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The Effects of Brand, Design, and Price on Intent to Purchase an Activity Tracker

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FLORIDA STATE UNIVERSITY
COLLEGE OF EDUCATION

THE EFFECTS OF BRAND, DESIGN, AND PRICE ON INTENT TO PURCHASE
AN ACTIVITY TRACKER

By

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TABLE OF CONTENTS

List of Tables	vi
List of Figures	viii
Abstract	ix
1. INTRODUCTION	1
1.1 Background of the Study	1
1.2 Significance of Study	3
1.3 Research Purposes and Questions	4
1.4 Definitions of Key Terms	6
1.5 Overview of the Chapters	7
2. REVIEW OF LITERATURE	8
2.1 Cue Utilization Theory (CUT)	8
2.2 Brand	13
2.3 Design	15
2.4 Price	19
2.5 Relationships between Product Cues, Perceived Quality, and Willingness to Buy	21
2.5.1 The Relationship between Brand and Perceived Quality	22
2.5.2 The Relationship between Design and Perceived Quality	23
2.5.3 The Relationship between Price and Perceived Quality	25
2.5.4 The Relationship between Perceived Quality and Willingness to Buy	28
3. METHODS	30
3.1 Research Design	30
3.2 Participants	31
3.3 Instruments	33
3.4 Scale Modifications	33
3.5 Data Collection	36
3.6 Data Analysis	37
4. RESULTS	39
4.1 Sample Characteristics	39
4.1.1 Response Rate	40
4.1.2 Demographic Characteristics	41
4.1.3 Participants' Preference among Six Activity Trackers	43

4.1.4	Participants' Product Cue Utilization for Perceived Quality and Willingness to Buy.....	44
4.2	Reliability Assessment.....	45
4.3	Assumption Tests.....	47
4.3.1	Assumptions for Product Cues-Perceived Quality Relationships.....	48
4.3.2	Assumptions for Perceived Quality-Willingness to Buy Relationship.....	53
4.4	Statistical Analysis of the Proposed Study Model.....	56
4.5	Summary.....	61
5.	DISCUSSION.....	63
5.1	Introduction.....	63
5.2	General Discussion of Findings.....	64
5.2.1	Question Items with Low Item-to-Total Correlations.....	64
5.2.2	Awareness of Activity Trackers.....	65
5.2.3	The Impacts of Product Cues on Perceived Quality.....	65
5.2.4	Product Cues Utilized by the Participants in the Groups of Nike Fuelband and FitBit Flex.....	67
5.2.5	The Relationship between Perceived Quality and Willingness to Buy.....	68
5.3	Contributions to the Field.....	68
5.4	Practical Implications.....	69
5.5	Limitations and Directions to Further Research.....	71
5.6	Conclusion.....	72
APPENDICES		
A.	LETTER OF CONSENT.....	74
B.	QUESTIONNAIRE.....	75
C.	HUMAN SUBJECTS COMMITTEE APPROVAL MEMORANDUM.....	78
D.	HUMAN SUBJECTS COMMITTEE APPROVAL MEMORANDUM (FOR CHANGE IN RESEARCH PROTOCOL).....	79
REFERENCES.....		80
BIOGRAPHICAL SKETCH.....		91

LIST OF TABLES

3.1	Product cues, original vs. revised	33
3.2	Revised items grouped by product cue	35
3.3	Items to measure overall product quality perceptions	35
3.4	Willingness to buy, original vs. revised.....	36
4.1	Response rate by LAP courses.....	40
4.2	Response rate of the visitors of a recreational center on the FSU campus	40
4.3	Finalized sample size and response rate	41
4.4	Demographic characteristics.....	42
4.5	Participants' preference among six activity trackers	43
4.6	The comparison of mean scores of product cues	44
4.7	The comparison of mean scores of product cues between the groups of Nike Fuelband and FitBit Flex.....	44
4.8	Internal consistency of items grouped by five factors	46
4.9	The table for multicollinearity	53
4.10	The correlations among the three product cues	56
4.11	Model Summary prepared from multiple regression.....	56
4.12	ANOVA prepared from multiple regression.....	56
4.13	The correlations between the product cues and perceived quality	57
4.14	Coefficients prepared from multiple regression	57
4.15	Model Summary prepared from simple regression.....	59
4.16	ANOVA prepared from simple regression	59
4.17	The correlation between perceived quality and willingness to buy.....	60
4.18	Coefficients prepared from simple regression	60

4.19 The results of hypothesis test.....61

LIST OF FIGURES

1.1	The proposed research model for this study	5
3.1	G power 3.1.7 output	32
4.1	Histogram for the distribution of the residuals (product cues-perceived quality)	48
4.2	Histograms for the distribution of the independent variables (product cues)	49
4.3	The partial regression plots for the relationships between product cues and perceived quality	50
4.4	The standardized residual scatterplot for homoscedasticity (product cues-perceived quality).....	52
4.5	Histogram for the distribution of the residuals (perceived quality-willingness to buy) ...	53
4.6	Histogram for the distribution of the independent variable (perceived quality).....	54
4.7	The scatterplot for the relationship between perceived quality and willingness to buy ...	54
4.8	The standardized residual scatterplot for homoscedasticity (perceived quality-willingness to buy).....	55
4.9	The multiple regression-based proposed study model with beta weights.....	58
4.10	The simple regression-based proposed study model with beta weight.....	60

ABSTRACT

As technology development has made the world better, the benefits of such development are also increasingly related to sports activities. Many sports devices have been combined with Information Technology (IT). One great example is an IT-combined sport device called “Activity Tracker.” It is a device that is worn on the body and records a user’s body status such as calories burned, steps walked, or heart rates. With people’s increasing attention to their health, it is expected that the popularity of the devices will increase. To aid in the sales of activity trackers in a competitive market, the manufacturers should be familiar with the impact of product cues such as brand, price, and design on consumers’ perceived quality, which will influence their willingness to buy.

The study was quantitative; paper and pencil questionnaires were utilized. The instruments were derived from three existing studies. The study participants were Florida State University undergraduate and graduate students; 200 questionnaires were distributed to students enrolled in Lifetime Activity Program (LAP) courses and/or visiting a recreation center on campus. The final sample size was 144 participants. The data was analyzed using several statistical methods with PASW Statistics 20.0. From the descriptive statistics, the frequency counts and/or mean scores were computed for profiling the participants. The Cronbach’s alpha scores, and item-to-total correlations were utilized to assess the internal consistency of the factors measured with the questionnaires. The assumptions of multiple regression, including as normality, linearity, homoscedasticity, and multicollinearity were assessed. Multiple regressions were utilized to gauge the extent to which price, brand, and design influence perceived quality. As the final step, a simple regression was utilized to measure the relationship between perceived quality and willingness to buy.

Examination of this data revealed several significant results regarding the relationships between product cues, perceived quality, and willingness to buy. While brand ($t=6.779$; $p<.05$; $\beta=.522$) and design ($t=5.934$; $p<.05$; $\beta=.450$) had a positive impact on perceived quality, price ($t=-1.681$; $p>.05$; $\beta=-.139$) had no significant impact on perceived quality. Perceived quality ($t=6.060$; $p<.05$; $\beta=.453$) had a positive impact on willingness to buy; however, the variance (20%) accounted for in willingness to buy was low, meaning that there may be mediating variables between perceived quality and willingness to buy.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Technology development has made it possible to produce smaller components and parts and apply them to many devices and machines that are commonly used in our lives. For example, the development of computer technology has made it possible for functions that were previously associated with a desktop or laptop can now be utilized with small handheld devices such as PDAs, smartphones, and tablet PCs. The benefits of technology development are also increasingly related to sports activities.

One example technology development with sports is Nike's line of products called "Nike Plus and Nike Fuel Band." These devices are known as activity trackers. When they were first introduced to the public, these were not well-known or recognized as a new sports product. However, the company invented the products because they recognized people are increasingly striving to achieve healthier lifestyles, including fighting obesity, and other health-related issues. These products work on their own or with handheld devices to show users' body status in detail, such as calories burned, steps, and miles walked or run. In addition, these devices also show the users' daily activity goals so that individuals can monitor how much they need to move or exercise to reach their goals. These devices may help motivate people to be more active. After Nike developed these products, other companies such as Adidas and Garmin began making similar offerings.

While other companies are now developing similar devices, activity trackers in general are not yet very popular, and many sport consumers do not even know such devices exist. However, people's increased attentions on health-related issues have led to a decline in the rate

of chronic conditions such as obesity and diabetes (Dwyer-Lindgren, Freedman, Engell, Fleming, Lim, Murray, & Mokdad, 2013). Dwyer-Lindgren et al. (2013) also mentioned that increased attention to health issues have motivated people to be more active. In other words, nowadays people are paying more attention to their health and trying to manage their bodies to become healthier. With people becoming more health conscious, it is possible that activity trackers will be recognized by more people and become a “must-have” sports accessory for those seeking a healthier lifestyle. In other words, there is a window of opportunity to increase the sale of activity trackers.

To stimulate the sale of activity trackers additional efforts should be made by manufacturers to identify target consumers and take steps to increase product awareness. To make it happen, the companies should first know what component(s) of an activity tracker are attractive to consumers. There are three noticeable differences among existing activity trackers in the market: brand, price, and design. Better understanding the role the variables may play in consumer decision making has the potential to positively impact sales of activity trackers.

There are several brands of activity trackers. Some are well-known brands such as Nike, FitBit, Motorola, and Jawbone. Other brands are relatively unknown such as BodyMedia, Lark, and Striiv. Activity trackers produced by well-known companies (e.g., Nike) may reach more consumers than lesser known brands because popular brands usually have percentages of market share. Consumers are likely to pay more attention to activity trackers produced by well-known companies.

Activity trackers in the current market have different prices. For example, the lowest price and the highest price among the brands mentioned above are \$59.95 and \$249.99. Even

though those activity trackers are classified in the same category, they have vastly different prices, which are likely to influence consumers' choices.

There are also different types of designs among activity trackers. Activity trackers produced by Nike, Larklife, Jawbone, and FitBit are designed like bracelets with LED lights. Some activity trackers resemble watches, and others are designed in clip-on style and are meant to be slipped in a pocket or clipped a wrist belt. Such different designs may also influence consumers' decisions whether to purchase an activity tracker, and which tracker to purchase.

1.2 Significance of Study

Consumers may not have any idea about activity trackers before they purchase or use one in their daily lives, and their uncertainty about the product when contemplating a purchase will likely be high. Consumers are likely to seek out product information such as product reviews to help them make a purchase decision. Brand, price, and design are elements of product information that are also recognized as product cues that consumers can easily detect, and which can influence decision making.

Brand and price are product attributes used by consumers to estimate product quality or evaluate products (Lee & Lou, 2011). Ulgado and Lee (1993) also indicated that extrinsic product cues such as brand and price are considered as product quality indicators. The results of a study conducted by Szybillo and Jacoby (1974) provide evidence that intrinsic cues such as design and product compositions significantly influenced consumers' product quality perception judgments. Thus, brand, price and design are important factors for consumers' product quality perceptions and evaluations.

Consumers' product quality perceptions are a key to willingness to buy. To begin, product evaluation is "consumers' judgments and choices among alternatives based on marketer provided cues and on other sources of information about product characteristics" (Lee & Lee,

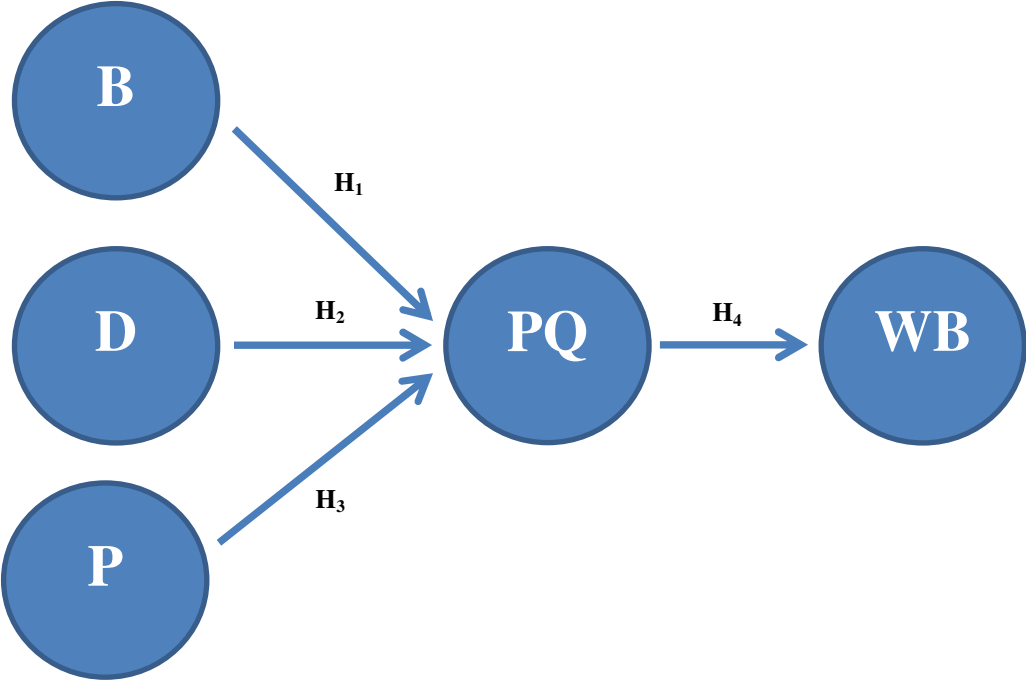
2009, p. 142). If a consumer perceives a product as high quality, the product evaluation of the consumer will be positive. On the other hand, if the consumer perceives the product as low quality, the product evaluation will be negative. Lee and Lee (2009) also defined willingness to buy as an individual's intention to buy a product or a "conscious plan to make an effort to purchase" (p. 142) a product. If a consumer perceives a product as high quality and evaluates the product positively, we can surmise that the consumer prefers the product to its alternatives. Chu, Choi, and Song (2005) indicated that high and positive product preference results in an increase in consumers' willingness to buy. Cronin and Taylor (1992) also found that positive perceived quality leads to higher consumer satisfaction, which has a significant, positive effect on consumers' willingness to buy.

Product cues play an important role in consumers' product evaluations. Brand, price and design can be signals that consumers of activity trackers use to perceive quality, and the perceived quality may influence their willingness to buy an activity tracker. To design better marketing plans, sports product companies or manufacturers producing activity trackers should be familiar with the process through which product cues such as brand, price, and design influence perceived quality, which will influence willingness to buy at the end. Being familiar with the process will help the companies or manufacturers of activity trackers develop better products that can lead to better quality perceptions and increase consumers' willingness to buy. Lastly, analyzing cues of activity trackers in order to know which cue has more or less influence on consumers' purchase decisions will help companies and manufacturers to not only reach consumers more effectively, but also increase awareness and the sales of the devices.

1.3 Research Purposes and Questions

Based on the three remarkable differences between activity trackers, brand, price, and design, I proposed to investigate what component(s) most influenced consumers' perception of

product quality, and the extent to which perceived quality influenced willingness to buy. The research model for this study is illustrated below:



B: Brand D: Design P: Price PQ: Perceived Quality WB: Willingness to Buy

Figure 1.1. The proposed research model for this study

I expected that each of the three cues, brand, price, and design, would have a significant effect on consumers' perceived quality, and their quality perceptions would influence their willingness to buy an activity tracker. Accordingly, the purposes of this study were to examine (1) the relationship between the three cues and perceived quality, (2) which cue positively influenced consumers' perceived quality the most, and (3) the extent to which the

quality perception formed by each of the three cues influenced consumers' willingness to buy.

To meet the purposes, the study was directed by three research questions:

1. Are the cues of activity trackers positively related to perceived quality?
2. Which cue significantly influences perceived quality?
3. Is perceived quality positively related to consumers' willingness to buy an activity tracker?

The answer to the first question was expected to be an important result and to guide the answering of the two remaining questions. The answer to the second question will give sports companies or manufacturers producing activity trackers a better sense which cue they should focus on to attract consumers. Lastly, the answer to the third question is expected to inform the companies or manufacturers of how the quality perceived by consumers influences their willingness to buy an activity tracker.

1.4 Definitions of Key Terms

Intrinsic cues: "product attributes such as ingredients, taste, and size that are actually part of the physical product itself" (McCarthy & Norris, 1999, p. 269)

Extrinsic cues: "attributes such as brand name, price, and packaging that are not a part of the physical product itself" (McCarthy & Norris, 1999, p. 269)

Confidence value (CV): "the degree to which a consumer has assurance in his or her ability to accurately judge a particular cue" (Fejes & Wilson, 2012, p. 321)

Predictive value (PV): "a measure of a consumer's perception that a cue is a valid indicator of one or more subjective attributes" (Sullivan & Burger, 1987, p. 64)

Brand: “the name, term, sign, symbol, or design, or a combination of them, intended to identify the goods or services of one seller or group of sellers and to differentiate them from those of competitors” (Kotler, 1991, p. 442)

Price: “what is given up or sacrificed to obtain a product” (Zeithaml, 1998, p. 10); “objective external characteristic of a product that consumers perceive as a stimulus” (Dodds, Monroe, & Grewal, 1991, p. 308)

Design: “different aspects of the structure of an object, as well as the choices about various parameters through which the object is created” (Rindova & Petkova, 2007, p. 218).

