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THESIS:**

**COTTON UTILIZATION IN WOMEN'S APPAREL: GENDER,
APPAREL PURCHASE DECISIONS, AND FIBER COMPOSITION.**

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decisions, and fiber composition.**

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Abstract

Cotton utilization in women's apparel: gender, apparel purchase decisions, and fiber composition.

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A cursory review of domestic apparel production data from 'Cotton Counts Its Customers' reports by The National Cotton Council of America showed a discrepancy between the amounts of cotton utilized in domestically produced women's apparel and that for men's apparel. It appeared that the men's apparel sector had a higher percentage market share of cotton than women's apparel. For both genders, cotton's dwindling market share was similar to that of diminishing domestic US apparel production overall. Since the majority of apparel in the U.S. is imported, import data was obtained from the United States International Trade Commission and compiled with the domestic apparel data to offer a more expansive view of cotton's market share and its use separated by gender. The compilation of domestic and import apparel data followed the overall trend of a higher percentage of weight of cotton being used in men's apparel than in women's.

Challenging apparel categories which may offer potential for expanded utilization with increased performance were Coats, Underwear/Nightwear, Suits, and Dresses.

In an attempt to add context to the apparel market data, we explored two stages of the apparel supply chain: the first at the retail setting, the second at the consumer purchase and wear decision level.

At the retail level, we investigated the availability of fiber composition information and its use as a part of the assortment offered to consumers. Two stores were selected for this exploratory phase and retail availability by gender and fiber content were physically tallied in the two retail settings. In both retail assortments, there was no emphasis of fiber composition as part of the information offered to the consumer. For the consumer wanting to find cotton apparel in these two settings, prior knowledge regarding the feel or look of cotton would seem necessary to facilitate locating cotton among the assortment of apparel. Fiber blends can offer cotton-like appearance and hand, so fiber composition tags could give consumers certainty regarding the garments they are buying. In addition to the observations above, we also noted in both stores a prevalence of cotton in men's apparel, and a larger presence of man-made fibers in women's apparel, which reflects the overall market situation.

Finally, the second exploratory stage focused on clothing diaries and a wardrobe inventory provided by a small purposeful sample of respondents to examine the role of fiber composition, cotton in particular, in the individual's garment purchase and daily-use decisions. The findings suggested that fiber composition was an important part of the daily garment selection process, based upon the daily activity and a set of personal beliefs

about what the diary respondent felt that fiber had to offer. Similar to the market data Results, in the Clothing Diary responses males showed a greater tendency to select both 100% cotton Tops and Bottoms than did the female respondents. Overall, cotton appeared challenged by man-made and other fibers when the respondents needed to “dress up”, to attend to athletic activity, or to satisfy the need for specific functionalities such as rapid drying.

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Chapter One: Introduction

Clothing is a changing representation of cultural, historic, economic, technological, and aesthetic themes (Schneider, 1994). The story of apparel has been partially woven with the thread of American cotton. In the past, cotton has dominated the textile market. However, cotton's share of the textile market is challenged by man-made fibers (Jacobsen & Smith, 2001). Based on market statistics compiled by organizations such as the International Cotton Advisory Committee (ICAC) and Cotton Incorporated, other fibers increasingly erode cotton's share of the world market in general, and particularly in specific apparel sectors (Cotton Incorporated, 2009; ICAC, 2010). A cursory review of ICAC reports shows a downturn in United States production of cotton between 2006 and 2010. It is possible that in addition to producing less cotton, the US consumer has less cotton available in the marketplace and is using less cotton (ICAC). In a competitive marketplace, it is also possible that cotton's share of the market can expand. Understanding the desires of the consumer could lead to the creation of new products that utilize cotton fibers, an increase in the percentage of cotton fibers in blended products and other creative innovations that positively impact the economic prospects of the cotton industry.

Women's apparel makes up 60% of the apparel marketplace, and is therefore critical to maintaining and expanding cotton's share of the fiber market (Thiry, 2008). It is for this reason that the women's apparel market will be the focus of concern in this research. Understanding the current position of cotton fiber in the women's category, issues of selection of fibers by manufacturers, retail buyers and consumers may aide in the expansion of the use of cotton in the women's apparel segment of the market. If manufacturers, retail buyers, and consumers were to make a concerted effort to include

natural fibers in their apparel selection decision-making processes, they would likely amplify the presence of cotton within the greater context of women's sphere. This paper elicits data on fiber production and usage, retail apparel availability of fiber, and consumer preferences in the apparel market segment. If daily clothing selection decisions of the end user include fiber composition as a variable, this information may offer insight to cotton marketing organizations.

This study included three parts: Part I is the analysis of market data obtained over a ten-year period. During this phase, we compiled and indexed historical apparel purchase data from 1998 to 2008. This data offered two views: Cottons' position in the apparel marketplace, and the consumption patterns of both male and female consumers concerning apparel fiber composition. The domestic purchase data came from Cotton Counts Its Customers reports from the National Cotton Council (Huffman, 2001, 2005, 2008, 2009) and the foreign apparel import data from the U.S. International Trade Commission (United States International Trade Commission, 2012). Part II is an apparel retail availability inventory. During this process, we tallied apparel fiber content tags for apparel of both genders. Taking place at two different retail spaces: a specialty store and a big box store, this process revealed fiber content of the apparel as a part of the retail assortment.

Part III included clothing diaries and a wardrobe inventory. This section of work attempted to explore the selection and use processes of consumers. A sample known to the author volunteered to construct clothing diaries and wardrobe inventories. The overall purpose of Part III was to gain insight into preferences for particular fibers through data provided by the consumers. Content analysis was used to identify patterns within the participant's written Clothing Diary entries to observe the role of fiber content in garment selection.

Chapter Two: Literature Review

Cotton and Synthetics Overview

The United States was not a major source of cotton as the Industrial Revolution began. At two million pounds, the U.S. cotton output in 1791 paled in comparison to other countries. That year, India's cotton output was almost 200 million pounds (Rivoli, 2005). In the next ten years American cotton production grew 25 fold (Rivoli), and steadily increased thereafter. From 1815 to 1860, cotton made up approximately half of all American exports (Jacobsen & Smith, 2001; Rivoli, 2005). More than 70 percent of all American cotton was exported (Rivoli). In 1860, roughly two billion pounds were produced (Jacobsen & Smith; Rivoli). In 1880, this number grew to approximately three billion pounds, in 1900 it was just shy of five billion pounds, and by 1930, the U.S. produced roughly seven billion pounds of cotton (Jacobsen & Smith). The U.S. had toppled their foreign competition (Rivoli).

In the 1930s American cotton production slipped behind the world's combined cotton output (Jacobsen & Smith, 2001) and prices bottomed out (Rivoli, 2005). The domestic market stabilized and consumption increased in tandem with population growth during this period (Jacobsen & Smith). World War II caused a break in the supply chain of American cotton reaching Europe, creating an opportunity for non-American production (Jacobsen & Smith). As more and more players entered the cotton game, "U.S. producers were beset by excess production capacity, overages, and low prices" (Jacobsen & Smith, p. 280). In addition to battling competition from other cotton-producing countries, this was an inopportune moment for U.S. cotton to simultaneously fight a battle against other fibers.

For over 100 years, there has been competition in the cotton fiber marketplace from man-made fibers. Man-made fibers can be divided into two types, synthetic and semi-synthetic. Synthetic fibers are made from oil, whereas semi-synthetic (cellulosic) fibers are made from natural plant sources, but undergo chemical alteration to transform this plant material into fibers. Rayon was the first man-made fiber, patented in France in 1885. The first synthetic fiber—nylon—was launched by DuPont in 1929. During WWII, international rayon production increased by 200% (Schneider, 1994). Post WWII saw further development of other synthetic fibers—acrylics, polyesters, polyvinyls, polypropylenes, and spandex. Between the 1950s and the 1960s, there was a dramatic increase in the production of all textiles globally, from 9.4 million tons to 17.7 million tons (Schneider). By 1966, “world per capita consumption of fibers was 11.5 pounds per year, but the American market, released from its wartime sacrifices, had grown to a staggering 47.9 pounds per capita” (Schneider, p. 7). Man-made fibers made up five % of the global fiber output in 1950, and grew to 29% by 1962 (Sharp, 1964) and approximately 60% of world fiber consumption by 2004 (Baffes, 2004). In this same year, demand for synthetics in the United States ballooned to 35% (Sharp). By the 1990s, the United States was still a strong exporter of cotton (Jacobsen & Smith, 2001), however as the 20th century came to an end, imported yarns, fabrics, and goods made up about 60% of what was consumed in the United States.

Cotton is still a significant player in the world apparel market. In 2000/2001, the roughly 20 million tons of cotton produced was valued at approximately \$20 billion worldwide (Baffes, 2004). The value of this cotton is considerably important to countries worldwide, including the United States, which accounts for approximately 20% of world cotton output. Following the global economic recession that began at the end of 2007, personal annual apparel purchases were down in 2009, and therefore so were clothing

imports into the United States. This economic downturn was unique in that it was globally synchronous. A few countries were impacted to a relative lesser degree, such as China, which saw an increase of manufacturing volumes in both man-made fibers and cotton in 2009-10 (Oerlikon, 2010). On the other hand, the U.S. textile industry continues to close textile and apparel plants and showed a loss of 60,000 textile and apparel jobs in 2009 (Oerlikon). According to the USDA's Foreign Agricultural Services (FAS), domestic mill use of cotton fiber went from 11.39 million bales in 1997 to 4.56 million bales in 2007. Over the same 10-year period, exports more than doubled and grew from 7.5 million bales in 1997 to 16.2 million bales in 2007 {USDA-FAS, 2008 #973}. Thus, the U.S. is still currently the largest exporter of raw cotton (ICAC, 2010; Oerlikon). Estimates show the U.S. will continue to be the largest cotton exporter through 2014 (ICAC).

Cotton Support Agencies

Synthetics' increased popularity in the mid-20th century combined with the leveling out of the U.S. supply of cotton that occurred in the 1930s and the 1940s exhibited problems in both supply and demand for the U.S. cotton industry. The American government initially responded to this problem by focusing on the supply side of the solution, and in turn national organizations assisted growers. First came the National Cotton Council (NCC) in 1938, then the Cotton Producers Institute in 1960, and the Cotton Board in 1966. In contrast, Cotton Incorporated was formed in 1970 to increase demand.

Legislation paralleled the work of the NCC and CCI starting in 1965. It was in this year that the U.S. Senate passed a bill to help cotton's competitiveness. Signed in 1966 the law was deemed "cotton's last chance to beat back the synthetics threat"

(Jacobsen & Smith, 2001), and would become the basis for the Cotton Research and Promotion Program. The program was designed to increase demand for cotton as compared to synthetics, and to accrue profits for both growers and processors (Jacobsen & Smith; Murray, 2001). The Secretary of Agriculture appointed a “quasi-governmental nonprofit” (Murray) Cotton Board who would implement the Cotton Research and Promotion Act and administer the Program.

The challenge regarding marketing and consumer lifestyle today is similar to what the cotton industry faced in 1966. This program was developed with the premise that an increased market share lies in fiber research and promotion, and in the re-ignition of the consumer demand for cotton. Based on the 1990 amendment to the Cotton Research and Promotion Program, the Cotton Board is required to complete a program effectiveness study every five years. In this study, effectiveness is based not solely on market share or output of research, but on the cost effectiveness of campaigns for increasing these factors. Econometrics show that the Cotton Research and Promotion Program is cost effective (Murray, 2001). It stands to reason that increased and focused promotions could bolster program effectiveness.

Complex Apparel Marketplace

The apparel marketplace is a substantial piece of the global economy, and the framework is a complex international system, see Figure 1. A gin receives cotton from multiple growers at which point traders (merchants) buy cotton from throughout the world and sell it through global markets. Spinners use cotton from a range of regions to generate yarn. Fabric mills take a similar approach to produce a fabric, and garment manufacturers may have subcontractors dye, screenprint, or finish their product. Retailers source products from garment manufacturers (Muller).

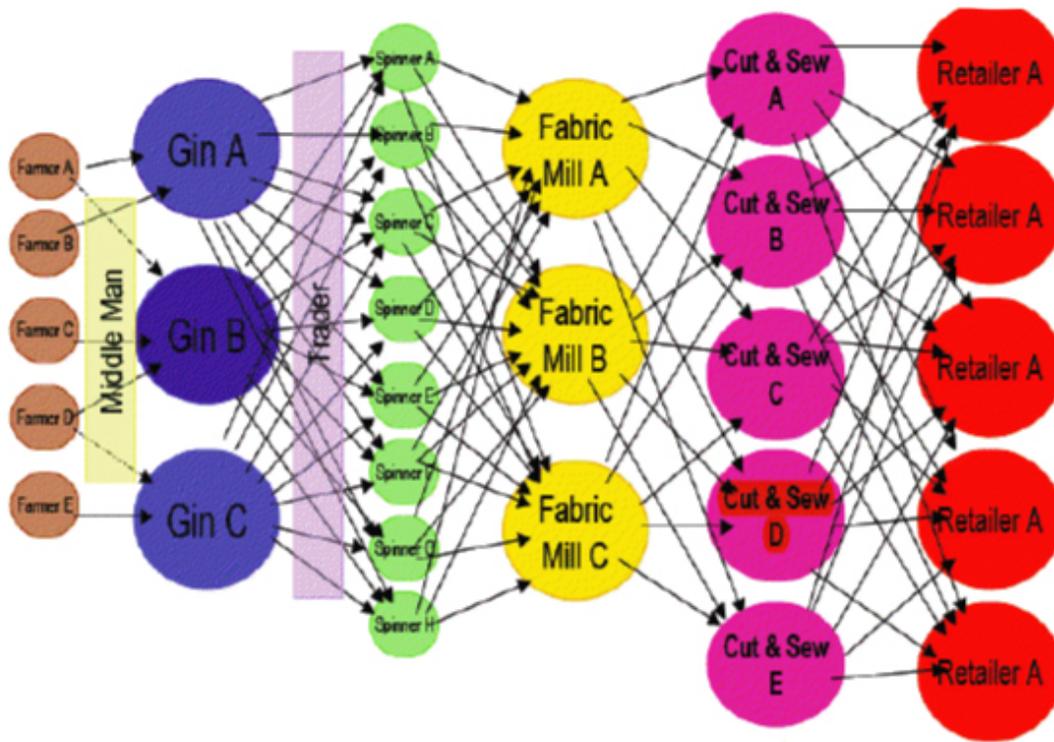


Figure 1. Illustration of the complex cotton supply chain. (Muller, p. 3. Used with permission.).

