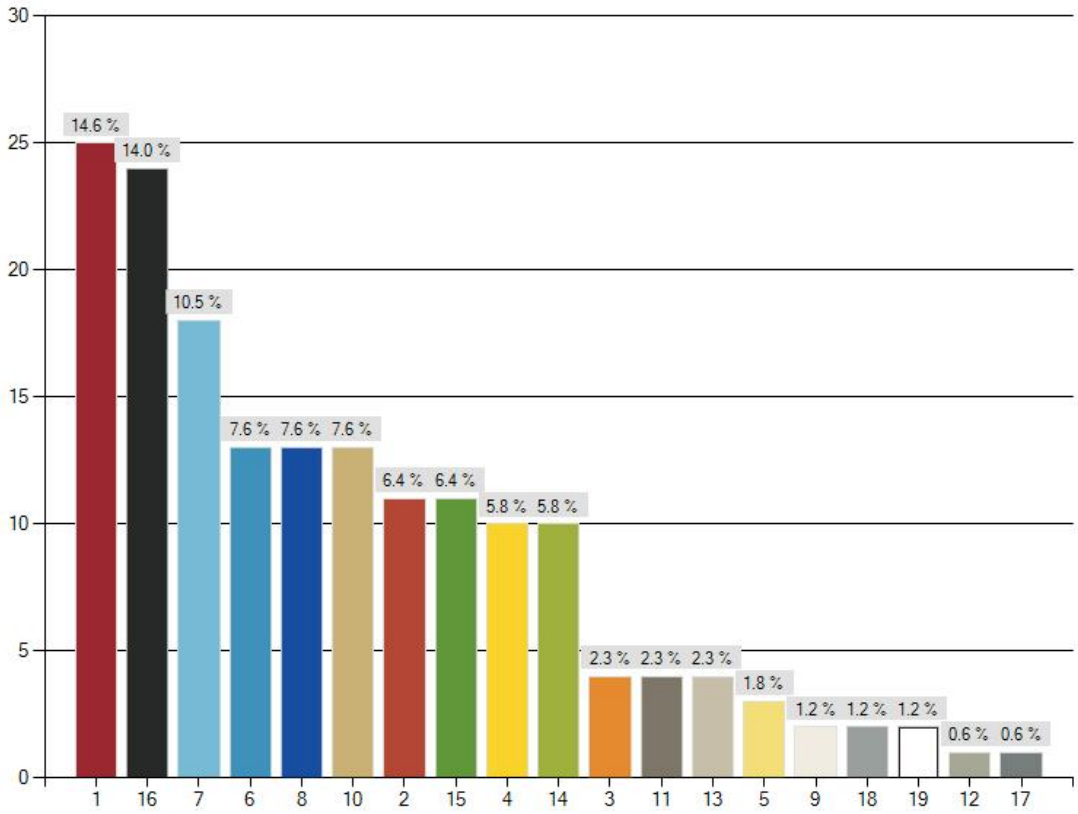

Figure 8. Bar Graph of most preferred color when not applied to chair design.

The next two color questions asked participants to rank the six chairs shown, which all varied in color but not form or material. The results from the first question seen in Figure 9, showed that most people (50.3%) preferred the black colored chair, followed by preference for white, teal, lime green, orange, and then hot pink. The

second color question revealed that once again participants preferred the black chair (40.3%), followed by white, purple, orange, green, and then dark red. The final color question showed twelve chairs in twelve of the same colors from the original color question, and asked survey participants to choose the chair they found to be the most appealing. The one that the majority (37.7%) of the people chose was the chair in black.

