

**INFLUENTIAL PRODUCT CHARACTERISTICS  
OF APPAREL PRODUCT PERFORMANCE  
AS MEASURED IN PROFIT**

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Master of Science

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by

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The undersigned, appointed by the Dean of the Graduate School, have examined the thesis entitled.

**INFLUENTIAL PRODUCT CHARACTERISTICS  
OF APPAREL PRODUCT PERFORMANCE  
AS MEASURED IN PROFIT**

Presented by Jong Han Hyun

A candidate for the degree of Master of Science

And hereby certify that in their opinion it is worthy of acceptance.

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Professor Wayne Wanta

This thesis is dedicated to my parents who have supported me all the way since I was born. Without their love and encouragement, my studies could not be completed.

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# **INFLUENTIAL PRODUCT CHARACTERISTICS OF APPAREL PRODUCT PERFORMANCE AS MEASURED IN PROFIT**

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## **ABSTRACT**

This study investigated what previous studies have suggested as influential product characteristics of apparel product performance in an effort to prove the statistical significance of those characteristics. One hundred and two participants were recruited at a fixed location at a mid-western university bookstore. Ten university-licensed caps, bearing different product characteristics, were purchased from the university bookstore, and presented to the participants while he or she answered a set of four questions for each university-licensed cap. Each question was designed to assess the participants' perception of quality, price, style, and fabrication of each university-licensed cap. Results indicated that perceptions of price, style, and fabrication are highly related to the performance of apparel products as measured in profit. However, the perceived quality failed to show any significant effect.

# CHAPTER ONE

## INTRODUCTION

It is widely accepted in both industry and academics that new products are critical to the growth of most manufacturing firms. Accordingly, a considerable amount of effort has been made by industry to increase the success rate of new products. Academic researchers also have been attempting to identify the factors that influence new product performance. Periodicals such as *Academy of Management Journal*, *Journal of the Academy of Marketing Science*, *Journal of Marketing Research*, and *Journal of Product Innovation Management* have been publishing product performance related articles for decades, and efforts are still being made. A body of research in the New Product Development (NPD) field has been concentrating on understanding what factors separate successful products from unsuccessful products. But in spite of all the efforts, the rate of new product success has not advanced over the last 50 years.

A Ross Federal Research Corporation's study, conducted in 1961, showed that 80 percent of new products introduced by leading packaged-goods manufacturers failed (O'Meara, 1961). In addition, Angelus (1969) mentioned that over 80 percent of new consumer goods have unsuccessful outcomes. Shifting to a study done in the early 90, Moore (1993) mentioned that a representative sample of industry people working in the product development area commonly responded that about one-third of all new products

failed to meet the company's needs. Another recent study (Clancy, 2003) noted that no more than 10 percent of all new products or services are successful.

### ***Statement of Problems***

*Lack of differentiation between industries.* Why has product success rate remained unchanged despite the efforts made by researchers? Recent studies in the New Product Development (NPD) field suggested that factors influencing new product performance change across products and industries (Brown, 1995; Cooper, 1993; Terwiesch, 1999). But in contrast, most research involving this particular topic attempts to apply its conclusions to the whole industry in general, which doesn't satisfy the different concerns of each individual sector.

The influence of lacking differentiation in product performance research is very evident in the apparel industry. Together with the textile mill industry, statistical records from 1996 and 1997 show that the apparel industry has the highest business failure rate (*Business Failures, by industry: 1990 to 1998*, The Dun and Bradstreet Corporation, Murray Hill, NJ). Many factors including international competition may be responsible for the phenomenon. However, considering the fact that new product failure is closely related to business failure, it is quite obvious that the apparel industry has been lagging in terms of new product performance research. The situation is well described in Keiser and Garner (2003) where it was mentioned that over 60 percent of customers feel apparel product developers do not understand their preferences. Despite the above, only a small number of studies in the apparel field have addressed apparel product success and failure,

and even fewer studies have been conducted in the NPD field. The situation suggests the need for studies with a specific industry focus. And among the industries, the apparel sector is most in need of efforts to identify the factors influencing product success and failure.

*Lack of focus on product characteristics.* The single most important dimension leading to new product success is product uniqueness and superiority (Cooper, 1979). Cooper discovered that unique and superior products have the highest success rate of 82 percent followed by 79.5 percent in best marketing and 64 percent in best technical/production (Cooper, 1980). In contrast, most research in the New Product Development (NPD) area concentrates on process characteristics (e.g., marketing, human resources) rather than the characteristics of the product itself as performance predictors. The data set collected in a meta-analysis conducted by Hernard (2001) represents the situation well. Among 300 NPD related studies analyzed in the research, only 35 studies were done in the product characteristic area whereas 95 were done in the process characteristic area. This implies the need for more emphasis on product characteristics as product performance predictors.

### ***Research Approach***

This study attempted to identify and reinforce what previous studies have proposed as influential product characteristics of apparel product performance. But the amount of research done in the apparel field in this particular topic was assumed to be very small. Therefore, additional studies from the NPD field were referenced to find

support for what is proposed in the apparel field. The influential product characteristics, identified through review of previous studies, were tested through a survey.

Samples of commercialized products were selected and evaluated by a representative consumer group based on the influential product characteristics. The collected data were examined to determine the existence of a relationship between the influential product characteristics and the performance of each product as measured by profits.

For the purpose of this research, university bookstore customers were chosen as the sample apparel consumer group. This study recognized the fact that the majority of the bookstore customers are college students and might create some bias in the results of the research. However, researchers in the social science field claimed that college students are more homogeneous than non-students (Greenberg, 1987; Kraus, 1995). Assumptions were made by Brown and Stayman (1992) that the homogeneity of college students translates into stronger hypothesis tests than non-students since there is less noise associated. Also, it is believed that college students are the primary focus for many apparel businesses due to their great potentiality as customers. Thus, this study took the above as the rationale for using college bookstore customers as its research subjects.

In addition, a decision had to be made on what products would be most appropriate for the sample group to evaluate. Due to several factors, it was determined that university-licensed caps best fit the purpose of this research. First, the popularity of university-licensed caps among college students is high. Presumably, most college students have the experience of purchasing a university-licensed cap, thus the evaluation process would be more accurate. Second, the evaluation process required the participants

to put on the sample products. The fact that caps can be easily put on and removed prevented excessive time consumption. Moreover, since caps are generally one-size-fits-all, size consideration could be disregarded. Size can be a significant obstacle for other product categories such as t-shirts or pants.

In regard to measuring performance level, several studies suggested profit as measures of product performance (Cooper, 1984; Jang, Hawley & Dickerson, 2005; Urban and Hauser, 1980; Sadd, 1996; Senanayake and Little, 2001).

In summary, samples of university-licensed caps were evaluated by university bookstore customers based on the influential product characteristics. Then, the collected data were compared to the profit of each cap to determine the existence of a relationship between the influential product characteristics and the performance as measured in profit.

### ***Contribution***

As mentioned earlier, the apparel industry is lagging behind in terms of identifying the influential product characteristics of apparel product performance. But only a small number of studies in the apparel field has paid attention to this issue. We hope that our research will contribute in reinforcing what is proposed in the field, thus acting as a motivator of further studies in identifying the influential product characteristics.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

A review of literature in the apparel field revealed that there has been no research conducted to identify the influential factors of apparel product performance except for an exploratory study by Jang, Hawley, and Dickerson (2002). Therefore, Jang, Hawley, and Dickerson (2002) was set as the main reference article for this research. Related studies from the apparel product development field and the New Product Development (NPD) field were referenced to provide support for what was proposed in the study by Jang, Hawley, and Dickerson.