Thus, the international apparel marketplace is made up of a complex and multi-faceted supply chain. The apparel product itself is complex and multi-faceted and includes the variables of gender, fiber, and a variety of apparel categories. Patterns in the U.S. consumer apparel purchase data suggest discrepancies in the fiber content by gender and apparel sector. Data shows that men are purchasing more cotton than women in terms of percent of total apparel purchases (Huffman, 2001, 2005, 2008, 2009; United States International Trade Administration, 1995-2010). Trends in the fiber content of this existing apparel purchase data suggest that in women’s dresses, cotton is being edged out to make room for other fibers. For tops and bottoms, this data shows that cotton still has a strong foothold. More cotton is utilized in men’s tops than in women’s (Huffman;

United States International Trade Administration). Interestingly, while the domestic data shows that women and men purchase the same amount of cotton in bottoms, the imported apparel data suggests that women are purchasing quite a higher percentage (17%) of cotton bottoms than men (United States International Trade Administration). Therefore, in order to identify apparel market sectors in which cotton competes unfavorably against synthetic fibers and that represent potential for a bigger share of the market available for cotton, it is necessary to reconcile the data and include both domestically-produced and imported apparel. To explore this issue, we examine this data in further detail in the results and discussion section.

Getting Apparel to market

Role of Retail Buyer

From total apparel production, the retail buyer selects an assortment designed to fulfill the customers' desires. The retail buyers' selections are a best guess based on consumer preferences as measured by sales reports from the previous year or season. An understanding of the preferences and values of the consumer, based on sales data, demographics and professional and life experience of the buyer can shape the businesses' selection of product offerings (retail assortment) and future revenue. The majority of retail buyers do not consider fiber type when selecting apparel for future season.

Retail Assortment

Most retail assortment research is based on the consumer perspective as intertwined with the retail perspective as a part of the complex apparel system (Chernev, 2003; Hines & O'Neal, 1995; Hogge, Baer, & Kang-Park, 1988) products available in a product category at a given time in the retail store are called the assortment. The ideal

assortment for a retail store is assumed to be the one that offers maximum revenue and encourages repeat customers. To the consumer, the ideal retail assortment is based upon personal preference. Assortment determinations are made in advance by the retail Buyer. Buyers in different industries make selections for their stores with varying lead times, from a consideration of hours in the case of the grocery industry, to months or years in regard to apparel or automobiles. Consumer feedback, demographic data, and reviewing market shares and sales over time can help to forecast future successful product assortments (Fisher & Vaidyanathan, 2009).

A product for purchase in a retail store is represented by a stock keeping unit (SKU), an individual code for every item available for purchase. Fisher and Vaidyanathan (2009) attempted to create a model for estimating demand to actualize the optimal retail assortment. Fisher and Vaidyanathan view each SKU as a collection of individual attributes, suggesting that the optimal assortment will have products with a variety of attribute values, but showing a stronger frequency of the values that the buyer thinks are more popular with their customers. Sales reports can be measured for the quantity level of each attribute, and this number used to make sales predictions, estimate consumer product substitutions, as well as forecast demand for SKUs that are not a part of the assortment.

A retail assortment is thought to be varied to the extent that attribute levels are dispersed and there is limited association between differing attribute pairs (Krafft & Mantrala, 2010). The following is an example of assortment: Product Group A has two red cotton t-shirts and two white, rayon blend t-shirts; Product Group B has one red cotton t-shirt, one red blend t-shirt, one white cotton t-shirt and one white blend t-shirt. Group B provides a broader assortment for the consumer. Current retail assortment research focuses on a variety of product categories including grocery, tires and apparel.

The consumer's perception of assortment is vitally linked to sales in the food product category where research shows that assortment perception is shaped by three things: the offering of unique SKUs, the physical area dedicated to each category and the availability of a customer's favorite item (Krafft & Mantrala, 2010). In this category, consumers were shown to be able to sustain a reduction of SKUs of 25-50% if the shelf space and location remained consistent and if they had access to their desired item (Krafft & Mantrala, 2010). If the specific desired item was not available, the replication of favored items in the assortment could ease the selection process.

Retail assortment has changed in recent decades. In an effort to speak to the consumer perception of assortment and offer "option value" (Chernev, 2003), the 1980s retail assortment model (which was generally run as lean) increased in the 1990s. For example, a store with 6,000 SKUs in the 1980s might have 30,000 in the 1990s (Krafft & Mantrala, 2010). The expansive assortments of the 1990s would prove difficult for retailers to maintain, as broad assortments can equate to high costs. Also, at a certain point, larger assortments may have negative consequences. Consumers claim that they want increased assortments, but too many available options during the decision-making process can cause consumers to leave the retailer without making a purchase (Chernev, Krafft & Mantrala).

For the most part, however, consumers are processors who adjust to the display arrangement before them (Krafft & Mantrala, 2010). For example, if a display is organized by color, the consumer will process by color. If a display is processed by end-use, the consumer will compare across product by end-use. While consumers are adaptable, consumers process information through the inherent "internal structure" (Krafft & Mantrala), which organizes these perceptions into "schemas" (Krafft & Mantrala). One consumer might inherently organize by color, another by brand. It has

been shown that when a consumer's inherent structures match with the product layout, the consumer perception of variety will be higher along with the level of satisfaction. It is possible that this tendency could influence the buyer who sees merchandise grouped by fiber. It would stand to reason that processing available apparel by fiber would offer a segment of the consumer population an assortment intuitive to their internal structure or schema. It is possible that in this way retailers could guide customers to cotton.

Consumer Preferences

Studies show that price, color, ease of care, fit fashion, fiber, fabric hand, consumer daily activity, social necessity for apparel, etc., all influence consumer choice (Hines & O'Neal, 1995; Hogge, Baer, & Kang-Park, 1988; Norum & Ha-Brookshire, 2011). "Consumers tend to compare and contrast alternative products made up of different attribute combinations" (North, de Vos, & Kotze, 2003) and make apparel purchasing decisions "on the basis of the value they attach to certain product attributes" (North et al., 2003). Recent preference studies indicate consumer desire for apparel of Texas cotton fibers, organic natural fibers and socially responsible products (P. S. Norum & J. E. Ha-Brookshire, 2011).

Values in this context can be thought of as the needs and goals associated with the individual assessment of products (Kim, 2005). Apparel has both intrinsic values, which are product attributes that cannot be changed, and extrinsic values, which are applied by the manufacturer or retailer (North et al., 2003). According to North, et al., intrinsic values are the most important to consumers, and in studies specifically regarding apparel, price and brand are the most frequently used attributes. It is this combination of attributes that most directly influence apparel purchase decisions.

Product involvement works together with values as an input to product acquisition (Kim, 2005). The consumer will become involved when the object of interest (product)... is perceived as being important in meeting one's needs, goals, and values" (Kim). Empirical data on purchase trends and retail availability, along with personal accounts could work together to tell a story of women and cotton in the United States, and potentially provide avenues for natural fiber textile producers to increase their market share among female consumers.

Fabric has been found to be a consistent identifier of quality (Hines & O'Neal, 1995). Attributes are more concrete, while values are linked to consequences and in the end, the consumer's sense of self. "Consequences accrue from consuming products and...personal values determine whether consequences are positive or negative...values provide impetus for behavior, perceived consequences determine the behavior, and the attributes are what make up the product that actually produces the consequences" (Hines & O'Neal). This 1995 study shows that of all attributes studied, "Fabric" was the only attribute mentioned by the majority of research subjects as a link to values. While not every consumer has specific brand or construction knowledge, consumers do have an internal value judgment about fabric and perceived clothing quality.

These purchasing inputs are evidenced in consumer tendencies; consumer tendencies present in the awareness of particular advertisements, the adherence of significance to specific products, and knowledge about explicit brands and product attributes (Kim, 2005). In their paper regarding personal relationships with apparel, Guy and Banim suggest that inquiry should move beyond consumption that ends at apparel purchase to the various ways in which clothing is lived in and referenced (Guy & Banim, 2000). To do so, Guy and Banim examined apparel usage post-purchase through in-depth interviews and personal clothing diary entries from a small, purposive sample. A

qualitative study of female consumers' clothing purchases based on apparel attributes and personal preference enriches the understanding of the value that consumers place on particular apparel attributes, offering a glimpse into the reasoning for apparel purchases.

Complexity of categories

Categories of apparel purchase also present complex challenges to research. Apparel can be separated into many categories not limited to use, societal values, image, etc. Each of these may address a separate set of preferences and values. For purposes of illustration of these complex relationships, three large categories are discussed:

Women's apparel sector

Women's apparel makes up 60% of the United States apparel market (Thiry, 2008). In addition to differing in apparel selection processes, men and women vary in their use of apparel. The vastness of the women's sector is due to a plethora of causes, especially operative reasons. These would include: the quantity of apparel purchased, a large range of product sizes, and many product types for a multitude of social, cultural, functional, and age-specific dressing choices (Thiry). The women's sector is ample due to aesthetic options, with many female's adherence to fashion trends and the quest for personal differentiation through apparel (Thiry). Based on domestically-produced apparel data for the years 1998 through 2008, provided by the National Cotton Council of America, we see that in certain apparel sectors women are purchasing apparel of manmade fibers over cotton fibers more often than men (Huffman, 2001, 2005, 2008, 2009). As women are the strongest apparel consumer group, this trend has serious

implications for the key constituents in the textile industry, and ultimately cotton itself. Currently, there is a lack of understanding of the challenges to cotton in the women's apparel market.

Children's sleepwear

Societal values also add to the complexity of evaluating apparel categories. It is generally perceived that there is in the West a general trend toward the adoption of a "culture of safety" (Schieber, 2000), especially in regard to protecting sensitive segments of society, such as children. Laws and regulations are in place to reduce the amount of bodily injury to a child experienced during a fire occurrence (Schieber). In 1971, strict standards were put into place for flammability levels of children's sleepwear.

The flammability test necessitates that all components of sleepwear exhibit self-extinguishing characteristics. They must "stop burning after removal from a three-second exposure to a small open ignition source that resembles a match or a cigarette lighter flame" (Schieber, 2000). As long as a fabric passes the above test, it can be used to make a sleepwear garment. In addition to the fabric selected for sleepwear, the fit of the garment either facilitates or quells flame. Looser apparel creates a chimney effect for fire and increases the amount of oxygen available as fuel for the flame. It is for a similar reason that untreated raised-surface cotton can be generally quick to ignite. Though thermoplastic fibers may not be quick to ignite, they can wreak havoc in regard to level of burn devastation on skin (Horrocks, 2004).

There seems to be a general confusion about the functionality of children's sleepwear among consumers, as made evident by approved and non-approved pieces of apparel stocked on the same shelves (Schieber, 2000), and a desire by industry for a

broader offering that steps outside the imposed sleepwear guidelines. Law and regulatory commissions and non-governmental advocacy groups work to balance the consumers and industry alike while supporting a “culture of safety.” In general, cotton has been cast aside to support this culture.

Performance Sportswear

According to a recent marketing report, the international market share for performance sportswear in 2008 was \$6.40 billion dollars (Research and Markets, 2008). This number displays 19.4% growth over the preceding four year period, with an increase of 18.75% growth predicted by 2014 (Research and Markets). Another report shows athletic apparel at 15.3 billion dollars by 2014 (Cotton Incorporated, 2009). This is significant market growth. A majority of consumers purchase athletic apparel based on comfort (Cotton, Inc.). A recent widespread trend has been wearing comfortable sports apparel as daily casual wear, a development that breaks sports apparel out of its previous, more conventional context (Cotton, Inc.).

While the consumer audience is rapt, there is misinformation within the marketplace. General consumer performance sportswear education is leaving cotton by the wayside, as evidenced in multiple fitness blogs (Livestrong.com; Rodriguez; Sorgen). The health and fitness blog Livestrong.com discourages consumers from purchasing cotton: “Contrary to popular belief, cotton is not the best choice to wear under your exercise clothing. Cotton absorbs moisture and can promote bacteria growth. Choose breathable, moisture-wicking and quick-drying performance fabric” (Livestrong.com, 2011). Increasing market share in this category would provide cotton with potential

growth, but this category too is complex in the values and preferences of its purchasers and heavily influenced by advertising.

There is clearly the potential to increase the use of cotton fiber in the apparel market. It is also true that the values, preferences, gender and age differences and complexities of specialty categories make the understanding of product offerings and purchase choices challenging. It is possible that well designed research can cultivate action from within the marketplace to respond to the wants of the consumer.

Chapter Three: Research Objectives

Cotton's natural properties offer unparalleled comfort to textile and apparel consumers. In the attempt to preserve its position, cotton faces a forceful competitor—manmade fibers. Recent developments leave cotton facing arduous challenges against manmade fibers through the loss of market shares. This is significant to the economies of Texas and the United States.

Based on claims in the market by organizations such as Cotton, Inc. and the International Cotton Advisory Committee (ICAC), other fibers are increasingly eroding cotton's market share of the world market in general, and particularly in specific apparel sectors. For instance, cotton is not faring well in the performance apparel market, children's sleepwear, and the women's market. Women's apparel comprises 60% of the apparel marketplace, and is therefore critical to maintaining and expanding cotton's share of the fiber market. It is for this reason that the women's apparel market will be the topic of interest in this research.

The overall objective of this research is to investigate the relationships among consumer gender demographics, apparel product characteristics and retail availability order to identify competitive opportunities and offer guidance toward expanding cotton utilization in such market sectors as the women's apparel. Specific questions we will address include the following:

1. Is there a difference between the quantity of cotton used in women's apparel and that used in men's apparel?

Data available from the National Cotton Council of America about the quantity of cotton consumed in apparel produced in the U.S. suggests that overall women's apparel contains less cotton than men's. However, those results do not take into account the bulk of the apparel available to the U.S. consumer, i.e. imports, given the shrinking domestically-made portion. Thus, our first objective is to compile market data for both domestic and imported apparel in order to offer a comprehensive analysis of cotton's market share and its dependence on gender.

2. In what apparel categories is this true?

Cotton is prevalent in some apparel categories regardless of gender (e.g., jeans and dungarees), while it may be challenged in others. The second objective we will pursue is to identify the major apparel sectors in both men's and women's apparel end-uses and quantify the place of cotton in each of these categories. This will help pinpoint the specific products constituting a potential target for growth for cotton.