Perceived quality: “a judgment usually made within a consumer’s evoked set” (Zeithaml, 1988, p. 3)

Willingness to buy: people’s capability to buy or being willing and capable of buying a product (Marton & Pong, 2005)

1.5 Overview of the Chapters

The remainder of the proposal is arranged as follow. Chapter 2 includes a review of previous literatures and research findings, and the hypotheses. Chapter 3 presents the methods for the proposed study, and includes descriptions of the research design, participants, instruments, scale modifications, data collection, and data analysis. Chapter 4 presents the statistical results of the proposed study model and the summary of the results. Lastly, Chapter 5 consists of the introduction of the chapter, general discussion of the findings, contributions to the field, practical implications, limitations and directions to further research, and the conclusion of the chapter.

CHAPTER TWO

REVIEW OF LITERATURE

The content in this chapter consists of a review of previous literature relative to Cue Utilization Theory (CUT), brand, design, price, perceived quality and willingness to buy. Through this chapter I will first explain Cue Utilization Theory (CUT) as the theoretical background of this study. I subsequently explain the three variables, brand, price, and design, and the relationships between each of the three variables and perceived quality, and the relationship between perceived quality and willingness to buy as hypothesized in the proposed model (see Figure 1.1). Research hypotheses are provided at the end of each section where appropriate.

2.1 Cue Utilization Theory (CUT)

Buying a product is not an easy task. According to Akdeniz, Calantone, and Voorhees (2013), since product quality is not always easily identified, “consumers generally make their purchase decisions while experiencing feelings of uncertainty” (p. 76). For example, when a sports consumer plans to buy a tennis racket, the consumer may first think about his/her level of play. Based on the perceived level of play, the consumer will then compare rackets based on variables such as price, brand, feature, and design, to assess value and quality in order to purchase the most appropriate racket. If a particular racket has no competitors or there is no alternative to consider, the consumer of the product does not need to spend time thinking and comparing. When there are competing products though, consumers will have to make comparisons.

Almost all products have competitors, and the quality differences among competing products may not be easily recognizable. It is difficult, if not impossible, for consumers to avoid

comparing competing products before selecting the product they will purchase. Consumer purchase decisions, however, “are frequently made under conditions of varying uncertainty regarding the product and its attributes” (Jacoby, Olson, & Haddock, 1971, p. 570). To overcome uncertainty consumers are likely to try and find product cues that will provide some ideas about the products in which they are interested (Akdeniz et al., 2013). Unfortunately, consumers will face increased uncertainty or complexity when making purchase decisions because the number of competing products is increasing as time goes by (Sullivan & Burger, 1987). Thus, manufactures have to consider how consumers process product information and assess variables such as quality and value. In addition, they need to make their products’ cues more remarkable so that consumers will be attracted to a focal product, and have positive thoughts about product quality.

The importance of product cues may be understood through Cue Utilization Theory (CUT) (Cox, 1967; Olson & Jacoby, 1972). CUT helps us to understand how consumers process product cues to assess product quality and make purchase decisions. According to Clement, Kristensen and Grønhaug (2013), this theory is based on the presumption that “consumers might formulate a set of personal criteria, explore several options, evaluate them and then select the best among alternatives” (p. 235). In reality, Acebrón and Dopico (2000) explained that consumers make “inferences about products from cues available in the sales outlet” (p. 229). In addition, Lee and Lou (2011) mentioned that consumers rely on product cues to evaluate and make an appropriate purchase decision. Through CUT, products are described as “an array of cues” (Cox, 1967, p. 324). These cues serve not only “as surrogate indicators of quality to shoppers” (Richardson, Dick, & Jain, 1994, p. 29), but also “as signals to consumers that enables consumer decision making” (Dwivedi & Merrilees, 2013, p. 451). According to Fejes and

Wilson (2012), “the consumer’s task in the process of evaluating any given product is to utilize cues from the array in order to make evaluative judgments about the product” (p. 321).

Jacoby et al. (1971) enumerated the product cues that are utilized to form impressions of quality: (1) price, (2) product composition characteristics, (3) brand (manufacturer), (4) advertising, (5) word-of mouth reports, and (6) past purchase experience. “These cues are dichotomized as either intrinsic or extrinsic to the product” (Reimer & Kuehn, 2005, p. 786). Reimer and Kuehn (2005) explained that intrinsic cues are attributes that physically exist in the product such as size and design, whereas extrinsic cues are attributes such as price and brand that do not exist in physical forms in the product.

Based on the definitions, it can be seen that extrinsic cues are flexible and can be changed relatively easily; however, intrinsic cues cannot be easily altered unless there are physical changes to a product (Richardson et al., 1994). For example, price (an extrinsic cue) can be easily changed without any physical force, while design or size (intrinsic cues) requires some physical force to literally alter the physical make-up of a product. Lee and Lou (2011) also explained the distinction between intrinsic and extrinsic cues, noting that “extrinsic cues, when compared to intrinsic cues, are more general and applicable to a wider range of products, whereas intrinsic cues are specific only to a particular product” (p. 22). For example, Nike sells many soccer cleats with different colors, designs, materials, and stud configurations. In this example the brand, “Nike” is an extrinsic cue that is related to all cleats the company produces, whereas colors, designs, materials, and stud configurations, which are regarded as intrinsic cues, are only applied to a particular pair of cleats. Extrinsic cues tend to be highly visible information that consumers can easily process, compared to intrinsic cues. For this reason, “consumers are

generally more familiar with extrinsic cues than intrinsic cues, and thus tend to rely more heavily on them when evaluating products” (Lee & Lou, 2011, p. 22).

Extrinsic cues are used by consumers to make judgments about variables such as quality and value. According to Leavitt (1954), consumers believe that high-priced (extrinsic cue) products come with “extra quality or extra value or extra prestige” (p. 206), which makes them select and purchase higher-priced products. Extrinsic cues seem to provide more explicit information than intrinsic cues, and as a result are likely to be used more by consumers. However, Miyazaki, Grewal, and Goodstein (2005) argued that consumers use intrinsic cues more than extrinsic cues when they formulate evaluations of products in which they are interested. Karaatli and Veryzer (2012) also mentioned that since intrinsic cues provide more predictive value than extrinsic cues, they are recognized as more important cues for consumers’ product quality judgments. Thus, intrinsic and extrinsic cues are different from each other and have different characteristics and effects. However, no matter which type of cue is used, it is an undeniable fact that both cues are important information for consumers’ product evaluations. For this reason, manufacturers should focus on making those two types of cues more attractive and attention getters so that their products can be outstanding among alternatives or competitors.

Consumers do not only use intrinsic and extrinsic cues to evaluate products. They also use values of those two types of cues for their product evaluations and final purchase decisions. There are two types of values used by consumers to assess products: predictive value (PV) and confidence value (CV) (Woodside, 2012). Sullivan and Burger (1987) defined PV “as a measure of a consumer’s perception that a cue is a valid indicator of one or more subjective attributes” (p. 64). In addition, “it is also the degree that consumers link a certain cue to quality, which expresses the reliability of the cue and accuracy of judgment” (Yang, 2012, p. 1115). For

example, the weight of a performance hybrid bike may be a good indicator for consumers to predict how fast and comfortable the bike is when riding. In addition, the tread design of a golf club grip will be a good indicator for golfers to predict how it will effectively help golfers to hold a club when hitting a ball.

Fejes and Wilson (2012) defined CV as “the degree to which a consumer has assurance in his or her ability to accurately judge a particular cue” (p. 321). For example, when a consumer is about to buy a pair of shoes with an air cushion underneath the sole, both the consumer and the shoe designer will believe that the air cushion is a good indicator of comfort. However, the shoe designer will be more confident than the consumer in distinguishing how the shoe design is different from the design of other shoes. For this reason, the designer’s CV will be much higher than the customer even though both assign a high PV to the shoe design as a cue.

Predictive value (PV) and confidence value (CV) serve as indicators as to how important a cue is (Lawley, Birch, & Hamblin, 2012). If a cue has a high PV and CV, it may be considered as “the greatest weight in the consumer assessment process” (Jha, Deitz, Babakus, & Yavas, 2013, p. 158) and “will play a key role in value estimation” (Yang, 2012, p. 1115). Yang (2012) also mentioned that if “intrinsic cues are unavailable, their PV or CV or are both very low, consumers tend to use extrinsic cues” (p. 1115) and vice versa. In other words, cues will be only used in consumers’ product evaluation process when cues possess high PV and CV (Castleberry & McIntyre, 2011). However, in reality, “the confidence value assigned to extrinsic attributes, such as price and brand, is generally higher than the confidence value assigned to intrinsic attributes because extrinsic attributes are more easily recognized and processed” (Wells, Valacich, & Hess, 2011, p. 375). In the context of the proposed study, three variables are included as product cues: brand, design, and price.

2.2 Brand

As the theoretical background for this study, Cue Utilization Theory (CUT) provides the means through which to explain that a brand is an extrinsic cue for a product. Dolak (2003) defined a brand as “an identifiable entity that makes specific promises of value” (p. 1). Kornberger (2010) explained that “brands are interfaces: they mediate between production and consumption; between the planned system of organization and market force; between control and desire” (p. 22). Martin, Stewart, and Matta (2005) simply defined a brand as “the most fundamental and long-lasting assets of a firm” (p. 275). Kotler (1991) defined brand as, “the name, term, sign, symbol, or design, or a combination of them, intended to identify the goods or services of one seller or group of sellers and to differentiate them from those of competitors” (p. 442).

The preceding illustrates there are different definitions of brand. While there may not be a consensus on the specific wording, it is clear that a brand is an important asset for an organization. A brand is important for an organization and for consumers. Developing a strong brand is one way in which marketers can try to make a product remarkable.

A brand has several roles. To begin with, Srinivasan and Till (2002) mentioned that managers use a brand to “reduce uncertainty about product performance” (p. 417) and “signal product quality” (p. 417). In reality, a brand may be recognized as a risk reducer by consumers because they can see brands as “a guarantee of consistent quality” (Chernatony & Riley, 1998, p. 420). In addition, Srinivasan and Till also argued that “brands help to differentiate a product from other competitors in the product category” (p, 417). For example, “Nike” and “FitBit” are branded companies, and both companies have produced the same devices called “activity

trackers.” Even though the devices fall into the same product category, they are differentiated because of their brands.

A brand also provides important leverage to companies so that they can get into new product categories more easily (Tauber, 1981). Nike did not produce any information technology (IT)-combined sports devices before a small transmitter attached to or embedded in a shoe called “Nike Plus.” If the brand of Nike were not popular and strong, they may have faced some difficulties to get into IT-related product categories. However, Nike is a well-known global sports brand, so the product was leveraged through the Nike brand. As a result, the company could later produce another IT-related sports product called “Nike Fuelband,” which is now gaining in popularity.

According to Heiman and Muller (1996), a brand is used by consumers “to identify product quality and refine their choice” (p. 422). In fact, brands “have been shown to have a significant but moderate effect on buyers’ perceptions of quality” (Dodds et al., 1991, p. 309). For this reason, Rao and Ruekert (1994) assumed that a brand reduces a buyer’s shopping effort by providing information about the product’s expected quality. They also proposed that one main purpose of a brand is “to give consumers information about product quality.” In addition, a brand “is seemingly to enhance the effect of price on buyer’s quality perceptions” (Dodds et al., 1991, p. 309). Thus, a brand “will influence consumers’ evaluation and subsequently, affect the buying decision” (Chow, Chen, Yeow, & Wong, 2011, p. 46).

How a brand works in consumers’ evaluations of products may occur in the same way for activity trackers. I expect that consumers who are interested in purchasing an activity tracker will prefer a device produced by a well-known brand, compared to a device produced by a company with a less-popular brand, thinking about the product quality. In addition, consumers

may feel more confident buying an activity tracker with a well-known than one produced by a company with a lesser known brand.

2.3 Design

Design denotes “different aspects of the structure of an object, as well as the choices about various parameters through which the object is created” (Rindova & Petkova, 2007, p. 218). Design is the most explicit product attribute because it shows how products are formed. Bloch (1995) mentioned that design is “the most fundamental characteristic of a product” (p. 16). Design is also referred to as “the choices along the parameters related to color, material, shape, and proportion” (Rindova & Petkova, 2007, p. 218). Since design is a physical attribute that can be easily identified by consumers, it is one of the most important cues used by consumers to evaluate products.

According to Crilly, Moultrie, and Clarkson (2004), design is “a critical determinant of consumer response and product success” (p. 547). They also proposed that consumers interpret designs by interacting with products to evaluate quality and value because they cannot know meanings of products directly from the designers. Blijlevens, Creusen, and Schoormans (2009) argued that if companies can show certain meanings of products through designs, they may have a competitive advantage and increased possibilities of products’ success. In addition, Page and Herr (2002) contended that design is “gaining increased attention as a strategic tool that firms can use to gain a sustainable competitive advantage” (p. 133). In other words, products should be well-designed to deliver meanings of products to consumers as much as possible.

Krippendorff (1989) also emphasized that product designers should design products which are understandable or meaningful, so consumers can easily interpret the purposes and meanings of the designs. For example, if a designer of soccer cleats makes the design of a pair

of cleats complicated and convoluted, consumers may face difficulties in understanding the meaning of the design and may not be attracted to the product. However, if the designer considers consumers and designs the cleats to be fitted to their purpose and with simple design, consumers may easily understand the meaning, which will increase their purchase intentions. Thus, companies ought to first understand customer needs and produce products that meet the customer needs (Khalid & Helander, 2004), and product designers should design products that express “the connotative and denotative meanings” (Hsu, Chuang, & Chang, 2000, p. 376).

The preceding helps to illustrate that design has several roles. According to Creusen and Schoormans (2005), there are six roles that design plays: communication of aesthetic product information, communication of symbolic product information, communication of functional product information, communication of ergonomic product information; attention drawing, and categorization. Following is a brief explanation of each role.

Aesthetic information is what consumers perceive and appreciate about a product itself, without the influence of other factors such as functions (Holbrook, 1980). Mahlke (2007) defined aesthetic information as “the sensual experience a product elicits and the extent to which this experience fits individual goals and spirits” (p. 2). Veryzer and Hutchinson (1998) mentioned that “Aesthetic aspects of a product are a potential source of pleasure for the consumer” (p. 374). In addition, Kreuzbauer and Malter (2005) posited that designs that are aesthetically appealing bring positive consumer evaluations. Crusen and Schoormans (2005) also stated that “when product alternatives are similar in functioning and price, consumers will prefer the one that appeals the most to them aesthetically” (p. 65). For example, if a consumer is hesitating about what to pick among three different pairs of shoes having similar price and functions, the consumer may pick one that is most aesthetically pleasing.

Design may also deliver symbolic information. Mahlke (2007) defined symbolic information as “the meanings and associations that are caused by the products” (p. 2). Crusen and Schoormans (2005) mentioned that symbolic information is a key determinant that influences consumers’ product selections. They also argued that such information may exist in products or brands. For example, “Nike” and “Adidas” are global sports brands that are well-known around the world, and people perceive both as high quality sports brands. In this case, high quality can be seen as a symbol attached to those two brands. According to McCracken (1986), a product should “leave the designer’s hands with its new symbolic properties displayed” (p. 77) in physical properties so that the meaning the designer infused in a product can be surely delivered to consumer. In other words, products can directly deliver their symbolic values with their designs. For example, golf drivers produced by “Taylormade” are designed differently than other drivers. They are designed with various colors such as matte black or matte white with some orange stripes, and they are also designed with a weight on the underside of the drivers. The colors and weight makes the drivers look more dynamic and stable, which may be symbolic to consumers. Thus, the way that a product is designed and what meaning a product designer infuses may make products symbolic and has the potential to attract consumers more effectively.

Design also delivers functional information to consumers. Functional information refers to “the utilitarian functions a product can perform” (Creusen & Schoormans, 2005, p. 67). Veryzer (1995) argued that functional information of products is “thought to fall almost entirely within the domain of engineering design” (p. 643), so it seems to be relatively straight forward. In other words, designs are forms or configurations that determine what products can be used for (Veryzer, 1995). A simple example of functional information of a product in sports can be a football helmet. Football players may expect their helmets will protect their heads when

crashing into opponents. Another example can be a golf driver. Consumers might expect that they can hit a ball more accurately and longer with a larger head driver. Thus, design is an important factor that directly or indirectly tells consumers product functions.

The ergonomic information of a product is “the adjustment of a product to human qualities” (Creusen & Schoormans, 2005, p. 67). Designs may include a suggestion of how ergonomic they are. For example, touch screen smartphones can be an example of ergonomic information of a product. Such phones do not have a lot of buttons and are more easily operated by touch. According to Bloch (1995), ergonomic information of a product involves “the matching of a product to the target user’s capabilities to maximize safety, efficiency of use, and comfort” (p. 18). Designers should consider future users’ demands and reflect the demands in designs. For example, a shoe line in Reebok called “ZIG TECH” is an example of a design that delivers ergonomic information. There is a big difference between the Reebok shoes and other running shoes, which is the outsole. Reebok’s running shoes called “ZIG” have zigzag-shaped outsoles so that runners can run with more comfort. In addition, the outsole design not only attracts consumers, but also allows them to perceive comfort and incredible cushioning. Thus, design is an important factor that consumers use to perceive ergonomic aspects of a product.

Lastly, design can involve factors that attract consumers’ attentions and categorize a product (Creusen & Schoormans, 2005). According to Schoormans and Robben (1997), “attention refers to the momentary focusing of information processing capacity on a particular stimulus” (p. 274). Designs are one facet of product stimuli, so it may be natural for designers to take a lot of time on design processes so that the products are attractive and eye-catching. Creusen and Schoormans (2005) found that “attention-drawing ability of a product can be enhanced” (p. 68) by changing designs.