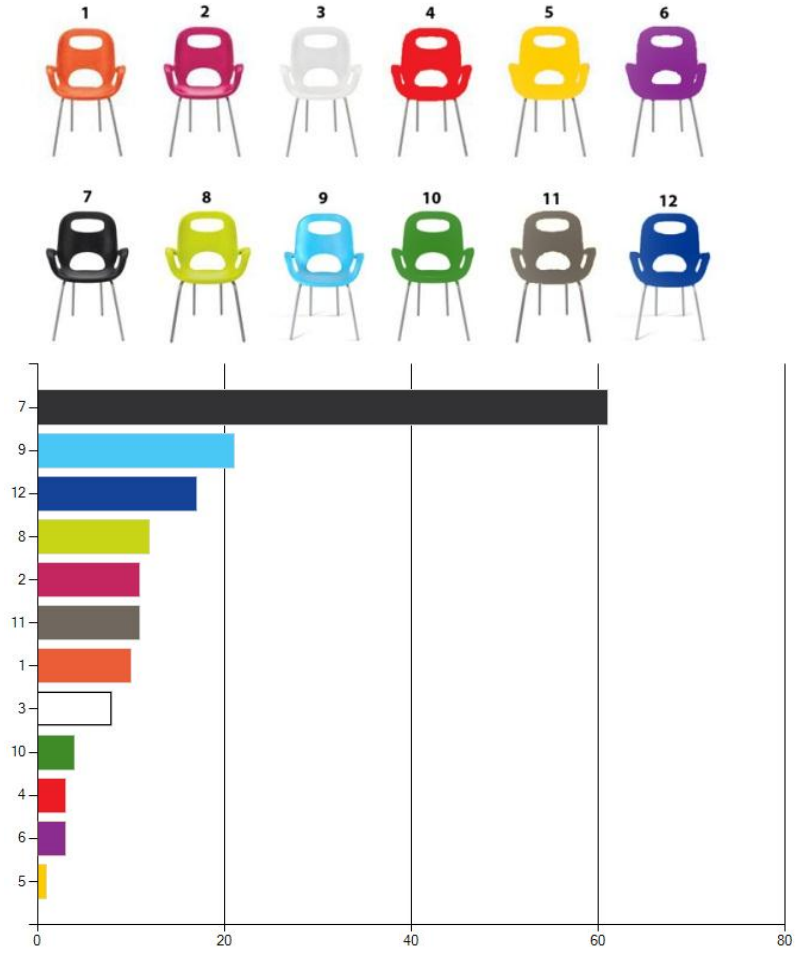

Figure 9. Result showing that the majority of participants prefer the color black.

Form

I opened this section of the survey with asking the participants to choose between a circle and a square - representing the two categories of form: curvilinear and angular. Similar to the color swatch question at the beginning of the color section, this question was designed to get an idea of which form people are attracted to without any connection to chair design. This question shows an interesting perspective to a human's subconscious appeal to form. The results showed that 68.5% of the participants selected the circle (therefore curvilinear forms) over the 31.5% who chose the square. The next four questions showed a set of four chairs shown in black and white to keep color attraction and materials out of the decision making. To tie back into the original form question with the circle and square, I made two of the chairs in each set curvilinear in form and two of the chairs angular

Figure 10. Result showing that three out of four times participants selected more rounded forms as their favorites.

to see if there is any correlation, and if consumers would agree on which type of form they were most attracted to. Three out of the four questions showed that participants chose the curvilinear and more rounded-formed chairs as their favorite choices as shown in Figure 10.

The last question in the form section gave the participants the option of choosing between all the chairs tested to find out which was the most favored for its' form overall. As shown in Figure 12, the majority of people (23.3%) decided that Eero Aarnio's Ball Chair (Figure 11) was their favorite. When asked to respond why they chose this as their first choice, most of the feedback came from the fact that the participants like the shape, apparent comfortableness, and uniqueness of the design. There were also numerous responses remarking on how it appealed to them due to the privacy and shelter that the chair offers.

bonluxat.com/a/eero_aarnio_ball_chair.html

Figure 11. Chair picked as favorite for the form question of the online survey. The Ball Chair by Eero Aarnio.

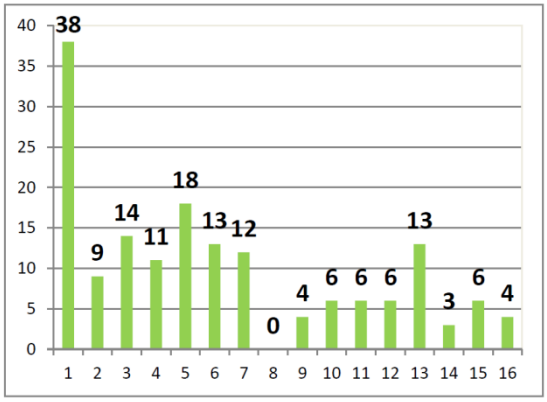

Figure 12. Bar graph showing that the majority of participants preferred the Ball Chair as their favorite.

