A CASE STUDY OF VISUALLY IMPAIRED INDIVIDUALS’ PREFERENCES OF THE
AVAILABILITY OF BRAILLE CLOTHING LABELS IN SHOPPING AND SELECTION OF
APPAREL

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ABSTRACT

RESEARCH PAPER: A Case Study of Visually Impaired Individuals’ Preferences of the Availability of Braille Clothing Labels in Shopping and Selection of Apparel

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Visually impaired individuals have obstacles in their lives that could make them feel less independent and equal to people who can see. Specifically, those who are visually impaired are not able to see common details of clothing (i.e., colors, texture, sizes, pricing) they intend to buy, making these individuals subject to seeking help from others or having to opt for using the same colors and patterns for all of their clothing. Introducing a Braille design embossed on the label would allow visually impaired individuals to read crucial data about the piece of clothing. The subjects for this study included a convenience sample of visually impaired individuals from a midsize, Midwest university. Visually impaired individuals face challenges while shopping for clothing, especially in the identification of the prices, color, and size of the clothes. The results show that dependence on family members is high and seems to be a primary option the participants have. Additionally, a majority of the participants indicated that a Braille label for clothing is important to enable them to shop for the clothes of their choice. Participants confirmed that they would desire attributes, especially color, price, and care, be included on Braille labels.
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CHAPTER 1

INTRODUCTION

Visually impaired people are subjected to confusion and are often unable to make their choices regarding selection of clothing (Hasanuzzaman, 2012). One solution to aid this problem is to use Braille labels on clothing. Braille is a tactile system of writing for the blind that uses characters made up of raised dots (Ng, Ng & Lau, 1999). Without Braille labels, blind individuals must imagine or guess the coloring of the fabric and precautions of fabric handling when making a decision about whether or not to buy certain clothes. When labels are embossed with Braille, the user can read what is written (Luckner, 2008).

Visual impairment, although it can occur at birth, it is not always present from childbirth. Visual impairment can be caused by several traumatic events or diseases that affect the eye sight of a person (Mills, 2006). Glaucoma (damage optic nerve), macular degeneration (destruction of eye parts which disables a person to view), cataracts (cloudy vision), lazy eye (hindrances in vision), optic neuritis (eye inflammation leading to permanent or temporary vision loss), retinitis pigmentosa, (retinal damage) and eye tumors (optic nerve or retinal damage) are examples of medical conditions that impair eyesight and can lead to blindness (Klaver, Wolfs, Vingerling, Hofman, & de Jong, 1998).
Visually impaired individuals must be concerned about learning the details of everything they encounter in their daily life, particularly when they are making decisions as consumers (Ven, 2010). Being able to make independent decisions empowers visually impaired people, instilling a feeling of power and joy (Vohs, 2008). Prior to being empowered to make personal decisions, many visually impaired people tend to wear clothing that other people choose for them while some wear the same patterns and colors day in and day out. The use of Braille labels on clothing would provide visually impaired individuals access desired information by touching the label, enabling them to make their own independent decision regarding clothing choices (Koenig, 2000). Little research has been conducted, however, to identify if Braille labeling is desired, and, if so, the type of information desired on Braille clothing labels. Thus, identifying the preferred attributes to be included by visually impaired individuals is warranted.

**Problem**

People who are sighted have the luxury of looking at items and reading the labels on clothing to make decisions about what to purchase. People who are visually impaired can feel the items, but they cannot easily tell the color of the garment, the type of clothing, or the care of the garment. In essence, the fashion industry discriminates against visually impaired people by not making the standard information available to them in a form that they can read. The fashion industry should identify an acceptable way for visually impaired individuals to identify specific characteristics of interest about the clothing they purchase.

**Purpose**

The purpose of this study was to survey visually impaired individuals to identify their
preference of the availability of Braille labelling on clothing products as they are shopping/selecting apparel.

**Research Questions**

The following research questions were examined in this study:

RQ#1: Do visually impaired people want to have a Braille label available on the clothing while they are shopping?

RQ#2: What attributes would visually impaired people want to have available in Braille on a clothing label? (price, color, size, care of clothing, other)

RQ#3: Do visually impaired people require assistance while shopping?

RQ#4: Do visually impaired people require assistance at home after they purchase clothing?

RQ#5: What venues do visually impaired people use to shop for/purchase clothing?

RQ#6: How important is the Braille clothing label to visually impaired people when shopping for clothing?

RQ#7: How important is the Braille clothing label to visually impaired people after they purchase clothing?

**Rationale**

Visually impaired people are often dependent on others to let them know what they are buying, which, in turn, reduces their independence and can impact their self-esteem. The use of Braille labels can enable visually impaired people to visualize the clothes by touching the label, making the individuals no longer dependent on others to obtain details about clothes. The primary research question--Do visually impaired people want to have a Braille label available on their clothing while shopping -- is of vital importance. This question describes the need of the
availability of braille labels to enable visually impaired people to make independent decisions. In addition, identifying the attributes a visually impaired person wants to have available in Braille on a clothing label is important to identify. This question describes the need of adding features on the label to provide significant ease to its visually impaired users. It is important to identify the need for, attributes of Braille labels on clothing among the visually impaired.

Assumptions

The researcher makes the following assumptions in the implementation of the study and in the interpretation of the data:

1. All survey participants will be visually impaired, ensuring their opinions reflect those with similar experiences;
2. Participants will have knowledge of and able to use Braille
3. The survey participants will answer the survey questions honestly;

Definitions

For the purpose of this study, the following definitions will be used:

1. **Embossed**: raised surfaces that adds a new dimension and patterns to the object and lets the user feel the patterns. (Holger Becker, 2000)
2. **Braille**: a tactile system of writing for the blind that uses characters made up of raised dots (Merriam, n.d.).
3. **Visually impaired**: a person who is having a reduced vision so severe as to constitute a handicap. (Dictionary, n.d).
Summary

The ability to be able to make independent decisions and choices the way sighted people make -- including clothes to purchase and wear -- is important for visually impaired people. To enable visually impaired people to make choices for selection of clothing, a Braille label concept is introduced. A Braille label is particularly designed with embossed raised dots to enable visually impaired people to know the details of clothing by just touching the labels. This step of including specially designed Braille labels can enable visually impaired people to be independent enough to make decisions without any assistance from others in the selection and purchase of apparel. Braille labels can enable them to have knowledge of the details of clothing they intend to buy.
CHAPTER 2

REVIEW OF LITERATURE

The purpose of this study is to survey visually impaired individuals to identify their preference of the availability of Braille labelling on clothes product as they are shopping/selecting apparel. This chapter will provide a review of the literature related to: a) legal requirements of clothing labels, b) overview of visually impaired individuals, c) technology to aid the visually impaired with daily life struggles, d) What is Braille? e) methods to identify clothing attributes desired by the visually impaired, and f) Quick Response code.