#### ***Main Article***

As stated above, an exploratory study by Jang, Hawley, and Dickerson (2002) provided the main foundation for this research. The objective of their research was to identify the influential factors of apparel product performance. The study found its ground in two separate areas; the apparel product development field and the NPD field. Jang, Hawley, and Dickerson (2002) took a qualitative research approach to accomplish the objective. Twenty-seven individuals of various managerial position levels from ten apparel companies and two retail companies participated in in-depth face-to-face interviews. They were interviewed and taped about their opinions on what factors



influence apparel product performance. Each theme revealed by a participant was checked and counted. Afterwards, frequency ranking was used to identify what themes were perceived as most important by the participants.

Product differentiation was the theme declared most frequently, thus implicating its importance. The fact that product differentiation was discussed most often also coincided with our research objective to identify the influential product characteristics of apparel product performance. Four sub-themes were identified under the product differentiation theme; quality, price, style, and fabrication. Table 1 presents these four sub-themes and the third-order themes identified through this research. The study noted that these findings will provide guidance for the industry by recognizing the factors that should be avoided or pursued (Jang, Hawley, & Dickerson, 2002). However, having taken a qualitative approach, the findings of this study could not be extended to wider populations with the same degree of certainty. The product differentiation theme and the four sub-themes proposed in this research were not tested to discover whether they are statistically significant or due to chance.

Table 1

*Emergent Factors of Apparel Product Success and Failure in Product Differentiation (Jang, Hawley, & Dickerson, 2002)*

| Quality         | Price             | Style   | Fabrication    |
|-----------------|-------------------|---|----------------|
| General quality | Price vs. Quality | Stronger focused on vs. Distance from target customer | Comfort        |
| Fit             | Low or High price | Evolutionary vs. Revolutionary style                  | Hand           |
|                 | Price vs. Style   | Versatility vs. Inability to mix & match              | Appearance     |
|                 |                   | Uniqueness vs. No specialty                           | Tailor-ability |
|                 |                   | Widespread vs. Limited appeal                         |                |
|                 |                   | Harmony   |                |
|                 |                   | Ease of wear vs. Complexity                           |                |
|                 |                   | Color   |                |

***Supporting Articles***

This section of the chapter attempted to identify studies from the apparel product development field and the New Product Development (NPD) field that can support what was revealed in the study by Jang, Hawley, and Dickerson (2002).

*Apparel product development.* In the 1970's, the number of studies conducted in the apparel product development field was less than 10 every two years. This number experienced a three to four fold increase during the last decade (Senanayake and Little,

2001). But unfortunately, no study was conducted with specific focus on the influential factors of apparel product performance. However, a body of research made constant efforts to understand the process of apparel product development and to present a product development model for the apparel industry. Some of the proposed models allowed us to grasp an idea of what factors might influence apparel product performance.

Gaskill (1992) examined the product development process used by specialty retailers carrying private label merchandise. The Retail Product Development Model, which was developed through this study, provided a chronological sequence of the product development process. The model consisted of retail product development activities pertaining to trend analysis, concept evolution, palette decisions, fabrication, fabric design, silhouette directions, prototype construction and analysis, line presentation, and subsequent activities. The study also identified the intervening factors of the product development process.

Later on, the above model was tested and expanded by Wickett, Gaskill and Damhorst (1999). This follow-up study tested the validity of Gaskill's (1992) model across a broader range of specialty stores and also expanded the model to include post-adoption product development. As a result, the Retail Apparel Product Development Model was developed, in which a post-adoption stage was added to the original model. The post adoption section consisted of fit and style perfecting, production pattern making, materials/garment specification writing, retail firm development, and manufacturer development. Expansion was also made on the intervening factors, owing to the study result which revealed new factors that were not shown in Gaskill's (1992) original model.

An attempt to apply the engineering design process theory to the apparel design process was made by Regan, Kincade, and Sheldon (1997). The goal of the research was to understand the apparel design process and determine whether the engineering design process theory was used by apparel designers and merchandisers. The results showed that there is a direct relationship between the two processes. Also a frequency count of the tasks revealed that the information searching stage required the most time for design associates. The information searching stage included visual display of the stores, departmental color transition, and garment body styles.

May-Plumlee and Little (1998) proposed a different approach in presenting an apparel product development model. This study argued that existing apparel product development models are limited by a sequential nature. That is, current models do not clarify the concurrent nature of some development activities and also do not consider the involvement of functional areas of the manufacturing firm. In response to the limitations current models have, this study presented the No-Interval Coherently Phased Product Development (NICPPD) model. The NICPPD model had multiple phases in order to provide for developing both product lines and individual products, development of seasonal lines and multiple seasons annually, and developing new products, take-offs, and modifying existing products. May-Plumlee and Little (1998) described the 6 phases as the following:

- Phase 1 – Line planning and research
- Phase 2 – Design/concept development
- Phase 3 – Design development and style selection
- Phase 4 – Marketing the line

- Phase 5 – Pre-production
- Phase 6 – Line optimization

Several major publications in the apparel field also offered a preferable reference on what issues were considered in developing an apparel product. A recent publication by Keiser and Garner (2003) put considerable weight on the designing process of apparel product development. It was noted that the product designing process is divided into two sections; creative planning and technical design. Creative planning deals with trend forecasting, color management, fabrication, garment styling, line planning, and development. The technical design section deals with pattern making, trim, sizing, and quality assurance.

Another publication in the apparel field by Kadolph (2007) described product development as the design and engineering of a product. It was further mentioned that in order for companies to generate profit, companies must develop products that satisfy consumers' expectations for serviceability and performance. Serviceability concepts included aesthetics, durability, comfort, safety, appearance, retention, care, environmental impact, and cost. Performance was described as how products respond when exposed to some environmental factors that might adversely affect it. Product quality was also mentioned as an important dimension in the competitive global marketplace. Kadolph (2007) described quality as the sum total of product characteristics including appearance, end use, performance, material interactions within the product, consistency among identical products, and freedom from defects in construction or materials.

*New Product Development (NPD)*. As mentioned earlier, the amount of research done in our particular topic with apparel industry focus is scarce. Therefore, the study of previous literatures was broadened to the NPD research field. NPD research is a segment of the business field that has a specific focus in improving the new product development process.

In a study of 114 industrial new product failures, Cooper (1975) found that the primary reason for failure was sales falling below expectations. Subsequently, he mentioned that the primary cause of low sales came from an inferior product. For example, customers would not buy a product that is priced too high for its value or show interest in a product that lacks uniqueness. Findings of this study that were identified to influence new product performance led to the development of a conceptual descriptive model.

The model proposed above provided structure to another study by Cooper (1979) in which an extensive investigation was conducted into what separates successful from unsuccessful new products. A mailed questionnaire was utilized to measure the variables identified in the prior research. Presidents, division managers, and new product development officers from one hundred seventy seven firms were selected to participate in the study. The results revealed three dominant factors of product success, which were product uniqueness and superiority, market knowledge and marketing proficiency, and technical and production synergy and proficiency. Among the three factors, product uniqueness and superiority was mentioned as the single most important dimension leading to new product success. Cooper (1979) described product uniqueness and superiority factor as the following:

- Unique, superior products were typically highly innovative and new to the market.
- Incorporated unique features for the customer; met customers' needs better than competing products.
- Allowed the customer to reduce costs or to do something previously impossible.
- Were of higher quality than competing products.