Material

The first material question asked participants to choose which material they found the most appealing in a chair without looking at any designs or pictures. Figure 13 shows how the most popular response was wood with 33.3%, followed closely by fabric with 29%.

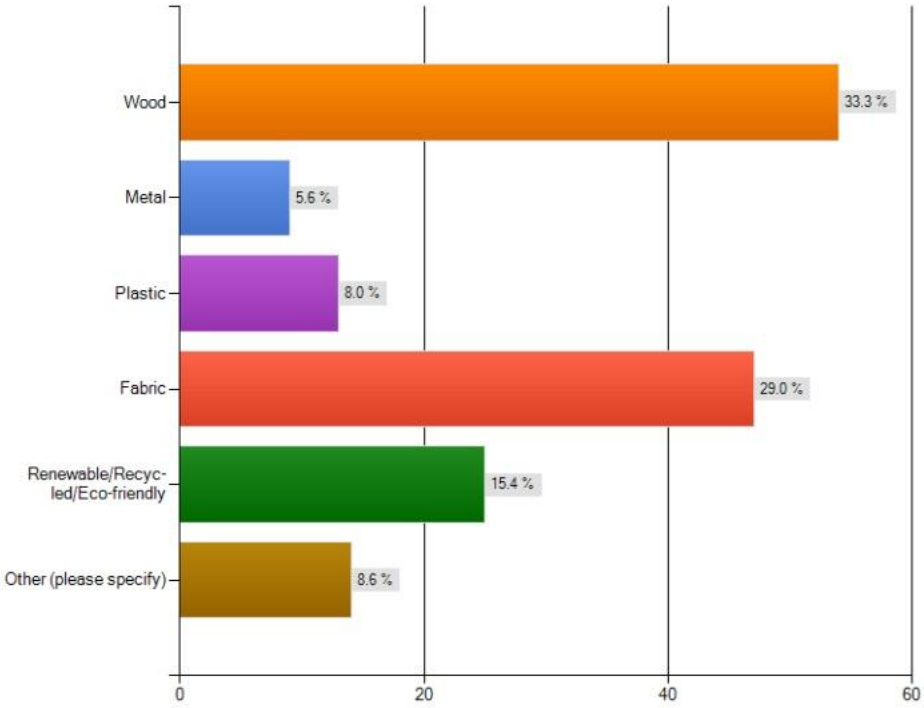

Figure 13. Bar graph showing the participants' initial preference for wood material in chairs.

The next four questions, which showed parts of chairs with different materials, asked participants to select their favorite. The four materials that were chosen are shown in Figure 14 and were wood with 33.8%, foam with 74.1%, wrapped electroluminescent wires with 46.2% and white leaves with 43.9%.

Figure 14. Most preferred materials in the four questions asked.

The final question in the material section asked survey takers to select which material they preferred the most out of all the previous questions. The results in Figure 16 show that the most popular was the Breathing Chair made from foam that is designed by Taiwanese designer Yu-Ying Wu, that can be seen in Figure 15. When asked why they selected the foam chair as their favorite, only 3 of the 64 didn't use comfort as their reasoning.

Figure 15. Most preferred chair material overall. design-milk.com/breathing-chair-made-of-foam.