Legal Requirements of Clothing Labels

The requirement to put information on clothing labels vary from country to country. Broadly speaking, labels contain the following information: country, language, origin, fiber content, size, manufacturer/importer, care and may include some sort of advertising (Federal Trade Commission, 2014). Similarly, the pattern in which the label is designed (paragraph text, word-based or table form) is also dependent upon the style being followed in that certain country (Federal Trade Commission, 2014).

Since this research focuses on the legal requirements in the United States, it is relevant to point out those requirements in order to have a better understanding of the legal issues that
govern the labeling of clothes. Textile products that are sold in the United States are required to have at least the following information in the label: the fiber content, the country of origin, the manufacturer identity, and the care information (U.S. Labeling Requirements).

It is worth mentioning the fact that the United States customs and border protection regulations are sometimes separate from those of the Federal Trade Commission. Therefore, manufacturers and importers must abide by the rules of both FTC and customs (Federal Trade Commission, 2014).

Below, the researcher will try to shed light on four of the most important regulations, without delving deep into the nuances of the legal issues surrounding each regulation, as doing so would be out of the scope of this study:

- **Country of origin**: if a product is partly manufactured in the United States and partly somewhere else, both aspects must be identified. For instance, “made in Malaysia, finished in the U.S.A.”
- **Manufacturer or importer**: textile labels must identify either the company name or the registered identification number, issued by the FTC.
- **Labeling technicalities**: the required labeling information may appear on one or both sides of the label. The information has to be both conspicuous and accessible to the consumer. The country of origin must appear on the front of the label.
- **Care Requirements**: dry cleaning or washing, bleaching, drying, ironing must be included. The labels must also indicate if the product is not colorfast (e.g., “wash separately”), and these labels must be permanent and readable.
Overview of Visually Impaired Individuals

According to the World Health Organization database of 2011, there are thirty-nine million blind in the world, and 285 million visually impaired (International Eye Foundation, 2011). According to the American Foundation for the Blind, findings from the National Health Interview survey in 2015 indicated that an estimated twenty-four million Americans (roughly ten percent of the population) reported they either had trouble seeing, even with the aid of glasses or contact lenses, or they were blind (American Foundation for the Blind, Sheffield).

Diseases that can lead to visual impairment or blindness are several. These include, in their frequency of occurrence: refractive errors, age-related macular degeneration, cataract, diabetic retinopathy, glaucoma, amblyopia, and strabismus (Common Eye Disorders, 2015).

Refractive errors are the most frequent eye problems in the United States today. Refractive errors are comprised of four different eye illnesses: presbyopia, myopia, hyperopia, and astigmatism. Presbyopia is the loss of the ability to focus or read from, say, a phone book. It is considered a form of far-sightedness. Myopia, or near sightedness, is the inability to see clearly unless things are closer to the eye. Hyperopia, or far-sightedness, is the inability to see clearly, unless things are far from the eye. Finally, astigmatism is the distortion of vision in all distances. These refractive errors can be corrected by contact lenses, eyeglasses, and sometimes surgery (Common Eye Disorders, 2015)

Age-related macular degeneration is associated with aging and results in losing focus or central vision. The disorder, also known as AMD, affects the macula, which is the central part of the retina. Wet AMD happens when there is leakage in the blood vessels behind the retina which can cause damage to central vision. A symptom of wet AMD is that straight lines appear wavy.
Dry AMD, on the other hand, happens when the macula thins over time as part of aging process, and it is the more common form of AMD. Dry AMD usually affects both eyes, making them lose central vision. It is estimated that there are two million Americans who are affected by AMD (Common Eye Disorders, 2015).

Cataract is the clouding of the eye’s lens and is the leading cause of blindness in the world and the leading cause of vision loss in the United States. Treatment usually involves the removal of the cataract. There are some barriers that hinder the removal of the cataract, such as lack of awareness, insurance coverage, treatment costs, and patient’s choice. There is an estimated twenty-seven million Americans affected by cataracts (Common Eye Disorders, 2015).

Diabetic retinopathy is a complication of diabetes and is the most common cause of blindness in the United States. It is characterized by progressive damage to the retina. Diabetic retinopathy can be controlled by the management of blood pressure, lipid abnormalities, and blood sugar. As many as fifty percent of patients are not getting their eyes diagnosed or are diagnosed too late. An estimated of five million are affected by retinopathy (Common Eye Disorders, 2015).

Glaucoma occurs when the normal fluid pressure inside the eye slowly rises. Early treatment can often protect the eye from vision loss. Open angle glaucoma occurs slowly and favors the other eye. An estimated two percent or three percent of the population suffer amblyopia (Common Eye Disorders, 2015).

over long periods without patient taking notice of it. Closed angle glaucoma occurs suddenly and is more painful (Common Eye Disorders, 2015).

Amblyopia occurs in children and happens when the eye and the brain do not function properly together. Although the eye looks normal, it is not being used normally because the brain
Strabismus involves an imbalance in the position of the two eyes, either inward or outward, the result of which is a lack of coordination between the two eyes. In most cases, strabismus hits shortly after birth (Common Eye Disorders, 2015).

**Technology to aid the visually impaired with daily life struggles**

Visually impaired individuals frequently encounter environmental, social, and technological challenges. (Williams, Hurst, Kane, 2013). The visually impaired encounter navigation difficulties; they must travel very carefully if they are moving independently to stay safe from obstacles. Social challenges such as inability to meet people remains frequent; there are many social activities such as dressing and clothing choices in which visually impaired people cannot participate independently which may affect their developmental process.