To achieve the two objectives above, historical apparel purchase data from 1998-2008 was compiled and indexed. This data offers two views: cotton's position amid the breadth of the apparel marketplace as well as the consumption patterns of both male and female consumers, noting apparel fiber composition. This historical apparel purchase data comes from two different sources. The domestic purchase data comes from the National Cotton Council's Cotton Counts Its Customers (CCIC) reports. The international

purchase data comes from the U.S. International Trade Administration (ITA), which is a part of the U.S. Department of Commerce.

3. What are the factors that shape women and men's apparel product selections with potentially different fiber composition?

In this third specific objective, we will explore possible causes and explanations of the potential differences in fiber composition preferences and/or availability for both genders. To achieve this objective we conducted two exploratory studies of consumer apparel choices and of retail assortment. The first pilot study focused on retail assortment and sought to identify available apparel in two stores, and group this apparel by the variables fiber, gender, and apparel category. While in no way representative of all available apparel, this methodology could serve as a model for future studies.

The second study entailed a qualitative methodology involving a group of ten consumers. Clothing diaries and wardrobe inventories were used to understand respondents' relationships with their apparel. It is thought that the ways in which consumers inhabit their clothes will lend insight into the desires they have for future apparel purchases.

Chapter Four: Methodology

Cotton travels a complex supply chain, which must be understood on many levels in order to anticipate opportunities to increase its market share. Current data collection methods for the various phases of the fiber supply chain offer a disjointed view of this expansive discourse. The gaps existing between data concerning apparel consumption, retail apparel availability, the in-store consumer decision-making process, and ultimately consumers living in their clothes, are problematic to a comprehensive understanding. In this exploratory study concerning cotton fiber usage, an attempt was made to search for missing connections between the consumer and the available assortment. If the ultimate goal is to increase the market share for cotton, all vantage points must be examined. An attempt was made to unite three methods of data collection in this preliminary study in order to connect the cotton fiber with its consumer and demonstrate the need for the use of multiple methodologies in order to fully explore this complex problem.

Stage I:

The US Apparel Market – A statistical review

The purpose of the initial exploratory methodology for data collection was to strategically collect market data on apparel purchases delineated by gender, fiber content and apparel category. Three different data sources were used to begin to piece together the broad apparel consumption landscape. Market data was extracted from two different trade data sets, and a third coding source, which provided nationally accepted codes for ease of comparison between data sources.

Domestic Apparel Data

The source for the domestic data was the National Cotton Council market research report specific to cotton: Cotton Counts Its Customers (CCIC)¹. The CCIC documents provide a measurement of the domestic production of each item contained for nine years observed. While CCIC provided information regarding apparel, home furnishings and miscellaneous uses, this research focused on apparel. The CCIC documents selected for use in this study were 2001, 2005, 2008, and 2009. Each annual edition provides end-use data for the most recent three years, in this case all years from 1998 to 2008, with the exception of 2001.

Imported Apparel Data

To broaden the scope of the analysis beyond the domestic production of apparel items, the next source utilized measured foreign produced apparel items imported into the United States. The International Trade Administration's (ITA) Office of Textiles and Apparel (OTEXA) provide annual trade data. The data is free and available to the public, for the purposes of this research, 1998-2008 was recorded.

Annual trade data was observed in two different places on the OTEXA website depending upon the year's data that was desired. To obtain trade data for the two most recent years (the current search year and the immediate year preceding the internet search) the steps listed in Table 1 were followed on the OTEXA website.

¹ At print, the National Cotton Council is no longer publishing Cotton Counts Its Customers. The NCC will now offer a new document, Cotton Counts Its Trade.

Table 1.
Steps taken to arrive at USITC data.

Step Number	Task
1.	http://otexa.ita.doc.gov/
2.	U.S. Imports for Consumption
3.	HTS Items
4.	Current U.S. Trade (1996-2012)
5.	Proceed with new query
6.	Select the data to report
7.	Create commodity list (show all records)
8.	HTS 2 (all apparel categories)
9.	Select aggregate level and type, Aggregate in HTS 10
10.	Enter a commodity number, Articles of apparel are 61, 62
11.	Display commodity description
12.	Select years needed
13.	Move groups from left to right in windows
14.	Display and/or export records

In addition to offering varying units of measure for apparel, the CCIC documents and the USITC offer different groupings for demographic data. The North American Industry Classification System (NAICS) codes are included with CCIC and NAICS in Table 4. NAICS will be discussed further for its benefit as a grouping and comparison tool.

Table 2.
Comparison of gendered groupings by CCIC, USITC, and NAICS.

	CCIC	USITC	NAICS
Gender			
M			
MB		X	X
MYB	X		
W			
WG		X	
WGI			X
WMJ	X		
GCI	X		
Babies		X	

M =	Men	W =	Women
MB =	Men and Boys	WG =	Women and Girls
MYB =	Men, Youth, Boys	WGI =	Women, Girls, and Infants
		WMJ =	Women, Misses, & Juniors
		GCI =	Girls, Children's, Infants

The CCIC and ITA apparel groups do not directly correspond. There are variations in the items included in each group, gender, age category, and the ways in which the groups are recorded (e.g. item vs. weight). Though not perfect, an attempt was made to group and convert the data for comparison.

Fiber categories

Fiber representation in the chosen databases was not consistent. The CCIC presents its end-use data in weights and percentages cotton versus the total of all other fibers. This differs from the ITA fiber summaries, which are separated into cotton, man-made fibers, wool, silk, the group silk and other vegetable fibers (Silk and veg). For the purposes of this study, the ITA data compared cotton to man-made fibers due to the negligible amounts of these fibers.

Units

Unit data analyzed in this study also differs between databases. Available CCIC final use data is sorted by bales, thousands of bales, square yards, thousands of pounds, as well as cotton's percent share of the total market. Thousands of pounds were converted to kilograms for this research. USITC posts its data in kilograms per apparel category.

North American Industry Classification System (NAICS) codes

NAICS codes are used to group products into categories and for ease of comparison across data collection agencies (Berdine, Parrish, Cassill, & Oxenham, 2008; Ha-Brookshire, 2009; Ha-Brookshire & Dyer, 2009; Hodges & Karpova, 2006; Yuskavage, 2007). In the current study, these codes were used for grouping apparel categories. The three-digit NAICS code is the major category code. Additional digits are added to increase the specificity of the code, and U.S. industries sit at the six digit codes. Figure 2 offers a glimpse into the structure of the NAICS, with a broad three-digit code for apparel at the top, moving down toward more specific groups. These have more digits.

3 digit code - 315 (Apparel Manufacturing)

4 digit code-3152 (Cut and Sew Apparel Manufacturing)

5 digit codes –

- 31522 (Men’s and Boys’ Cut and Sew Apparel Manufacturing)
- 31524 (Women’s, Girls’, and Infants’ Cut and Sew Apparel Manufacturing)
- 31528 (Other Cut and Sew Apparel Manufacturing)

6 digit codes –

- | | |
|-------------------------------------|--------------------------------------|
| 315221 MB Underwear/Nightwear | 315231 WGI Lingerie |
| 315222 MB Suits, MB Coats/Overcoats | 315232 WGI Blouses & Shirts |
| 315223 MB Shirts | 315233 WGI Dresses |
| 315224 MB Trousers | 315234 WGI Suits, WG Coats/Overcoats |
| 315228 MB Other Outerwear | 315239 WGI Other Outerwear |

Figure 2. NAICS Code Structure. (Census, 2012). This figure illustrates the structure of the multi-digit NAICS codes.

Six digit codes were selected as the outline for the apparel categories in this research. The NAICS groups were renamed for the current study to cluster such items as “Skirts,” “Trousers,” and “Slacks” into “Bottoms”. Table 6 shows the way in which CCIC and USITC apparel categories were clustered into NAICS-type groups for comparison.

Table 3.

Apparel group names for this study as compared to the NAICS apparel categories and codes.

NAICS code	NAICS group	Group used for this research
315221	MB Underwear/Nightwear	Group 05 = Underwear/Nightwear
315222	MB Suits	Group 00 = Suits
315238	MB Coats/Overcoats	Group 02 = Coats
315223	MB Shirts (exc. Work)	Group 03 = Tops
315224	MB Trousers	Group 04 = Bottoms
315119	Ungendered Hosiery	Group 07 = Hosiery
315228	MB Other Outerwear (this includes, sweaters, sweatshirts, swim, etc.)	Group 06 = Other
315231	WGI Lingerie	Group 05 = Underwear/Nightwear
315232	WGI Blouses & Shirts	Group 03 = Tops
315233	WGI Dresses	Group 01 = Dresses
315234	WGI Suits	Group 00 = Suits
315239	WGI Coats/Overcoats	Group 02 = Coats
315119	WGI Hosiery	Group 07 = Hosiery
315239	WGI Other Outerwear (this includes, sweaters, sweatshirts, swim, etc.)	Group 06 = Other

Once the gendered apparel groups were defined and converted to comparable units, the data was reviewed for trends based on gender and cotton versus total fibers.

Stage II: Retail Assortment

Consumer choice in a particular retail environment is limited to the assortment available at the time. The breadth of that particular assortment actually demonstrates one slice of the complex path a fiber takes to its end use. An intricate set of decisions with many junctures brought that particular assortment to that particular location. Even then, the customer, with all his/her individual preferences and needs, makes the final decision. The “supply chain” is that entire process. This predetermined assortment is the one from which the consumer selects apparel.

While apparel purchase data exists at many levels, including retail, wholesale, national and international, it does not currently exist as a percentage of the retail assortment of apparel defined by fiber content. Therefore, if the fibers are not available for purchase, they will not be a part of the purchase data. Availability could be impactful to specific fiber industries due to missed sales. Missed sales in women's apparel are compelling due to the high percentage of women's sales as a part of total apparel sales. This study focused on the possible missed retail opportunities for the cotton industry that result from other fibers being available in apparel for purchase.

Two types of apparel retailer were chosen to participate in the pilot study. Both offered apparel, yet provided different environments with varying levels of service, and a wide range of price and quality. Apparel in these stores was tallied and divided by gender, apparel sector, and fiber content in order to establish the fiber content of the retail assortment in each. The inventories were completed at two locations in Austin, Texas in the spring of 2012. See detailed descriptions of process below.

The first location of the retail assortment inventory was a specialty apparel store. The Gap is a men's, women's and children's apparel store with over 3,000 locations in the United States (Gap Inc., 2012). The Gap at Central Park in Austin, Texas has approximately 3,000 square feet of men's and women's apparel and accessories in an urban setting. This information was gathered on March 29, 2012,

The second retail assortment was examined at Target. Target has over 1,700 stores in the United States aimed at providing a wide variety of products to consumers (Target, 2011). Target stores offer apparel, books, games, home furnishings, home improvement, grocery items, pharmacy, etc., at a value to their customers (Target, 2011). Target at Hancock Center in Austin, Texas is a warehouse style store in a suburban strip mall. This information was gathered on April 2, 2012,

The researcher inventoried the available apparel assortment for majority fiber content. Internal garment tags were tallied into the fiber composition categories “Mostly Cotton,” “Mostly Man-Made Fiber” and “Other.” Both men’s and women’s apparel was categorized into tops and bottoms and women’s dresses, following the pattern of the domestic and international data. For ease of comparison against cotton and to mimic the fiber categories in both the domestic and international data, man-made fibers and “other” fibers were combined. At the end of the inventory trip, the researcher totaled the apparel by categories and fiber content, and created percentages of fiber content of the total available apparel assortment for each gender category in the retail stores on that day and at that time.

Stage III: Clothing Diaries

As demonstrated by the retail assortment analysis, consumer choice is limited by retail availability. A review of consumer decision-making research reveals much quantitative work (Forsythe, 1989; Hines & O'Neal, 1995; Kim, 2005; Knowles, 2006; North et al., 2003; Rothschild, 1979; Shiv & Fedorikhin, 1999; Teare, 1994). Some consumer focused preference and decision-making work includes fiber as a factor (Eckman, Damhorst, & Kadolph, 1990; Forsythe, 1989; Hines & O'Neal, 1995; Hogge et al., 1988; Huddleston, Cassil, & Hamilton, 1993; Knowles, 2006; P. Norum & J. E. Ha-Brookshire, 2011).

The motivation for particular apparel selections can best be explored through qualitative procedures, which allow the emergence of reasons for choices from the purchaser’s own testimony. Regarding the difference between quantitative and qualitative methodologies, Berg offers “quantity is elementally an amount of something. Quality refers to the what, how, when, and where of a thing-its essence and ambience” (Berg,

2004, p.3). Therefore, the qualitative portion of this study was developed to begin exploration of the consumers' decisions to purchase cotton apparel, with the meaning imparted by understanding how they inhabit their clothes and interface with them.

Guy and Banim (2000) expand upon Tseelon's work (1992 and 1995) which uses multiple and varied methods of interactions with women to communicate a rational dialogue (Tseelon, 1995) in female's impressions of themselves as understood by their relationship with their clothing. This research draws upon Tseelon's mixed method model and uses Guy and Banim's personal wardrobe accounts and opens the dialogue to expressions of consumer fiber preference.

Two techniques were used to collect data: 1) a clothing diary and 2) a wardrobe inventory. The clothing diary format was borrowed from Guy and Banim (2000) and provided a landscape of how participants lived in their apparel. Physical, bound diaries were mailed to the participants who were instructed to keep a daily log of clothing items selected for wear each day of a one-week period. One reason to move beyond the point of apparel purchase and into the participants' homes was supported by Babbie: "qualitative field research is especially appropriate for the study of those attitudes and behaviors best understood within their natural setting as opposed to the somewhat artificial settings of experiments and research" (Babbie, 2011, p. 315) and "this contextual approach allows the researcher to study the meanings with which dress, textiles, and attendant behaviors are imbued" (Lennon & Burns, 2000). For the qualitative section of the methodology, type of clothing was defined as "Top (ex. blouse, t-shirt, etc.)", "Bottom (ex. Jeans, skirt, etc.)", "Other (ex. dress, romper, etc.)". The participants were also asked to list and explain the day's activities as motivators for the selection, list the fiber composition of the pieces of apparel selected, and comment on what benefit (if any) they felt the fiber offered.