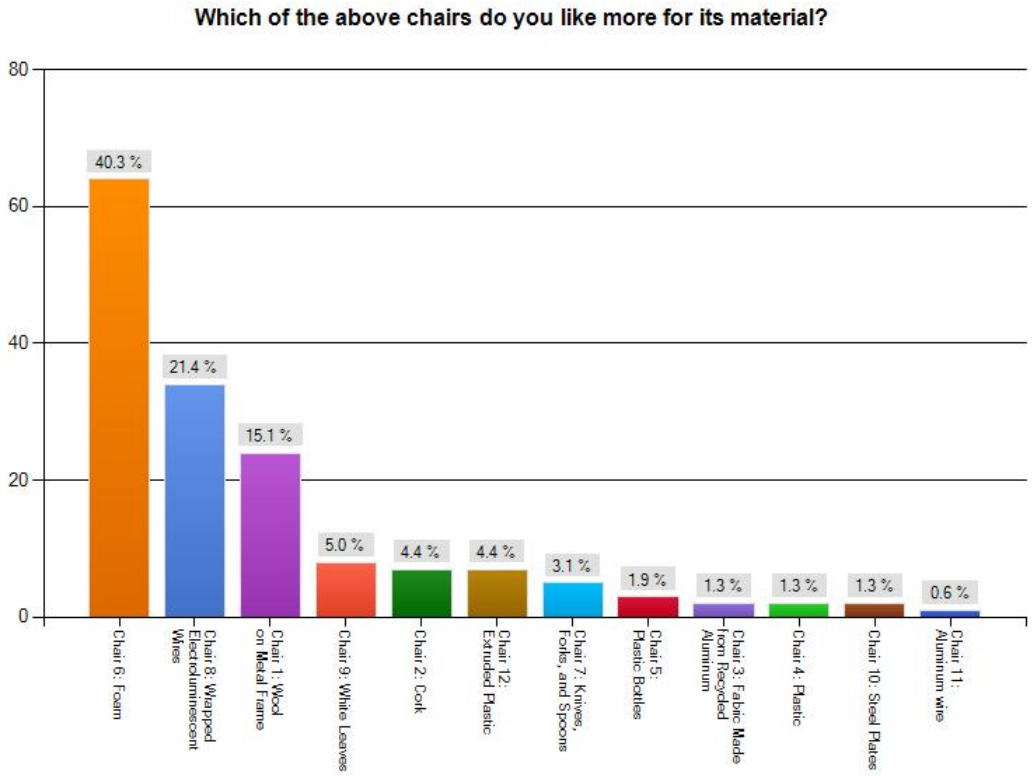

Figure 16. Bar graph showing results of most popular chair material overall.

The next chapter discusses how the results from the survey were interpreted into the final design of my chair.

CHAPTER IV

FINAL DESIGN

The final step in my experiment was to interpret the results from my online survey into a design of my own chair. In theory, by taking the qualities of chairs that people most preferred and agreed upon, and taking into account what participants stated as what they found the most appealing, I can determine a standard formula for design. This formula and design qualities that it entails can then be applied to the creation of new chairs that should appeal to the majority of consumers.

Color

The color section of the survey found that the majority of the participants, when asked to pick a color out of a group selected red, followed very closely by black. No other colors came anywhere close to being as popular in this question. This question was trying to find the most appealing color when the color is not applied to the design or form of a chair. The next two questions showed color applied to chairs, and in both questions black was the strong favorite of all participants. And in the last question which showed the same colors from the first form-less color question, black again received the majority of votes. This shows that while red and black may be the most appealing colors to the majority of consumers, the color black is the very obvious favorite color when applied to chair design.

The first part of my formula then, means that no matter what the rest of the results of the survey are, black needs to the be the principal color in my resulting design.

Form

The next section of my survey asked questions about form – mostly asking participants to differentiate between curvilinear and angular forms in chairs. The majority of people selected the circle over the square in the original form question, which did not apply the shapes to the form of a chair. The next four form questions showed that three out of four times, the chairs with the curvilinear forms were selected as the top choice over the chairs that incorporated angular features. The final question in the form section showed that the majority of participants selected a very curvilinear chair design as their top choice, and even the next three chairs in succession were curvilinear in form.

With the results showing that participants almost unanimously selected chairs with circular and curvilinear forms and features, it is easy to say that the final design should be curvilinear in form.

Material

The final section of my online survey asked participants about the materials of chairs to find which they found the most appealing. The initial question in this section asked consumers to specify which material they considered to be their

favorite material in a chair without looking at different examples of them. The majority said that they preferred when chairs were made from wood. The next four questions, which showed different materials applied to actual chairs showed that participants selected wood, foam, wrapped electroluminescent wires, and white leaves as their top choices. The final question allowed the participant to select their favorite choice out of all the materials shown before, and the result was that the majority of consumers selected foam as their top choice. The feedback I received from participants showed that the foam was selected over every other option due to how important they considered their comfort to be.

The results from this section of the survey show that consumers consider wood to be an appealing choice aesthetically. But this section also shows that when given the option of a softer material, people will select the more comfortable material over the wood. As the final part of my design formula that deals with the most appealing material, I will take into account that people really prefer the chair to be comfortable, and will sacrifice aesthetic appeal for a comfortable place to sit.

Final design

Using the results of the survey and the criteria for the design of an appealing chair, I found that my final design should incorporate comfort, while being black in color and curvilinear in form.