Visually impaired people undergo many life struggles and challenges in their daily routine (Cimarolli & Boerner, 2005). Many tools have been designed to assist those who are visually impaired in their daily challenges, including computer visions and sensors (Global Positioning System, radar canes and VizWiz, an iPhone app that allows visually impaired users to receive quick answers to questions about their surroundings (www.vizwiz.org). VizWiz combines automatic image processing, anonymous web workers, and members of the user's social network to collect fast and accurate answers to their questions. A longitudinal study of 5,329 visually impaired users who used the VizWiz app, the majority were found to be more independent in their everyday lives. (Bigham, Ladner & Borodin, 2011).

Current development in portable computers, digital cameras and computer vision has provided assistance to blind people through production of camera-based products in which the technology of computer vision is combined with other current products available at commercial
level such as the system of optical character recognition (OCR systems). Off the shelf, the system of optical character recognition can be used by blind people to recognize words on localized regions of texts which would eventually get converted into audio output for blind customers (Vasanti, 2014).

Every individual seeks independence in decision making in terms of both thoughts and actions (Van der Heide, Deliens, Faiss, Nilstun, Norup, Paci, & van der Maas, 2003). Many visually impaired individuals prefer to go out on their own for shopping purpose (Baker, Stephens, Hill, 2001). However, shopping independently is often a challenge for these individuals especially when shopping for apparel: selecting colors and clothing styles. In order to resolve this problem, an advanced computer vision-based technology has been developed which can assist color blind or visually impaired people in cloth matching activities through use of two different clothing images captured with the help of a camera. A PDA or mini laptop can be utilized to execute a color and texture matching procedure. This process can help in identifying clothing with similar colors, especially those without any texture, as well as clothing with complicated patterns of texture and varying colors (Tian & Yuan, 2010).

**What is Braille?**

Braille is a tactile system of writing for the blind that uses characters made up of raised dots (Merriam, n.d.). Braille is named after its creator, Frenchman Louis Braille, who lost his eyesight due to a childhood accident. In 1824, at the age of 15, Braille developed his code for the French alphabet to improve the night writing. He published his system, which subsequently included musical notation in 1829 (Braille, 1829). An individual reads Braille by touching a series of raised dots that, in specific configurations, represents alphabets, punctuations marks,
numbers, and symbols (Figure 1). The basic symbol of Braille is called a Braille cell which has six dots that are arranged in rectangular shapes; 3 high and 2 across (Chekol, 2010).

![Braille Alphabet](image)

**Figure 1.** The Braille alphabet (Braille, 1829).

There are many currently options available in Braille clothing labels for visually impaired. They can purchase them and add them to their clothes at home. These labels printed with Braille. These labels made of lightweight aluminum. They can be machine washed and dried. These labels are available online. In the beginning, they may need some help. Each label has different color printed with Braille. Visually impaired can organize and Label their clothing. They can sew or safety pin them to their clothes. These labels might help visually impaired to identify colors at home. However, the apparel industry needs to include Braille labeling to help visually impaired in other clothes information such as size, price, country of origin...etc.

**Methods to Identify Clothing Attributes Desired by the Visually Impaired**
Matching and identification of clothes on a daily basis by those who are visually impaired is a complex task. Creativity and proper organization of clothes will help in fulfilling this task (Brady, Morris, Zhong, White, Bigham, 2013).

There are different challenges faced by visually impaired people in making a choice of clothing. Selecting clothes with appropriate colors is considered as one of the significant challenges which is repeatedly faced by visually impaired people. These challenges pertain to difficulties in recognizing the stitching pattern tags on clothes which forces visually impaired people to wear clothes without any pattern or of uniform colors (Harshini, Kannan & Dakhlore, 2015). Because the visual impaired have a difficult time in making clothing choices on their own, clothing recognition systems have been developed. One example is a computer vision technology of clothing patterns and colors that has been developed to help blind individuals improve their quality of life (Harshini, Kannan & Dakhlore, 2015). The system has a microphone, computer and camera. The system can be controlled by speech input through the microphone. The user develops an interaction with the system through input of speech, the algorithm gets recognized through a speech recognition system, the speech input is then transformed into a form where further processing of the input is carried out and the command is processed. According to item analysis, the system can help visually impaired to recognize the clothing colors and other clothing features such as, cost, material, length, size, pattern. The clothing details will display on a screen of desktop computer that has a reader for visually impaired (Harshini, Kannan & Dakhlore, 2015).

Another assistive system that has been introduced includes a system that incorporates identifying and displaying clothing colors and patterns for the visually impaired people so that they can purchase independently (Yang, Yuan & Tian, 2014). This system is based on camera
assisted technology that observes cloth patterns and classifies them into one of four categories: stripped, irregular, plaid and pattern-less, with any of eleven colors (i.e., black, white, purple, yellow, green, orange, pink, cyan, red, grey and blue) (Liu, Feng, Song, Zhang, Lu, Xu & Yuan, 2012). This system helps visually impaired to compare their clothes and match clothes colors to wear properly. For example, it helps them know that white T-shirt matches better blue pants than green pants.

Tian and Yang (2010) developed a system that substitutes for vision that works for three navigation categories (i.e., electronic orientation, travel aid and position locator assistance). The system is a computer vision-based method to detect if two images of two clothes matches for both fabric and color. Visually impaired use mini-laptop or a PDA to perform the texture and color matching process. The two pictures are captured by a wearable camera which is connected to a computer. All of these techniques were developed with the intent of helping those who are visually impaired and/or color blind. This system is working with clothes in uniform color without any texture, clothes with multiple colors and complex textures patterns. Then the matching results are displayed as audio outputs. Some of these systems are available in some stores. However, the stores should have a Braille labels tags in their clothes so visually impaired can take the labels with them easily to their home.

In additional to visually impaired individuals, those who are color blind face problems in selecting clothes as they cannot differentiate colors. Harshini, Kannan & Dakhlore (2015) examined a series of ways to assist color blind individuals identify both the color and other important cloth components. A camera with sensors was used for capturing images of clothes, a microphone receptive of speech input command, a data storing and an analysis system for cloth recognition that included color identification through wearable or desktop computer was used.
The results included items displayed on desktop/wearable computer screen. The input on the computer screen is then transformed into audio signals which can be heard by blind people through speakers or earphones (Harshini, Kannan & Dakhlore, 2015). The voice processing is dependent on the system used and how data would be entered in the system. This is a complex system that is offered in a store to assist visually impaired individuals in the selection and purchase of apparel. The data about the clothing (i.e., the category and subcategory of clothing) must be entered to the system by the shopkeeper. The system receives the input, processes it by accepting the relevant sound and rejecting or filtering the unnecessary sounds. The input is in the form of waves converted into readable string format for semantic interpretation and generates results in the form of dress/cloth for gender, category (i.e., saree, shirt, pant). Then the results are displayed as audio outputs on the screen of desktop.