In addition, design can help people categorize a particular product. In fact, design is acknowledged as a major instrument to facilitate product categorization (Kreuzbauer & Malter, 2005). For example, shoes with studs can be classified as field sports shoes such as football and soccer; shoes that are designed with cushions and high cut at the ankles can be seen as basketball shoes. Thus, design is an explicit clue for consumers to easily categorize a product.

2.4 Price

The variability in product performance increases the uncertainty consumers feel when purchasing, which results in a decrease in reliance on prior expectations of products or services (Han & Ryu, 2009). “In such situations, consumers tend to use price as a cue of performance expectations” (Mattila & O’Neill, 2003, p. 328). As emphasized in the discussion of the theoretical background of this study, price is an extrinsic cue of a product that we, as consumers, consider before making purchase decisions. Lichtenstein, Ridgway, and Netemeyer (1993) also emphasized that price is an important marketplace cue because it is basic, but it is also important information that is shown in all purchase situations which tells how much consumers should pay in order to get a product.

Erickson and Johansson (1985) argued that price plays an important role in consumers’ product evaluations, which are, according to Völckner (2008), “a measure of sacrifice” (p. 359) and “an information cue” (p. 359). Dodds et al. (1991) mentioned that “price is an objective external characteristic of a product that consumers perceive as a stimulus” (p. 308). Price can be also seen, from the consumer’s perspective, as “what is given up or sacrificed to obtain a product” (Zeithaml, 1988, p. 10). For this reason, Zeithaml (1988) contended based on the argument of Ahtola (1984) that price cannot be seen as lower attribute of a product because it is what consumers should ‘give’ in order to get a particular product.

Based on the descriptions above, price has characteristics of sacrifice and information cue. However, the characteristic of sacrifice may imply that higher prices tend to decrease consumers' purchase probabilities because they need to sacrifice more money (Lichtenstein et al., 1993). It can be seen as a "negative role" (Lichtenstein et al., 1993, p. 234). However, higher prices do not always play a negative role. For example, when a consumer who is interested in buying a set of golf clubs has to select one set of clubs from the available supply, the consumer may evaluate the quality of clubs based on price and decide a higher-priced club set has better quality. In this case, higher prices play a "positive role" (Lichtenstein et al., 1993, p. 234). Thus, price has both positive and negative roles, depending on the situation.

Lichtenstein et al. (1993) have identified five constructs of the price perception that represent a negative role of price: value consciousness, price consciousness, coupon proneness, sale proneness, and price mavenism. Among those, value consciousness, price consciousness, and price mavenism are relevant to this study because they are the constructs that indicate how price can negatively affect consumers' price perceptions by itself, while coupon proneness and sale proneness are constructs that explain how consumers respond to a price discounted by a retailer, producer, or manufacturer through use of a coupon.

Value consciousness is "a concern for price paid relative to quality received" (Lichtenstein et al., 1993, p. 235). Consumers want the quality of products they purchase to be similar to what they pay for. For this reason, consumers usually become quality-sensitive when looking for and purchasing products. Price consciousness is "a buyer's 'unwillingness' to pay a higher price for a product and/or 'the exclusive focus' on paying low prices" (Sinha & Batra, 1999, p. 238). Even though consumers want to buy great quality products, they want to pay less than the actual value of the products. In this case, consumers become price-sensitive. Price

mavenism may be described as the degree to which individuals “not only gather information, but tend to share such knowledge, initiating shopping-related discussions and providing tips to others as to where the best prices are to be had” (Sternquist, Byun, & Jin, 2004, p. 88). Consumers sometimes get together and share their information such as the best place or store to buy a certain product at a discounted price. For example, there are forums online where people discuss and share information.

Lichtenstein et al. (1993) have also identified two constructs of the price perception that represent a positive role of price: price-quality schema and prestige sensitivity. They defined price-quality schema as “the generalized belief across product categories that the level of the price cue is related positively to the quality level of the product” (p. 236). In the case of prestige sensitivity, it is “favorable perceptions of the price cue based on feelings of prominence and status that higher prices signal to other people about the purchaser” (p. 236).

Thus, price is not a simple attribute in consumption markets and plays both positive and negative roles, depending on situations and consumers. For this reason, “setting prices for products represents one of the most critical decisions for managers” (Völckner, 2008, p. 359). To consumers who are interested in purchasing an activity tracker, price may work in the same way it works for other products. It can be also expected that some prices of activity trackers will work positively or negatively.

2.5 Relationships between Product Cues, Perceived Quality, and Willingness to Buy

Even though a consumer wants to buy a product, if the quality is not satisfactory, the consumer will not buy the product. In other words, product quality is an important factor to consumers when they make purchasing decisions. Zeithaml (1988) defined perceived quality as follows:

Perceived quality is (1) different from objective or actual quality, (2) a higher level abstraction rather than a specific attribute of a product, (3) a global assessment that in some cases resembles attitude, and (4) a judgment usually made within a consumer's evoked set (p. 3).

Teas (1993) defined perceptions as consumers' beliefs about the service or quality that they receive. Perceived quality is also "a global assessment characterized by a high abstraction level and refers to a specific consumption setting" (Tsotsou, 2006, p. 210). Based on the descriptions above, perceived quality is consumers' expectation regarding the quality of the products they are interested in or have already purchased. With the proposed model I plan to assess the influence of brand, price, and design of a product on consumers' quality perceptions.

2.5.1 The Relationship between Brand and Perceived Quality

Having a strong brand is important for not only companies but also consumers because it is an attribute that is easily identified by consumers and is also used by them to judge a product. According to Forsythe (1991), brand indicates some product features and influences "consumers' perceptions of product quality" (p. 1). Forsythe also argued that brand is information that may substitute for "a much larger set of indicators" (p. 1) of product quality. For this reason, the absence of brand "often results in the absence of information about quality" (Rao & Ruekert, 1994, p. 88). Researchers have found that a brand is one of the product cues that helps consumers "form their impressions of quality" (Davis, 1985, p. 671), and it is also a crucial product cue to enhance the perceptions of product quality (Davis, 1985). Nevid (1981) reported that the brands of carbonated bottled water beverages heavily promoted or advertised were highly rated compared to other bottled water beverage brands that were not well advertised or promoted. Wheatley, Walton, and Chiu (1977) explained that a well-known brand was found to "enhance the perceived quality of skis for both skiers and non-skiers" (p. 72). They also discovered that consumers have lower quality perceptions of an unknown or little known brand.

According to Purohit and Srivastava (2001), brand is a high-scope cue that is less dependent on other cues. For example, “Adidas” is a well-known global sports brand, and most consumers do not doubt the product quality, in part because they are popular globally. In other words, the brand Adidas does not necessarily need other attributes to enhance a consumer’s quality perceptions, and can stand alone as a guarantee of high quality.

Companies or manufacturers should take care of their brands and images. Richardson et al. (1994), Jacoby et al. (1971), and Severi and Ling (2013) identified that product quality perceived by consumers is highly relative to brand and image. If a company keeps producing low quality products, consumers may perceive the company as a bad company and will have negative images attached to the brand. The image of bad quality will come up in consumers’ minds when they see the company’s brand. Unfortunately, the company’s brand and products will become Must-Avoid. According to Malai and Speece (2005), building a strong brand depends on how well companies or manufacturers deliver great service or qualified products to their consumers. They also mentioned that a brand “can foster customer fulfillment, frequently by implicitly or even explicitly communicating in terms of superior customer value” (p. 14), which may result in positive quality perceptions based on brand. Consequently, companies or manufacturers should manage their product quality to make their brands provide better value to consumers and lead to perceptions among consumers that a product is “high quality.” Based on the previous studies and their findings, a brand may enhance consumers’ perceptions of quality. Thus, I hypothesize the following:

H₁: Brand will have a positive impact on perception of product quality.

2.5.2 The Relationship between Design and Perceived Quality

Brand is not the only cue that aids consumers’ product evaluations; other factors that influence perception of quality include information about a product’s features, meanings, and

value. Another important factor is design, which is the most explicit attribute that consumers may easily detect and utilize as a cue to assess the quality of a product.

Consumers' expectations regarding design have increased, which has made consumer markets more competitive and consumers' product selection processes more complicated. In such a competitive market place, "satisfying consumers' needs and tastes has become a great concern of almost every company" (Yan, Huynh, Murai, & Nakamori, 2008, p. 2). Karnes, Sridharan, and Kanet (1995) emphasized that consumers are "the ultimate judge of quality" (p. 215). Product designers must work to make products remarkable and attractive to not only catch a consumer's eye, but also to communicate information about product quality.

Bhuian (1997) concluded that design "is positively related to the perceived quality of the product" (p. 221). For this reason, many companies invest extensively in improving the designs of their product (Bhuian, 1997). For example, among automobile manufacturers, European companies such as BMW, Benz, and Audi are recognized by consumers as luxury automobiles. A South-Korean automobile company, "Kia" hired the former chief designer Peter Schreyer at the German automobile company "Audi," to give their automobiles European designs and luxurious looks. The company's strategy has been successful and attracted more consumers. In addition, consumers' quality perceptions of their automobiles have positively increased.

How a product is designed or looks can influence perception of product quality. Hoegg and Alba (2011) realized that designs are visual information that can be a reliable indicator of product quality, especially in terms of functional performance and durability. For example, recent golf drivers tend to be bigger and wider, which is supposed to indicate stable drives; golf shoes that are designed with spike outsoles are presumed to offer consumers better stability during the golf swing than shoes that are designed with spike-less outsoles. In addition,

consumers may identify product quality through materials that are used to design a product or product exteriors (Hoegg & Alba, 2011).

Thus, aesthetics, performance, and durability are dimensions of product quality that are important elements in design (Horn & Salvendy, 2006). Consumers may perceive product quality through examining such dimensions and make judgments about whether the quality is satisfactory. For this reason, companies or manufacturers should attend to the quality dimensions when designing a product that not only “corresponds to consumer taste and preference” (Han & Hong, 2003, p. 1441) but also results in better consumers’ quality perceptions.

According to Wang (2013), consumers tend to form product quality perceptions when they are exposed to or evaluate visual information regarding a product such as design. Honea and Horsky (2012) and Venter, Merwe, Beer, Kempen, and Bosman (2011) also mentioned that designs are the first observable visual stimuli or product signal for consumers’ quality perceptions. Sehrawet and Kundu (2007) suggested that companies or manufacturers should design products that explicitly show quality as much as possible because design is “the face of a product” (p. 630) that is believed to have an important influence on consumers’ buying decisions, especially “at the point of sale” (p. 630). Therefore, the following is hypothesized:

H₂: Design will have a positive impact on perception of product quality.

2.5.3 The Relationship between Price and Perceived Quality

When consumers perceive product prices, they expect product quality to be comparable to what they pay. If the same product types that are, however, differently priced, consumers might expect that the higher-price product will be a better quality product. From that perspective, it seems that consumers “are more likely to use price as an indicator of quality”

(Rao & Monroe, 1989, p. 352). Price specifically serves as quality indicator when consumers have “little previous experience with the product or potential risk or uncertainty” (Peterson, 1970, p. 525). Gerstner (1985) also mentioned that the information about price is important because quality is rarely detectable at a glance and “consumers engage in relatively little information search” (p. 209). Thus, “price and the perceived quality of goods and services have a high, positive correlation” (Sjolander, 1992, p. 34).

Sjolander (1992) also explained that “quality is a measure of the utility or the want-satisfying capacity of products” (p. 34). A product thought of as “high quality” is expected to contain more utility or want-satisfying capacity, and the product tends to be priced higher (Sjolander, 1992). The higher the quality of a product, the higher the price is likely to be; accordingly, consumers naturally perceive a higher-priced product as having higher quality. In other words, “consumers impute quality on the basis of price” (Tull, Boring, & Gonsior, 1964, p. 186). As such, price is an important factor to consider in determining how quality is perceived (McConnell, 1968).

Based on the preceding information, price may be considered an influential factor when assessing consumers’ quality perceptions. The relationship between price and perceived quality is what companies or manufacturers should significantly focus on (Curry & Riesz, 1988). However, “the value of price in consumer’s perceptions of quality may depend on the availability of additional product information” (Woodside, 1974, p. 116). Peterson and Jolibert (1976) also argued that unless price is the only product information signaling quality, other information such as brand image or prior product experience will diminish the influence of price. In other words, price can be an indicator of product quality, but the influence will be less when other product information is available. Several studies provide evidence of this point, that “the

saliency of price in quality perceptions was negligible under conditions when other informational cues are available to consumers” (Woodside, 1974, p. 116). Other cues include prior product experience, brand image, or brand reputation. Thus, Stafford and Enis (1969) suggested that consumers’ quality perceptions may vary directly with price under the condition that price is the only product information for product quality.

Researchers have shown that the relationship between price and perceived quality varies based on the types of product: durable and non-durable. Durable products are things that “survive for long periods of time and are often possessed by many different people over the life of the good” (House & Ozdenoren, 2008, p. 452), while non-durable products only survive for short-periods of time and are usually owned by one person. When a consumer buys a durable product such as golf clubs or a tennis racquet, the consumer will not purchase another such item until the product is broken or becomes useless. However, consumers purchase non-durable products frequently, as soon as (or shortly after) the product has been consumed. Due to the longer lifespan, consumers do not frequently purchase durable goods; as such, many consumers are less knowledgeable about durable goods (Völckner & Hofmann, 2007). Lichtenstein and Burton (1989) concluded that the limits on knowledge weaken the quality evaluations for durable goods, so “consumers may be more likely to use price as an indicator of quality for durable goods” (p. 432). In addition, researchers have reported that the relationship between price and perceived quality for non-durable goods is less significant or highly variable (Brucks, Zeithaml, & Naylor, 2000), because consumers have other product cues besides price such as past experience or knowledge, which also influence their quality perceptions.

Activity trackers are a durable good, so it may be expected that there will be a strong relationship between price and perceived quality. However, the model for this study has other

product information cues: brand and design that may weaken the influence of price for perceived quality. Therefore, I hypothesize the following:

H₃: Price will have a positive impact on perception of product quality.

2.5.4 The Relationship between Perceived Quality and Willingness to Buy

Consumers want to buy a product with a feeling of certainty. However, it may be difficult to feel certainty until they have consumed a product. In other words, even though consumers perceive quality based on product information, they may remain doubtful until they actually buy and use products. Consumer uncertainty makes them perceive risk in products before they buy. Peter and Ryan (1976) mentioned that perceived risk is equivalent to the concept of uncertainty. According to Sweeney, Soutar, and Johnson (1999), risk is a potential sacrifice consumers worry about, so “the higher the perceived risk, the more consumers must gamble in buying the product” (p. 78). From that perspective, it can be said that the lower the perceived risk, the better the perceived quality, which may increase the willingness to buy. Accordingly, consumers conduct pre-purchase searches “to reduce their uncertainty about the decision to tolerable levels” (Urbany, Dickson, & Wilkie, 1989, p. 208). “Pre-purchase information search is a critical step in the buying process of consumers, especially in the case of highly involving products and services” (Mourali, Laroche, & Pons, 2005, p. 308). It will be more helpful for consumers who do not have prior experience with a product to get to know it and perceive its quality before they make purchase decisions.

Researchers have different perspectives about the relationship between perceived quality and willingness to buy. Some believe there is a direct relationship between perceived quality and willingness to buy while others argue that value is an intervening construct between those two measures (Devaraj, Matta, & Conlon, 2001). However, Devaraj et al. (2001) realized based on

the study conducted by Jacoby, Chestnut, Hoyer, Sheluga, and Donahue (1978) that “quality and value are not well differentiated from each other and thus are difficult to distinguish in the minds of the consumers” (p. 427). Based on the finding, it may be said that perceived quality directly influences consumers’ willingness to buy. Wells et al. (2011) also indicated that perceived quality “is found to have a strong relationship” (p. 381) with willingness to buy.

According to Tsotsou (2005) it is a general notion that perceived quality is a post-purchase construct and satisfaction is a mediator between perceived quality and willingness to buy. In other words, consumers need previous product experience as determinants of product quality and satisfaction (Tsotsou, 2005). However, Tsotsou also argued that perceived quality is also a pre-purchase construct; previous product experience is not needed to evaluate quality. As indicated in the previous sections, there are positive relationships between brand, design, and price and perceived quality. Without previous product experience, product quality can be perceived by consumers with those product cues. At the end, perceived quality will positively influence willingness to buy (Tsotsou, 2006). Therefore, I hypothesize the following:

H₄: Perceived quality will have a positive impact on willingness to buy.

CHAPTER THREE

METHODS

The main purpose of this study was to test the extent to which three product cues - brand, design, and price - impact perceived quality and the influence of perceived quality on willingness to buy. The purpose of this chapter was to outline the methods used to examine the proposed model and hypotheses. This chapter is divided as follows: (1) research design, (2) participants, (3) instruments, (4) scale modifications, (5) data collection, and (6) data analysis.

3.1 Research Design

The proposed study was non-experimental and quantitative. I proposed to test three product cues in order to identify which cue(s) positively influenced perceived quality. I also examined the extent to which perceived quality positively influenced an individual's willingness to buy. According to Nenty (2009), the purpose of quantitative research is to validate a theory. For this reason, "it starts from theory and ends in theory" (Nenty, 2009, p. 21). The proposed study was based on the models designed by Dodds et al. (1991) and was supported by Cue Utilization Theory (CUT) (Cox, 1967; Olson & Jacoby, 1972).