The study added that firms must seek its differential advantage through the product.

Cooper (1980) added depth to the above research. It was argued that simply being new or unique or different is not enough. The study noted that the product must be unique and superior in the eyes of the customer. In other words, the product's uniqueness and innovativeness must yield a net benefit to the customer (Cooper, 1980).

Two hundred and three new products were studied by Cooper and Kleinschmidt (1987) to expand and confirm the prior studies. After a test of ten hypotheses using data obtained from this study, it was concluded that product superiority is the dominant factor influencing commercial success. It was also cited that project definition and early, predevelopment activities are the most critical steps in the new product development process.

Clancy and Krieg (2003) presented a similar idea in explaining new product performance. The study pointed out two possible reasons for product failure, which were concept testing that falls short, and breakdowns in marketing plans. A simulated test market (STM) method was suggested to help marketers find the best product and service concept to discover a marketing plan that will stimulate demand.

Whereas the above studies focused on identifying multiple influential factors of product performance, a body of research deals with specific individual factors. Morgan and Vorhies (2001) put specific focus on the management of product quality as the prime driver of product and process innovation. The study declared that over the past decade many firms have come to understand the importance of quality and have been making efforts for improving product quality. However, many of these efforts have failed to bring anticipated performance benefits. This research assumed that the cause of the problem is differences between the firms' views of product quality from those of the customers. Accordingly, exploratory interviews with quality and marketing managers were conducted to examine the causes and performance outcomes of quality alignment. Analysis of the collected data set provided evidence that product quality alignment significantly affects business unit performance.

Berkowitz (1987) discussed the impact of design on a proven successful product in the marketplace which attempted to identify if the design dimension can be used to achieve differentiation from competitive products. Results showed that good design not only adds sales appeal, but encourages trading up, provides a basis for market segmentation, as well as building a larger line from the same engineering investment (Berkowitz, 1987). Perks, Cooper, and Jones (2005) also examined the role of design in the new product development process. This study found its ground in recent academic suggestions that design is adopting a more essential position in the management of product development. It was proposed that firms should invest considerably in appropriate design recruitment and training policies thus nurturing a more central role for the designer.



Dean (1969) cited the importance of product pricing in the whole market performance of a product. It was suggested that a high proportion of new product failures came from the difficulty of pricing them correctly. Redmond (1999) also studied the effect of pricing. The study attempted to examine how pioneer firms' pricing strategy affects the development of posterior market concentration during the growth stage of the product life cycle. Market concentration level of firms pursuing penetration price strategy and price-skimming were compared. The results indicated that markets approached by skim pricers tend to have lower levels of concentration during the growth stage.

*Measures of product performance.* As mentioned earlier, this research attempted to reinforce what previous studies have proposed as influential product characteristics of apparel product performance. The data set collected through a survey were examined to determine the existence of a relationship between the influential product characteristics and the performance of a product. In doing so, a method to measure the performance of a product was needed. This section attempted to identify what previous studies have suggested as measures of product performance.

In a study of new product strategies and performances of 122 industrial product firms, Cooper (1984) found that a firm's new product strategy is closely related to the performance results. Cooper (1984) attempted to combine seven commonly used measures of new product performance to yield a single index of performance and described them as the following:

- The percentage of current company sales made up by new products introduced over the last five years.

- The success, failure, and kill rates of products developed in the last five years.
- The extent to which the new product program met its performance objectives over the last five years.
- The importance of the program in generating sales and profits for the company.
- The extent to which profits derived from new products exceed the costs of the new product program.
- The success of the program relative to competitors.
- The overall success of the program.

However, the analysis of seven measures failed to show total consistency. Thus, Cooper (1984) suggested three, not one, dimensions of performance. First was the impact of developed products on company sales and profits. Second, was the success rate of the product development program. And lastly, the overall performance of the product development program relative to objectives.

Among the three dimensions proposed in the above study, a number of studies coincided with the first dimension in which sales and profit was addressed as a measure of product performance.

Urban and Hauser (1980) iterated that the continuing force for product innovation is profitability. Sudd (1996) focused on financial gains in assessing the performance level of new products. Financial indicators such as margins, sales volume, markdowns, and etc. were studied to assess the effectiveness of different product

development strategies. Senanayake and Little (2001) stated that a successful product must return its development cost and, furthermore, contribute to the development cost of unsuccessful products. In other words, an important goal in developing a new product is growth in sales and profits.

Jang, Hawley, and Dickerson (2005) took a qualitative research approach to identify the measures of apparel product performance. 27 individuals of various managerial position levels from ten apparel companies and two retail companies participated in in-depth face-to-face interviews. They were interviewed and taped about their opinion on what qualities of apparel products would influence their performance. Each theme relayed by a participant was checked and counted. Afterwards, frequency ranking was used to identify what themes were perceived as most important by the participants. Table 2 presents the themes discussed by the participants. Frequency ranking indicated that sales and retail profitability are the dominant measurement criteria for apparel product performance. Sales had three sub-themes which were sell-through, longevity, and growth. As defined by the researcher, sell-through is how much percent of products is sold per a period of time, longevity is whether a product has a longer life cycle or not, and growth is how the product is growing in sales. For retail profitability, it was cited that each product must be sold at a markup percentage that met expected profitability margins in order to be regarded as successful. However, Jang, Hawley, and Dickerson (2002) noted that no matter how well a product performed in sales, it could not be regarded as successful unless the profitability is met.

Table 2

*Performance measures for apparel products (Jang, Hawley, and Dickerson, 2005)*

| Customer Acceptance Measure  | Financial Performance          | Product-Level Measure  | Firm-Level Measure                                    |
|--|--------------------------------|--|---|
| <b>1. Sales *</b> <ul style="list-style-type: none"> <li>• <b>Sell-through</b></li> <li>• <b>Longevity</b></li> <li>• <b>Growth</b></li> </ul> | <b>1. Retail Profitability</b> | 1. Product value to consumer<br>2. Adaptability<br>3. Excitement<br>4. Style mixes of line<br>5. Cost efficiency | 1. Contribution to firm business<br>2. Brand building |
| 2. Customer Satisfaction   |                                |  |   |
| 3. Market Share  |                                |  |   |

\* Measurement criteria considered as important in apparel product performance are shown in **Bold** font.

## **CHAPTER THREE**

### **RESEARCH HYPOTHESIS**

The objective of this study was to identify and reinforce what previous studies have proposed as influential factors of apparel product performance in terms of product characteristics. Influential product characteristics were identified through review of Jang, Hawley, and Dickerson (2002) and other supportive articles from the apparel product development field and the New Product Development (NPD) field. Jang, Hawley, and Dickerson proposed product differentiation as the determinant of apparel product performance. Perceptions of quality, price, style, and fabrication were suggested as the sub-themes of product differentiation.