As a component of their 2000 study, Guy and Banim utilized semi-structured interviews to investigate their participants' clothing collections. The limitations of the current exploratory study did not allow for total replication of the closet interview process. In lieu of interviews, this study allowed the participants to complete a personal wardrobe inventory after the clothing diary was complete. The wardrobe inventory was a one-time physical questionnaire mailed with the diary in which the respondents completed an apparel purchase log. The log was a listing of the apparel items and corresponding fiber composition of the apparel purchased by that respondent within the last six months. Questions accompanying the purchase log surrounded clothing care time and fiber composition awareness. The apparel selected for daily use was compared with the available recently purchased apparel.

It was decided to recruit participants who owned and wore clothes, and who were willing to commit to journaling about their clothing for one week. Participants were recruited using a snowball strategy to obtain a sample of both genders and with a range of ages. Snowball sampling is "used primarily for exploratory purposes" (Babbie, p. 208). "The basic strategy of snowballing involves first identifying people with certain attributes...these subjects are then asked for the names of other people who possess the same attributes as they do" (Berg, p. 33). "Researchers can begin snowballing additional relationships from the initial group" (Berg, p. 32).

This was a concentrated study with a purposeful small group of participants. Although it has been demonstrated that men and women make apparel decisions differently (Bakewell & Mitchell, 2004; Chang, Burns, & Francis, 2004; Cowart & Goldsmith, 2007; Fairhurst & Fiorito, 1990) it is not known whether men and women make different apparel selections based upon fiber or if they relate differently to their purchased wardrobe. For this reason, a total of six women and six men participated in

this segment of the study for a total of twelve participants. Limited demographic information was recorded to report ten gainfully employed participants with a range of positions from office professional to blogger to rancher (See Table 7). The sample contained five participants who live with dependent children, five with non-dependent children, as well as two who do not have children. The participants were white and heterosexual and lived in Austin, TX, Midland, TX, Oklahoma City, OK, and Galveston, TX when data was gathered in mid-November 2011. Participant names were changed to ensure privacy.

Table 4.
Participant code name, gender, age, and occupation.

Male	Age	Occupation	Female	Age	Occupation
David	28	Writer	Tina	36	Blogger/ Mom
William	30	Landscaper	Jeannie	60	Retired
Trey	32	Property Manager	Susan	58	High School Teacher
Tom	35	Attorney	Laurel	55	Rancher
Joseph	54	Insurance Appraiser	Julia	34	Stay at home Mom
Bruce	59	Professional - Office	Carrie	40	College Professor

This segment of the research design sought to explore the complexity of the problem and offer a qualitative methodology alongside current empirical data in hopes that there was potential for new understanding of a complex problem in using a more complex methodology.

Chapter Five: Results and Analysis

The US Apparel Market – A statistical review

Between the late 1990s and the current day, the U.S. textile industry collapsed resulting in a significant and sustained decrease in domestic apparel production. Domestically produced apparel fell from 43% of the U.S. apparel market in 1998 to 6% in 2008 (Huffman, 2001, 2005, 2008, 2009; United States International Trade Commission, 2012). Therefore, the apparel import data represented in this research is more representative of what the U.S. consumer buys. As discussed in the methods sections, some apparel categories do not directly correspond between the domestic and international databases. In the domestic apparel database for instance, Women, Misses, and Juniors (WMJ) are grouped together and Girls, Children's and Infants (GCI) are grouped together. In contrast, the import databases cluster Women's and Girls (WG) together. In such cases where categories are gendered but are not fully equivalent across databases, our discussion will be based on the import data given that it accounts for the major portion of apparel on the U.S. market.

In addition to the domestic apparel industry losing ground in the overall U.S. apparel market, cotton is losing its share of the domestically made apparel. We represent in Figure 3 cotton's share in the U.S. market of domestic and imported apparel. Between 1998 and 2008, cotton lost approximately a 20% market share of apparel made domestically (see Figure 3), with 3/4 of this loss happening between 2005 and 2008. It appears from these results that domestic cotton apparel was impacted substantially by the

collapse of the U.S textile industry. Indeed, the decline in cotton's share of the domestic apparel market does not represent a consumer's drift away in favor of other fibers. On the contrary, cotton's share of imported apparel appears on the rise since 2005, which drives the increase in the overall market share (see Figure 3). According to the data compiled from both the domestic and imported apparel, cotton constituted about 62% of all WG and MB apparel available to the U.S. consumer in 2008, up from 58% in 2004. In other words, the decline in cotton's share of the domestically-made apparel was more than compensated by the rise in cotton apparel imports. It is probable that trade policies and negotiations impacting cotton imports and exports and other policy issues impact the state of cotton usage. This is an exceedingly complex issue that has international economic implications. The data in this report is specific to the U.S. apparel market and does not consider exports or international demand.

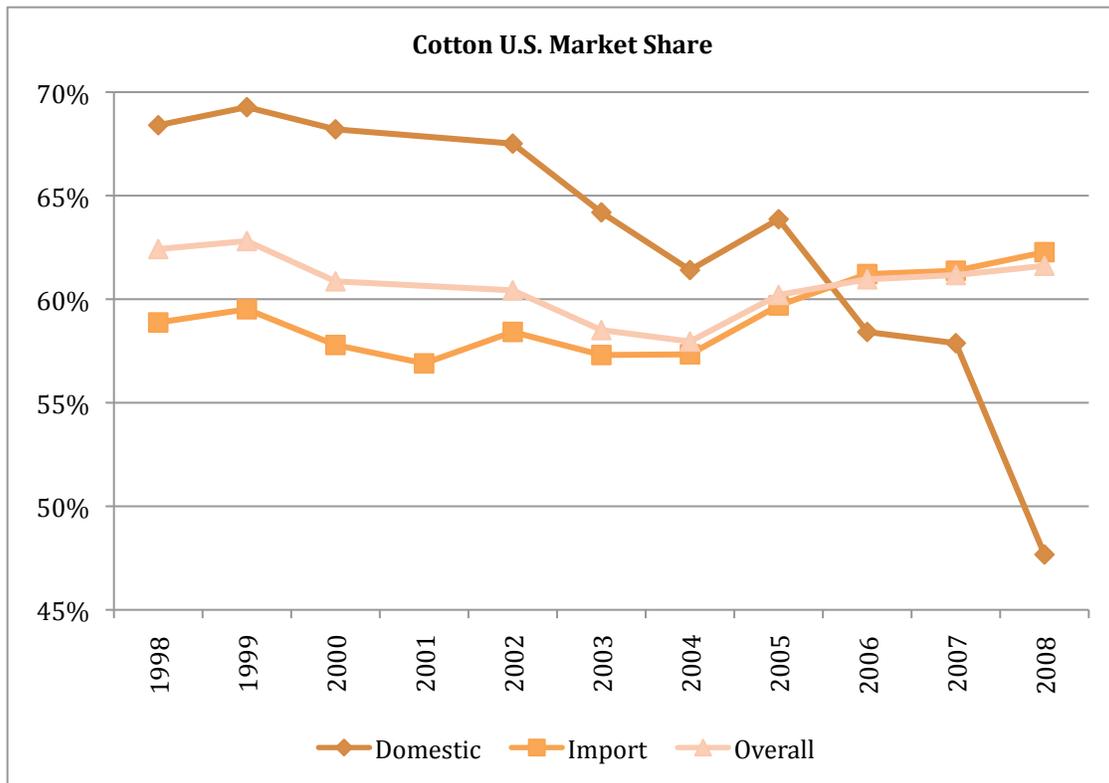


Figure 3. Cotton’s share in the U.S. market of domestic and imported apparel.

Figure 4 depicts cotton’s percentage market share of domestically produced (a), imported (b), and overall (c) U.S. apparel as broken down by gender. From Figure 4-a, it is apparent that despite the overall decline of cotton’s percentage of domestically made apparel, the men’s apparel has maintained a greater share of cotton than the women’s counterpart. In 2008, cotton represented approximately 42% of the domestic women’s apparel market; while the men’s market has over 56% of apparel made of cotton (see Figure 4a).

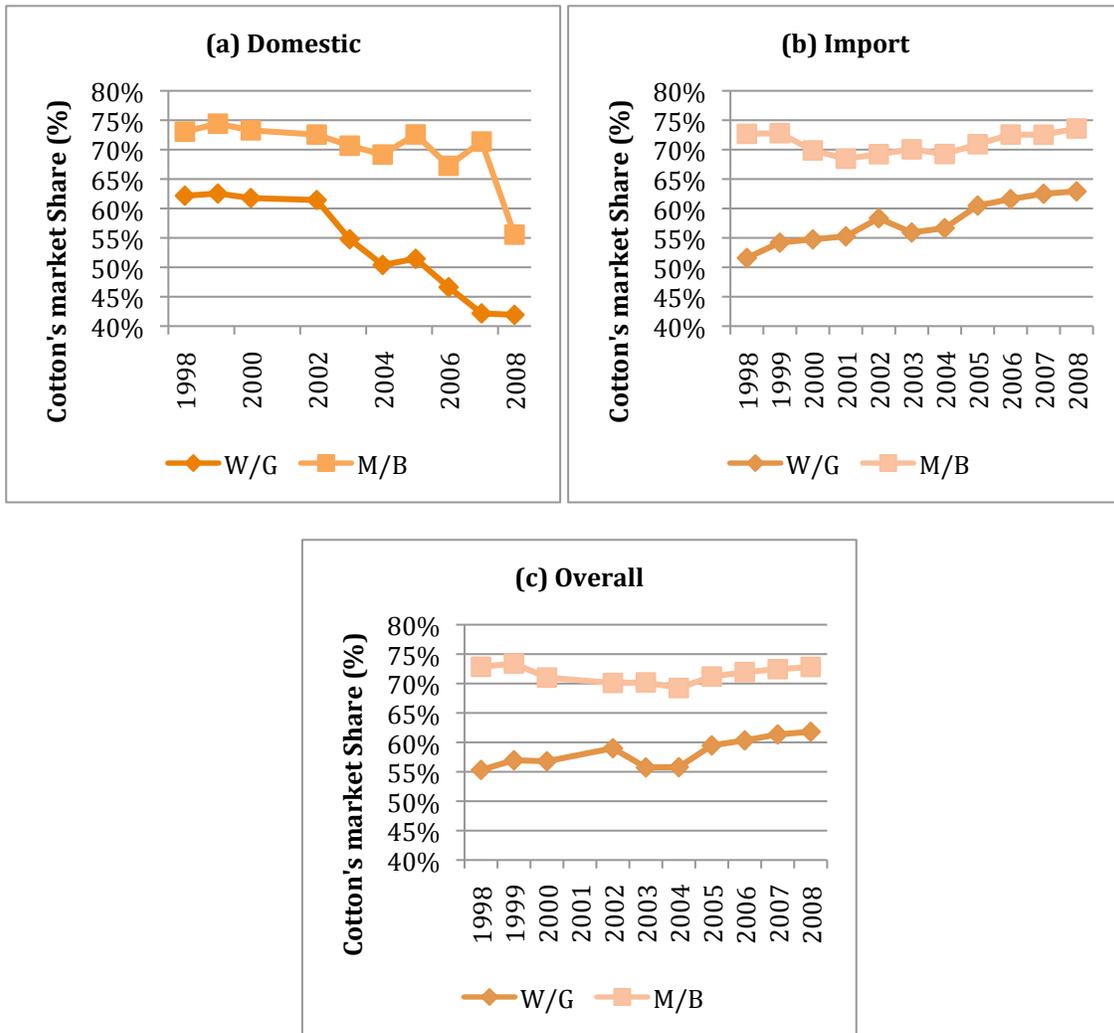


Figure 4: Cotton’s percentage market share of domestic (a), imported (b), and overall U.S. apparel (c) as classified by gender.

Figure 4-a shows that cotton’s share of women’s domestic apparel is both substantially lower than for men’s domestic apparel, and on the decline at a faster pace.

When including imported apparel data, the decreasing trend is reverted, which underscores the fact that more women’s cotton apparel is being imported. Overall between 1998 and 2008, cotton’s percentage share of women’s apparel increased from

55% to 62%, a trend driven by the increased cotton apparel imports as mentioned above (Figures 4-b and c). Despite this rise, cotton's market share in the Women's apparel sector is still substantially lower than that observed in the Men's apparel (Figure 4-c). The Men's apparel sector consistently maintained a higher share of cotton, i.e., 70 to 75%, than did the women's sector for the years reviewed. For the Men's apparel sector during the ten years 1998-2008, cotton's share dipped approximately five percent between 2000 and 2005. This share was regained to upwards of 70% by 2008. For the Women's imported apparel sector during the years reviewed, cotton's percentage share was steadily moving upwards from the lower fifties in 1998 to upwards of 60% share in 2008.

Major apparel categories

The domestic and import databases break apparel down into thousands of gendered apparel categories. These apparel categories vary across databases and terminology for categories varies between genders. The umbrella categories offered with a NACIS level 6 grouping were chosen because of the necessity to consolidate the apparel categories into a manageable number of groups (see Appendix A for the groupings). The groups represented by NAICS level 6 headings in this research are Suits, Coats, Tops, Bottoms, Underwear/Nightwear, and Other Outerwear. Women's apparel has the additional apparel categories of Dresses and Hosiery. Men's Hosiery is grouped into an ungendered Hosiery apparel category.

The seven major categories of imported women's apparel accounted for about 77% of total apparel based on weight, and ranked as follows: 1. Bottoms (35%), 2. Tops

(18%), 3. Underwear/Nightwear (11%), 4. Coats (6%), 5. Dresses (4%), 6. Suits (2%), and 7. Hosiery (2%). All apparel not included in these categories was classified as ‘Other’ and represented 23% of the total. The five major categories for men’s apparel based on weight in rank order are: 1. Bottoms (32%), 2. Tops (27%), 3. Underwear/Nightwear (11%), 4. Coats (7%), and 5. Suits (1%). The ‘Other’ category accounted for 19%.