A paper and pencil questionnaire was used to present the product cues, through which participants responded to items about perceived quality and willingness to buy. There were several reasons why I administered paper and pencil questionnaires. Webster and Compeau (1996) indicated that many research studies have traditionally gathered data through paper and pencil questionnaires. Pettit (2002) mentioned that the paper and pencil survey has remained the most popular questionnaire administration method. Using paper and pencil questionnaires is an appropriate means through which to actively contact participants in classes and gather the data.

3.2 Participants

According to Enis, Cox, and Stafford (1972), students are used as subjects in consumer behavior research because they are one of the subjects that are easily accessible and available to researchers at little or even no cost. Based on the advantages and convenience, college students were utilized for this study. In the case of sampling, Peters and Eachus (1995) noted that “the purpose of sampling is to select a subset of a population for detailed investigation, in order to draw valid conclusions about that population” (p.219). Sampling methods are usually divided into two types: nonprobability sampling and probability sampling. “The difference between nonprobability and probability is that nonprobability sampling does not involve random selection and probability sampling does” (Trochim & Donnelly, 2008, p.48). A convenience sample, which is a type of nonprobability sampling, was used. The participants were students who were enrolled in Lifetime Activity Program (LAP) courses at Florida State University (FSU), and students utilizing a recreational center on the FSU campus. The sample included undergraduate and graduate students.

To calculate the minimum sample size, I used G*Power 3.1.7 program (see Figure 3.1). The calculation was based on the alpha (.05), effect size (.15), power (.95), and number of predictors (3). There was no information about the effect size in the similar previous studies. However, Stevens (1990) indicated that a medium effect size is typically meaningful. The program indicated that .15 is a medium effect size, so I set it for this study.

As indicated in the Figure 3.1., 119 was calculated as the minimum sample size for this study. Allowing for incomplete questionnaires and individuals declining to participate, 200 forms were distributed to participants (a) enrolled in LAP courses, or (2) participants at the recreation centers on campus. Since the product in this study was an activity tracker, it seemed

reasonable to recruit participants who were involved in an activity course or working out at a recreation center on campus. While the participants were students, they were also part of the target market for activity trackers. The questionnaires were completed during the respective class or on site at the particular recreation center.

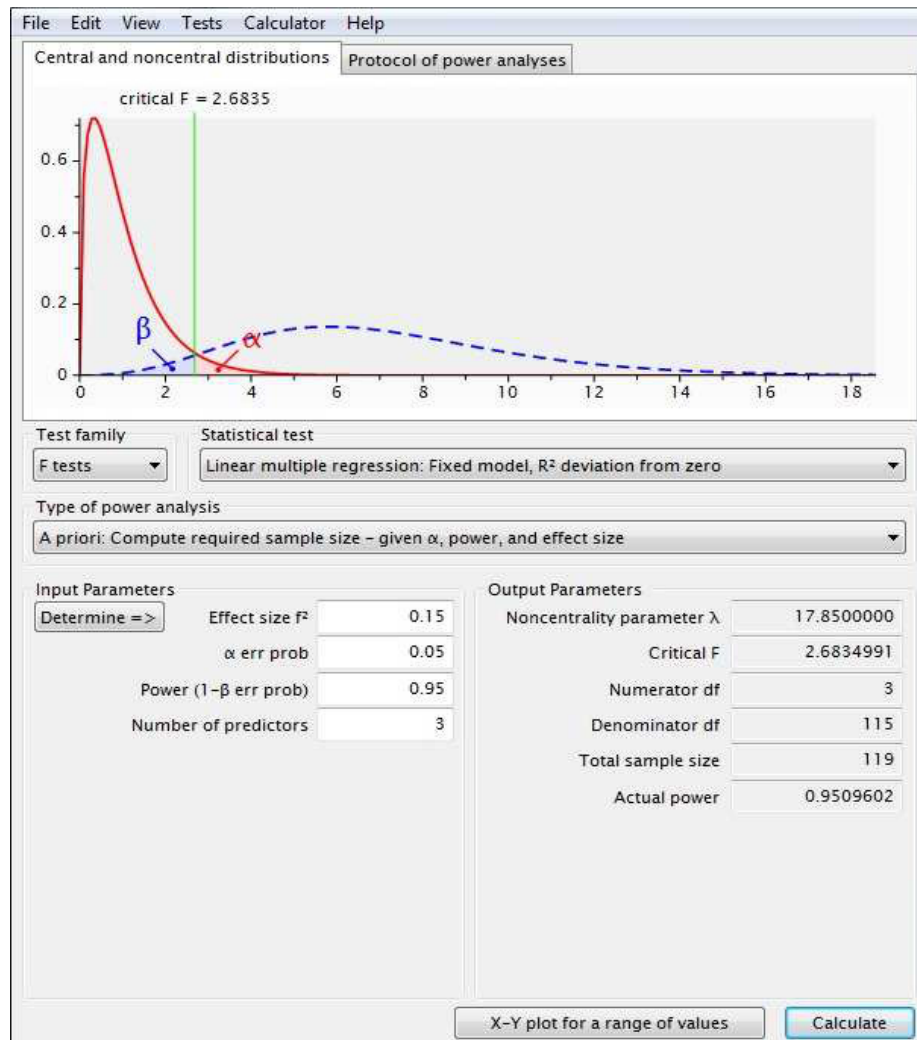


Figure 3.1. G power 3.1.7 output

3.3 Instruments

In this section I present the instrument that were used to measure the relationships between three product cues and perceived quality, and the relationship between perceived quality and willingness to buy. Three previous studies were utilized to construct the instruments in this study. The items from the study conducted by Bao, Bao, and Sheng (2011) were adapted as a measure of perceived quality. The studies conducted by Dodds et al. (1991) and Richardson et al. (1994) included items that were adapted for use in the proposed study to assess perceived quality and willingness to buy respectively.

3.4 Scale Modifications

Some modifications of existing measures were needed to make the instruments most appropriate for the proposed study. Some items from various scales were omitted due to the similarities with each other or the fact that they were not germane to this study. The proposed study included three product cues: brand, design, and price. Table 3.1 lists the original scale items for perceived quality, and the revised items I proposed to use to assess the three product cues. Table 3.2 presents the items used to measure the three product cues, grouped by product cue.

Table 3.1. Product cues, original vs. revised

Bao et al. (2011)	Revised
This (product) is of low quality/high quality.	(Omitted)
This (product) is not at all reliable/very reliable.	<ol style="list-style-type: none"> 1. I believe the quality of the product is reliable based on the design. 2. I believe the activity tracker is reliable based on the brand. 3. I believe the activity tracker is reliable based on the price.

Table 3.1. Continued

Bao et al. (2011)	Revised
This (product) is an inferior product/superior product.	<ol style="list-style-type: none"> 1. I believe the product is a superior activity tracker based on the brand. 2. I believe the product is a superior activity tracker based on the price. 3. I believe the activity tracker is a superior product based on the design.
This (product) is of very bad quality/very good quality.	<ol style="list-style-type: none"> 1. I have doubts about the quality of the product based on its design. 2. I have doubts about the quality of the activity tracker based on its price. 3. I have doubts about the quality of the product based on the brand.
Dodds et al. (1991)	Revised
The workmanship of product would be very high/very low.	<ol style="list-style-type: none"> 1. Based on the price, the workmanship of the product is... 2. Based on the brand, the workmanship of the product is... 3. Based on the design, the workmanship of the product is...
This product would seem to be durable.	<ol style="list-style-type: none"> 1. I believe the product looks durable based on the price. 2. Considering the brand, I think the product is durable. 3. The activity tracker looks durable based on the design.
Richardson et al. (1994)	Revised
All things considered I would say this (product name) has poor overall quality/excellent overall quality.	<ol style="list-style-type: none"> 1. Considering the price, the overall quality of the product is excellent. 2. Considering the brand, the overall quality of the product is excellent. 3. Considering the design, the overall quality of the product is excellent.

Table 3.2. Revised items grouped by product cue

Design	
1.	I believe the quality of the product is reliable based on the design.
2.	I believe the activity tracker is a superior product based on the design.
3.	I have doubts about the quality of the product based on its design.
4.	Based on the design, the workmanship of the product is...
5.	The activity tracker looks durable based on the design.
6.	Considering the design, the overall quality of the product is excellent.
Brand	
1.	I believe the product is a superior activity tracker based on the brand.
2.	I believe the activity tracker is reliable based on the brand.
3.	Considering the brand, I think the product is durable.
4.	Considering the brand, the overall quality of the product is excellent.
5.	I have doubts about the quality of the product based on the brand.
6.	Based on the brand, the workmanship of the product is...
Price	
1.	I believe the product looks durable based on the price.
2.	I believe the product is a superior activity tracker based on the price.
3.	Considering the price, the overall quality of the product is excellent.
4.	I have doubts about the quality of the activity tracker based on its price.
5.	I believe the activity tracker is reliable based on the price.
6.	Based on the price, the workmanship of the product is...

Table 3.3 presents a list of the items to measure overall product quality perceptions, which was adapted from the study conducted by Dodds et al. (1991).

Table 3.3. Items to measure overall product quality perceptions

Dodds et al. (1991)	Revised
The likelihood that the product would be reliable is very high/very low.	The reliability of the product is high.
This product should be of very good quality/very poor quality.	I believe the quality of the activity tracker is poor.
The likelihood that this product is dependable is very high/very low.	The dependability of the product is low.

Table 3.4 includes a list of the willingness to buy items, the original items from the works of Dodds et al. (1991) and Richardson et al. (1994), and the items for inclusion in the proposed study.

Table 3.4. Willingness to buy, original vs. revised

Dodds et al. (1991)	Revised
The likelihood of purchasing this product is very high/very low.	Based on my quality perception of the product, the likelihood of me purchasing this product is...
If I were going to buy this product, I would consider buying this model at the price shown.	(Omitted)
At the price shown, I would consider buying the product.	(Omitted)
The probability that I would consider buying the product is very high/very low.	Based on my quality perception of the product, the probability of me purchasing the product is...
My willingness to buy the product is very high/very low.	Based on my quality perception of the product, my willingness to buy the product is...
Richardson et al. (1994)	Revised
If I were to buy a brand of (product name) I would never buy the brand I just tried/definitely buy the brand I just tried.	Considering the price, brand, and design, I would purchase this activity tracker.

3.5 Data Collection

Before the survey was conducted, I contacted instructors via email and in person to request approval for visiting their classes and conducting the survey. After receiving instructor approval I visited the classes, explained the purpose of the study to the students, what was involved in completing the questionnaire, answered questions about the process, then distributed questionnaires for completion to those willing and consenting to participate. Participants had up to 10 minutes to complete a questionnaire.

To recruit participants visiting one of the recreation centers, I first asked for permission from the staff at the recreation center to set up a table inside the entrance so that I could easily intercept individual entering or leaving the facility. I approached individuals in no particular pattern and ask them to participate in the survey. I explained the purpose of the project, what was involved, and asked individuals to take a few minutes to fill out a questionnaire.

When completing the questionnaire, the first task for participants was to choose one of six activity trackers they would be interested in buying, based on information provided. The second task was to report basic demographic information including age, gender, race, year in school, and number of hours of physical activity per week was asked. The third task involved responding to the items used to measure the proposed relationships the model. Participants were instructed to respond to the items thinking about the activity tracker in which they were interested. The completed questionnaires were returned to me.

3.6 Data Analysis

After completion of the data collection phase, the questionnaires were checked for completeness of the responses and usability. Questionnaires that were incomplete were omitted in order to ensure that complete information is included in the data analysis. The data was coded electronically and analyzed using PASW Statistics 20.0.

The first step in the analysis of the data was to compute the descriptive statistics for the age, gender, race, year in school, and number of hours of physical activity. The frequency counts and/or mean scores was computed as part of profiling the participants. The second step in the data analysis involved assessing the evidence of reliability for the scale items: brand, design, price, perceived quality, and willingness to buy. Cronbach's alpha scores and item-to-total

correlations were examined to gauge how well the respective items fit together for the specific variables.

The third step in the data analysis included testing the assumptions pertaining to regression, prior to testing the relationships among the variables. The required assumptions included normality, linearity, homoscedasticity, and multicollinearity. Normality, linearity, and homoscedasticity were tested through the visual inspection of histograms, residual scatterplots, and standardized residual plots. In the case of multicollinearity, it was checked with the values of Variance Inflation Factor (VIF) and tolerance in the coefficient table.

After ascertaining the viability of the data, multiple regressions were utilized to gauge the extent to which price, brand, and design influence perceived quality (Step 4). The final step in the data analysis included computing a simple regression to measure the influence of perceived quality on willingness to buy. The results of this study were presented in subsequent chapters after the data was collected and analyzed.

CHAPTER FOUR

RESULTS

The main purpose of this study was to examine the relationships between product cues, perceived quality, and willingness to buy. As described in the preceding chapter, three product cues were identified for activity trackers: brand, design, and price. Based on cue utilization theory (CUT), it was expected that consumers would utilize product cues to form perceptions of quality, which would subsequently influence their willingness to buy an activity tracker. The modified instruments- originally from three previous studies conducted by Bao et al. (2011), Dodds et al. (1991), and Richardson et al. (1994) - provided the main content for the survey used in this study. Basic demographic information including participants' knowledge and usage of an activity tracker were also collected. Objectives of this research were to identify which product cue positively influences consumers' perceived quality the most and assess whether the quality perception influences willingness to buy. The results of the data collection and the data analysis are presented below.

4.1 Sample Characteristics

Questionnaires were distributed to FSU undergraduate students enrolled in Lifetime Activity Program (LAP) courses, and both undergraduate and graduate students visiting one of the recreational centers on the FSU campus. There was no specific qualification the participants had to meet. I contacted instructors of the respective LAP courses and requested an opportunity to attend the classes and administer the questionnaire. I also contacted the staff at the Leach Recreation Center and asked permission to conduct the survey at the facility. The distribution process is explained in the following section.

4.1.1 Response Rate

A total of 200 questionnaires were distributed; 96 questionnaires (48%) were distributed to students in the LAP courses and 104 questionnaires (52%) questionnaires were distributed to the visitors of the Leach Center. Table 4.1 includes a list of which LAP courses were utilized for the survey, and Table 4.2 is the summary of the information about the survey distribution at the Leach Center. All the students in the LAP courses were willing to participate, as illustrated in Table 4.1

Table 4.1. Response rate by LAP courses

Course Name	# of Participants	# of Responses	Response rate (%)
Basketball	13	13	100
Soccer	16	16	100
Self defense	12	12	100
Basic weight training	14	14	100
Stretch & Relaxation	20	20	100
Stretch & Relaxation	21	21	100
Total	96	96	100

The purpose of the project was explained to the students in the LAP courses before the questionnaire was distributed. The survey was conducted 10 minutes before the classes finished so the students would have enough time to fill out and return the completed forms before leaving the respective class.

Table 4.2. Response rate of the visitors of a recreational center on the FSU campus

Name of Recreational Center	# of Participants	# of Responses	Response Rate (%)
Leach Center	104	78	75

In the case of the Leach Center, two tables were set up so individuals would have a place to sit and fill out a questionnaire. Individuals were intercepted as they were entering or leaving the Center, depending on when I had time to intercept an individual. The purpose of the project

was explained to those who were willing to stop. Those willing to participate were asked to complete a questionnaire at one of the tables. However, as indicated in Table 4.2, 26 participants who agreed to participate started but did not complete the questionnaire, resulting in a response rate of 75%.

As illustrated in Table 4.3, of the 174 returned questionnaires, 30 forms were removed from consideration because the questionnaires were incomplete or the same number was picked for all items. The final sample size was 144 resulting in an overall response rate of 72%.

Table 4.3. Finalized sample size and response rate

Survey Area	# of Participants	# of Responses	Response Rate (%)
LAP courses	96	96	100
Leach center	104	78	75
Incomplete or invalid (removed)		30	
Finalized sample size	200	144	72

4.1.2 Demographic Characteristics

The participants' demographic information was collected through seven items at the beginning of the questionnaire. The results of the information are organized in Table 4.4. Among the respondents, the number of male participants ($n=76$; 52.8%) was slightly greater than females participants ($n=68$; 47.2%). The average age of the participants was 22.06 years, and the majority were Caucasian ($n=98$; 68.1%). In addition, the majority of the sample were in their senior year ($n=48$; 33.3%). The average hours of physical activity per week was 9.40 hours; most participants reported 11 hours per week for their physical activity ($n=36$; 25.2%), followed by 10 hours per week as the second highest rate of activity ($n=29$; 20.1%).