Various studies commonly suggested sales and profit as a measure of apparel product performance (Cooper, 1984; Urban and Hauser, 1980; Sadd, 1996; Senanayake and Little, 2001; Jang, Hawley, and Dickerson, 2005). However, profit was used for this research since sales include various costs such as wages, rent, manufacturing, and etc and may complicate the data analyzing process.

Accordingly, the research hypotheses were designed based on the four sub-themes and the impact they have on apparel product performance as measured in profit.

## ***Quality***

The importance of product superiority and uniqueness in product development was addressed several times in the literature review section (Cooper, 1979; Cooper, 1980; Cooper and Kleinschmidt, 1987). In describing what product superiority and uniqueness are, Cooper (1979) pointed out that unique and superior products are of higher quality than competing products. Similarly, Morgan and Vorhies (2001) proposed that the business performance of a firm can be significantly affected by product quality. In the apparel product development field, Wickett, Gaskill and Damhorst (1999) cited the importance of fit, which is regarded as a sub-category of quality. Keiser and Garner (2003) addressed quality assurance as an important task in the technical design process. Also, Kadolph (2007) mentioned product quality as an important dimension in the competitive global marketplace. Thus, based upon the above studies, we tested the following hypothesis.

H1: Perception of quality has significant relationship with the apparel product performance as measured in profit.

## ***Price***

Dean (1969) iterated the importance of product pricing in the market performance of a product. It was suggested that high proportion of new product failures derived from the difficulty in pricing them correctly. In a study of new product developments in 177 firms, Cooper (1979) specifically declared that superior products

allowed the customers to reduce cost. Redmond (1999) studied the different market concentration levels caused by different pricing strategies and found that skim pricers tend to have lower levels of concentration during the growth stage of the product life cycle. Kadolph (2007) also briefly mentioned cost in describing serviceability concepts. Thus, based upon the above studies, the following hypothesis was tested.

H2: Perception of price has significant relationship with the apparel product performance as measured in profit.

### *Style*

The significance of style was addressed predominantly in the apparel product development field. Gaskill's (1992) product development model put considerable weight on trend, concept, color, and silhouette. Wickett, Gaskill and Damhorst (1999) specifically discussed style in adding the post-adoption stage to Gaskill's (1992) model. Regan, Kincade, and Sheldon (1997) mentioned that deciding visual display of the stores, departmental color transition, and garment body style required the most time for design associates, thus implying the importance of the process. 2 out of 6 phases in May-Plumlee & Little's apparel product development model (1998) involved design and style selection. Keiser and Garner's (2003) description of the apparel product development process involved quite a few style related factors such as, trend forecasting, color management, garment styling, and pattern making. The quantity was not large but studies in the New Product Development (NPD) field also addressed design as a significant

dimension of new product development (Berkowitz, 1987; Perks, Cooper, & Jones, 2005). Thus, based upon the above studies, the following hypothesis was investigated.

H3: Perception of style has significant relationship with the apparel product performance as measured in profit.

### ***Fabrication***

Perhaps due to the fact that the essentiality of fabrication is generally limited to apparel products, no specific support for fabrication could be found in the New Product Development field (NPD). However, in the apparel product development field, Gaskill (1992) discussed fabrication and fabric design in its product development model. Also, Wickett, Gaskill and Damhorst (1999) mentioned the importance of material/garment specification in the post-adoption stage of apparel product development. Based upon the above studies, the following hypothesis was tested.

H4: Perception of fabrication has significant relationship with the apparel product performance as measured in profit.



## CHAPTER FOUR

### METHOD

#### *Data Collection*

A convenience sample of 102 participants was recruited at a mid-western university bookstore. This university bookstore was chosen because (1) the research subject caps were purchased from this location, and (2) the visitors at the university bookstore were assumed to be potential buyers of those university-licensed caps. A recruiting ad was set inside the bookstore and a survey questionnaire was presented to anyone who was willing to participate. Eligibility of the respondents was not limited, to minimize the sampling error.

Ten university-licensed caps, bearing different product characteristics, were selected and purchased from the university bookstore (see Appendix 6). Five were randomly selected from the ten and presented to the participants while he or she answered a set of four questions for each university-licensed cap (see Appendix 5). Each question was designed to assess the participants' perception of quality, price, style, and fabrication of each university-licensed cap.

***Dependent variable***

The dependent variable, performance level of each cap, was assessed by the profit each cap generated in the winter semester of year 2007. The caps were arranged in the order of profit amount and numbered from one to ten. Data were provided by the sales manager of the university bookstore (Table 3).

Table 3

*Financial summary of the subject caps*

| Cap # | Retail price | Total profit in winter 2007 |
|-------|--------------|-----------------------------|
| 1     | \$16.99      | \$68.18                     |
| 2     | \$16.95      | \$88.20                     |
| 3     | \$16.99      | \$96.14                     |
| 4     | \$16.99      | \$135.60                    |
| 5     | \$14.99      | \$122.58                    |
| 6     | \$16.99      | \$205.48                    |
| 7     | \$16.95      | \$218.90                    |
| 8     | \$16.99      | \$332.15                    |
| 9     | \$15.95      | \$552.90                    |
| 10    | \$18.99      | \$578.89                    |

### ***Independent variable***

The independent variables, influential product characteristics of apparel product performance, were determined through review of the study by Jang, Hawley, and Dickerson (2002) and other supportive articles from the apparel product development field and the New Product Development (NPD) field. Jang, Hawley, and Dickerson proposed product differentiation as the determinant factor of apparel product performance. Quality, price, style, and fabrication were suggested as the sub-themes of product differentiation. Accordingly, the independent variables were designed based on the four sub-themes. The independent variables for this research were perceptions of quality, price, style, and fabrication.

All independent variables were measured on a Likert rating scale (1=very dissatisfied and 6=very satisfied). The collected data were analyzed to identify the existence of a relationship between the influential product characteristics and the performance as measured in profit.

### ***Data Analysis***

Data were analyzed through regression to identify whether the perceptions of quality, price, style, and fabrication can predict the caps' performance as measured in profit. Specifically, backward regression was used to separate non-contributing variables from contributing variables.

ANOVA analysis was conducted on the demographic variables to identify if there was significant difference among demographic groups in perceiving quality, price, style, and fabrication of each cap.

However, an unexpected variable was suspected to be driving the profit of Cap 9. During the data collection process, unfavorable reaction towards Cap 9 was frequently observed despite the fact that Cap 9 generated the second highest profit among the subject caps. Also, the mean score of the independent variables showed a significant downward fluctuation in Cap 9, especially for the style variable (Figure 1). It was assumed that the profit of Cap 9 was driven by its unique functionality which met the need of a specific consumer group in the market. Therefore, Cap 9 was removed and regarded as not appropriate for this research which intended to study the general consumer group.