I first thought of a material to use for my chair. I decided upon using black stress balls as the main material, since it incorporated all the elements in my formula. Being made of foam, it would provide the comfort that consumers desired, while also being contained in a spherical form, and had the option of being ordered in a black color. This fulfilled all the requirements of color, form, and material in one step.

The next step of the design process was to decide how to actually construct a chair using large amounts of stress balls. This step still needed to fit into the guidelines specified by my design formula. I decided in the end to construct a frame out of wood. Since wood seemed to be the top choice of the participants in my survey, especially for aesthetic reasons, this would be a good way to incorporate this preference into the final design, while still getting to maintain the comfort provided by the stress balls. Also, wood allows me to maintain a curvilinear form in the overall form of my chair due to its flexibility.

Chair construction

I first used the Autodesk AutoCAD program to design the chair to make sure that everything would work. This computer model would also give me a template for tracing and cutting out the wood portion of my chair. Using standard design specifications of chairs, I designed my chair to fit an average adult. I made a general outline of a chair form I liked (making sure it maintained curvilinear

qualities), and then altered it to contain the angles and spacing specified by the standard dimensions listed in the charts.

After receiving my shipment of 160 black unmarked stress balls, I went to the Architecture Woodshop, and drilled out a 5/8” hole through the middle of every ball using a drill press. I then purchased dowel rods, cut them down to size, and stained and lacquered them. To construct the exterior pieces of the chair, I bought a sheet of plywood, printed out a template from CAD, and traced the outline onto the plywood. I then used a ban saw to cut out the pieces, then sanded, stained, and lacquered them also. The final step was to thread the balls onto the dowel rods, and glue them into each side piece of the wood.

The final product can be seen in Figure 17 and was a chair that followed the restrictions of the formula that was created from the results of my survey. The last step of my experiment was to make another survey that included my chair in the question choices for color, form, and material. The results from this survey will find out how successful my design formula and chair design are, and will be explained in the next chapter.

Figure 17. Completed chair.

CHAPTER V

SUMMARY AND CONCLUSIONS

The final chapter in my thesis discusses the conclusions found as a result of my experiment, what was changed, and what its' future implementations are. I had originally planned to conduct my experiment using actual designer chairs that I would collect and allow participants sit in. While I liked the fact that having the chairs physically present created a more realistic survey environment, I did not have the resources available to gather this many all at one time and one place. By switching to an online survey, I was not limited to any number of chairs, and was able to reach more participants through email and social networking sites such as www.Facebook.com . I had also originally planned to interview prominent Industrial Designers for their opinion and knowledge on the subject. I decided to take this method out of the experiment due to the fact that it was harder to get concrete and correlative data from. Having one survey that I could control and get specific answers from helped maintain and produce accurate results. The third part of my original design changed at the end, when I decided not to create a second product based off the resulting design formula found from the survey results. Based off the results of my survey, responses and preferences of the participants seemed to change when the question was not generalized, but applied to a chair design. Since the resulting information seemed to be very specific to the creation and preference of chairs, I concluded that the formula could *not* be applied to the creation of other products as well as chairs.

My original hypothesis was that the results would show that products with an "eye-catching" characteristic or specific design quality would be preferred by the general consumer public, and they would choose the chairs form over its function. The results showed that this was partly false and partly true. Based on survey results and comments from the participants, consumers really desire chairs to look and be comfortable, and would gladly sacrifice aesthetic appeal for a more functional chair. Therefore form really does follow function in chair design. The results also show that participants were attracted to chairs that had some unique quality or idea to them, proving at least half of my original hypothesis was true.

This experiment showed me an interesting way to approach design and the design process. While a lot of high tech Industrial Design does start with thorough research and consumer opinions, I wouldn't say much furniture and small scale industrial design does. This methodical approach to a resulting chair design could be imitated in a lot of different areas of design, and can only improve the final design and consumer approval of the product. I think I approached the experiment in the correct way since it was successful and produced results that were accurate and could be applied to what I was trying to find. I would have liked more time to be able and resurvey my final chair design – possibly comparing it to others to get honest design feedback, or to tweak the design in the early stages of design, before producing it in actuality. I think the design formula created as a result of this experiment can be used by other designers to create a chair of their own designs, or

as a starting point or inspiration for similar approaches to the design method. The formula gives enough guidelines but remains broad enough for multiple designs to be interpreted and created from them. In the end, I think my research can have a small but significant impact on the design community.

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