Table 4.4. Demographic characteristics

	Frequency	%
Gender		
Female	68	47.2
Male	76	52.8
Year (Age) ($M=22.06;SD=2.788$)		
19	21	14.6
20	23	16.0
21	26	18.1
22	24	16.7
23	23	16.0
24	10	6.9
25	2	1.4
≥26	15	10.5
Ethnicity		
Caucasian	98	68.1
African American	16	11.1
Hispanic	19	13.2
Asian	8	5.6
Other	3	2.1
Classification		
Freshman	27	18.8
Sophomore	18	12.5
Junior	33	22.9
Senior	48	33.3
Graduate	18	12.5
Number of hours of physical activity per week ($M=9.40;SD=6.197$)		
0	3	2.1
1	2	1.4
2	3	2.1
3	11	7.6
4	8	5.6
5	17	11.8
6	10	6.9
7	8	5.6
8	15	10.4
9	2	1.4
10	29	20.1
≥11	36	25.2

Table 4.4. Continued

	Frequency	%
Do you know what an activity tracker is?		
Yes	116	80.6
No	28	19.4
Number of activity trackers users		
Adidas	1	.7
FitBit	2	1.4
Garmin	1	.7
Nike	4	2.8
Polar	3	2.1
TomTom	1	.7
No activity tracker	132	91.7

Of the 144 participants, 116 (80.6%) were familiar with activity trackers, and 12 participants (8.4%) did use an activity tracker.

4.1.3 Participants' Preference among Six Activity Trackers

On the first page of the questionnaire, the participants were directed to select one activity tracker they would be most interested in buying from among six choices. Table 4.5 illustrates the participants' preference among six activity trackers. The majority of the participants chose Nike FuelBand ($n=57$; 39.6%), followed by FitBit Flex ($n=48$; 33.3%).

Table 4.5. Participants' preference among six activity trackers

Brand(model name)	Frequency	%
Jawbone (Up)	15	10.4
FitBit (One)	11	7.6
Basis (B1)	12	8.3
Nike (FuelBand)	57	39.6
FitBit (Flex)	48	33.3
Bodymediafit (Core)	1	.7
Total	144	100

4.1.4 Participants' Product Cue Utilization for Perceived Quality and Willingness to Buy

The mean scores of the three product cues were compared to see which cue(s) the participants focused on when they selected one activity tracker from among the six choices.

Table 4.6 has the mean scores of the product cues.

Table 4.6. The comparison of mean scores of product cues

	# of Participants	Mean	SD
Brand	144	4.85	1.058
Design	144	4.86	.931
Price	144	4.78	.976

Considering the mean scores for the product cues, the participants rated brand and design slightly higher than price. The mean score for price was not negative per se, but was scored lower than brand and design. This could mean that participants focused less on price when choosing one of the six activity trackers.

Table 4.7. The comparison of mean scores of product cues between the groups of Nike Fuelband and FitBit Flex

	Groups	# of Participants	Mean	SD
Brand	Nike Fuelband	57	5.34	.129
	FitBit Flex	48	4.31	.121
Design	Nike Fuelband	57	4.98	.116
	FitBit Flex	48	4.63	.123
Price	Nike Fuelband	57	5.03	.104
	FitBit Flex	48	4.42	.126

As indicated in Table 4.5, Nike Fuelband and FitBit Flex were the activity trackers that were chosen by a majority of the participants. Table 4.7 was included to illustrate how the participants rated the product cues for these two activity trackers. Based on the information in Table 4.7, the participants choosing the Nike Fuelband focused mainly on brand, while the participants choosing the FitBit Flex focused mainly on design.

4.2 Reliability Assessment

Trochim and Donnelly (2008) defined reliability as “the degree to which a measure is consistent or dependable” (p. 80). It is important to check for evidence of reliability with the scale items since they were revised from previous research to fit the context of this study. Cronbach’s alpha scores and item-to-total correlations were evaluated to check the internal consistency of the items expected to assess brand, design, price, perceived quality, and willingness to buy. According to Helms, Henze, Sass, and Mifsud (2006), Cronbach’s alpha is “the most frequently used procedure for estimating reliability” (p. 632). “Cronbach’s alpha coefficient normally ranges between 0 and 1” (Gliem & Gliem, 2003, p. 87), but “the closer Cronbach’s alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale” (Gliem & Gliem, 2003, p. 87). According to Bernardi (1994), “for the purpose of basic analysis, Cronbach’s alpha should be at least .70, and that it is better to have the alpha closer to .80” (p. 767).

In the case of the item-to-total correlations, it is “the correlation of each item to the sum of the remaining items” (Bock & Kim, 2002, p. 17). Bock and Kim (2002) also emphasized that any item with an item-to-total correlation lower than .50 should be dropped because scores lower than .50 indicate that the items lack evidence of reliability (Wang, 2003). Table 4.8 includes the item-to-total correlations and Cronbach’s alpha scores for the respective factors.

Table 4.8. Internal consistency of items grouped by five factors

	Item-to-total correlation	α
<i>Brand</i>		.90
I believe the product is a superior activity tracker based on the brand.	.78	
I believe the activity tracker is reliable based on the brand.	.83	
Considering the brand, I think the product is durable.	.74	
Considering the brand, the overall quality of the product is excellent.	.80	
I have doubts about the quality of the product based on the brand.	.50	
Based on the brand, the workmanship of the product is...	.71	
<i>Design</i>		.80
I believe the quality of the product is reliable based on the design.	.56	
I believe the activity tracker is a superior product based on the design.	.66	
I have doubts about the quality of the product based on its design.	.32	
Based on the design, the workmanship of the product is...	.63	
The activity tracker looks durable based on the design.	.54	
Considering the design, the overall quality of the product is excellent.	.69	
<i>Price</i>		.82
I believe the product looks durable based on the price.	.56	
I believe the product is a superior activity tracker based on the price.	.64	
Considering the price, the overall quality of the product is excellent.	.60	
I have doubts about the quality of the activity tracker based on its price.	.40	
I believe the activity tracker is reliable based on the price.	.78	
Based on the price, the workmanship of the product is...	.61	
<i>Overall product quality perceptions</i>		.79
The reliability of the product is high.	.59	
I believe the quality of the activity tracker is poor.	.70	
The dependability of the product is low.	.62	
<i>Willingness to buy</i>		.95
Based on my quality perception of the product, the likelihood of me purchasing this product is...	.91	
Based on my quality perception of the product, the probability of me purchasing the product is...	.91	
Based on my quality perception of the product, my willingness to buy the product is...	.88	
Considering the price, brand, and design, I would purchase this activity tracker.	.80	

All five proposed factors had Cronbach's alpha scores greater than .70; these groups all had alpha scores equal to, closer to, and even greater than .80. There was reasonable evidence of

reliability for the five proposed factors. It is important to note that even though all factor groups had acceptable Cronbach's alpha scores, the Design and Price factors each had one item with an item-to-total correlation under .50; accordingly, the items with low item-to-total correlations were deleted from further analysis.

4.3 Assumption Tests

According to Osborne and Waters (2002), "most statistical tests rely upon certain assumptions about the variables used in the analysis" (p. 1), and the study results may not be reliable if required assumptions are not met (Osborne & Waters, 2002). It is important to test assumptions before statistically calculating the study model to see if the study model is appropriate. Since the proposed study model was regression-based, the assumptions of normality, linearity, homoscedasticity, and multicollinearity were checked. Cohen, Cohen, West, and Aiken (2003) and Osborne and Waters provide information about how normality, linearity, homoscedasticity, and multicollinearity should be met: (1) the residuals are normally distributed, (2) the relationships between independent variables (IV) and dependent variables (DV) are linear, (3) the variance of the residuals is constant for all levels of IVs, and (4) VIF should be less than 10, and the tolerance value should be greater than .10.

The first part of the analysis included multiple regression due to the attempt to assess the relationships between three product cues and perceived quality. The second part of the analysis included assessing the relationship between perceived quality and willingness to buy. The second part was composed of one IV and one DV, so simple regression was utilized. Assumptions of multiple regression and simple regression are the same except for multicollinearity. "Multicollinearity is a problem in multiple regression that develops when one or more of the independent variables is highly correlated with one or more of the other

independent variables” (Ethington, 2005, p.1). There was no assessment of multicollinearity for the second part of the study.

4.3.1 Assumptions for Product Cues-Perceived Quality Relationships

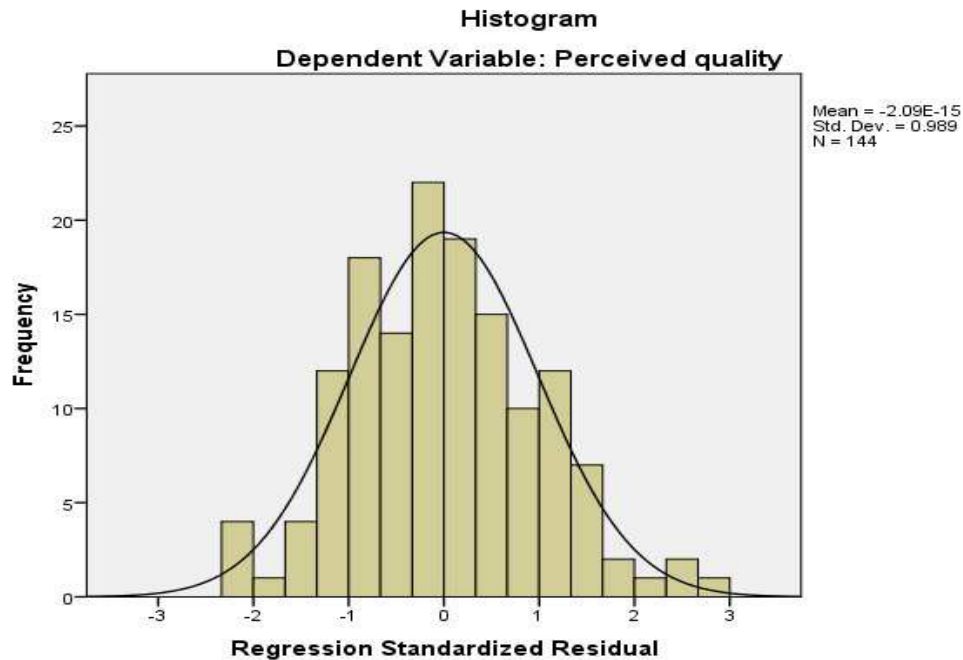


Figure 4.1. Histogram for the distribution of the residuals (product cues-perceived quality)

Figure 4.1 was included as part of the assessment of normality of the residuals. The histogram showed a normal distribution. I also elected to examine the distribution of the IVs (product cues), as further evidence of normality (see Figure 4.2). As shown, the product cue variables were normally distributed; therefore, there was evidence the assumption of normality was met.

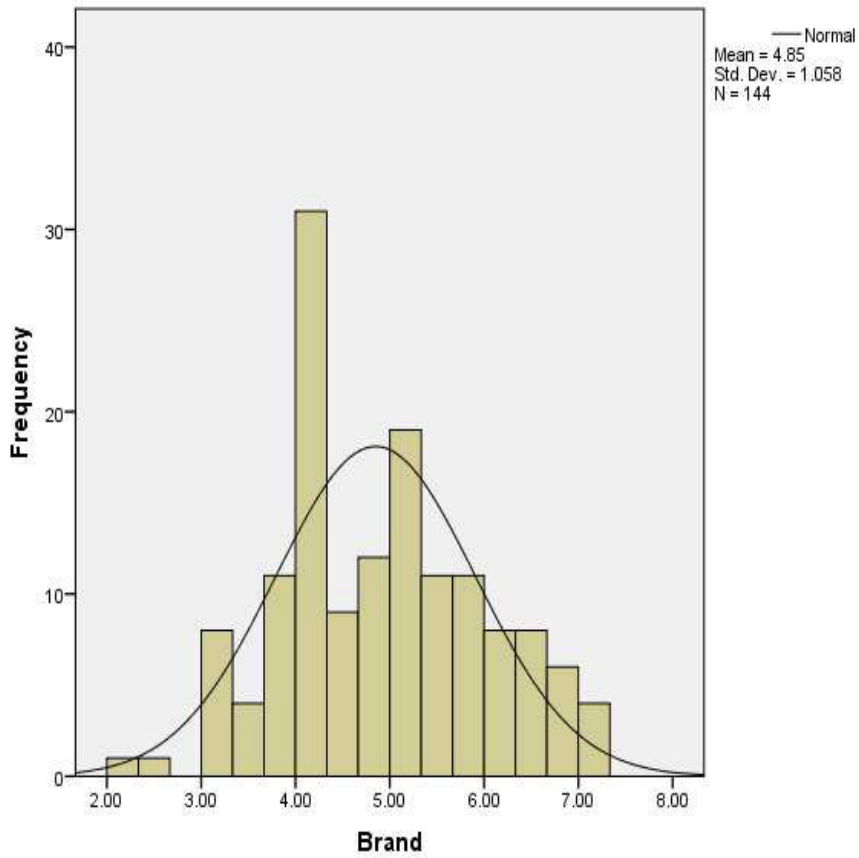
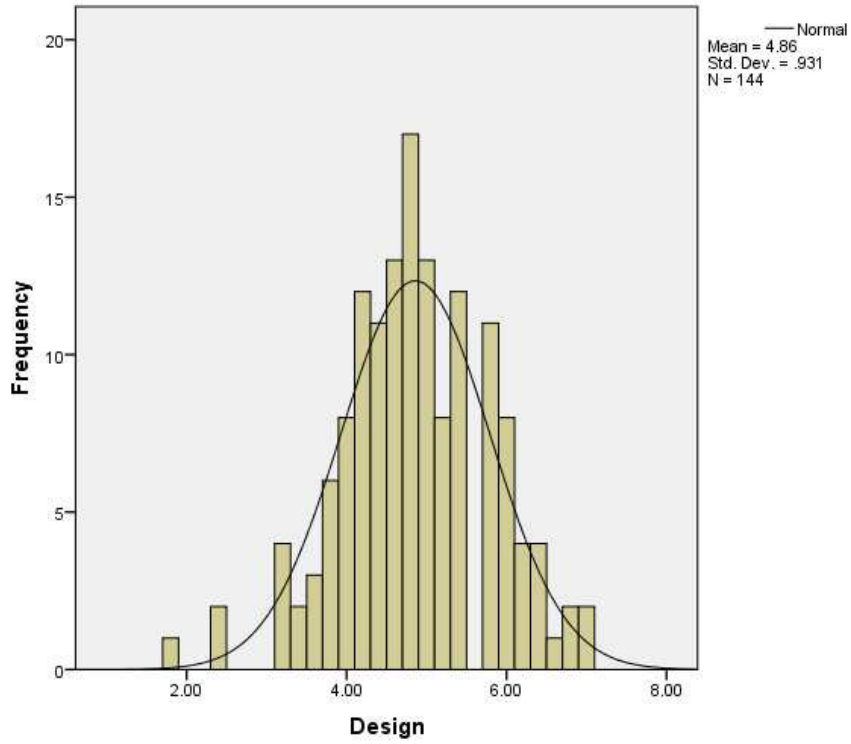


Figure 4.2. Histograms for the distribution of the independent variables (product cues)

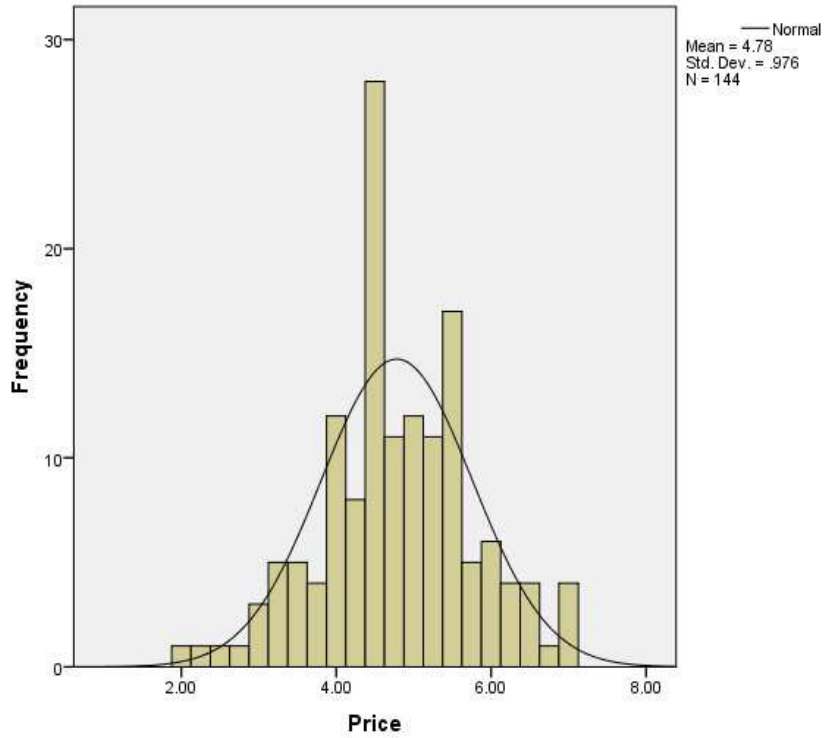


Figure 4.2. Continued

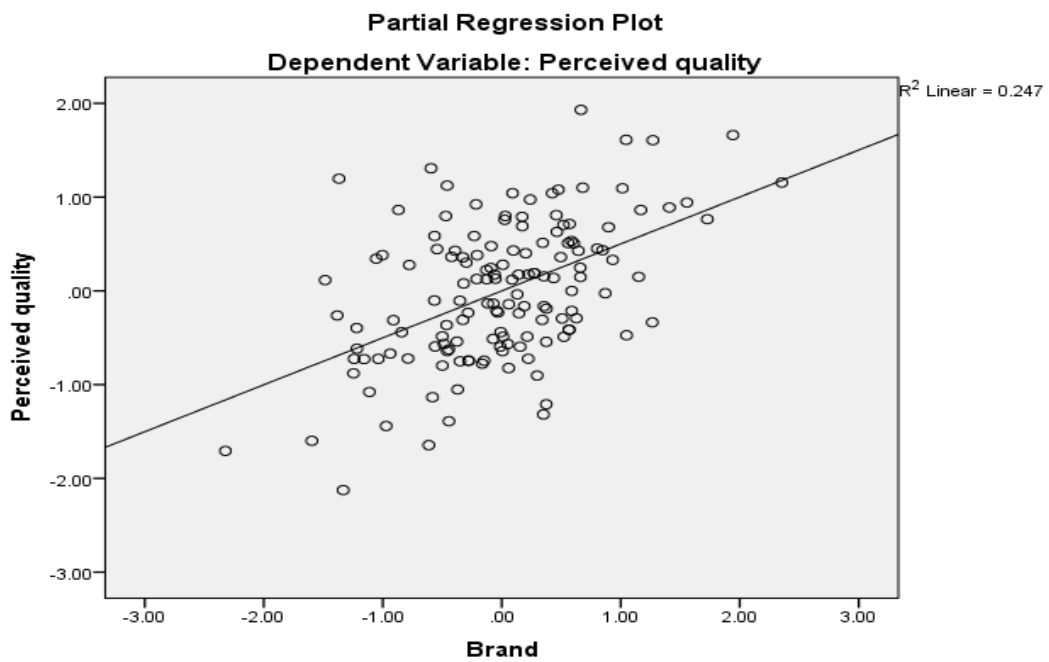


Figure 4.3. The partial regression plots for the relationships between product cues and perceived quality