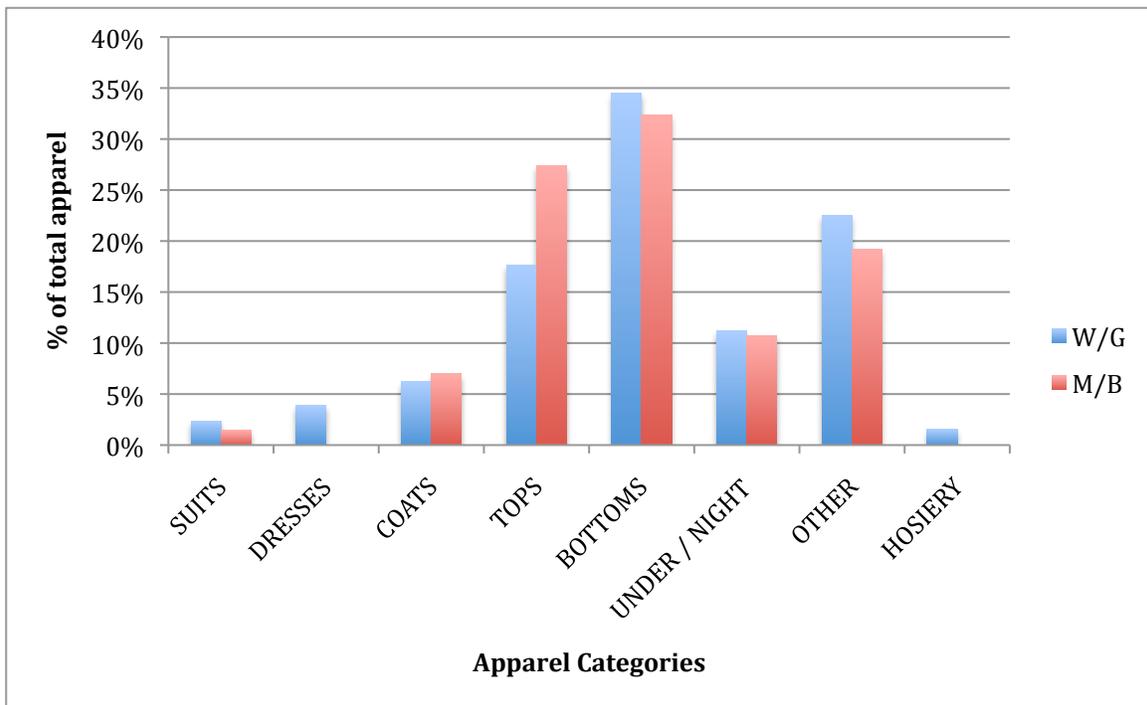


Figure 5. Apparel categories as a percentage of total apparel based on gender.

The ranking above is a function of both the number of apparel units put on the market and the weight of each unit. Certain apparel categories account for more poundage than do others. Intuitively, we know that a Hoodie sweatshirt (included in the ‘Other’ category) or denim jeans (Bottoms) will weigh more than a women’s

undergarment. Factors that impact apparel weight include yarn denier, fabric construction, garment size, fiber blend, and apparel design, among other things.

Figure 6 shows the women’s cotton apparel percentage of total weight by apparel category. Figure 7 shows analogous cotton market share data for men’s apparel. Men’s apparel maintains a more consistent share for cotton across categories than does the women’s sector. Referring to the rankings of apparel groups based on overall poundage, Tops, Bottoms, and Other Outerwear are the top three groups.

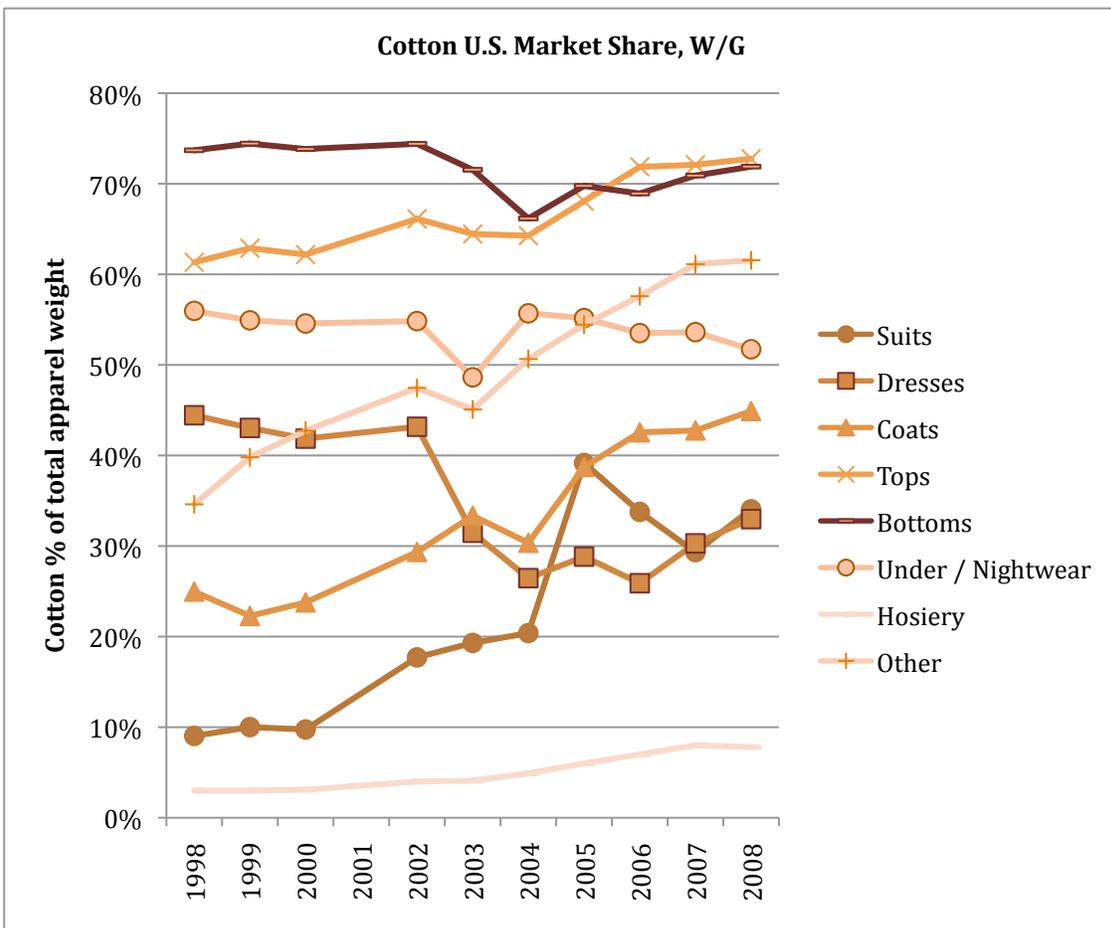


Figure 6. Cotton’s share of women’s apparel consumption as a percentage of total weight by apparel category.

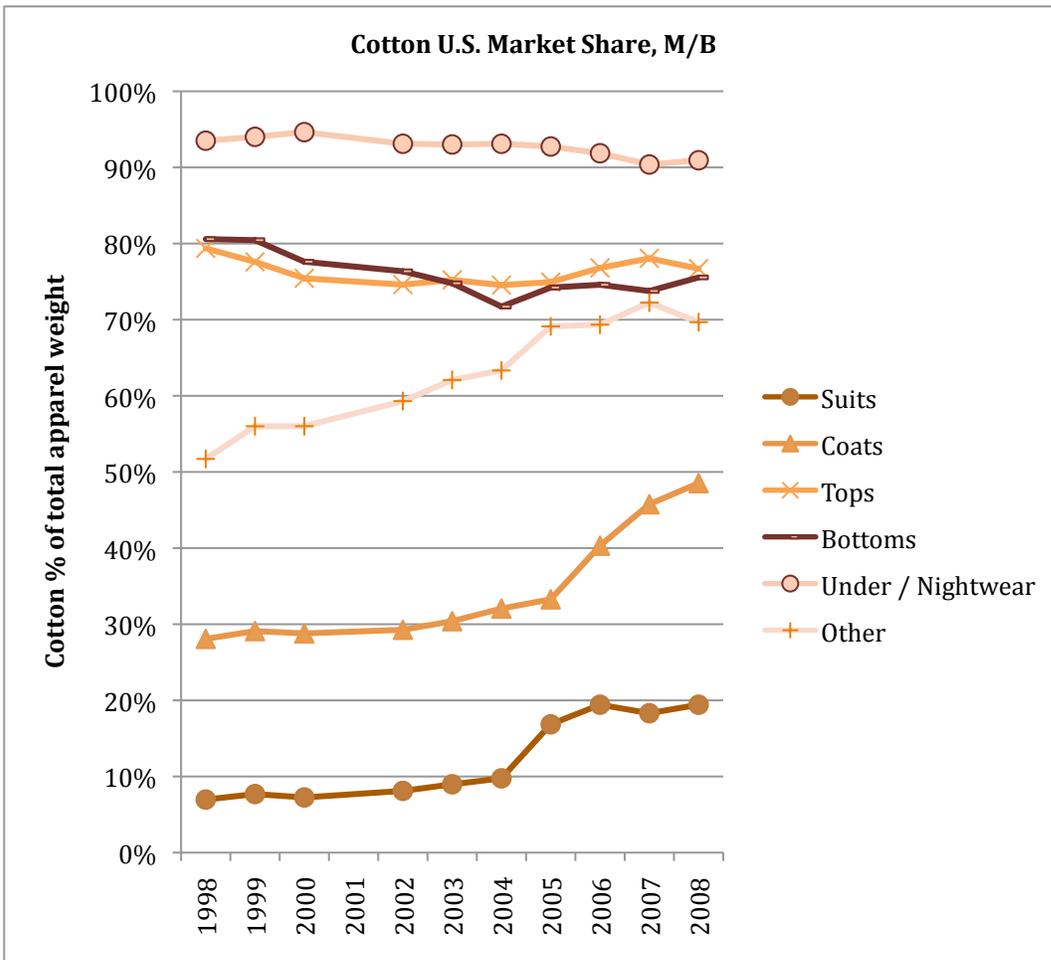


Figure 7. Cotton’s share of Men & Boys’ apparel consumption, percentage of total weight by apparel category.

Over the 10-year period, cotton held between 60 and 74% of the total apparel in the Women’s ‘tops’ and ‘bottoms’ groups. The two categories maintain the highest percentage of cotton as compared to the other groups. Like the Women’s market, Men’s Tops and Bottoms are mostly cotton, with the market share of cotton in men’s tops and

bottoms consistently averaging above 70% and close to 80% in most years. This was about 10% higher than the same categories in women's apparel, particularly for tops.

The next major apparel category depicted in the figures above is 'Underwear/Nightwear'. For the Men's apparel sector, Underwear/Nightwear is ranked fourth based on overall poundage, but maintains over 90% share of cotton fiber between 1998-2008. By contrast, cotton's share in the women's Underwear/Nightwear category is consistently below 60%, and closer to 50% in the most recent years. Given the importance of the Underwear/Nightwear category in terms of total fiber consumption, this contrast in cotton's market share may be one of the major contributors accounting toward the overall difference between genders.

The women's apparel sector has a long history of undergarments getting smaller over time to keep up with changes in the fashion industry, with an evolution from apparel pieces such as cotton pantaloons to the current briefs of lace, silk, and synthetics (Hersch, 2009). Compared with Men's Underwear/Nightwear that sits at the high level of upwards of 90% (shown in Figure 6 and discussed above), Women's Underwear/ Nightwear maintains 50-60% share during the years reviewed for this study. Women's Underwear/Nightwear shows promise for increased market share if future research specific to the female consumer delves into the psychology surrounding undergarment purchases and consumer demand for cotton undergarments could be increased.

Women's Hosiery is another category in which cotton is challenged for market share. Between 1998-2008, cotton's share was consistently less than 10% in the Women's Hosiery category (See Figure 6). The advent of synthetics created a substantial

apparel category with sheer, synthetic “nylons”, which constitute a major part of the women’s hosiery. However, the data in Figure 6 shows a sizeable increase in cotton market share, which went from 3% in 1998 to 8% in 2008.

Hosiery not included in the category above, i.e., essentially socks, is reported in the market data available to us as an ungendered group (both men’s and women’s). Cotton’s share of the ungendered hosiery market is reported in Figure 8. Between 1998 and 2008, cotton lost about 10% share of the ungendered Hosiery category, with most of this loss happening since 2006 (See Figure 8). These results are likely driven by increased competitiveness of man-made fibers in the socks market.

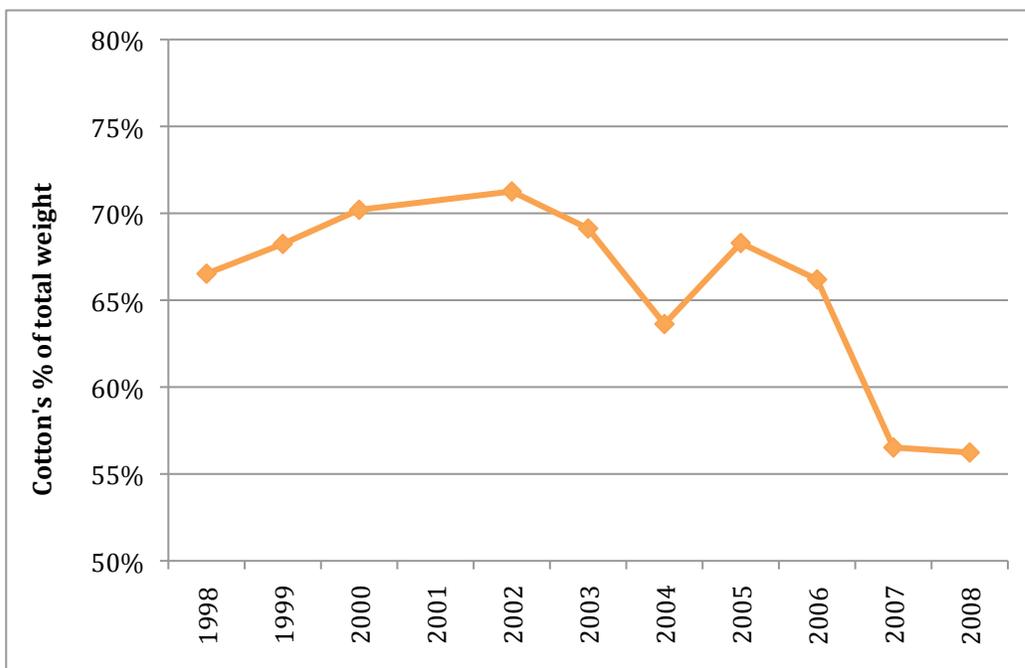


Figure 8. Cotton’s share of ungendered Hosiery consumption, percentage of total weight.