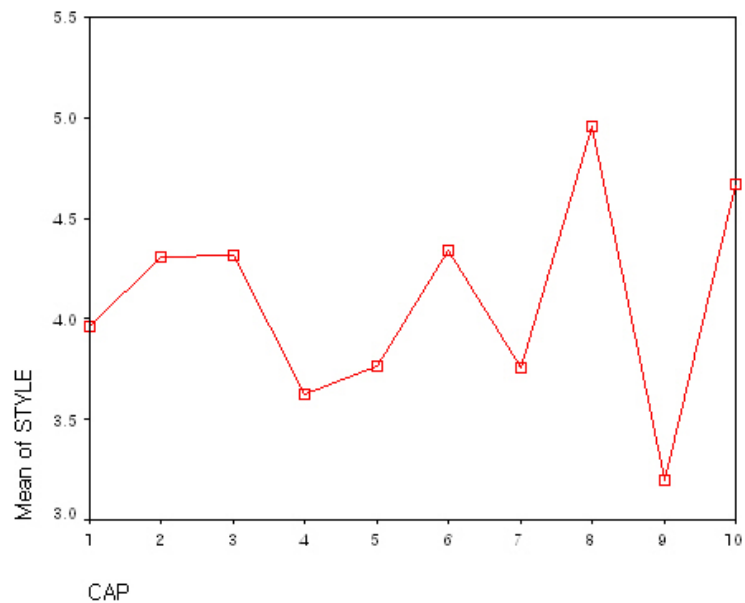


Figure 1. Mean plot of cap vs. style

After Cap 9 was removed, skewness and kurtosis values of 8 variables were obtained to test the normality. All values of skewness and kurtosis were within  $\pm 2$  except for race, indicating that 7 other variables were normally distributed (Table 4). Accordingly, the race variable was not included in the analysis.

Table 4

*Skewness and kurtosis*

| Variable    | Skewness | Kurtosis     |
|-------------|----------|--------------|
| Quality     | - .888   | .633         |
| Price       | -.286    | -.523        |
| Style       | -.339    | -.743        |
| Fabrication | -.771    | .193         |
| Gender      | -.215    | -1.962       |
| Race        | .182     | <b>3.340</b> |
| Age         | .739     | -1.084       |
| Performance | 1.477    | 1.137        |

\* Skewness and kurtosis level not within  $\pm 2$  is shown in **Bold** font.

***Regression Assumption Check***

The data were also checked for regression assumptions. No case was found outside standard residual  $\pm 3$  and the maximum leverage value was less than .20 indicating that there were no problem cases (Table 5). Multicollinerity problem was not detected with all tolerance values less than .20 and all VIF values greater than 4 (Table

6). Also, the normal probability plot indicated that the residuals were close to a 45 degree line, which is close to perfect normality (Figure 2).

Table 5

*Summary of residual statistics*

|                         | Minimum | Maximum | N   |
|-------------------------|---------|---------|-----|
| Std. Residual           | -1.561  | 2.784   | 459 |
| Cook's Distance         | .000    | .038    | 459 |
| Centered Leverage Value | .001    | .041    | 459 |

Table 6

*Summary of collinearity diagnostics*

|             | Tolerance | VIF   |
|-------------|-----------|-------|
| Quality     | .483      | 2.072 |
| Price       | .597      | 1.675 |
| Style       | .517      | 1.935 |
| Fabrication | .435      | 2.301 |

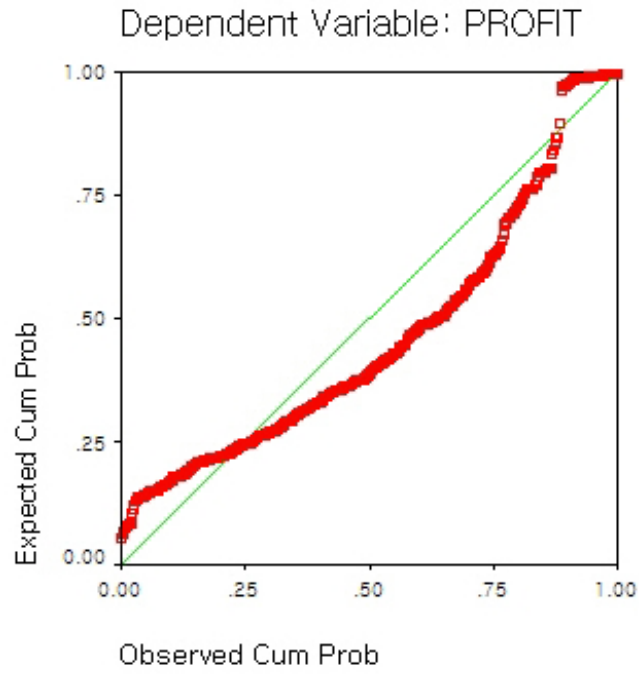


Figure 2. Normal probability plot of regression standardized residual

## CHAPTER FIVE

### RESULTS

#### *Participants*

There were 102 participants and each participant evaluated 5 caps, resulting in 510 cases total. 51 cases that were associated with Cap 9 were removed as discussed in the earlier section, leaving 459 cases to be inputted and analyzed. Females accounted for 55.3 percent with 254 cases, and males were 44.7 percent with 205 cases. A majority of the participants were White/Caucasian with 318 cases followed by Black/African American, Asian, Hispanic, and others (see Table 7; 8). Age data were collected through an open-ended question but were categorized into three groups afterwards. Most participants fell into the 18-21 years group by about 57 percent (Table 9).

Table 7

*Summary of the cases according to Gender*

|        | Cases (N=459) | Percent |
|--------|---------------|---------|
| Male   | 205           | 44.7    |
| Female | 254           | 55.3    |



Table 8

*Summary of the cases according to Race*

|                        | Cases (N=459) | Percent |
|------------------------|---------------|---------|
| Asian                  | 44            | 9.6     |
| Black/African American | 55            | 12.0    |
| White/Caucasian        | 318           | 69.3    |
| Hispanic               | 33            | 7.2     |
| Others                 | 9             | 2.0     |

Table 9

*Summary of the cases according to Age*

|                    | Cases (N=459) | Percent |
|--------------------|---------------|---------|
| 18-21 years        | 262           | 57.1    |
| 22-25 years        | 99            | 21.6    |
| 26 years and older | 98            | 21.3    |

### ***Test of Hypotheses***

H1, H2, H3, and H4 were designed to determine whether performance level can be predicted by consumers' perceptions of quality, price, style, and fabrication. All hypotheses were tested simultaneously through backward regression analysis.

As shown in Table 10, Model 1 was significant ( $F(4, 454) = 8.960, p < .01$ ) in which all independent variables were entered. But the test of regression coefficients

showed that quality does not have a significant effect. Model 2, in which the quality variable was removed, was also significant with greater F value ( $F(3, 455) = 11.512, p < .01$ ). Moreover, higher significance was shown for fabrication and style as predictors. Interestingly, price showed a negative relationship both in model 1 and model 2, indicating that lower level of price satisfaction leads to higher performance as measured in profit.

Table 10

*Summary of backward regression analysis predicting performance as measured in profit on quality, price, style, and fabrication*

| Model |             | $\beta$ | t          |
|-------|-------------|---------|------------|
| 1     | Quality     | .074    | 1.133      |
|       | Price       | -.225   | -3.848 *** |
|       | Style       | .183    | 2.918 ***  |
|       | Fabrication | .136    | 1.984 **   |
| 2     | Price       | -.206   | -3.676 *** |
|       | Style       | .193    | 3.107 ***  |
|       | Fabrication | .169    | 2.707 ***  |

\*\*  $p < .05$ , \*\*\*  $p < .01$

In all, H1 was rejected and concluded that perception of quality does not have a significant relationship with the apparel product performance as measured in profit. H2 was accepted and concluded that perception of price has a significant relationship with the apparel product performance as measured in profit. H3 was accepted and concluded that perception of style has a significant relationship with the apparel product

performance as measured in profit. Finally, H4 was also accepted and concluded that perception of fabrication has a significant relationship with the apparel product performance as measured in profit.