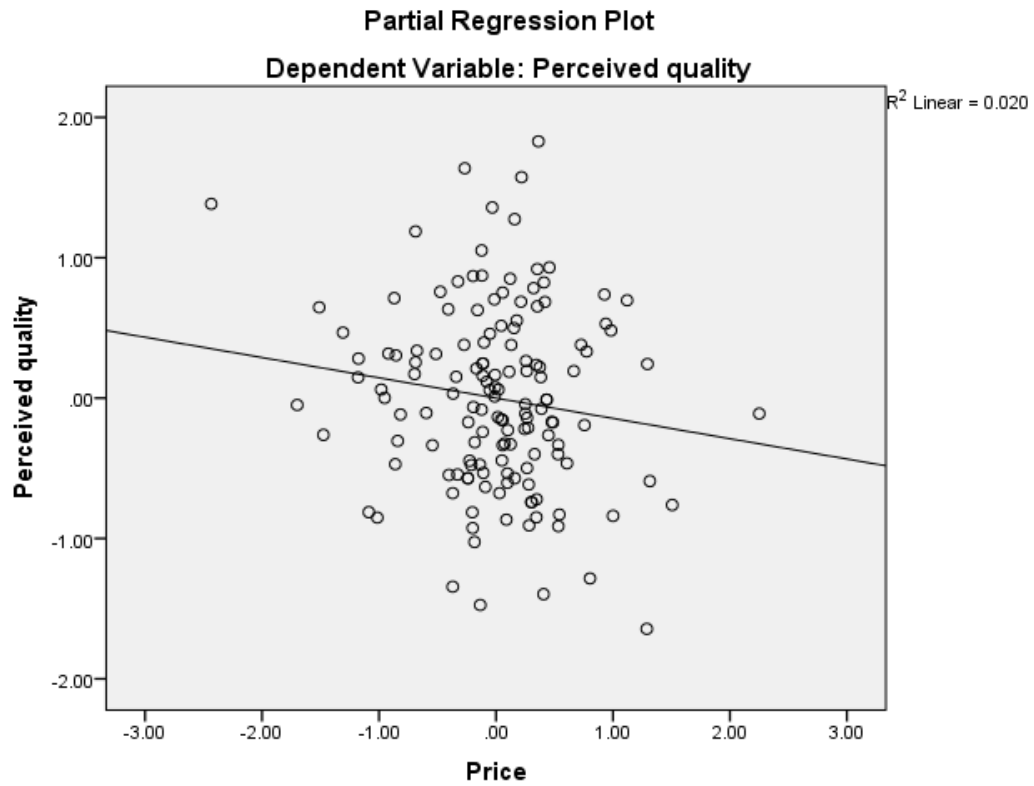
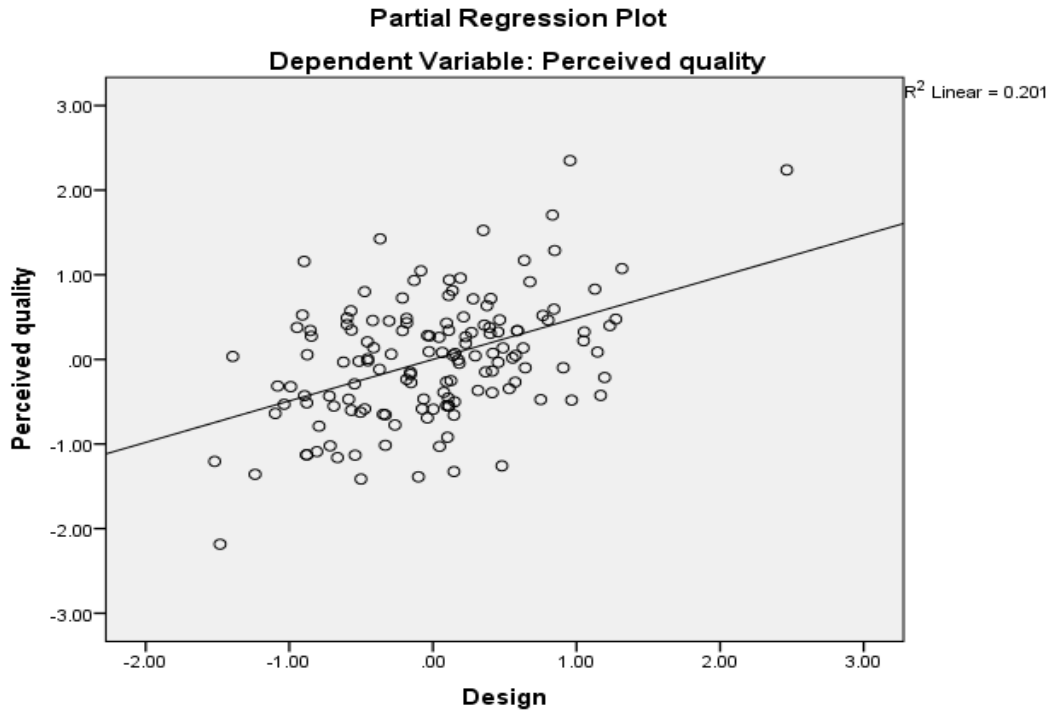


Figure 4.3. Continued

According to Velleman and Welsch (1981), the partial regression plot is “an x-y plot that displays information about a single regression” (p. 235) in multiple regressions and make it easier to check the linearity assumption. For this reason, the partial regression plots showing the linearity of the relationships between product cues and perceived quality were utilized and illustrated in Figure 4.3.

While each of brand and design had a positive linear relationships with perceived quality, price had a negative linear relationship with perceived quality. According to Taylor (1990), the direction of the relationship is not relative to the assumption of linearity. In addition, Taylor also noted about the strength of the relationship that r values less than or equal to .35 “are generally considered to represent low or weak correlation” (p. 37), and the values between .36 and .67 are considered as medium correlation. Based on the rule of thumb, the strength of brand-perceived quality ($R^2=.247$; $r=.50$) and design-perceived quality ($R^2=.201$; $r=.45$) were positive medium relationships, and the strength of price-perceived quality ($R^2=.020$; $r=.14$) was a negative weak relationship. All three relationships represented linearity, so the assumption of linearity was met.

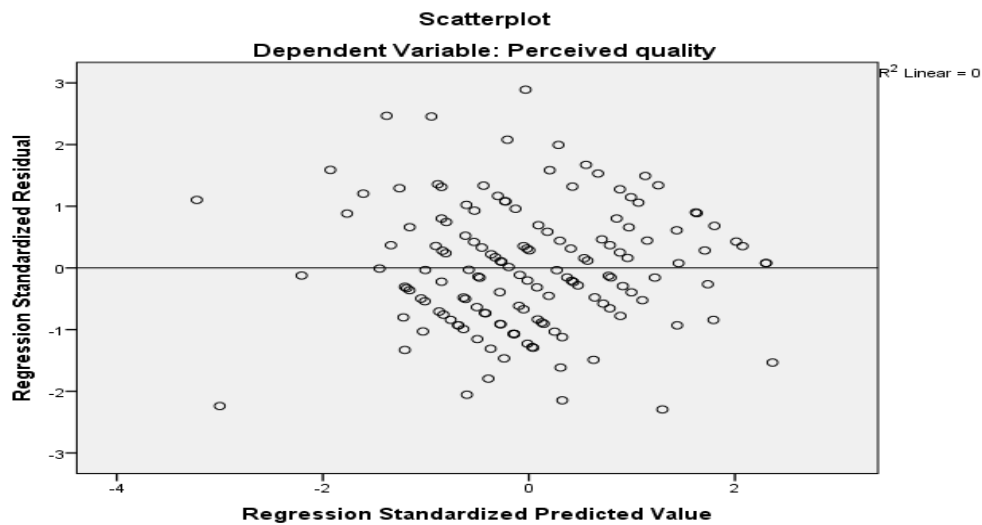


Figure 4.4. The standardized residual scatterplot for homoscedasticity (product cues-perceived quality)

Figure 4.4 was included as part of the check for homoscedasticity. The fitted line in the scatterplot appeared flat, which meant that the variance of residuals was constant. Therefore, the assumption of homoscedasticity was met.

To check for problems with multicollinearity, the values of tolerance and VIF of product cues had to be looked up. The rule of thumb for multicollinearity is that tolerance values should be greater than .01; VIF values should be less than 10. As indicated in Table 4.9, the assumption of multicollinearity was met.

Table 4.9. The table for multicollinearity

Product cues	Tolerance	VIF
(Constant)		
Brand	.485	2.063
Design	.501	1.995
Price	.421	2.337

a. Dependent Variable: Perceived quality

4.3.2 Assumptions for the Perceived Quality-Willingness to Buy Relationship

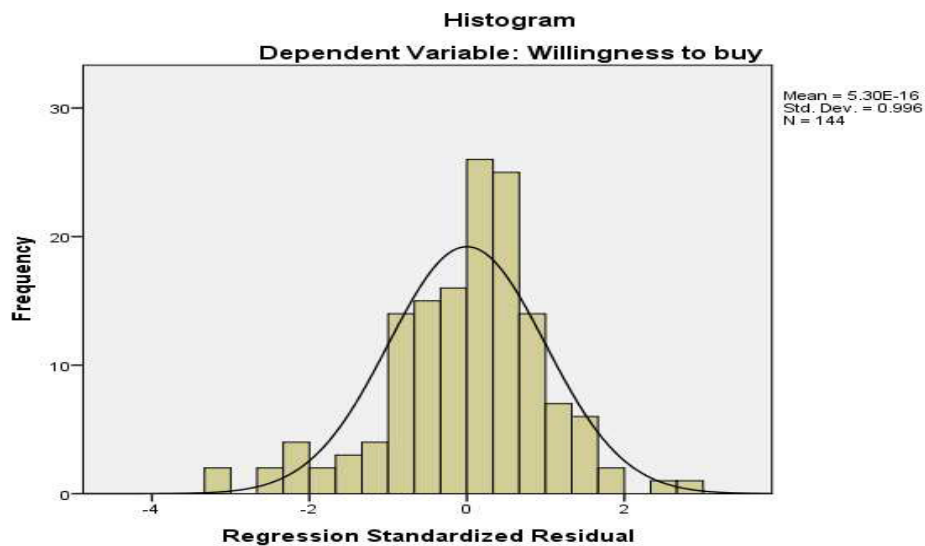


Figure 4.5. Histogram for the distribution of the residuals (perceived quality-willingness to buy)

Figure 4.5 was included as part of the assessment of normality of the residuals for the DV Willingness to buy. As shown, the residuals were normally distributed, providing evidence the assumption of normality was met.

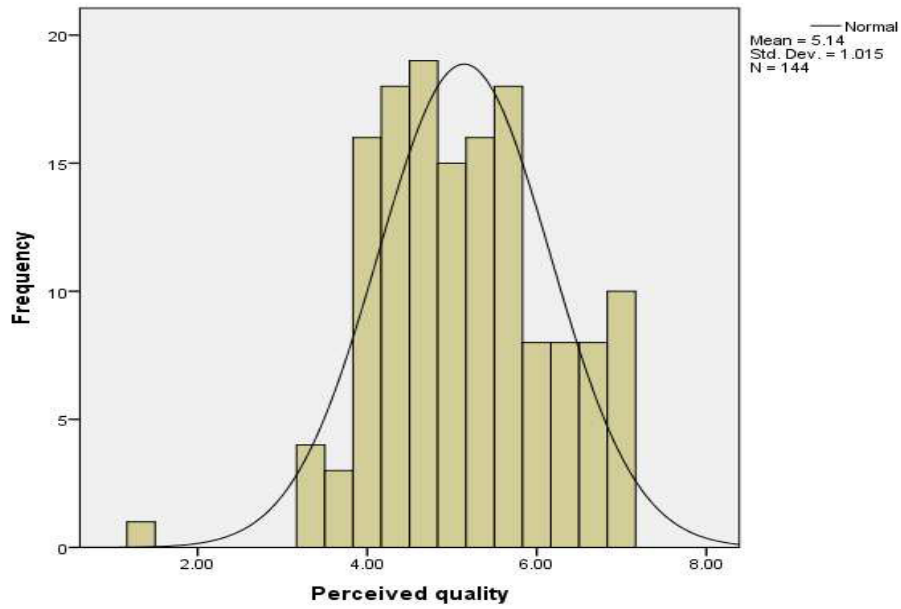


Figure 4.6. Histogram for the distribution of the independent variable (perceived quality)

Figure 4.6 was included as part of the assessment of the normality of the distribution of the IV Perceived Quality. As shown, there is evidence the variable was normally distributed, therefore, the assumption of normality was met.

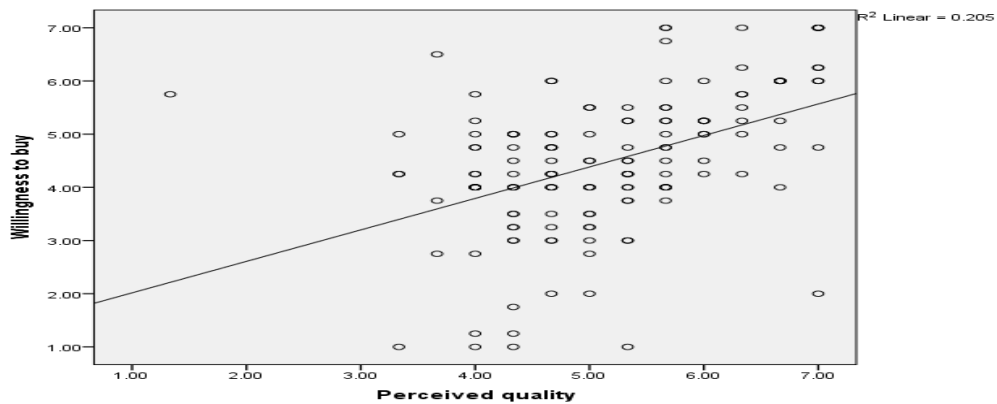


Figure 4.7. The scatterplot for the relationship between perceived quality and willingness to buy

Figure 4.7 was included as part of the check to assess the linearity of the relationship between perceived quality and willingness to buy. As indicated in the scatterplot, the values of R^2 and r were .205 and .45, which indicated that there was a positive medium linear relationship between perceived quality and willingness to buy. Therefore, the assumption of linearity was met.

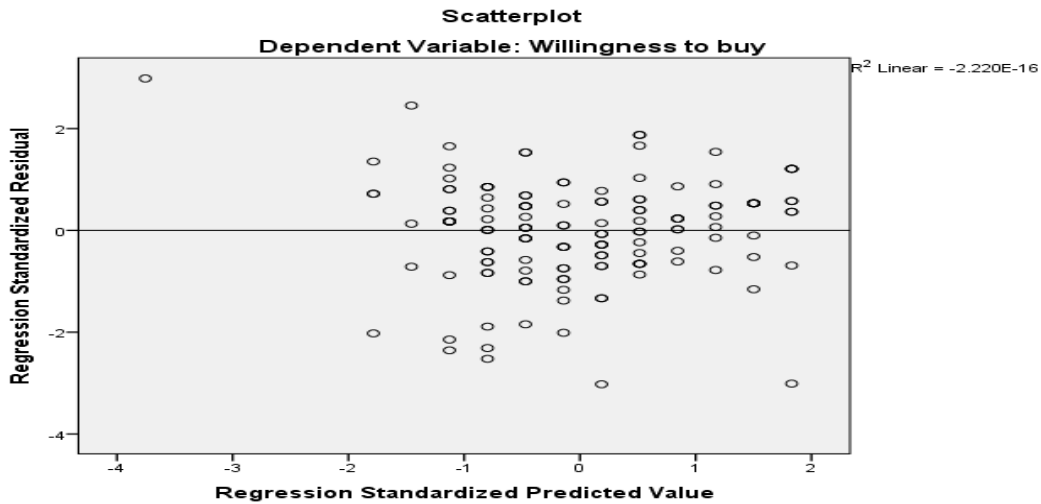


Figure 4.8. The standardized residual scatterplot for homoscedasticity (perceived quality-willingness to buy)

Figure 4.8 was included as part of the check of homoscedasticity. The fitted line in the scatterplot appeared flat, which meant the variance of residuals was constant. Therefore, the assumption of homoscedasticity was met.