The “Dress” category is of particular interest for the women’s market. While Dresses rank fifth in the Women’s apparel sector in regard at overall poundage (sitting at 4% of the Women’s apparel market), they are a category unique to the female consumer. In addition, dresses are garments that may adhere to design specific to social requirements. In 1998, approximately 45% of the total weight of women’s dresses was made of cotton. By 2004, this number dipped under 30%, and was 33% in 2008.

For both genders (See Figures 6 & 7), Suits and Coats appear as another challenge for cotton. These are the two lowest cotton-consuming apparel categories that are shared by both genders. However, cotton utilization in Suits and Coats displays sizeable growth starting from 2001, with a sharper growth between 2004 and 2008. The men’s Suits category went from 7% cotton market share in 1998 to 19% in 2008. For women it increased from 9% to 33%. The Coats category went from just over 20-30% cotton share in 2004 to almost 50% cotton share in 2008 for both genders.

Therefore, one interesting pattern seen on Figures 6 and 7 is the increasing share of cotton in the coats and suits market for both men and women, though these categories remain as weak spots for cotton utilization. Cotton appears to be making inroads into these apparel categories for both genders, and given the current market shares, there is probably potential for further expansion. Typically for the consumer, coats and suits are thought of as investment pieces that should last for extended periods of time with the major functionality of protecting against cold and weather. Current research is addressing these needs, for instance offering cotton finish innovations regarding durability and water resistance (Cotton Incorporated, 2012).

In addition to the above, the Women's 'Other' category shows a sustained gain in cotton market share between 1998 (35%) and 2008 (62%). The Men's "Other" category, also shows gain, and sits at a higher percentage market share than does that of the Women's sector between 1998-2008. The cotton market share for the Men's category sits between 52% in 1998 to 70% in 2008. The specific garments driving this trend are Pullovers, Sweatshirts, and Sweaters, and it appears from these results that cotton is gaining market share in these applications in the same way it did with suits and coats.

Summary of Market Statistics Review

The domestic and import apparel data reveal trends based upon gender, fiber, and apparel category. Overall, cotton utilization is higher in men's apparel than in women's apparel. This is particularly driven by the sheer contrast between the amount of cotton used in men's and women's underwear/nightwear, and by the less striking, though influential, difference observed in tops and bottoms. In addition, dresses appear to be particularly challenging for cotton, which contributes to the difference in market share.

The amount of cotton selected for use in apparel design for both of the women's apparel categories Dresses and Underwear/Nightwear, could be impacted by the desired aesthetic appearance for a garment in these categories. Cotton has a matte luster and a range of drape softness which might not be desired for certain dress designs or women's undergarments.

Beyond the difference between genders, examination of the market data also showed major apparel categories that represent challenges for cotton in both genders.

This is the case of suits and coats which are typically made of other fibers such as wool/other animal fibers or synthetics. Cotton appears to be making inroads into these apparel categories for both genders, and given the current market shares and progress in finishing and processing research, there is probably potential for further expansion.

Women's Hosiery, consisting of things such as sheer hosiery and pantyhose, was quite expectedly constituted of mostly man-made fibers, with cotton representing only between 3 and 8% of the total weight. The Women's specific apparel category "Hosiery" is led by man-made fibers that respond to consumer preference and fashion trends for sheer hosiery. Although it remains very limited, cotton's share of this market has been increasing and more than doubled in the 10-year period we considered. On the other hand, the ungendered Hosiery category (mostly made up socks) exhibits a higher market share for cotton (consistently over 50%). However, cotton lost ground between 1998 and 2008 and its share of the ungendered hosiery market fell from a peak 71% in 2002 to 56% in 2008.

Therefore, our survey of the US apparel market data uncovered interesting trends in cotton fiber utilization by both genders and in varied apparel categories. In order to add context to this data and attempt to explore those trends from the consumer's perspective, we examined the role of fiber composition in the consumer's apparel selection process at two stages of the apparel supply chain: the first at the retail setting, the second at the consumer purchase and wear decision level.

Consumer Apparel Selection & Fiber Composition

If the goal were to initiate conversation to increase cotton's market share through increased cotton apparel consumption for specific apparel categories and for both genders, it would stand to reason that more information about the consumer would be necessary in order to investigate possible causes and explanations of the potential differences in fiber composition preferences and/or availability for both genders. A better understanding of these issues require answering questions such as, what is available to the consumer on his shopping trip? Is fiber composition among the features put forth in a typical retail assortment? How and why does the consumer make apparel purchase decisions when faced to a given assortment, and after the point of purchase, how do they live in and think about their clothes? To attempt an answer to these questions, we conducted the two exploratory studies of consumer apparel choices and of retail assortment, as described in the methods section.

Retail Apparel Assortment Results and Analysis: A Pilot Study

Specialty Store and Big Box Store

Specialty apparel and many big box stores typically have apparel available for purchase. Both Gap and Target offer apparel styles with “deep” offerings. A deep offering is one that has multiple pieces in each size per SKU, typical of non-boutique apparel stores (Chernev, 2003). As detailed in the methods section, the researcher collected data counts per apparel style (SKU). The categories chosen for this exploratory research were Tops, Bottoms, and Dresses. This was never intended to be a full retail

apparel inventory, and these categories were selected because of their use in eliminating subjectivity from the study. All categories were easily determined by the researcher.

To collect the apparel counts, the researcher physically walked up to apparel merchandising fixtures and selected a stack or rack of apparel at a time. While the process itself is simple and can be done by one researcher, it is a time consuming process. For the apparel stacks (representing a SKU in multiple sizes, one color), the researcher would check the inner fiber composition tag that would represent the entire stack of apparel.

Beyond the inventory of apparel assortment, availability of fiber composition information and its use as a part of the assortment was a major focus of researcher. In the assortment of apparel at both Gap and Target, there was no signage representing fiber composition, and no fiber-based groupings other than like styles being together. For the consumer wanting to find cotton apparel in these two settings, prior consumer knowledge regarding the feel of cotton or the look of cotton would facilitate locating cotton among the assortment of apparel. Fiber blends can offer cotton-like appearance and hand, so a double check of the fiber tags could give the consumer certainty regarding fiber composition for garments.

We summarized in Table 8 the observed percentages of apparel as classified by apparel category, fiber content, and gender at a specialty store and a big box store. For ease of comparison with the domestic and foreign data, this blend data was grouped into “mostly” cotton or “mostly” man-made fiber, or other. To mimic the assortment of the Gap, which at the time of data collection did not offer a men’s fitness apparel selection, the fitness apparel section of Target was not tallied.

Table 5.

Specialty store and big box percentages as defined by apparel category, fiber content, and gender.

	Specialty		Big Box	
	Women	Men	Women	Men
TOPS				
Mostly Cotton	60%	100%	64%	100%
MMF and Other	40%		36%	
BOTTOMS				
Mostly Cotton	71%	100%	82%	100%
MMF and Other	29%		18%	
DRESSES				
Mostly Cotton	26%		25%	
MMF and Other	74%		75%	

Generally, the available men’s apparel was primarily cotton. Conversely, women’s apparel showed that man-made fibers constitute a significant part of the available assortment for women’s apparel in the two stores explored for this research. For the Gap and Target, the percentage make-up of the women’s apparel categories selected was very similar. While Women’s Tops and Bottoms at Gap and Target maintain between 60%-82% cotton share (similar to the import and domestic data), the discrepancies in fiber content of the pilot study retail assortment were considerable for dresses. Man-made fibers were between 74 and 75% of the dress assortment in the stores studied.

Qualitative Results: Clothing Diaries and Wardrobe Inventories

The qualitative method selected to explore the possibility of consumer apparel selection based on fiber content consisted of clothing diaries and closet inventories. Clothing diaries and closet inventories were completed by twelve participants and returned to the author. The data produced from Clothing Diaries and Wardrobe Inventories was grouped as quotes, clustered by topic, and coded for themes. Matrix rows entitled “activity,” “benefit,” and “piece(s) of clothing/fiber composition” gave

organization to the responses. The matrix was built for tallying the number of references to various reported choices based on the day's activity and the specific fiber content of the piece of apparel selected as a part of the respondent's daily selection process. In this way, both the daily activity and perceived benefit of the fiber could be linked with the piece(s) of apparel selected for each day. Examples of organized data included:

- activity: "work outside,"
- benefit: "warmth and comfort,"
- piece(s) of clothing/fiber composition: "100% cotton sweatshirt, 100% cotton jeans."

In addition to the organizational rows, columns were labeled for emanating themes, and the activities, benefits, and pieces of apparel were marked into the columns if they matched the theme. The coded quotes were reviewed in triangulation by the primary investigator and two outside individuals. The quotes were agreed upon by all code reviewers and placed into categories. While in no way relatable to a population, the information produced by the clothing diaries and the Wardrobe Inventories provides a narrative regarding the personal relationship between the respondents and their clothing.

Two stages of consumer decision-making were recognized in the clothing diaries. Some respondents referred to the selection that occurs at the point of apparel purchase. Moving past the point of purchase, other respondents referred to daily apparel selection from their wardrobe. Upon filtering the diary responses, the daily apparel selection process and the reasons behind these selections from the available wardrobe became the focus of this analysis. The collated and indexed quotes from the diaries fit into themes tallied in Table 6.

Table 6.

Indexed themes drawn from clothing diaries in rank order of number of mentions.

Rank order	Theme	Number of mentions
1	"Comfort is key"/ Fabric Hand	76
2	"Cotton when necessary"/ Prior knowledge, idea about fiber functionality	75
3	Aesthetics	54
4	Social/Cultural Implied dress code/level of dress	46
5	Externally imposed "Dress Code"/Work	41
6	Weather/ climate	39
7	Change from "dressy" outfit to more "comfortable" outfit (or vice versa)	31
8	Ease of Care	19
9	"Chores"/ Hanging around the house"	19
10	Performance/ Exercise	18
11	"Kid"	10
12	"Work from home"	8
13	"Errands"	7

Respondent Profiles

The following twelve consumer profiles illustrate the personal information gleaned from these documents and explore the decision making process to which they give insight.

David, 28, Writer

David is a single writer with no children who works in an office environment. David's responses list his daily activities, weather, and expectations at work as factors that combine to shape his daily clothing changes. David states in reference to a day's activity, "I wore a t-shirt and running shoes in the AM because I was walking to work,

[then] changed into work clothes once there.” In addition to changing clothes for his walks to and from work, David also changes an additional time on the days when he goes running. For work, David’s attire generally has a higher level of cotton composition than for his athletic activities. The work top referred to in the previous quote was a “dress” shirt of 100% cotton and the ‘bottom’ worn to work was jeans of 98% cotton, 2% elastane. To walk to work, David wore a 100% cotton t-shirt beneath a “hoodie” of 50% cotton, 50% polyester, and to run, he wore T-shirt of 100% cotton and shorts of 100% polyester. On a day with no work, David goes “casual. No walking dictated (his) outfit.” While he does not don a 100% cotton dress shirt, he is again in a 100% cotton t-shirt. The jeans selected for a casual day were 99% cotton, 1% elastane.

Carrie, 40, College Professor

Carrie is a married mother of one child who is gainfully employed as a math Professor. While she does not work in an office setting, she does mention dressing “up a little” to teach. For work, outfits selected during the response period include mostly blends with synthetic components. Examples of tops she chose included a sweater of 55% cotton, 20% viscose, 15% acrylic, and 10% rabbit hair, along with a cardigan of 55% cotton, 25% acrylic, 10% nylon, and 10% rayon. Carrie saw a benefit in synthetic fibers and said that she “wanted [the] sweater to have some synthetic fabrics because all cotton sweaters aren’t warm”. Additionally, she offered that, “typically...[she doesn’t]...get fabrics...[she has]...to dry clean- but the cardigan was so cute...[she]] bought it anyway.” While Carrie selected synthetic fibers in her garment for functional purposes

(“to stay warm”), she elected to add to her garment (dry cleaning) for aesthetic reasons. The aesthetic trumped ease of care in this instance. Carrie offered other quotes about her prior knowledge regarding fiber functionality in her clothing diary. Regarding care time, Carrie said she did not “have time to iron clothes and...(doesn’t)...want to take clothes to be dry-cleaned.” Regarding fiber functionality, she offered about a 95% polyester, 5% spandex dress, “(I) wore (this) dress because it was raining and if (it) get(s) wet it would dry quickly.” Regarding fiber functionality *and* fit, she stated in reference to a 50% cotton, 50% polyester “T-shirt,” “(it) would breathe and be comfortable and fit well.” Speaking of fiber functionality again, she said “I like cotton dresses because they breathe—same for tank tops.” and “Cotton for t-shirts because it breathes and it’s so hot here [Austin].”

Trey, 32, Property, Store, Gym Manager

Trey is a married father of one, and is employed in a position that requires a variety of physical settings. Varying by the day, Trey travels from a meeting at the office, to manage an apartment complex, to call on a chain of retail stores, or to manage a gym. In his words, “the day of the week was a big motivator for...[my]...dress.” On one day documented through the clothing diary process, weather combined with weekend activities and comfort to determine the garment for the day. On this cool day, and while attending “a gun show and watching football,” Trey wore a sweatshirt of 71% cotton, 29% polyester and jeans of 100% cotton. Trey utilized his beliefs to determine that the “sweatshirt was super soft” and that “it would be comfortable.” When Trey returned to work after the weekend, the first day was in the office. The top he donned was a “long

sleeve button up dress shirt” of 100% cotton with slacks of 95% wool, 5% spandex. In contrast with his choices for a day at the office, Trey varied the selection to dress for a day managing a gym. He stated, “I’m working at the gym some today, so I need to ‘look the part’.” Trey does this in a 50% cotton, 50% polyester t-shirt and a “hooded sweatshirt” of 57% cotton, 41% polyester, and 2% spandex. The bottoms selected for this day were “wind pants” for which the fiber content was not stated. While Trey selected a cotton Top and natural fiber Bottom for his office work, he chose garments with a synthetic component to be “comfortable” or for work in a fitness setting.