**Quick Response Code**

Quick response code is a matrix bar code that is read by photographing it with the camera of a smartphone or other mobile device that is equipped with a bar-code reader (dictionary, n.d.). Quick response (QR) codes are printed tags that can be declared as two dimensional bar codes (Walsh, 2010). QR codes contain vital details to let buyers and users know what they are buying (Shintaro Okazaki, 2012). When it comes to visually impaired users, they find QR codes relatively useless in its current form since it still requires being able to see the information provided (João Oliveira, 2011). QR codes can read through mobile applications freely available to mobile users. QR code are now increasingly being integrated in every product in many countries of the world (Shintaro Okazaki, 2012).
QR codes are helpful to people by providing great convenience to access product details by scanning just a code through a mobile application within seconds (Bonin, Eichhorst, & Florman, 2008). Visually impaired people need to have special accessibility to take full benefits of QR codes in comparison with people having normal eye sight (Al-Khalifa, 2008). To sort out this issue, a QR reader can be used along with QR codes (Two-dimensional bar code). A QR reader will work with the assistance of a camera phone that will scan a QR code and then the QR reader will start reading the product details present in QR code verbally (Wymelenberg, 2012). The mobile phone usage can further be extended for visually impaired people with real time interactions by letting the visually impaired utilize all the perks that are currently enjoyable for sighted people. QR codes are capable of retaining huge amount of data including alphabetic and numeric characters, binary digits, symbols and logos and icons (João Oliveira, 2011). A QR reader is developed to read and convey all type of icons, symbols, strings and characters to read out loud for visually impaired individuals to let them know about each and every detail associated with product (Al-Khalifa, 2008).

QR code can be utilized with blind assisted technology tools such as ViFlex (Samuel Roselier, 2014). ViFlex is a low cost device designed for mobile applications. Its primary function is to enhance and enable “freedom force feedback” that is not a built-in feature of mobile phones (Samuel Roselier, 2014. The ViFlex device includes actuators and a position detector (Shintaro Okazaki, 2012) that will locate and scan QR code while the actuator will read all the instruction coming from QR code (Pau Giner, 2011).

ViFlex and QR readers are an add-on feature and device that enables visually impaired people to enjoy all the product details the way non-Visually impaired people do (Walsh, 2010). If a QR code has already been scanned, visually impaired will get vibration sensing in the QR.
reader alerting them the QR Code has already been scanned (Al-Khalifa, 2008). For example, if a visually impaired person already scanned the QR code on a product, the QR reader will vibrate to give an alert that the QR code is already scanned. It will help in avoiding duplication in selecting products (Al-Khalifa, 2008). This functionality is assisting visually impaired individuals in terms of saving time and frustration of scanning the same QR code again and again. ViFlex, a handheld device and QR reader, can perform their functions together as well without interfering each other’s functionalities.

Summary

Visually impaired people face many issues when attempting to purchase clothing. Most of the time they must either rely on the guidance and opinions of their relatives/friends or sales associates when purchasing clothes. The only thing they have available to them is the ability to feel the fabric in an effort to understand its texture and quality level. For promoting independency of decision making, many assisting solutions have been designed for helping visually impaired people, including navigation system for guidance in stores, and computer aided cameras and attached equipment that help in explaining the labels and important cloth information. Another potential solution that would not require specialized technology and equipment would be to provide Braille clothing tags that include important information required for purchase decision. Thus, the review of literature in this chapter has concentrated largely on legal requirements of clothing labels, visually impaired life, technology that helps visually impaired with daily life struggles, Braille, methods to identify clothing attributes desired by the visually impaired, and Quick Response code.
CHAPTER 3

METHODOLOGY

The purpose of this study is to survey visually impaired individuals to identify their preference of the availability of Braille labelling on clothing products as they are shopping/ selecting apparel. This chapter will describe the methods used to conduct the study.

Institutional Review Board

Permission was obtained from Ball State University Institutional Review Board prior to implementing this study. The researcher conducting this analysis completed the Collaborative Institutional Training Initiative training (Appendix A).

Subjects

The sample for this quantitative method study included a convenience sample of visually impaired individuals (students and instructors) from a midsize Midwest university. Surveying college students and instructors was selected because they may be more familiar with assistance technology and are more socially active. The survey was sent to the Office of Disability Services and that office forwarded the survey to university students and instructors who met the criteria of visually impaired.
**Instrument**

The researcher developed a Braille Clothing Attributes Survey (Appendix B). The instrument included a series of questions regarding how visually impaired individuals currently shop for and purchase their clothing and whether or not a Braille label would be beneficial or preferred for specific clothing items in that environment. The participants were asked to indicate what clothing attributes (i.e., price, color, pattern, type of material, care of the item, style, size, other) should be included on Braille clothing labels in general. Demographic data (i.e., age, length of time they have been visually impaired, etc.) was gathered. In addition, in order to determine the consistence of the use of Braille in relation to clothing, participants were asked if they add individual Braille labels/tags for color identification to their clothing once the product is brought home.

The survey questions were pre tested and examined for face and content validity by a group of experts in the field who were not part of the sample population. No revision to the survey were deemed necessary for clarity.

**Letter of Permission and Consent**

Each of the individuals who participated in the study provided consent prior to beginning the Braille Clothing Attributes Survey (Appendix C-1).

**Methods**

The Braille Clothing Attributes Survey was made available to visually impaired individuals (students and instructors) at a midsize, Midwest university through the Qualtrics online survey platform.
Data Analysis

The survey responses were entered into SPSS v.23.0 for Windows (SPSS, 2016) for the data to be analyzed. Frequency counts (number and percent) were used to determine the overall preference for each survey questions.