All assumptions pertaining to simple and multiple regressions were met, which meant that the proposed study model did not have any issue or violation that interfere the further analysis.

4.4 Statistical Analysis of the Proposed Study Model

Table 4.10. The correlations among the three product cues

	1	2	3
1. Brand	1		
2. Design	.613**	1	
3. Price	.690**	.677**	1

** $p < .05$ (2-tailed)

Table 4.10 includes the correlations among the three product cues; the correlations were all significant ($p < .01$), and the strength were all moderate and positive based on the rule of thumb that scores between .50 and .70 indicate moderate positive correlations (Mukaka, 2012). Even though they were correlated with each other, multicollinearity was not an issue due to their appropriate VIF and tolerance values (see. Table 4.9) and the rule of thumb that correlation scores above .90 indicate multicollinearity (Hair, Anderson, Tatham, & Black, 1998).

A multiple regression analysis was conducted to examine the extent to which each product cue influenced perceived quality. Table 4.11 and 4.12 are the tables of Model Summary and ANOVA.

Table 4.11. Model Summary prepared from multiple regression

Model	R	R ²	Adjusted R ²	SE
1	.773	.597	.589	.651

a. Predictors: (Constant), Price, Design, Brand

Table 4.12. ANOVA prepared from multiple regression

Model	Sum of Squares	df	Mean Square	F	Sig.
1. Regression	87.942	3	29.314	69.191	.000
Residual	59.314	140	.424		
Total	147.256	143			

a. Predictors: (Constant), Price, Design, Brand

b. Dependent Variable: Perceived quality

Based on the information in Table 4.11, the multiple correlation coefficient was .773, which is interpreted to mean that nearly 59% ($R^2=.597$; Adjusted $R^2=.589$) of the variance of perceived quality was accounted for by the three product cues (brand, design, and price). The information in Table 4.12 allows for the conclusion that the linear combination of the product cues was significantly related to perceived quality, $F(3,140)=69.191, p < .001$.

Table 4.13 includes the correlations between the three product cues and perceived quality. According to Carver and Nash (2009), beta weights “allow us to compare the relative importance of each independent variable” (p. 200). For this reason, Table 4.14 was utilized to examine the significance of the relationships between product cues and perceived quality and the impacts of the three product cues on perceived quality based on the beta weights. Figure 4.9 is the first part of the proposed study model with beta weights.

Table 4.13. The correlations between the product cues and perceived quality

	1	2	3	4
1. Brand	1			
2. Design	.613**	1		
3. Price	.690**	.677**	1	
4. Perceived quality	.702**	.676**	.526**	1

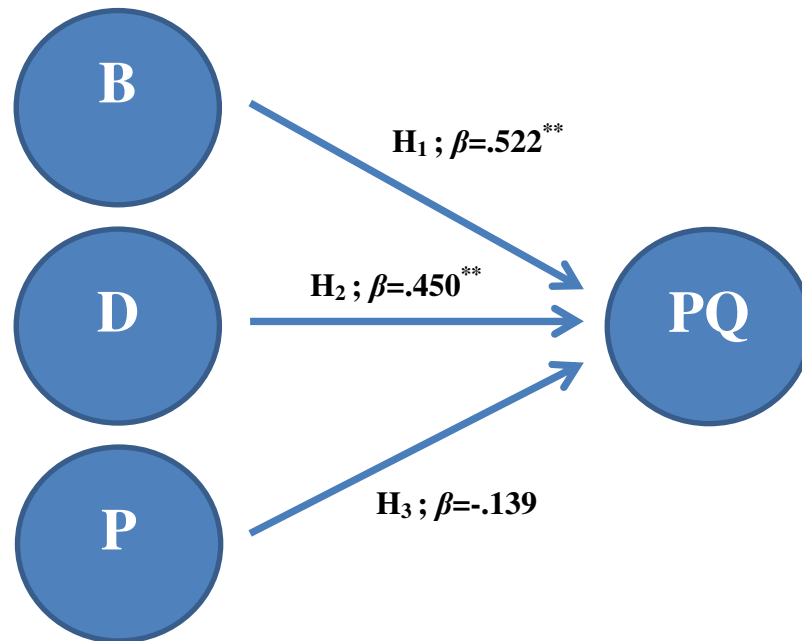
** $p < .01$ (2-tailed)

Table 4.14. Coefficients prepared from multiple regression

Model		Unstandardized Coefficients		Standardized Coefficient	t	Sig.
		B	Std. Error	Beta		
1.	(Constant)	1.024	.311		3.292	.001
	Brand	.501	.074	.522**	6.779	.000
	Design	.490	.083	.450**	5.934	.000
	Price	-.145	.086	-.139	-1.681	.095

a. Dependent Variable: Perceived quality

b. ** $p < .01$ (2-tailed)



B: Brand D: Design P: Price PQ: Perceived Quality β: Beta Weight

Figure 4.9. The multiple regression-based proposed study model with beta weights

According to the rule of thumb regarding the strength of correlations, the scores between .50 and .70 indicate moderate positive correlation and the scores between .70 and .90 indicate high positive correlation (Mukaka, 2012). The correlation between brand and perceived quality ($r=.702, p<.01$) were high. In addition, brand ($t=6.779; p<.05; \beta=.522$) had a positive impact on perceived quality and its relationship with perceived quality was significant. Therefore, the hypothesis (H_1) that brand will have a positive impact on perception of product quality was supported.

The correlation between design and perceived quality ($r=.676, p<.01$) were moderate. In addition, design ($t=5.934; p<.05; \beta=.450$) also had a positive impact on perceived quality and its relationship with perceived quality was significant. Therefore, the hypothesis (H_2) that design will have a positive impact on perception of product quality was supported.

The correlation between price and perceived quality ($r=.526, p<.01$) were moderate. However, price ($t=-1.681; p>.05; \beta=-.139$) had no impact on perceived quality and its relationship with perceived quality was not significant. Therefore, the hypothesis (H₃) that price will have a positive impact on perception of product quality was not supported.

As a final step, a simple regression analysis was conducted to examine the relationship between perceived quality and willingness to buy. Table 4.15 and 4.16 are the tables of Model Summary and ANOVA prepared from the simple regression analysis.

Table 4.15. Model Summary prepared from simple regression

Model	R	R ²	Adjusted R ²	SE
1	.453	.205	.200	1.18503

a. Predictors: (Constant), Perceived quality

Table 4.16. ANOVA prepared from simple regression

Model	Sum of Squares	df	Mean Square	F	Sig.
1. Regression	51.573	1	51.573	36.725	.000
Residual	199.412	142	1.404		
Total	250.984	143			

a. Dependent Variable: Willingness to buy

b. Predictors: (Constant), Perceived quality

Based on the information in Table 4.15, the simple correlation coefficient was .453 from which it can be concluded that approximately 20% ($R^2=.205$; Adjusted $R^2=.200$) of the variance of willingness to buy was accounted for by perceived quality. According to Carver and Nash (2009), R^2 “ranges from .000 to 1.000” (p. 168), and “the higher the value of R^2 , the better” (p. 168). Based on the rule of thumb, the value of R^2 was low. In other words, perceived quality did not effectively explain the willingness to buy. However, as noted in Table 4.16, perceived quality was significantly related to willingness to buy, $F(1,142)=36.725, p < .001$.

Table 4.17 includes the correlation between perceived quality and willingness to buy. Table 4.18 includes the information about the relationship between perceived quality and willingness to buy, and the impact of perceived quality on willingness to buy based on the beta weight. Figure 4.10 is the second part of the proposed study model with correlation scores.

Table 4.17. The correlation between perceived quality and willingness to buy

	1	2
1. Perceived quality	1	
2. Willingness to buy	.453**	1

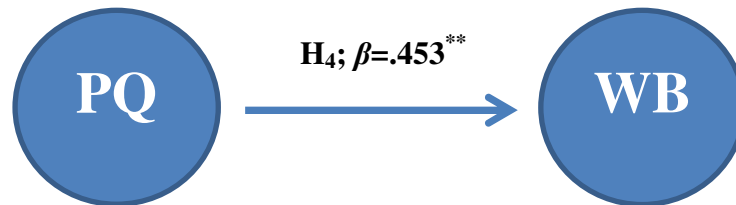
** $p < .01$ (2-tailed)

Table 4.18. Coefficients prepared from simple regression

Model	Unstandardized Coefficients		Standardized Coefficient	t	Sig.
	B	Std. Error	Beta		
1. (Constant)	1.425	.512		2.783	.006
Perceived quality	.592	.098	.453**	6.060	.000

a. Dependent Variable: Perceived quality

b. ** $p < .01$ (2-tailed)



PQ: Perceived Quality

WB: Willingness to Buy

β =Beta Weight

Figure 4.10. The simple regression-based proposed study model with beta weight

Considering the rule of thumb that scores between .30 and .50 represent low positive correlations, the correlation between perceived quality and willingness to buy ($r=.453, p < .01$) was low. In addition, perceived quality ($t=6.060; p < .05; \beta=.453$) had a positive impact on

willingness to buy and its relationship with perceived quality was significant. Therefore, the hypothesis (H₄) that perceived quality will have a positive impact on willingness to buy was supported.

4.5 Summary

Table 4.19. The results of hypothesis test

# of Hypothesis	Hypothesis	Result
H ₁	Brand will have a positive impact on perception of product quality.	Supported
H ₂	Design will have a positive impact on perception of product quality.	Supported
H ₃	Price will have a positive impact on perception of product quality.	Not Supported
H ₄	Perceived quality will have a positive impact on willingness to buy.	Supported

In summary, it was necessary to assess the Cronbach's alpha and item-to-total correlations scores as evidence of internal consistency because the items were modified from three previous studies conducted by Bao et al. (2011), Dodds et al. (1991), and Richardson et al. (1994) to fit the context of this study. All factor groups had reliable Cronbach's alpha scores, but the Design and Price factors each had one item with an item-to-total correlation under .50; the two items were deleted from further analysis. All assumptions pertaining to simple and multiple regressions such as normality, linearity, homoscedasticity, and multicollinearity were met, so the proposed study model could be statistically calculated without any issue or violation.

A table of Model Summary prepared from the multiple regression analysis (see Table 4.11) provides evidence that nearly 59% of the variance of perceived quality was accounted for by the three product cues (brand, design, and price). A table of ANOVA prepared from multiple regression (see Table 4.12) provides evidence that the linear combination of the product cues was significantly related to perceived quality, $F(3,140)=69.191, p < .001$.

Tables of the correlations between the three product cues, perceived quality, and willingness to buy and the coefficients (see Table 4.13 and 4.14) were utilized to examine the

correlations between product cues and perceived quality and the impacts of product cues on perceived quality. The correlation between brand and perceived quality ($r=.702$, $p<.01$) were moderate; brand ($t=6.779$; $p<.05$; $\beta=.522$) had a positive impact on perceived quality and its relationship with perceived quality was significant. The correlation between design and perceived quality ($r=.676$, $p<.01$) were moderate; design ($t=5.934$; $p<.05$; $\beta=.450$) had a positive impact on perceived quality and its relationship with perceived quality was significant. The correlation between price and perceived quality ($r=.526$, $p<.01$) were moderate. However, price ($t=-1.681$; $p>.05$; $\beta=-.139$) had no significant impact on perceived quality.

A table of Model Summary prepared from the simple regression analysis (see Table 4.15) indicated that nearly 20% of the variance of willingness to buy was accounted for by perceived quality, which meant that perceived quality did not fully explain willingness to buy. However, a table of ANOVA prepared from the simple regression analysis (see Table 4.16) provided evidence that perceived quality was significantly related to willingness to buy, $F(1,142)=36.725$, $p < .001$. The correlation between perceived quality and willingness to buy ($r=.453$, $p<.01$) was low, but perceived quality ($t=6.060$; $p<.05$; $\beta=.453$) had a positive impact on willingness to buy and its relationship with willingness to buy was significant.

Hypotheses about the relationships between product cues, perceived quality, and willingness to buy were checked based on the statistical results of the proposed study model. As indicated in Table 4.19, all hypotheses except the hypothesis of price (H_3) were met. In the last chapter, discussions of the findings, practical implications, contributions to the field, limitations and directions to further research, and overall conclusion will be presented.

CHAPTER FIVE

DISCUSSION

5.1 Introduction

The study was designed based on three purposes. To begin with, this study was conducted in order to examine the relationship between three product cues and perceived quality. Second, the study was conducted in order to examine which product cue positively influences consumers' quality perceptions the most. Lastly, the study was conducted to examine the extent to which consumers' quality perceptions influence their willingness to buy an activity tracker. Previous researchers have reported how consumers utilize product cues to perceive product quality and make a purchase decision (Olson & Jacoby, 1972; Zeithaml, 1988; Lee & Lou, 2011); however, previous researchers have not examined the role of specific product cues that consumers may use in form perceptions of quality about particular products.

To find out which product cue may most influence consumer perception of product quality, participants were exposed to product cues (brand, design, and price) for activity trackers. Instruments from previous studies conducted by Bao et al. (2001), Dodds et al. (1991), and Richardson et al. (1994) were revised to assess the product cues and the relationships between three product cues, perceived quality and willingness to buy. In this chapter, I will first provide a general discussion of the findings and whether I obtained answers to the three research questions discussed in Chapter 1. Next, I will discuss contributions to the academic field. Third, I will discuss practical implications for sports product companies. Fourth, I will present limitations as well as the directions to further research. Finally, the study conclusion will be presented at the end.

5.2 General Discussion of Findings

5.2.1 Question Items with Low Item-to-Total Correlations

During the reliability assessment, two questions emerged with item-to-total correlation scores below .05. The two items were in the Design and Price groups. As discussed in Chapter 4, Jones, Harding, Berry, Wiklund, Chen, and Leidy (2009) and Jacobson and Newman (1990) mentioned that the item-to-total correlation scores below .05 mean that the items do not contribute or little contribute to the overall reliability of the section that the questions belong to. These two items were “I have doubts about the quality of the product based on its design” and “I have doubts about the quality of the activity tracker based on its price.”

One possible explanation is the wording of the two items. Each group of product cues had six questions; all the questions in each group - except the “doubt” items – are worded in a positive manner. According to Cappelleri, Althof, Siegel, Shpilsky, Bell, and Duttadupta (2004), not wording all items positively or negatively helps to avoid a bias. For this reason, the “doubt” items were included. However, of the 18 questions regarding the product cues, only three questions were negatively worded; the overall wording of the questionnaire for this study was positively biased. The participants may have been confused by the inclusion of a statement that has a negative tone. The participants may not have fully understood the different wording. Even though the same type of question under the group of Brand had an acceptable score, the different wording for price and design might have negatively influenced the item-to-total correlation scores of these two questions. Therefore, a similar ratio of positively and negatively worded items may be a solution to avoiding low item-to-total scores.

5.2.2 Awareness of Activity Trackers

There were two questions about activity trackers: (1) Do you know what an activity tracker is? and (2) Do you have an activity tracker? A majority of the participants had knowledge about activity trackers, but just 12 participants used an activity tracker. There was good awareness of activity trackers in general, but there was a very low incident of usage. On one hand, it seems the popularity of activity trackers may be low. Based on this finding, it may also be that the market of activity trackers is still in an early product lifecycle stage. Companies and/or manufacturers should focus on key components that may increase the popularity of trackers so the product can move onto the next stage. Ahn (2006) mentioned that product popularity “plays an important role in consumers’ purchasing decisions because most consumers are influenced by how others feel about a product or how widely a product has been exposed in the market” (p. 59). Efforts to increase the popularity of trackers may increase the number of users and size of the market.

5.2.3 The Impacts of Product Cues on Perceived Quality

As indicated in Chapter 4, the beta weights for product cues in relation to perceived quality provide evidence that brand and design had a positive impact on perceived quality, and price had no impact on perceived quality. Brand had the highest beta weight meaning that it was the most influential among the three product cues, which is consistent with findings from previous research. For example, Hoyer and Brown (1990) reported that brand had a positive impact on consumers’ product selections; consumers tended to believe that branded products had high quality even though the actual quality of the products was not high. Design was also found to be an influential cue but slightly less than brand. Garvin (1984) mentioned that design is an important cue for personal judgment and effects buying behaviors or purchase decisions.

Summing up the previous studies referenced in Chapter 2, brand and design ought to be what marketers of products should seriously consider when they are about to market or launch a product. Brand communicates to consumers consistent quality of a product, working as a risk reducer for consumers' uncertainty about a product (Chernatony & Riley, 1998). As Rao and Ruekert (1994) confirmed, brand is information for consumers to expect a product's quality or performance before their actual usage of the product. Design is what consumers can easily identify and utilize to perceive quality and evaluate a product, so from companies or manufacturers' perspectives, design is what they should notably take care of for better quality perceptions and product success.

Not only was there a lack of significant influence from price, the beta score was negative (-), an indicator price was not an influential cue, which is consistent with the results from previous research. For example, Peterson and Jolibert (1976) reported two findings regarding the influence of price: (1) brand had a significant influence on perceived quality but, "there was no significant main effect for price" (p. 535) and (2) the influence of price could be weakened by the availability of other product cues. The second finding may be a reason why the results of this study indicated that price was not an influential cue for perceived quality. In other words, the availability of brand and design might negate the impact of price on perceived quality. In the current study, as noted in the reporting of the results, brand and design make up a substantial portion of the variance accounted for. As such, when price was parceled into the assessment, of the variance accounted for, little remained to be associated with price. Having a moderate correlation, it is not surprising that price was not a significant factor – particularly in relation to brand and design.