Jeannie, 60, Retired

Jeannie is a married, retired woman with two adult children. Jeannie summarized her garment selection process for time spent working from home by saying “if [she’s] going to be at home and...want[s] to be comfortable doing a range of things from computer/paperwork to chores to cooking I will choose clothes that are cotton.” To be “comfortable but a little more dressed up,” Jeannie selected a top of 96% cotton, 4% spandex along with a jacket of 70% polyester, 28% viscose, and 2% elastane. For the bottom selected that day, Jeannie chose pants of 64% polyester, 31% rayon, and 5% spandex. These clothes were originally purchased because Jeannie believed that “they would pack well and could be worn day and evening and be dressed up with scarf or jewelry.” For garment selection on a day when she was having lunch with a friend, Jeannie selected a turtleneck of 55% cotton, 21% rayon, 16% nylon, and 8% angora along with a sweater that was 75% acrylic and 25% wool. The pants selected were 98% cotton and 2% lycra. Transitioning to the blends with a synthetic component that Jeannie

chose for a social outing or to dress up somewhat, Jeannie moved to apparel with a synthetic composition for exercise. A mostly spandex turtleneck paired with a 100% polyester polar fleece top and pants were the exercise selection for the day written about in the clothing diary.

Bruce, 59, University Alumni Relations Director

Bruce acts as a professional in an office setting, and is married with non-dependent children. His diary entries focused on “comfort, appearance, and ease of care.” The tops Bruce selected for work or church contained fiber blends with synthetic components, but when he changed clothes after these activities to be more comfortable, he selected garments of mostly cotton. To say “the prayer at a University basketball game,” Bruce selected a “long sleeve button shirt” of 60% cotton, 40% polyester with “slacks-dress” of 100% cotton. For church, Bruce selected a “long sleeve dress shirt” of 60% cotton, 40% polyester and “dress” slacks of 81% polyester and 19% rayon. Post-work comfort wear consisted of t-shirt[s] and jeans of 100% cotton.

William, 30, Landscape Designer

William is a single man with no children who works in the elements. His garment selection process begins by determining whether he will be working outside or attending another activity. He then decided whether or not he “liked the look.” For four days out of seven, either spent working outside, watching sports indoors, or running errands, William selected 100% cotton pieces. It was when William attended church or played softball that he integrated a synthetic blend into his daily garment selection. For church, his top was a “dress” shirt of 45% polyester, 55% cotton and his bottom was

100% cotton slacks. For an outdoor softball game, William selected a 100% cotton long sleeve t-shirt under a short sleeve shirt of 97% polyester, 3% cotton and 100% cotton sweat pants.

Susan, 58, Teacher

Susan is an unmarried teacher with two adult children. She appreciates “low care to prepare in the morning.” She doesn’t “check tags for fiber composition,” but will “always consider the touch and feel...(but) generally not purchase...if it doesn’t feel soft, comfortable, and good.” Susan wrote about a 100% cotton shirt and 100% cotton jeans selected for lunch with a friend, “comfort-cotton-less stress-more in tune with my lifestyle.” For “Home-comfort/relaxing,” Susan selected 100% cotton again for her sweat jacket and sweat pants, writing that she was “often hot and cotton is always cooler.” On a day where she needed to appear more professional for work, she selected garments with a blend of man-made fibers, a t-shirt of 96% rayon, 4% spandex along with a tank top of 100% acrylic. Speaking to her desire to wear clothes that “do not need ironing” and require little morning preparation, Susan selected Dockers with 97% cotton and 3% spandex.

Julia, 34, Stay at home Mom

Julia is a stay at home parent to two young children. “To be comfortable,” Julia selected the Top pieces of a t-shirt of 100% cotton under a sweater of 60% acrylic, 40% cotton, and jeans consisting or 88% cotton, 10% polyester, 2% spandex. To “look a little nicer” while “working at (her) daughter’s school,” Julia selected a sweater dress of 45%

acrylic, 25% wool, 15% viscose, 15% nylon, paired with leggings of 45% polyester, 43% viscose, 10% polyamide, 2% elastic.

Laurel, 55, Rancher

Laurel's responses disclosed that she "buy[s] cotton as much as possible. It usually seems to last longer, hold its integrity, and breathe better than man-made fiber." When writing about her choices, Laurel imparted, "I dress everyday for activities of the day. This morning I'm paying bills and working 52 head of new cattle this afternoon." Her response revealed that her day was varied in its demands and that she took these variances into consideration when choosing the day's wardrobe.

For the day she paid bills and worked cattle, Laurel listed a long-sleeve turtleneck of 99% cotton, 1% spandex and jeans of 100% cotton. She elaborated that "the denim jeans are heavy duty and I made the choice of 'cowboys.' Turtlenecks are more comfy around the neck with greater amounts of cotton. I love the natural knits in jackets as well. This afternoon I'm changing jacket for a barn coat that is 100% cotton."

Tina, 36, Mom/part-time blogger

Tina is a 36 year-old mother of a dependent child who blogs from home, but occasionally has to go into the office or attend work events. Accounts of her daily apparel selection were centered on comfort for working at home or playing with her son. For Tina, comfort was reflected in the choice of a 100% cotton t-shirt paired with 100% cotton khaki shorts or 100% polyester athletic pants. Comfortable to her was mostly cotton, except for the athletic pants. When Tina attended a work event that she "needed to dress up for," she chose a sweater that was 60% cotton, 40% acrylic.

Joseph, 54, Insurance Adjustor

Joseph, a professional father of non-dependent children, works as an insurance adjustor. About the requirements of his occupation, he writes: "I work outside a lot. I want my clothes to be appropriate for the weather, durable, and comfortable." Joseph's apparel must meet the needs of his daily activities and the qualifications for his personal dress code must meet the needs of functionality, weather and comfort.

Joseph writes on, "I meet with the public and don't want my clothes to be too casual but still allow me to do my job," He continued, "When I did not get out, I wanted my clothes to be comfortable but not look too relaxed." To meet these needs, Joseph selected tops with blended fiber composition. The choices he listed included a short-sleeve shirt of 66% cotton/34% polyester and a t-shirt of 60% cotton/40% polyester. For bottoms, Joseph listed slacks composed of 65% polyester/35% viscose and shorts of 75% cotton/25% nylon.

Tom, 35, Attorney

Tom is an attorney with young children at home. The daily activity in which he most often participates is working in an office environment. He wears a 100% cotton dress shirt to work almost every day. Tom wrote: "re: dress shirts- I like to buy the "wrinkle-free" so that I do not have to iron." And, later, "I intentionally bought wrinkle-free." Tom primarily wore natural fibers in his bottoms for the week selected for diary entries. For court, Tom chose slacks of 97% wool, 3% cashmere or 100% wool. For "Casual Friday," Tom was allowed to wear jeans to work.

Qualitative Analysis

After key words from the participants' diaries were organized into self-evident categories, themes arose which assisted in deriving meaning from the respondents thoughts. The two main themes gleaned from the diary responses were the Daily Activity Filter and Dress Code. In addition to the main themes, three sub-themes emerged within Dress Code. The themes and sub-themes are listed in Table 7 and will be discussed in detail in subsequent paragraphs.

Table 7.

Clothing Diary and Wardrobe Inventory themes.

(1) Daily activity filter - "Gun show" vs. "Working...new cattle"

(2) "Dress code"

a. Extrinsically imposed apparel guidelines - "Casual Friday"

b. Socially implied apparel guidelines - "Lunch with a friend"

c. Intrinsically held apparel guidelines - Personal dress code

i. "Comfort is key"

ii. "Breathable, absorbent fabrics" - Ideas about fiber functionality

iii. "Fabric appropriate to the season" - Weather and climate

Daily Activity Filter

In the daily activity discourse, diary respondents wrote the day's impending activities as a motivator for apparel selection. For every respondent, the day's activity was mentioned in the diaries. This process of showing preference from among choices of apparel in a personal wardrobe based upon these daily activities will be defined in this paper as Daily Activity Filter. This, the most oft mentioned reason for daily apparel selection, was termed a Filter by the Researcher because it was the first step in refining

daily apparel choice. A wide range of daily activities were offered by the respondents, including: “playdate at the park,” “going to court,” “working from home,” “a casual birthday party,” “church,” “watching football,” “gun show,” and “working...new cattle.” The respondent profiles illustrate specific apparel for certain activities, and the reasons for the specific apparel were elicited from the diaries. The diary entries listed for secondary reasoning for daily apparel selection gleaned from the diaries were grouped into the Dress Code theme and sub-themes.

Dress Code

From the Daily Activity Filter, the theme of Dress Code emerged. Dress code was constructed of themes named for the source of the apparel guidelines, which seemed to be socially codified. It is common in structured groups (family, social, religious, work, etc.) that there are accepted modes of dress which are either formally coded or reach the level of mandates in the mind of members of the group. The diary respondents brought up three themes, which appeared to fit this definition of a dress code: “Extrinsically imposed apparel guidelines,” “Socially implied apparel guidelines,” and “Intrinsically held apparel guidelines.” Respondents listed either from one to all three of these themes as a layer upon their decision making process. For example, some respondents listed only one sub-theme influencing their daily garment selection, for example the weather. Other respondents spoke more of a multi-step process of which multiple sub-themes were a part. For example, a respondent might mention the weather, their task for the day, as well as a desire to look a certain way while doing the task.

The Extrinsically Imposed Guidelines were those such as a formal work dress code. Respondent Tom wrote, “We have a dress code” and this “workdress code permits jeans on Friday.” Respondent Trey wrote in regard to a work dress code, “[today is] another day at the office, [I] need to dress it up.” Referencing another day in his week, Trey stated, [it was a] “work day so I needed to dress appropriate.” Respondent David wrote, “[today is] Casual Friday! I didn’t change into work clothes.”

The next theme to flow from the diary responses was that of “Socially implied Apparel Guidelines.” Differing from the specific guide formally lines that are imposed by a workplace for instance, these guidelines were implied by a society, culture, or social situation. Respondents wrote about “lunch with a friend,” “saying the prayer at a University basketball game” and “church.” Respondent Trey described that when he went to work at a gym, while he was not “working out” in the gym, he wanted to “look the part.” He responded to socially implied apparel guidelines by wearing wind pants and a sweatshirt. These quotes refer to subjective expectations for apparel in specific social situations. The participants made no mention of these things being formal requirements, rather they allude to “wanting” or “needing” to be dressed in certain ways for certain social events.

The third theme to come out of the clothing diaries was that of “Intrinsically Held Apparel Guidelines.” These guidelines worked to create what was titled the “Personal Dress Code.” The sub-themes that crafted the code included “Comfort.” One of the respondents elevated this theme by saying “comfort is key.” Ideas about fiber functionality informed another sub-theme under Personal Dress Code. An example of this

factor was “breathable, absorbent fabrics” as a reason for choice. Finally, “Weather and Climate” was a sub-theme, which captured some respondents’ reasons for choices: a reference to “fabrics appropriate to the season” was typical of phrases that defined this sub-theme. A final sub-theme that fits into the Personal Dress Code was “Aesthetics.” Respondent William drew from his intrinsically held aesthetic guidelines then decided whether or not he “liked the look.”

Also a part of the Personal Dress Code filter, were respondents’ ideas about fiber functionality. Respondent Susan expressed inherent beliefs about what cotton has to offer, and paired the fiber benefits with her daily activity filter. Respondent Laurel’s responses disclosed that she has a personal dress code that lends itself to cotton. While Laurel did not make mention of any externally imposed or intrinsically implied guidelines as reason for her selections, she did use her Personal Dress Code, and her response offered some insight into her beliefs about fiber functionality and the perceived benefit certain fibers will offer for the activities of her day. As a rancher, Laurel’s activities for the day included paying bills and working cattle. She wrote that the high amount of cotton content in her turtleneck was “comfy.” She appreciated “natural knits in jackets” and “made the choice of ‘cowboys’” and mentioned the benefit offered by her 100% cotton, “heavy duty” jeans.

Respondent Tina has stark opinions about the benefit of cotton that touched upon all three sub-themes within the Personal Dress Code theme. She “prefer[ed] cotton for breathability in hot weather,” “prefer[ed] cotton because it...breathe[ed] better in summer” and “prefer[ed] 100% cotton when necessary.” The sub-themes of comfort,

dressing appropriately for the weather and climate, and inherent fiber functionality were all touched upon when explaining her apparel selection for attending play dates and blogging. She suggested that there was either a socially implied or externally imposed expectation of how she should appear at the event. In this setting, the fiber content of her selected apparel changes slightly. In “need”[ing] to appear a certain way, she opted out of her normal 100% cotton t-shirt.

Comments in respondent diary entries created a framework through which the researcher categorized factors influencing the respondents’ daily apparel selections. The structure of this framework consisted of a Daily Activity Filter, themes, and sub-themes. The Researcher used the framework to organize the daily apparel selection process described in the Clothing Diaries by the respondents. They wrote of choosing specific garments for certain activities and what benefit they perceived these fibers offered for these activities.

All participants but one (Laurel, rancher) mentioned the need to “dress up” and expressed it using formulas such as being “more dressed up”, to “appear more professional” or “look a little nicer” and “not too relaxed”. To fulfill this need, the garment of choice appeared to be constituted of mostly man-made fibers, of fiber blends with some cotton, and of wool/other animal fibers. One exception to this was the 100% cotton “wrinkle-free” dress shirt selected by Tom. Overall, man-made fiber blends were prevalent in the apparel selected to “dress up”. It appears therefore that when it comes to dressing-up, a 100% cotton or predominantly cotton garment was not the natural choice for the respondents.

In addition to dressing up, seven of the 12 respondents noted the activity of exercise in the Clothing Diaries, which was of particular interest to this research. As noted in the literature review section of this thesis, performance sportswear for exercise is of concern in regard to the consumption of cotton.

The diary comments offered words regarding the activity of exercise, which were coded into the Daily Activity Filter theme and the Personal Dress Code sub-theme.

Of the Tops selected for exercise, there were 12 mentions total, three mentions by one respondent, two mentions by two respondents, and five single mentions by respondents. Of these Tops, eight were 100% cotton, one was mostly cotton, one was 50%/50% 50% cotton/50% polyester, and one was 100% polyester. Nine Bottoms were selected for exercise. Of the Bottoms, five were 100% polyester, one was 100% cotton, one was 95% cotton/5% spandex, one was 90% cotton/10% spandex, and one was 55% cotton/40%polyester/5% spandex.

Qualitative focus: Gender

Figure 9 and Figure 10 show the fiber composition percentages of tops and bottoms, respectively, mentioned in the Clothing Diaries as divided by gender. As mentioned previously, the apparel categories Tops and Bottoms in the Clothing Diaries may not be consistent with the Tops and Bottoms as defined in the import and domestic data in the results section. The diary respondents may have offered subjective definitions for the apparel they selected for wear. For ease of comparison, pieces of apparel worn on the top half of them were grouped as Tops, and garments worn on the bottom half of the body as Bottoms.