### ***ANOVA results***

ANOVA analysis was conducted to identify any significant differences among demographic groups in terms of perceiving quality, price, style, and fabrication of the subject caps. Gender and age were analyzed and race variable was not included due to its failure to meet the normality assumption.

According to Table 11, results for the ANOVA analysis performed on gender showed that males and females differ significantly. For perception of quality, female participants tended to be more satisfied with the caps ( $F(1, 457) = 10.142, p < .01$ ). Significant differences between male and female was detected also for perception of style ( $F(1, 457) = 5.025, p < .05$ ). The level of significance was lower but, perception of fabrication was also significantly different ( $F(1, 457) = 2.892, p < .10$ ). However, no substantial difference was found for perception of price ( $F(1, 457) = 2.489, p > .10$ ). Finally, Levene statistic values were not significant, indicating that the homogeneity assumption was satisfied. In summary, female participants tended to be more satisfied than male participants in terms of the subject caps' quality, style, and fabrication.

The same ANOVA analysis was performed for age. However, as Table 12 shows, significant difference was not found among age groups. In other words, perceptions of

quality, price, style, and fabrication for the subject caps, were consistent among age groups of 18-21 years, 22-25 years, and 26 years and older.

Table 11

*Summary of ANOVA analysis testing mean difference for gender groups*

|               | Male (N=205) |       | Female (N=254) |       |
|---------------|--------------|-------|----------------|-------|
|               | Mean         | SD    | Mean           | SD    |
| Quality ***   | 4.44         | 1.177 | 4.79           | 1.126 |
| Price         | 3.76         | 1.297 | 3.96           | 1.340 |
| Style **      | 4.03         | 1.292 | 4.31           | 1.367 |
| Fabrication * | 4.45         | 1.214 | 4.65           | 1.248 |

\* p < .10, \*\* p < .05, \*\*\* p < .01

Table 12

*Summary of ANOVA analysis testing mean difference for age groups*

|             | 18-21 years<br>(N=262) |       | 22-25 years<br>(N=99) |       | 26 years and older<br>(N=98) |       |
|-------------|------------------------|-------|-----------------------|-------|------------------------------|-------|
|             | Mean                   | SD    | Mean                  | SD    | Mean                         | SD    |
| Quality     | 4.65                   | 1.151 | 4.49                  | 1.101 | 4.73                         | 1.240 |
| Price       | 3.92                   | 1.322 | 3.71                  | 1.189 | 3.89                         | 1.449 |
| Style       | 4.21                   | 1.364 | 4.21                  | 1.198 | 4.21                         | 1.421 |
| Fabrication | 4.58                   | 1.225 | 4.54                  | 1.100 | 4.51                         | 1.394 |

\* p < .10, \*\* p < .05, \*\*\* p < .01

## **CHAPTER SIX**

### **DISCUSSION**

The purpose of this study was to identify and reinforce what previous studies have proposed as influential factors of apparel product performance in terms of product characteristics. Jang, Hawley, and Dickerson (2002) provided the main foundation for this research. In their research of the apparel industry, product differentiation was the theme highlighted most frequently, thus implicating its importance. The fact that product differentiation was discussed most often also coincided with this research objective to identify the influential product characteristics of apparel product performance. Four sub-themes were identified under the product differentiation theme; quality, price, style, and fabrication. Various studies from the apparel product development field and the New Product Development (NPD) field provided sufficient support for each of the four sub-themes proposed in the study by Jang, Hawley, and Dickerson (2002). However, having taken a qualitative approach, the findings of their study could not be extended to wider populations with the same degree of certainty. In other words, the influential product characteristics proposed by Jang, Hawley, and Dickerson were not tested to discover whether they are statistically significant or as a result of chance.

The current study attempted to reinforce what was proposed by Jang, Hawley, and Dickerson (2002). Hypotheses were designed based on perceptions of quality, price, style, and fabrication and tested for statistical significance via quantitative method. Data

were collected through a survey method and were examined to determine the existence of a relationship between the influential product characteristics and the performance as measured in profit.

The results of this study showed that perceived quality does not have significant relationship with the apparel product performance as measured in profit. But it should be noted that the subject caps were all obtained from a single store. Considering the fact that generally the quality of a product is stable within a single store, it can be assumed that the result for quality was not significant because there were only minor quality differences between the subject caps to begin with.

Perception of price had significant relationship with the apparel product performance as measured in profit. The relationship was negative indicating that lower price levels lead to higher performance level and vice versa. This result implied that even if the price is unsatisfactory, consumers will still purchase the product if they are satisfied with other dimensions of the product. However, due to the fact that the subject caps were obtained from a single store, the maximum price difference among the subject caps was approximately \$3.00. It cannot be assured that results will stay consistent if the same analysis was performed on subject products with greater variance in price.

As for perception of style, results showed the highest significance among the tested variables. Jang, Hawley, and Dickerson's (2002) emphasis on style as the theme brought up most frequently in their qualitative research was highly supported by this result. This result also coincided with Gaskill (1992) and May-Plumlee and Little's (1998) apparel product development model in which considerable weight was put on style related factors. Positive relationship was found also for perception of Fabrication.

Studies in the apparel product development field addressing the importance of Fabrication were supported (Gaskill, 1992; Jang, Hawley, & Dickerson, 2002; Wickett, Gaskill and Damhorst, 1999).

Comparison of means between male and female participants showed that females were generally more satisfied with the subject caps. However, this result is in contrast to the widely accepted idea that female consumers seek protection and safeness thus, being more careful and meticulous in purchasing products. A possible explanation of this phenomenon would be higher popularity of caps among males. Presumably, males have more experience in purchasing and wearing caps, thus driving them to be stricter than female in evaluating the subject caps of this research.

In the meantime, removal of Cap 9 data left us a few questions to consider. Should functionality be considered as another possible influential product characteristic of apparel product performance as measured in profit? If it is true that functionality is what drove the profit of Cap 9, can we include functionality as the fifth factor? Or, do we have to assume that influential product characteristics differ by apparel product category and develop a different set of influential product characteristic for caps with functional aspects? These questions provided guidelines for possible future research.

### ***Limitations and Implications***

Limitations associated with the fact that the subject caps were obtained from a single store were revealed in testing perceptions of quality and price. A simple solution for similar future research would be to run the same test on products from a larger variety

of stores or brands. However, appropriate treatment would be needed to prevent the factor associated with store image and brand image interfering with the research purpose to test purely the product itself. Obtaining accurate financial data will be another obstacle to clear since the data would have to be collected from multiple locations instead of one. Another future study recommendation would be to study functionality as the influential product characteristic of apparel product performance.

### ***Conclusion***

This study investigated what previous studies have suggested as influential product characteristics of apparel product performance in an effort to prove the statistical significance of those characteristics. Results indicated that perceptions of price, style, and fabrication are highly related to the performance as measured in profit. However, there were also outcomes that could not be explained just by the characteristics analyzed in this research. Accordingly, the existence of more variables associated with the performance level of apparel products was suggested.

This research contributed in reinforcing what is proposed in the field, thus acting as a motivator of further studies in identifying the influential product characteristics. This research also provided guidelines for future studies in identifying the influential product characteristics of apparel product performance.