Gardner (1971) also found that “price did not transmit information affection perception of product quality” (p. 243) whether a product is branded or not. In fact, the influence of price may be considered controversial. Rao and Monroe (1982) and Erickson and Johansson (1985) argued that price is utilized by consumers to measure the quality of a product and evaluate a product, which made me hypothesize that price has a positive impact on perception of product quality, believing that the influence would be the same as brand and design, even though the aforementioned previous studies made opposite arguments. However, the results of this study lead me to conclude at this point that the impact of price should be considered in tandem with other product cues.

5.2.4 Product Cues Utilized by the Participants in the Groups of Nike Fuelband and FitBit Flex

The significant influence of brand and design are apparent in one sense from the participants’ preference among the six activity trackers. The majority of participants selected Nike Fuelband and FitBit Flex. Even though brand and design were almost equally utilized by all participants, the participants in the group of Nike Fuelband mainly focused on brand while the participants in the group of FitBit Flex mainly focused on design, as indicated in Table 4.7 in Chapter 4. The participants selecting the Nike Fuelband might utilize brand because Nike is a company with well-known global brands for sports and health products. The importance of design detected in the group of FitBit Flex can be explained by the participants’ choices among the six activity trackers. There were two FitBit designs, a clip-on (FitBit One) and a wristband (FitBit Flex). The wristband design was preferred, even though they were essentially the same product from one brand. The participant choices reflect a preference for activity trackers designed as a wristband. That is why FitBit Flex was the one selected by the participants who are interested in FitBit. The most preferred activity tracker, Nike Fuelband is also designed as

wristband. In the case of the Nike tracker, it may be there was a combination of brand and design influencing consumers' perception of quality. Based on this finding, it is implied that product cues may have a greater impact when consumers utilize more than one product cue to perceive quality. Therefore, researchers should consider the impact of the combination of product cues and examine which combinations bring positive and negative impacts on perceived quality.

5.2.5 The Relationship between Perceived Quality and Willingness to Buy

The relationship between perceived quality and willingness to buy was significant, but the variance accounted for in willingness to buy was very low. One possible explanation for the variance accounted for is the existence of other variables between perceived quality and willingness to buy. In the model proposed by Dodd et al. (1991), there is the variable of perceived value between perceived quality and willingness to buy, and the researchers argued that perceived value "in turn directly influences willingness to buy" (p. 308). In addition, Patterson and Spreng (1997) mentioned that the major works in a consumer and retailing context used "willingness to buy as a key consequence of value perception" (p. 416). Based on those previous studies, it is reasonable to conclude that other variables must be considered to better understand what all may impact willingness to buy. The identification of variables between perceived quality and willingness to buy is necessary so that the variance of willingness to buy can be reliably accounted for by the identified variables.

5.3 Contributions to the Field

As sports products have become more innovative and sophisticated, people's attention and interest in sports products may be increasing. With such a tendency, it is necessary to analyze what components of sports products people look at to perceive quality and make a

purchase decision. By assessing the impact of the three product cues on perceived quality, this study established a basic foundation of the importance of product cues for researchers in the field of sport marketing, and they should be aware of how product cues in sports products are utilized by consumers to perceive quality and how perceived quality influence willingness to buy a product.

Sport marketing researchers have examined the effect of brand on perceived quality or the intent to repurchase tickets (which is the same as purchase decisions in this study) through sponsorship of sports teams. For example, Couvelaeur and Richelieu (2005) emphasized that building strong team brands is important for sports teams to build emotional relationships with fans and capitalize on the relationships. With a television clip of a NASCAR race, Levin, Joiner, and Cameron (2001) examined how consumer attitudes were influenced by a brand that appeared on cars. The results from the current and previous studies (Forsythe, 1991; Davis, 1985; Richardson et al., 1994; Jacoby et al., 1971; Severi & Ling, 2013) are consistent regarding the effect of brand on perceived quality. The previous research cited was based on intangible sports products such as games, events, and sports teams. The current study is a first attempt to examine the effect of brand on perceived quality using a tangible sporting good. Thus, this study serves as a cornerstone, so further research studies are necessary to examine the effect of brand for consumer behaviors for sports products.

5.4 Practical Implications

The findings of this study have produced some practical implications for sport marketers. To begin with, the importance of product cues should be addressed. As indicated many times in the earlier chapters, consumers utilize product cues to perceive quality to make a purchase decision. For this reason, it is necessary for sport marketers to identify cues in their products that

consumers can utilize. In addition, they should distinguish strong and weak product cues so that they can prepare strategic marketing plans based on the strong product cues to make up for the weak product cues.

In fact, the discovery of influential product cues in activity trackers is probably the most significant implication especially to the marketers of activity trackers. Through this study I found that brand and design are influential cues that influence consumers to positively perceive quality and to make a purchase decision. As indicated in Chapter 2, brand communicates to consumers consistent quality (Chernatony & Riley, 1998), and the tests conducted by Nevid (1981) and Wheatley et al. (1997) identified that consumers tended to positively perceive quality with branded products than unbranded products. The importance of design was also identified in Chapter 2 and a study conducted by Bhuian (1997) indicated that many companies seriously take care of their product designs believing that it is a positive product cue for product quality. The importance of brand and design can be also examined with the preference of the participants of this study, and it is implied that consumers tend to choose a product that combines great brand and design. Therefore, the marketers of activity trackers should be aware of importance of those two product cues in order to increase the popularity and sales of their activity trackers.

According to Mullin, Hardy, and Sutton (2007), sports products can be both tangible and intangible. Even though this study utilized a tangible sport product, the findings may be noteworthy to marketers for intangible sport products such as games and events. Since games and events are also sports products, they have product cues that the marketers should manage. For example, ticket prices and service quality can be recognized as extrinsic cues; seating and halftime events can be recognized as intrinsic cues in games and events based on the definition of intrinsic and extrinsic cues in Chapter 1. Thus, intangible sports products also consist of

various product cues, which consumers may utilize to perceive quality and make decisions of repeated attendance. Therefore, the marketers for intangible sports products should be aware of the importance of product cues in order to positively impact attendance rates and revenues.

5.5 Limitations and Directions to Further Research

To begin with, the sample of this study should be addressed. College students were selected as the main subjects for this study through a convenience sampling method. As mentioned in Chapter 3, the fact that students are one of the subjects that are easily and frequently used in the consumer behavior research provides some support the use of college students as the main subjects for this study. College student are also part of the target market for activity trackers, but the sample participating in the study are not representative of the population of consumers for activity trackers. In fact, the consumers of activity trackers can be any people who are interested in physical activities, sports merchandise, or IT combined devices. However, in this study the focus was just on the students who were enrolled in LAP courses or visiting a recreational center on the FSU campus.

The prices of the six activity trackers on the first page of the questionnaire that participants had to select from were limited. In fact, the prices of the six activity trackers were homogeneous; they were all near \$100. Since many students are usually financially restricted, they might think that there was no affordable price, which could be a reason why price was found not to be significant for perceived quality in this study. Therefore, if the researchers of further studies are going to use students as the study sample, they need to identify prices that students feel affordable and consider the inclusion of the affordable prices.

There was also a limitation in the proposed model. The model starts with three product cues: brand, design, and price. The three are product cues are easily detectable with one's eyes.

In other words, this study just focused on the product cues that consumers can detect at a glance. However, further studies should consider another cue, function, which must be judged based on actual use of a product. According to Berden, Brombacher, and Sander (2000), customers expect that products that they choose have great functions. From a business perspective, function is also an important product cue that drives businesses (Berden, Brombacher, & Sander, 2000). Page and Herr (2002) also mentioned that the function of product is “an important determinant of long-term product success” (p. 134) and “directly impact judgment of quality” (p. 135). In other words, function positively influences consumers’ quality perceptions and their purchase decisions. Based on those findings, function is also a cue that companies or manufacturers of activity trackers should focus on. Therefore, researchers of further studies should add the cue of function in their proposed models.

5.6 Conclusion

An activity tracker is an innovative sports product. It assists and motivates people’s participation in physical activity. However, compared to people’s awareness, this great innovative product has not been popular, which motivated me to analyze activity trackers and the characteristics of the current and potential consumers to examine the process of consumer behaviors.

This study consisted of three research questions: (1) Are the cues of activity trackers positively related to perceived quality? (2) Which cue significantly influence perceived quality?, and (3) Is perceived quality positively related to consumers’ willingness to buy an activity tracker? Two of the three cues were positively related to perceived quality. Specifically, brand was the strongest cue that significantly influences perceived quality. In the case of the

relationship between perceived quality and willingness to buy, their relationship was significant, but there was still a substantial portion of variance not accounted for by the proposed model.

The importance of product cues is important to emphasize; the findings from this study provide a foundation for further studies. Product cues are important information influencing consumers' perception of quality and willingness to buy. Further studies with similar topics will provide more applicable information or recommendations to sports marketers so that they can strategically make their marketing plans.

APPENDIX A

LETTER OF CONSENT



THE FLORIDA STATE UNIVERSITY
COLLEGE OF EDUCATION
Department of Sport Management

Consent to Participate

Dear Participant,

You are invited to be in a research study of activity trackers. The purpose of this study is to examine which product cues influence quality perceptions regarding a product, and the relationship between the quality perceptions and willingness to buy. Please read this form and ask any questions you may have before agreeing to participate in the study.

I am requesting your participation, which is extremely important and is greatly appreciated. It will take approximately 8-10 minutes to complete this questionnaire. The survey is anonymous; the survey does not need any identity related information. Your participation in this study is totally voluntary and there would be no penalty for nonparticipation. You may choose not to participate or to withdraw from the study at any time without affecting relationships with anyone and any organization such as the principal investigator or the Florida State University. Your decision whether or not to participate will not affect your current or future relations with the University. Responses will be anonymous; the results of the study may be discussed overall, but your information will remain private and confidential to the extent permitted by law. Research records will be stored securely in a safe for three years and only the primary researcher will have access to the records. The study has no risks greater than the ones that could happen in an ordinary daily life. Also, there is no direct benefit to participation.

This research is for my master's thesis. The researcher conducting this study is Kyoungwhan Oh (principal investigator). You may ask any question you have about the project. If you have a question later, you are encouraged to contact the investigator via email or phone, or Dr. Jeffrey James (advisor) via email (jdjames@fsu.edu) or phone (850-644-4813). If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), you are encouraged to contact the FSU IRB at 2010 Levy Street, Research Building B, Suite 276, Tallahassee, FL 32306-2742, or 850-644-8633, or by email at humansubjects@magnet.fsu.edu.

Sincerely,
Kyoungwhan Oh

APPENDIX B

QUESTIONNAIRE

Activity Trackers

A picture and description for six different activity trackers are presented below. After looking at each picture and reading each description, please, indicate which activity tracker you would be most interested in buying.

A.



Manufacturer: Jawbone

Name of the Product: Up

Price: \$129.99

Design Style: Wristband

B.



Manufacturer: FitBit

Name of the Product: One

Price: \$99.95

Design Style: Clip-on

C.



Manufacturer: Basis

Name of the Product: B1

Price: \$199.00

Design Style: Watch-like

D.



Manufacturer: Nike

Name of the Product: Fuelband

Price: \$149.00

Design Style: Wristband

E.



Manufacturer: FitBit

Name of the Product: Flex

Price: \$99.95

Design Style: Wristband

F.



Manufacturer: BodyMediaFit

Name of the Product: Core

Price: \$179.99

Design Style: Wristband

Which activity tracker would you be willing to buy? Please circle the appropriate letter.

A

B

C

D

E

F

Please place a check mark next to the appropriate answer and/or fill in the blank for each item below.

1. Please indicate the year in which you were born: _____
2. Gender: ___ Female ___ Male
3. Race: ___ Caucasian ___ African American ___ Hispanic ___ Asian ___ Other
4. Year in School: ___ Freshman ___ Sophomore ___ Junior ___ Senior ___ Graduate
5. Number of hours of physical activity per week: _____ hours
6. Do you know what an activity tracker is?: _____ Yes _____ No
7. (*If applicable*) Do you have an activity tracker? If no, proceed to item 8. If yes, please indicate the brand and name of your activity tracker (It is fine that your activity tracker and your choice on the first page are different.)
 - a. List the brand and name of your activity tracker: _____

Thinking of the tracker you would be willing to buy, please indicate the extent to which you agree or disagree with the following statements by circling the appropriate number in the scale next to each item.

	Questions	Strongly Disagree		Neutral			Strongly Agree	
8.	I believe the quality of the product is reliable based on the design.	1	2	3	4	5	6	7
9.	I believe the product is a superior activity tracker based on the brand.	1	2	3	4	5	6	7
10.	I believe the product looks durable based on the price.	1	2	3	4	5	6	7
11.	The reliability of the product is high.	1	2	3	4	5	6	7
12.	I believe the product is a superior activity tracker based on the price.	1	2	3	4	5	6	7
13.	I believe the activity tracker is reliable based on the brand.	1	2	3	4	5	6	7
14.	I believe the activity tracker is a superior product based on the design.	1	2	3	4	5	6	7
15.	Considering the price, the overall quality of the product is excellent.	1	2	3	4	5	6	7
16.	Considering the brand, I think the product is durable.	1	2	3	4	5	6	7
17.	I have doubts about the quality of the product based on its design.	1	2	3	4	5	6	7

	Questions	Strongly Disagree			Neutral			Strongly Agree	
18.	Considering the brand, the overall quality of the product is excellent.	1	2	3	4	5	6	7	
19.	I believe the quality of the activity tracker is poor.	1	2	3	4	5	6	7	
20.	I have doubts about the quality of the activity tracker based on its price.	1	2	3	4	5	6	7	
21.	The activity tracker looks durable based on the design.	1	2	3	4	5	6	7	
22.	Considering the design, the overall quality of the product is excellent.	1	2	3	4	5	6	7	
23.	I believe the activity tracker is reliable based on the price.	1	2	3	4	5	6	7	
24.	I have doubts about the quality of the product based on the brand.	1	2	3	4	5	6	7	
25.	The dependability of the product is low.	1	2	3	4	5	6	7	

Please rate your assessment of the workmanship of the product you chose by circling the appropriate number in the scale next to each item.

	Questions	Low			Average			High	
26.	Based on the price, the workmanship of the product is...	1	2	3	4	5	6	7	
27.	Based on the brand, the workmanship of the product is...	1	2	3	4	5	6	7	
28.	Based on the design, the workmanship of the product is...	1	2	3	4	5	6	7	

For each item listed below, please indicate your willingness to buy the product you chose by circling the appropriate number in the scale next to each item.

	Questions	Low			Average			High	
29.	Based on my quality perception of the product, the likelihood of me purchasing this product is...	1	2	3	4	5	6	7	
30.	Based on my quality perception of the product, the probability of me purchasing the product is...	1	2	3	4	5	6	7	
31.	Based on my quality perception of the product, my willingness to buy the product is...	1	2	3	4	5	6	7	
	Questions	Strongly Disagree			Neutral			Strongly Agree	
32.	Considering the price, brand, and design, I would purchase this activity tracker.	1	2	3	4	5	6	7	

APPENDIX C

HUMAN SUBJECTS COMMITTEE APPROVAL MEMORANDUM

The Florida State University
Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673, FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 1/31/2014

To: Kyoungwhan Oh

Address:

Dept.: SPORT MANAGEMENT

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research

The Effects of Brand, Design, and Price on Consumer Behavior for an Activity Tracker

The application that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and one member of the Human Subjects Committee. Your project is determined to be Expedited per 45 CFR Â§ 46.110(7) and has been approved by an expedited review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 1/30/2015 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is FWA00000168/IRB number IRB00000446.

Cc: Jeffrey James, Advisor
HSC No. 2014.12090

APPENDIX D

HUMAN SUBJECTS COMMITTEE APPROVAL MEMORANDUM (FOR CHANGE IN RESEARCH PROTOCOL)

Office of the Vice President For Research
Human Subjects Committee
P O Box 3062742
Tallahassee, Florida 32306-2742
(850) 644-8673 · FAX (850) 644-4392
APPROVAL MEMORANDUM (for change in research protocol)
Date: 03/06/2014

To: **Kyoungwhan Oh**

Address:

Dept: **SPORT MANAGEMENT**

From: Thomas L. Jacobson, Chair

Re: Use of Human subjects in Research
Project entitled: **The Effects of Brand, Design, and Price on Intent to Purchase an Activity Tracker**

The application that you submitted to this office in regard to the requested change/amendment to your research protocol for the above-referenced project has been reviewed and approved.

Please be reminded that if the project has not been completed by 01/30/2015, you must request renewed approval for continuation of the project.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: **Jeffrey James <jdjames@fsu.edu>, Advisor**
HSC NO. 2014.12391

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BIOGRAPHICAL SKETCH

Kyoungwhan Oh was born in Seoul, South Korea, on October 12, 1988. He started his academic life in Tallahassee, Florida in 2008. He earned an Associate's degree from Tallahassee Community College (TCC) in 2010. He transferred to Florida State University (FSU) in 2010 and received a Bachelor of Science in Sport Management with the Honors of Cum Laude in 2012.

In 2012, Kyoungwhan started coursework as a Master's student in Sport Management at FSU and is now expected to receive his Master's degree in Sport Management in May, 2014.