Summary

The main objective of the study was to survey visually impaired individuals to identify their preference of the availability of Braille labelling on clothing products as they are shopping/ selecting apparel. The sample for this quantitative method study included a convenience sample of visually impaired individuals. The anonymous online survey was forward to the Office of Disability Services who in turn sent the survey to the sample that included 10 visually impaired individuals (students and instructors) from a mid-sized Midwest university. The participants were provided with the Braille clothing attributes survey through the Qualtrics online survey platform. The survey responses were entered into a data file of SPSS to analyze and identify visually impaired individuals’ preference of the availability of Braille labeling on clothing products.
CHAPTER 4

RESULTS

The purpose of this study was to survey visually impaired individuals to identify their preference of the availability of Braille labelling on clothing products as they are shopping/ selecting apparel. This chapter will report the findings of the study related to: a) participants, b) shopping indicators – during shopping, c) shopping indicators – post purchase, d) use of Braille system, e) shopping venue, f) challenges for visually impaired people while shopping, g) thoughts and experiences - during shopping, and h) thoughts and experiences - post purchase.

Participants

According to the results, various aspects can be understood of visually-impaired people who would benefit from a Braille clothing identification system. Information regarding the total number of visually impaired individuals provided by the Office of Disability Services at a midsize, Midwest university indicated that were between 8-10 visually impaired students and instructors at the university. The total number of respondents completing the survey were four of which 50% were students (n=2), and 25% instructors (n=1) (25% missing data (n=1)). Only 25% of the participants indicated being visually impaired for less than one year (n=1) and the other 75% were impaired their entire lives (n=3). In addition, only 25% were totally
blind while the rest 75% had low vision (n=3). Fifty percent of the participants were in the age group of 30-49 years, 25% from 16-29 years (n=1) and 25% were from 50-64 years (n=1). The one instructor was from the 50-64 years’ age group. Gender balance was observed with 50% men (n=2) and 50% women (n=2). Income distribution was well distributed by having 25% of the participants from each of the following four income categories: $10,000 to $19,999, $20,000 to $29,999, $50,000 to $59,999 and $60,000 to $69,999 (n=1 respectively). Participants’ highest education level achieved consisted of Bachelor’s degree (50%, n=2) and the Graduate professional (Masters) degree (50%, n=2).

**Shopping indicators – during shopping**

Participants’ were asked about what assistance techniques they use while shopping (people, camera or mobile application) and selecting clothing. The majority use a family member for assistance (75%, n=3). It was found out that fifty percent of the participants (n=2) indicated they would use a camera along with a computer that can read audio, if available, and 50% indicated they would use phone applications such as magnify light pro, and scanner pro (ios), Scanner pro (ios), and mag light pro (ios), (n=2). Seeking assistance from employees at the store were indicated by 25% of the participants (n=1) and no one indicated they would ask other customers.

The frequency of how often the participant would use assistance techniques included: 75% (n=3) always used the camera, mobile application and employee options. Having access to someone who can shop for them was reported by 50% (n=2). However, all participants indicated they shop for themselves (n=4).

**Shopping indicators – post purchase**
Participants were asked about their behavior “once a product has been purchased and at home”. Dependence on their families was reported by 75% (n=3) of the participants in choosing the color and wearing the clothes they purchased. It was noted that fifty percent of the participants had software solutions in the form of a camera connected to a computer or a phone application to handle the process of using the item after shopping (n=2). The majority of the participants (75 %, n=3) indicated that they always depend on assistance offered by family member, camera or mobile applications in the process of handling the clothing items they purchased.

Use of Braille system

The participants were asked about their access to Braille system and its importance. A majority of the participants currently had no access to a Braille system that they can use to shop with ease (n=4). Additionally, 100% identified the fact that the process of using the item after shopping and the process of handling the clothing items they purchased are important (n=4). Only one or 25% once used Braille in the past to identify clothes in a shopping process. When asked about Braille experience, all or 100% of the participants responded by saying that they have minimum Braille experience with shopping for clothing (n=4).

Shopping venue

The places where visually impaired people shop was examined. Those that did their shopping online was 50% (n=2), however, data was missing for 50% (n=2). The frequency of participants purchasing online included: 50% (n=2) always, and 25% rarely or very rarely (n=1 each). Those that indicated they shop at stores was at 75%
(n=3) (data was missing for 25%). The frequency of purchasing through catalogs was divided into rarely, very rarely and never (25%, 50% and 25% respectively).

**Challenges for Visually Impaired People while Shopping**

Visually impaired people highlighted some challenges they face while shopping. One respondent stated “we have a problem in color identification and we have to rely on other people to pick an item of our indicated color.” Another respondent said that they faced a challenge with size; that is, while they can feel if the size of the item is appropriate, they are unable to see how that particular size exactly fits them. Also, they cited a challenge related to price; since they cannot see the price tags they have to depend on stores’ salespeople to indicate the price to them. As such, they are never certain if the price is actual or exaggerated as they are left to the “mercy” of the salespeople. This challenge mirrors that of care instructions where they have to rely on the salespeople to read the care instructions of an item for the visually-impaired people to confirm whether they are able to maintain the item. The participants also mentioned that they face a challenge with matching of the items; considering that they cannot see the design, color and size of specific items, they are unable to compare and match different items and visualize how they look in them. In light of these challenges, they provided suggestions to help address them. They suggested that stores have reader machines for labels in order to ease their shopping experience. Preferably, they should be provided with hand-held machines which they can use in scanning labels and hearing the prices and care instructions loudly thus informing their purchasing decisions.
Thoughts and experiences - during shopping

Participants were asked about their thoughts and experiences when shopping for apparel. Participants’ answers regarding the importance of “the availability of clothing labels in Braille” and “the ability to touch a label to find the size and fiber content” were equally distributed by having 25% of the participants indicating: not important at all, slightly important, somewhat important, and extremely important (n=1 respectively). The ability to touch a label to know the price was extremely important to 75% of the participants (n=3) while 25% found it slightly important (n=1). Related to the importance of being able to touch a label to know the color, 50% of the participants (n=2) thought this was slightly important and 50% thought it is extremely important (n=2). The ability to touch a label to know the country of origin was slightly important to 50% of the participants (n=2) while 25% found it important (n=1) and 25% found it somewhat important (n=1). Likewise, the ability to touch a label to know the care requirements was slightly important to 50% of the participants (n=2) extremely important to 25% (n=1) and somewhat important 25% (n=1). The ability to feel independent was extremely important to 75% of the participants (n=3) while 25% found it somewhat important (n=1).