For the apparel manufacturers, this research will enable the firms to grasp an idea of what to consider in developing a new product. This research would also provide a ground to base upon for manufacturers in describing the advantages of their products to



buyers. For apparel retailers, the influential product characteristics tested in this research can assist in analyzing why certain products performed well and some did not and, furthermore, assist in deciding what products to include and exclude for the upcoming seasons.

## Appendix 1: IRB approval

### Campus Institutional Review Board University of Missouri-Columbia

483 McReynolds Hall  
Columbia, MO 65211-1150  
PHONE: (573) 882-9585 FAX: (573) 884-0663

|                  |  |
|------------------|--|
| Project Number:  | 1086277  |
| Project Title:   | Influential product characteristics of apparel product performance |
| Approval Date:   | 04-13-2007   |
| Expiration Date: | 04-13-2008   |
| Investigator(s): | Dickerson, Kitty G<br>Hyun, Jong Han                               |
| Level Granted    | Exempt   |

### CAMPUS INSTITUTIONAL REVIEW BOARD APPROVAL FORM UNIVERSITY OF MISSOURI-COLUMBIA

This is to certify that your research proposal involving human subject participants has been reviewed by the Campus IRB. This approval is based upon the assurance that you will protect the rights and welfare of the research participants, employ approved methods of securing informed consent from these individuals, and not involve undue risk to the human subjects in light of potential benefits that can be derived from participation.

Approval of this research is contingent upon your agreement to:

- (1) Adhere to all UMC Policies and Procedures Relating to Human Subjects, as written in accordance with the Code of Federal Regulations (45 CFR 46).
- (2) Maintain copies of all pertinent information related to the study, included but not limited to, video and audio tapes, instruments, copies of written informed consent agreements, and any other supportive documents for a period of **three (3) years** from the date of completion of your research.
- (3) Report potentially serious events to the Campus IRB (573-882-9585) by the most expeditious means and complete the eIRB "Campus Adverse Event Report". This may be accessed through the following website: <http://irb.missouri.edu/eirb/>.

(4) IRB approval is contingent upon the investigator implementing the research activities as proposed. Campus IRB policies require an investigator to report any deviations from an approved project directly to the Campus IRB by the most expeditious means. All human subject research deviations must have prior IRB approval, except to protect the welfare and safety of human subject participants. If an investigator must deviate from the previously approved research activities, the principal investigator or team members must:

- a. Immediately contact the Campus IRB at 882-9585.
- b. Assure that the research project has provisions in place for the adequate protection of the rights and welfare of human subjects, and are in compliance with federal laws, University of Missouri-Columbia's FWA, and Campus IRB policies/procedures.
- c. Complete the "Campus IRB Deviation Report". This may be accessed through the following website: <http://irb.missouri.edu/eirb/>.

(5) Submit an Amendment form to the Campus IRB for any proposed changes from the previously approved project. Changes may not be initiated without prior IRB review and approval except where necessary to eliminate apparent and immediate dangers to the subjects. The investigator must complete the Amendment form for any changes at <http://irb.missouri.edu/eirb/>.

(6) Federal regulations and Campus IRB policies require continuing review of research projects involving human subjects. Campus IRB approval will expire one (1) year from the date of approval unless otherwise indicated. Before the one (1) year expiration date, you must submit Campus IRB Continuing Review Report to the Campus IRB. Any unexpected events are to be reported at that time. The Campus IRB reserves the right to inspect your records to ensure compliance with federal regulations at any point during your project period and three (3) years from the date of completion of your research.

## **Appendix 2: Recruiting ad wording**

### **Your participation is needed!**

Stop by and take a 5 minute survey of evaluating MU licensed caps.

Anyone can participate.

This questionnaire is a part of the thesis of Jong Han Hyun at the University of Missouri-Columbia. The primary goal of this research is to identify the influential product characteristics of apparel product performance.

Your participation will be greatly appreciated. Thank you.

### **Appendix 3: Consent Form**

Dear participants,

The apparel industry is lagging behind, in terms of identifying the factors that affect apparel product performance. But only a small number of studies in the apparel field have paid attention to the issue. The primary goal of this research is to identify the influential product characteristics of apparel product performance. We hope that our research will contribute in reinforcing what is proposed in the field, thus acting as a motivator of further studies.

If you choose to participate in this research project, you will be asked to fill out a questionnaire which will not exceed 10 minutes to complete. In the questionnaire, you will be asked to evaluate 10 university-licensed caps based on 4 factors; quality, price, style, and fabrication. The results will be analyzed to see if any of these factors have significant relationship with the product performance.

Nothing in this questionnaire is designed to harm you in any physical or emotional way. Your participation is fully voluntary, and you have the right to review the research materials. If you wish, you may withdraw from the process of your participation at any time. However, your input is critical to this study. We can assure you that the information you provide is confidential and will not be associated with you. Participants must be a student at the University of Missouri-Columbia.

If you have any further questions, please feel free to contact the researcher, Jong Han Hyun, at 573-673-4443 or send an email to [jhx8d@mizzou.edu](mailto:jhx8d@mizzou.edu). You may also contact the MU campus IRB at 483 McReynolds Hall, 573-882-9585, or send an email to [umcresearchirb@missouri.edu](mailto:umcresearchirb@missouri.edu).

## Appendix 4: Survey Questionnaire

### Part 1. Demographics

1. What is your age?

\_\_\_\_\_ years

2. What is your gender?

Male

Female

3. Which of the following best describes your racial or ethnic background?

Asian

Black / African American

White / Caucasian

Hispanic

Native American

Other (Please specify: \_\_\_\_\_)









## Appendix 5: Caps evaluated by each participant

- Evaluated caps are marked with a “V”.