Outside of the Tops category and the Bottoms category, three dresses were mentioned by female respondents. The first of three dresses mentioned was a Sweater dress of 45% acrylic, 25% wool, 15% viscose and 15% nylon, which was selected because Julia "wanted to look a little nicer, [for] working at daughter's school today." Next, a dress of 95% polyester and 5% spandex, was worn because Carrie was "teaching - [she] wore [this] dress because it was raining &...it (polyester) would dry quickly." Carrie selected the third dress mentioned in the Clothing Diaries again for teaching. This dress was 92% polyester, 8% spandex. Appearance and work were mentioned as factors in the choice of dresses in general. Care, the fact that polyester dried quickly, was mentioned as a fiber related criterion for choice of a dress. The fabrics moisture management capability (drying, wicking) is often cited as a major criterion in the athletic apparel application. Carrie's response suggests that it may also be a concern in other outwear.

For both genders during the seven days surveyed, 100% cotton Tops were the predominantly selected pieces of apparel. 67% of men's garments selected for wear were 100% cotton. At a lower percentage, 47% of women's garments selected for wear were 100% cotton. These results appear concordant with the trends observed in our survey of the market data. For both genders in Tops, all other fiber blends paled in comparison. The closest fiber blend was that of "mostly" man-made fibers (that is with greater than 50% man-made fiber content), at 23% for the females versus 1% for the male respondents (see Figure 9).

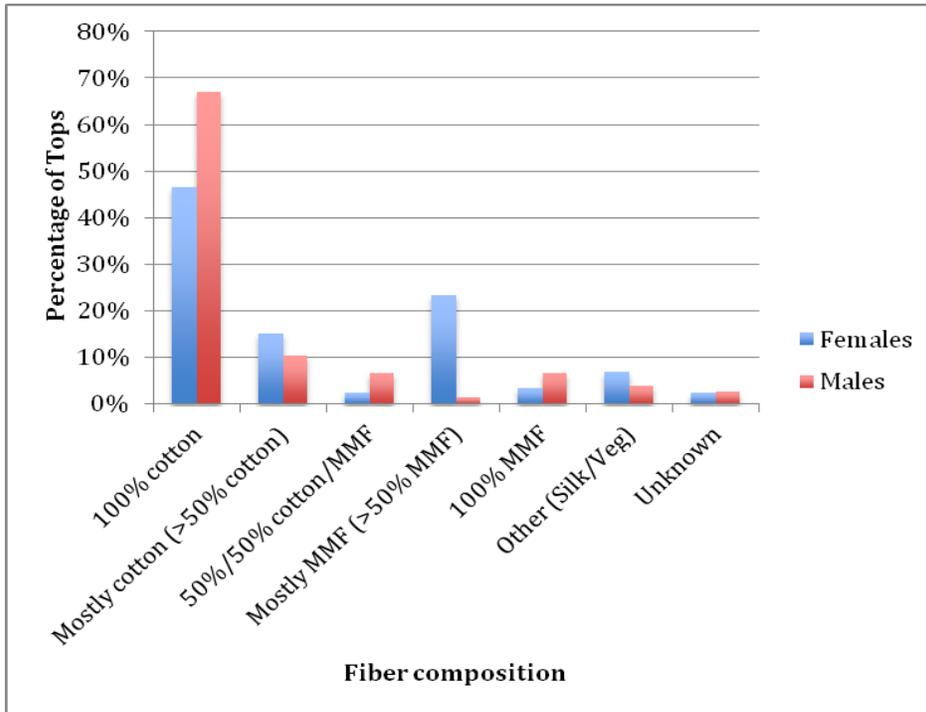


Figure 9. Percentage of Clothing Diary Tops as classified by fiber composition and gender.

In Figure 10, depicting fiber composition of Bottoms selected by the Clothing Diary respondents, the predominant fiber composition is not 100% cotton for both men and women. The fibers composition of Bottoms documented by Clothing Diary respondents is more varied between genders. For the week surveyed, female respondents selected 100% cotton Bottoms 30% of the time. This is in contrast with the 53% of Bottoms selected by male respondents for the same week. 43% of Bottoms that female respondents selected for the week were mostly cotton. These “mostly cotton” pieces refer to 23 bottom garments, 12 of which were respondent defined “jeans” of either 98% cotton, 2% spandex or 99% cotton, 1% spandex. The second ranking fiber composition

classification for the male Diary respondents was “Other.” 17% of male’s Bottoms selected for wear were 100% wool or wool blends in dress slacks.

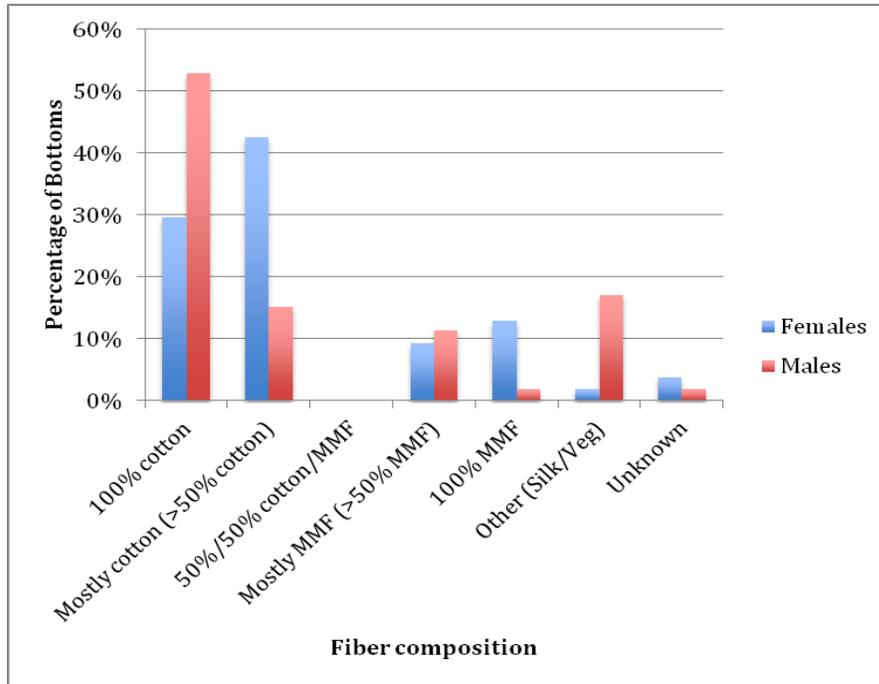


Figure 10. Percentage of Clothing Diary Bottoms as classified by fiber composition and gender.

In summary, Clothing Diary responses were concordant with the market data surveyed in the initial phase of this research and showed an analogous discrepancy in the prevalence of cotton in the men’s vs. women’s apparel composition. Fiber composition was revealed as an important factor in the daily garment selection process by the consumers because of perceived benefits related to daily activity or dress code. Overall, cotton appeared challenged by man-made and other fibers when the respondents needed to “dress up”, to attend to athletic activity, or to satisfy the need for specific functionalities such as rapid drying.

Chapter Six: Conclusions

A mixed methodology was adopted in an effort to clarify cotton's position in the U.S. apparel market. Apparel reports by the National Cotton Council of America reveal gender discrepancies in the amount of cotton used in the domestic production of apparel. The men's domestic apparel sector consumed a higher percentage of cotton than the women's apparel sector from 1998 to 2008. Since the majority of apparel in the U.S. is imported, import data was compiled to offer a more expansive view of cotton's market share and its use separated by gender. Like the domestic database, import data from USITC database showed a sizeable discrepancy between the total use of cotton in men's and women's apparel. Apparel imported to be used by male consumers utilized a higher percentage of cotton than that made for women. In addition to the variance in cotton usage between genders, an examination of cotton usage in various apparel categories, revealed a potential for increasing the use of cotton fibers. For example, in the women's sector, every apparel category selected for examination in this research exhibits lower percentage of cotton used than in equivalent men's categories. Although fiber usage and preference are influenced by many complicated factors, it is possible that some categories offer cotton the possibilities for market growth. For instance, cotton appears to be making inroads into the suit and coats apparel categories for both genders, and given the current market shares and progress in finishing and processing research, there is probably potential for further expansion.

In addition to the analysis of existing databases, apparel import and domestic production data was bolstered by contributing exploration at the retail level, as well as an investigation past the point of retail consumption at the level of personal daily apparel selection. The author used two exploratory techniques for enriching domestic reports and import trade data for apparel. The first exploratory method utilized was a pilot study for apparel retail assortment. Availability of fiber composition information and its use as a part of the assortment was a central focus of this research phase. In the assortment of apparel at both stores visited, there was no signage representing fiber composition, and no fiber-based groupings other than like styles being together. For the consumer wanting to find cotton apparel in these two settings, prior consumer knowledge regarding the feel of cotton or the look of cotton would facilitate locating cotton among the assortment of apparel. Fiber blends can offer cotton-like appearance and hand, so a double check of the fiber tags could give the consumer certainty regarding fiber composition for garments. For this portion, the fiber composition of available apparel was tallied from hang tags and labels on garments in three major apparel categories for both men and women at two retail stores in Austin, Texas in the spring of 2012. This study revealed more cotton was available in men's apparel at the retail level. At the market database level, one of cotton's most challenging apparel categories is Dresses. At the retail level, women's dresses with cotton fiber content were also limited. Man-made fiber blends were three times more available than 100% cotton or cotton blend dresses.

The second exploratory research method used was a qualitative clothing diary and wardrobe inventory designed to glean personal accounts of the daily apparel selection. The decision-making process was examined from data contributed by a small, purposeful sample of respondents. For the clothing diary respondents, fiber choice was specifically explored as a part of the daily apparel selection process. Participants revealed choices specifically involving traits they named and associated with cotton fiber. Their responses were categorized into themes of Daily Activity Filter and Dress Code. Dress Code was further broken down into sub themes based on social coding.

Garment selection for males and females during the period reported in the Clothing Diaries does show variances between genders. These gender discrepancies were in tune with both the retail assortment results and market data results. The Daily Activity Filter theme and the sub-theme of Personal Dress Code were evidenced in the Clothing Diaries when the respondents' wrote about their apparel selection process for certain activities, as well what benefit certain fibers may offer them for these activities. One activity of note was exercise. Garment selection was influenced by the perceived functionality of the piece selected. The need to satisfy a dress code or to "dress up" was another major factor impacting apparel selection and fiber composition. Cotton appeared challenged by man-made and other fibers when the respondents needed to "dress up", to attend to athletic activity, or to satisfy the need for specific functionalities such as rapid drying.

Chapter Seven: Recommendations

Data sets from CCIC and USITC (along with NAICS apparel categories) are disjointed and present information in a variety of ways. Data varies by gendered group, e.g. Women's, Misses, and Juniors (WMJ) together as compared to Women and Girls (WG). The inclusion of Girls to a group skews results from a purely adult group, which in turn may skew apparel purchases within certain categories or of certain fibers. Data also varies by the definition of apparel category, e.g. Hosiery being both gendered and non-gendered. An internationally adopted measuring system for apparel categories and gendered groups would allow for ease of comparison.

For ease in the duplication of the retail assortment study on a wider scale, an automated apparel fiber composition data collection system would save time and remove the possibility for human error. The possibility of building fiber composition into SKUs or Radio Frequency Identification (RFID) tags on apparel could greatly increase the speed at which data regarding the fiber composition of an apparel retail assortment is produced. Retail Buyers could be utilized to influence the amount of cotton available to American consumers. If Buyers were trained on fibers, the ideal assortment on the retail floor may possibly include more cotton.

For further research using the Clothing Diaries and Wardrobe Inventory, it may be beneficial not to mention the word "fiber" to the respondents. The original diaries could be compared against the second diaries to see how they vary. The next round of diaries may include more detail regarding the purchases that women make for children

and men and regarding the impact that women purchasing for others would have on the fibers selected at the retail level.

Appendix

Gender:	CCIC		USITC		NAICS		Apparel Group named and numbered for study:
	MYB	WMJ	MB	WG	MB	WG	
Apparel Category(ies):	Suits	Suit & Pant Suits	Suits, Jackets as suit, Trousers as suit, Ensembles, Jackets, Blazers, Suit type jackets	Suits, Jackets, and Ensembles	Suits, Coats, and Overcoats	Suits/Coats/Skirts	Group 00 = "Suits"
	Dresses		Dresses		Dresses		Group 01 = "Dresses"
	Coats, Jackets & Vests	Coats, Jackets & Vests	Overcoats, Carcoats, Capes, Cloaks, Anoraks, and Windbreakers	Overcoats, Carcoats	Suits, Coats, and Overcoats	Suits/Coats/Skirts	Group 02 = "Coats"
	Shirts	Blouses & Shirts	Shirts, T-shirts, Singlets, Tank Tops, Thermal Undershirts, Dress Shirts	Blouses, Shirts, T-shirts, Singlets, Tank tops	Shirts (excl. work)	Blouses/Shirts	Group 03 = "Tops"
	Trousers & Shorts	Shorts & Other play garments, Skirts, Slacks, Dungarees, Jeans	Trousers and Breeches, Shirts, and Overalls	Skirts, Divided Skirts, Trousers, Breeches, Overalls, Shorts	Trousers, Slacks, Jeans	Other Outerwear	Group 04 = "Bottoms"
	Pajamas & Other Nightwear, Robes, Dressing Gowns & Smoking Jackets, Underwear	Nightwear, Foundation Garments, Underwear, Robes, Dressing Gowns, & Housecoats	Briefs, Underpants, Nightshirts, Pajamas, Bathrobes, Dressing Gowns, Sleepwear, and Underwear	Briefs, Panties, Nightdresses, Pajamas, Underwear, Bathrobes, Dressing Gowns, Negligees	Underwear/ Nightwear	Lingerie	Group 05 = "Underwear/ Nightwear"
	Active Apparel, Raincoats (excl. plastic & rubberized), Sweaters, Knit, and Swimsuits	Active Apparel, Raincoats, Sweaters & Jersey, knit, Swimsuits	Sweaters, Vests, Pullovers, Sweatshirts, Tracksuits, Swimwear, Other garments	Sweaters, Vests, Pullovers, Sweatshirts, Tracksuits, Swimwear, Other garments	Other Outerwear	Other Outerwear	Group 06 = "Other Outerwear"

Appendix A. Apparel category grouping comparisons between CCIC, USITC, and NAICS databases.

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