Thoughts and experiences - post purchase

Participants were asked about their thoughts and experiences after purchase of apparel. When asked about the importance of the use of Braille clothing labels at home, participants’ answers were equally distributed by having 25% indicate: not important at all, slightly important, somewhat important, and extremely important (n=1 respectively). Participants’ responses about “the ability to touch the label to choose what to wear” was equally distributed with 25% of the participants indicating:
not important at all, slightly important, somewhat important, and extremely important (n=1 respectively). Fifty percent of the participants stated that the ability to touch a label to find the size was somewhat important (n=2) while 25% found it slightly important (n=1) and 25% found it not important at all (n=1). When asked about the importance of the ability to touch a label to select the color, fiber content, and the care requirements, participants’ answers were equally distributed by having 25% indicate: not important at all, slightly important, somewhat important, and extremely important each (n=1 respectively). In addition, 75% of the participants stated that feeling independent is extremely important (n=3) and 25% thought that it was somewhat important (n=1).

Summary

This chapter provides key insights, gained from visually impaired individuals’ opinions on their experiences in shopping for clothes. Specifically, it covered the assistance techniques used while shopping (people, camera or mobile application) and selecting clothing; their behavior once a product has been purchased and at home; their access to Braille system and its importance; their shopping venues; and challenges they face while shopping. The results on these issues show that visually impaired individuals stated there are inadequate techniques to promote independent decision-making while shopping thus making them rely on methods such as the use of family members for assistance.

Post-purchase behavior was hinged on their shopping experience; that is, visually impaired individuals stated having to rely on their family members in order to handle the purchased products. In addition, it was found that majority of the participants currently have no access to a Braille system while shopping for clothing.
that they can use to shop with ease. On shopping venues, the majority indicated that they shopped at stores, and therefore stores should devise ways of making their shopping experience easier. A number of challenges facing visually-impaired people while shopping was identified, especially relating to relying on others to give them accurate prices, color identification and care instructions.
CHAPTER 5

DISCUSSION

The purpose of this study was to survey visually impaired individuals to identify their preference of the availability of Braille labelling on clothing products as they are shopping/ selecting apparel. This chapter will provide a discussion of the findings from this study as they relate to the research questions.

Various researchers to date have explored ways to assist visually impaired individuals in their daily living, including shopping for clothing. Harshini, Kannan & Dakhlore (2015) developed a system that consisted of a computer, camera, and microphone that assists color-blind people in the recognition of colors along with other clothing features, such as material, size, length, cost, etc. Ringland (2013) developed a collection of tagging systems and argued that designing clothing tags for the visually-impaired user requires that the tags be comfortable, easy to locate, discreet, and that they have to be reasonably simple to retrieve information from them. Tian and Yuan (2010) proposed a new computer vision-based technology of clothes matching to help blind or color-blind people by using a pair of images from two different clothes captured by a camera. Yang, Yuan and Tian (2014) devised a system that incorporates a Bluetooth-enabled earpiece audio device, along with a microphone, computer, and camera. The device verbally describes colors and patterns to blind users.
The use of Braille as a system to assist visually impaired individuals, especially in the shopping and selection of clothing, has not been mentioned by previous researchers. Braille is a system that is already known to most visually impaired individuals and helps them make their own choices with greater freedom as well as being cheaper than other devices incorporating computers and/or advanced technology. This study attempted to fill the gap by investigating visually impaired individuals’ preferences for the use of Braille labeling when it comes to shopping for clothing. The results of this study make an important contribution to the field by highlighting visually impaired individuals’ dependence on family and their need for Braille system.

The sample of this study included a convenience sample of visually impaired individuals (students and instructors) from a midsize Midwest university (n=4). The majority were visually impaired their entire lives with low vision (not totally blind). Fifty percent were men, 50% were female and ranged in age from 16-29 years to 50-64 years. Income ranged from $10,000-19,000 to $60,000-69,999 and participants’ highest education level achieved included 50% Bachelor’s and 50% Masters degrees.

The majority (75%) of the visually impaired participants in this study indicated dependence on at least a family member for the selection of clothes meant to be purchased for themselves. A Braille system could create an efficient method for visually impaired individuals to scan clothes providing them with less dependence on others and therefore giving them independence in choosing what they want to buy. This research paper contributes to the field by bringing awareness to those visually impaired individuals with the plausibility of applying the Braille system on clothing labels to provide those individuals with more freedom of choice.
Research question #1: Do Visually impaired people want to have a Braille label available on the clothing while they are shopping?

There is a need for Braille labels in clothing to enable more independence for visually-impaired people to identify clothing attributes in order to decide for themselves to purchase clothing. Participants indicated they have a problem in color identification and they have to rely on other people to select the color. They faced challenges with selecting the appropriate size for their body. Although they may be aware of the label size, they cannot see how the product actually fits once worn. They are left to the “mercy” of the sales people because they are never certain if the price is actual or exaggerated. The findings suggest that visually impaired people would benefit from having a Braille label available on the clothing while they are shopping.

RQ #2: What attributes would visually impaired people want to have available in Braille on a clothing label? (price, color, size, care of clothing, other)

Participants’ answers regarding the importance of the availability of clothing labels in Braille as well as the importance of the ability to touch a label to find the size and fiber content was equally distributed between not important at all, slightly important, somewhat important, and extremely important. However, the ability to know the price was extremely important to the majority of the participants. Related to color, one half of the participants thought this was slightly important while the other half thought it was extremely important. Knowledge of the country of origin as well as the care requirements ranged from slightly important for half of the participants while others found it important and somewhat important. The ability to feel independent was extremely important to the majority of the participants while others indicated it somewhat important. Visually impaired people participants indicated they
wanted to have the price, color, size, care requirements, and country of origin available on a Braille label. However, from the results, the most important attributes that they wanted to have in a Braille labels are the price and the color.

**RQ#3: Do visually impaired people require assistance while shopping?**

The inclusion of specially designed Braille labels can enable visually impaired people to be independent enough to make selection and purchase decisions regarding apparel without any assistance from others. Visually impaired participants indicated they needed assistance while shopping. Dependence on family members is high and seemed to be a primary option the participants have. In addition, fifty percent of the participants indicated they would use a camera along with a computer that can read audio, if available, and fifty percent indicated they would use phone applications. The findings suggest that visually impaired individuals require assistance when shopping for clothes.