| Participant | Cap1 | Cap2 | Cap3 | Cap4 | Cap5 | Cap6 | Cap7 | Cap8 | Cap9 | Cap10 |
|-------------|------|------|------|------|------|------|------|------|------|-------|
| 1           |      | V    | V    |      |      | V    | V    |      |      | V     |
| 2           | V    |      |      |      | V    |      | V    | V    |      | V     |
| 3           |      | V    | V    | V    |      | V    |      |      | V    |       |
| 4           |      | V    |      |      | V    | V    | V    | V    |      |       |
| 5           |      | V    | V    |      | V    |      |      | V    | V    |       |
| 6           | V    |      | V    | V    |      |      |      |      | V    | V     |
| 7           |      | V    | V    |      | V    |      |      | V    |      | V     |
| 8           | V    |      |      | V    |      | V    | V    |      | V    |       |
| 9           | V    | V    | V    |      |      |      |      |      | V    | V     |
| 10          |      |      |      | V    | V    | V    | V    | V    |      |       |
| 11          |      |      | V    |      |      | V    | V    | V    | V    |       |
| 12          | V    |      |      | V    |      | V    |      | V    | V    |       |
| 13          | V    | V    |      | V    | V    |      |      |      |      | V     |
| 14          |      |      | V    |      | V    | V    | V    | V    |      |       |
| 15          |      |      |      | V    |      | V    | V    |      | V    | V     |
| 16          |      | V    | V    |      |      | V    | V    | V    |      |       |
| 17          |      |      |      | V    | V    |      | V    |      | V    | V     |
| 18          | V    |      |      | V    | V    |      |      |      | V    | V     |
| 19          |      | V    | V    |      |      | V    | V    | V    |      |       |
| 20          |      |      | V    | V    |      | V    | V    |      | V    |       |
| 21          | V    | V    |      |      | V    |      |      | V    |      | V     |
| 22          | V    | V    | V    | V    |      |      | V    |      |      |       |
| 23          |      |      |      |      | V    | V    |      | V    | V    | V     |
| 24          |      |      |      |      | V    | V    |      | V    | V    | V     |
| 25          | V    | V    | V    | V    |      |      | V    |      |      |       |
| 26          |      |      | V    | V    | V    | V    |      |      |      | V     |
| 27          | V    |      |      | V    | V    |      |      | V    | V    |       |
| 28          |      | V    |      |      |      |      | V    | V    | V    | V     |
| 29          |      |      |      | V    | V    | V    | V    | V    |      |       |
| 30          |      | V    | V    | V    | V    | V    |      |      |      |       |
| 31          | V    | V    | V    |      |      |      |      |      | V    | V     |
| 32          |      |      |      |      | V    | V    | V    | V    |      | V     |
| 33          |      | V    |      | V    | V    |      |      |      | V    | V     |
| 34          | V    |      | V    |      |      | V    | V    | V    |      |       |
| 35          | V    | V    | V    | V    |      | V    |      |      |      |       |
| 36          | V    |      |      | V    | V    |      | V    | V    |      |       |
| 37          |      | V    | V    | V    |      |      | V    |      |      | V     |
| 38          | V    |      |      |      | V    | V    |      | V    | V    |       |
| 39          |      |      | V    | V    |      | V    |      | V    | V    |       |
| 40          | V    | V    |      |      | V    |      | V    |      |      | V     |
| 41          |      | V    |      | V    |      | V    |      | V    |      | V     |
| 42          | V    |      | V    |      | V    |      | V    |      | V    |       |
| 43          |      |      | V    | V    |      |      | V    | V    | V    |       |
| 44          |      |      | V    | V    | V    | V    | V    |      |      |       |
| 45          |      | V    | V    | V    |      |      | V    |      | V    |       |

|    |   |   |   |   |   |   |   |   |   |   |
|----|---|---|---|---|---|---|---|---|---|---|
| 46 |   |   |   |   | V |   | V | V | V | V |
| 47 | V | V | V |   | V |   |   |   |   | V |
| 48 |   |   |   |   | V |   | V | V | V | V |
| 49 | V |   |   | V |   | V | V |   |   | V |
| 50 | V |   |   | V | V | V |   |   | V |   |
| 51 |   |   |   | V |   |   | V | V | V | V |
| 52 | V | V | V |   | V | V |   |   |   |   |
| 53 |   |   |   | V | V | V |   |   | V | V |
| 54 | V | V | V |   |   |   | V | V |   |   |
| 55 |   |   |   |   |   | V | V | V | V | V |
| 56 | V | V |   |   | V |   | V | V |   |   |
| 57 |   | V |   |   | V | V | V |   | V |   |
| 58 |   |   |   | V | V | V | V |   |   | V |
| 59 | V | V |   |   | V |   | V |   |   | V |
| 60 | V |   | V | V |   |   | V | V |   |   |
| 61 | V | V |   | V |   |   |   |   | V | V |
| 62 |   |   | V | V | V |   |   | V | V |   |
| 63 |   | V | V | V |   | V | V |   |   |   |
| 64 |   | V | V |   |   |   | V | V | V |   |
| 65 | V | V | V | V | V |   |   |   |   |   |
| 66 | V |   |   | V | V | V |   |   |   | V |
| 67 |   |   | V | V |   | V |   |   | V | V |
| 68 | V | V |   | V |   | V |   |   | V |   |
| 69 |   |   | V |   | V |   | V | V |   | V |
| 70 | V | V | V |   |   |   |   | V | V |   |
| 71 | V |   | V | V |   |   |   | V |   | V |
| 72 |   |   | V | V |   | V |   | V | V |   |
| 73 |   | V |   | V | V |   |   | V |   | V |
| 74 |   | V |   |   | V | V |   |   | V | V |
| 75 | V |   | V |   |   | V | V |   | V |   |
| 76 | V |   |   |   | V | V |   | V | V |   |
| 77 |   | V | V | V |   |   | V |   |   | V |
| 78 | V | V |   |   |   | V | V |   |   | V |
| 79 | V |   |   |   | V |   |   | V | V | V |
| 80 | V | V |   |   | V | V |   |   | V |   |
| 81 |   |   | V | V |   |   | V | V |   | V |
| 82 |   | V | V |   |   |   | V | V |   | V |
| 83 | V | V |   |   |   |   |   | V | V | V |
| 84 | V | V |   |   | V |   | V | V |   |   |
| 85 |   |   | V | V |   | V |   |   | V | V |
| 86 | V |   |   |   |   | V |   | V | V | V |
| 87 |   | V | V | V | V |   | V |   |   |   |
| 88 | V | V |   |   | V |   | V |   |   | V |
| 89 |   |   | V | V |   | V |   | V | V |   |
| 90 |   |   | V | V | V |   |   |   | V | V |
| 91 | V |   |   |   | V | V |   | V |   | V |
| 92 | V | V |   |   |   | V | V | V |   |   |
| 93 | V | V | V | V |   | V |   |   |   |   |
| 94 | V | V |   |   | V | V |   |   |   | V |
| 95 | V | V | V | V |   |   |   |   | V |   |
| 96 |   | V |   | V | V |   | V |   | V |   |
| 97 | V |   | V |   |   | V |   | V |   | V |
| 98 | V |   |   |   |   |   | V | V | V | V |

|     |   |   |   |   |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|---|---|---|---|
| 99  |   | V | V |   |   | V |   |   | V | V |
| 100 | V |   | V | V | V |   | V |   |   |   |
| 101 | V | V | V |   | V |   |   | V |   |   |
| 102 | V | V |   |   |   |   | V | V | V |   |

## Appendix 6: Photographs of the subject caps

Cap 1 (Distressed patch cap)



Retail Price: \$16.99  
Color: Black  
Fabric: 100% Cotton

Cap 2 (Raised paw cap)



Retail price: \$16.95  
Color: Yellow  
Fabric: 100% Cotton

Cap 3 (Navy tiger cap)



Retail price: \$16.99  
Color: Navy and  
Stone  
Fabric: 100% Cotton

Cap 4 (Reduced bar mizzou cap)



Retail price: \$16.99  
Color: Tan  
Fabric: 100% Cotton

Cap 5 (Corduroy trucker cap)



Retail price: \$14.99  
Color: Brown  
Fabric: 65% Cotton  
35% Nylon

Cap 6 (Wool appliqué M cap)



Retail price: \$16.99  
Color: White  
Fabric: 100% Cotton

Cap 7 (Reduced bar mizzou cap)



Retail price: \$16.95  
Color: Red  
Fabric: 100% Cotton

Cap 8 (Raised tiger cap)



Retail price: \$16.99  
Color: Black and  
Yellow  
Fabric: 100% Cotton



Cap 9 (Reduced bar camo cap)



Retail price: \$15.95  
Color: Camouflaged  
Fabric: 100% Cotton

Cap 10 (M tiger gametek cap)



Retail price: \$18.99  
Color: White and  
Gray  
Fabric: 100%  
Polyester  
(A-Flex)

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