**RQ#4: Do visually impaired people require assistance at home after they purchase clothing?**

Visually impaired participants indicated they needed assistance after they purchase clothing. The majority of visually impaired individuals stated having to rely on their family members in order to handle the purchased products (e.g. selecting the matching color for clothes). In addition, 75% of the participants indicated that they always depended on assistance of a camera or mobile applications in the process of handling the clothing items they purchased.
**RQ#5: What venues do visually impaired people use to shop for/purchase clothing?**

On shopping venues, all visually impaired participants indicated that they shop in stores very frequently. In addition, fifty percent of the participants shop online.

**RQ#6: How important is the Braille clothing label to visually impaired people when shopping for clothing?**

From the shopping indicators, it was evident that the visually impaired individuals experience difficulties in identifying the clothing attributes they desire to make purchasing decisions. The importance of the availability of clothing labels in Braille varied from not important at all to extremely important for the visually impaired participants when shopping for clothing. However, it can be useful to visually impaired individuals to know apparel attributes (price, size, color, fiber content, and country of origin) especially price and color, which visually impaired individuals, find it important for them while shopping. The findings suggest that the availability of clothing labels in Braille in stores can benefit visually impaired individuals.

**RQ#7: How important is the Braille clothing label to visually impaired people after they purchase clothing?**

Braille clothing label is not important to some of the visually impaired people after they purchase clothing. Visually impaired participant’s answers showed that having a Braille clothing label at home is not extremely important as it is in the store. While in the store, knowing the price and color is important, at home, they depend on...
their family or a computer, or camera that can help them to know attributes of the clothes such as color.

**Summary**

The results indicated that visually impaired individuals recognized where a Braille system in labeling clothes could help them rely more on themselves and less on others, especially family members and friends, in making choices for selecting clothes. Visually impaired people would benefit from having a Braille label available on the clothing while they are shopping. Price and the color are the most important information that visually impaired individuals need in Braille label while shopping. Visually impaired individuals require assistance when shopping for clothes so the Braille label would be useful tool for them.
CHAPTER 6

CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONS

The purpose of this study was to survey visually impaired individuals to identify their preference of the availability of Braille labelling on clothing products as they are shopping/ selecting apparel. This chapter will provide conclusions of the study, limitations and recommendations for future research.

Conclusions

The study focused on visually impaired individuals’ preference of the availability of Braille labelling in clothes to help make independent choices regarding the price, size, color, fiber content, and country of origin. A majority of the participants indicated that a Braille label for clothing is important to enable them to shop for the clothes of their choice. Participants confirmed that they would desire knowing clothing attributes, especially color, price, and care, be included on Braille labels. Most of the participants indicated that they shop primarily in stores, therefore Braille labels for clothing would be valuable for them in order to ease their shopping experience. Additionally, the availability of reader machines, Braille label and handheld machines for labels would allow for more independence in providing information for their purchasing decisions.
It was evident that visually impaired individuals experience difficulties in identifying desired clothing attributes on their own. It was found in this study that dependence on family members seemed to be the primary option the participants have to identify the attributes such as color and price of clothing. Thus, there appears to be a need for a Braille system for the visually impaired while shopping for apparel.

Limitations

Several limitations to the study are noted. The small sample size prevents the generalization of the findings to any population other than the individuals who participated in the study. In addition, an error was discovered during the initial distribution of the survey. In order to correct the error, the survey had to be redistributed. This may have compounded the small number of respondents.

Recommendations for future research

As a case study, this project suggests possibilities for future research. This study was limited to a very small sample of visually impaired individuals at one mid-sized Midwest university. Therefore, this study could be repeated with a larger sample and different populations in other regions. Further study could sample populations to determine difference related to age or gender. The sample for the present study were all in a university setting, further study to determine if there are differences between groups out of a university setting would help to determine if preferences of the availability of Braille clothing labels would be impacted.

The current study focused on visually impaired individuals in the United States. Further study could help to determine if there would be a difference compared to those in other countries, especially those places where there are more people with
vision troubles. Also, gender issues such as in Saudi Arabia where women must depend on men or other women when choosing a type of clothing for themselves may provide more insight for this issue.

Understanding the unique challenge of visual impairment and the shopping experience of visually impaired individuals may be of interest to retailers to increase industry success. The availability of reader machines for visually impaired people in stores could lead to increased industry success by providing the opportunities for the visually impaired individuals to go to stores and shop for clothing easily and more independently, and therefore, perhaps, more frequently. The availability of Braille clothing labels on the other hand could be a less expensive alternative for the industry to accommodate visually impaired people in the shopping and selection of clothing.
REFERENCES


Braille, L. (1829). *Method of Writing Words, Music, and Plain Songs by Means of Dots, for Use by the Blind and Arranged for Them*.


QR code. (n.d.) Dictionary.com Retrieved from
http://www.dictionary.com/browse/qr-code


APPENDIX A-1

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER
DATE: April 26, 2017
TO: Raghad Ali, Mater
FROM: Ball State University IRB
RE: IRB protocol # 1063563-1
TITLE: Identification of attributes preferred on clothing labels for individuals who are visually impaired
SUBMISSION TYPE: New Project
ACTION: APPROVED
DECISION DATE: April 26, 2017
REVIEW TYPE: EXEMPT

The Institutional Review Board reviewed your protocol on April 26, 2017 and has determined the procedures you have proposed are appropriate for exemption under the federal regulations. As such, there will be no further review of your protocol, and you are cleared to proceed with the procedures outlined in your protocol. As an exempt study, there is no requirement for continuing review. Your protocol will remain on file with the IRB as a matter of record.

Exempt Categories:

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<th>Category</th>
<th>Description</th>
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<td>Category 1</td>
<td>Research conducted in established or commonly accepted educational settings, involving normal education practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.</td>
</tr>
<tr>
<td>Category 2</td>
<td>Research involving the use of educational test (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior</td>
</tr>
<tr>
<td>Category 3</td>
<td>Research involving the use of educational test (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under category 2. If (i) the human subjects are elected or appointed officials or candidates for public office; or (ii) Federal statute(s) requires(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.</td>
</tr>
<tr>
<td>Category 4</td>
<td>Research involving the collection of study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or</td>
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Generated on IRBNet
If the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

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<th>Category 5: Research and demonstration projects which are conducted by or subject to the approval of Department or agency heads, and which are designed to study, evaluate or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in methods or levels of payment for benefits or services under these programs.</th>
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<td>Category 6: Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed which contains a food ingredient at or below the level and for a use found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture.</td>
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Editorial Notes:

1. N/A

While your project does not require continuing review, it is the responsibility of the P.I. (and, if applicable, faculty supervisor) to inform the IRB if the procedures presented in this protocol are to be modified or if problems related to human research participants arise in connection with this project. Any procedural modifications must be evaluated by the IRB before being implemented, as some modifications may change the review status of this project. Please contact (ORI Staff) if you are unsure whether your proposed modification requires review or have any questions. Proposed modifications should be addressed in writing and submitted electronically to the IRB (http://www.bsu.edu/irb) for review. Please reference the above IRB protocol number in any communication to the IRB regarding this project.

Reminder: Even though your study is exempt from the relevant federal regulations of the Common Rule (45 CFR 46, subpart A), you and your research team are not exempt from ethical research practices and should therefore employ all protections for your participants and their data which are appropriate to your project.
APPENDIX A-2

CITI CERTIFICATE OF COMPLETION

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)

COURSEWORK REQUIREMENTS REPORT*

* NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details. Separate Transcript Report for more recent quiz scores, including those on optional (supplementary) course elements.

- Name: Rasheda Ali (ID: 5385585)
- Email: ballstate@csu.edu
- Institution Affiliation: Ball State University (ID: 1998)
- Institution Unit: Family and Consumer Sciences

- Curriculum Group: Social & Behavioral Research - Basic/Refresher
- Course Learner Group: Same as Curriculum Group
- Stage: Stage 1 - Basic Course
- Description: Choose this group to satisfy CITI training requirements for investigators and staff involved primarily in Social/Behavioral Research with human subjects.

- Report ID: 18588568
- Completion Date: 03/12/2018
- Expiration Date: 03/12/2020
- Minimum Passing: 80
- Reported Score*: 100

REQUIRED AND ELECTIVE MODULES ONLY

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For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

CITI Program
Email: citiworkshops@csu.edu
Phone: 300-241-7970
Web: http://www.citiprogram.org
APPENDIX B

SURVEY INSTRUMENT

What is your gender?
- Male
- Female

What is your age?
- 16-29 years’ old
- 30-49 years’ old
- 50-64 years’ old
- 65 years and over

What is your highest level of education achieved?
- Some college, no degree
- Associate's degree
- Bachelor's degree
- Graduate or professional degree (Masters)
- Doctorate
- Other (please specify) ____________________

What is your total household income?
- Less than $10,000
- $10,000 to $19,999
- $20,000 to $29,999
- $30,000 to $39,999
- $40,000 to $49,999
- $50,000 to $59,999
- $60,000 to $69,999
- $70,000 to $79,999
- $80,000 to $89,999
- $90,000 to $99,999
- $100,000 to $149,999
- $150,000 or more

What is your primary role at the university?
- Teacher
- Student
How long have you been visually impaired?
- Less than 1 year
- 1 – 5 years
- 6 – 10 years
- More than 10 years
- My entire life

Which of the following best currently describes you?
- Totally blind/ no usable vision
- Low vision/ some usable vision

What techniques-systems-software do you use to assist you WHILE SHOPPING? (check all that apply)
- Friend/family member(s)
- Braille label
- Camera - (Camera that computer can read audio)
- Braille radio
- Phone applications (please specify the apps you use) ____________________
- Computer software (please specify the software you use) ____________________
- Other (please specify) ____________________

If you use any techniques-systems, How often?
- Always
- Very Frequently
- Occasionally
- Rarely
- Very Rarely
- Never

What techniques-systems-software do you use to assist you after shopping – ONCE THE PRODUCT HAS BEEN PURCHASED AND AT HOME? (check all that apply)
- Friend/family member(s)
- Braille label
- Camera - (Camera that computer can read audio)
- Braille radio
- Phone applications (please specify the apps you use) ____________________
- Computer software (please specify the software you use) ____________________
- Other (please specify) ____________________
If you use any techniques/systems, How often?
- Always
- Very Frequently
- Occasionally
- Rarely
- Very Rarely
- Never

Do you have someone who shops for you?
- Yes
- No

If Yes, How often?
- Always
- Very Frequently
- Occasionally
- Rarely
- Very Rarely
- Never

Do you go shopping by yourself?
- Yes
- No

If Yes, How often?
- Always
- Very Frequently
- Occasionally
- Rarely
- Very Rarely
- Never

Do you use any braille clothing identifiers?
- Yes
- No

If yes, what kind do you use? Please specify……….

Q20 How important is it to use clothing identifiers?
- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important
If you use any braille clothing identifiers, How often?
- Always
- Very Frequently
- Occasionally
- Rarely
- Very Rarely
- Never

Have you ever asked someone his or her opinion to guide you when you shop for apparel?
- Yes
- No

If yes, who assisted?
- Sales associate
- Another consumer
- Other (please specify) ____________________

Do you get/need assistance in the store?
- Yes
- No

If yes, how often
- Always
- Very Frequently
- Occasionally
- Rarely
- Very Rarely
- Never

Do you buy from… check all that apply?
- Catalogs
- Online
- Store
- Other ____________________

How often do you buy from Catalogs?
- Always
- Very Frequently
- Occasionally
- Rarely
- Very Rarely
- Never
How often do you purchase Online?
- Always
- Very Frequently
- Occasionally
- Rarely
- Very Rarely
- Never

How often do you buy in Stores?
- Always
- Very Frequently
- Occasionally
- Rarely
- Very Rarely
- Never
The following items relate to your thoughts and experiences WHEN SHOPPING FOR APPAREL. Please indicate the importance of each statement using the following scale from not important at all to extremely important:

<table>
<thead>
<tr>
<th>Item</th>
<th>Not important at all</th>
<th>Slightly important</th>
<th>Important</th>
<th>Somewhat important</th>
<th>Extremely important</th>
</tr>
</thead>
<tbody>
<tr>
<td>The availability of clothing labels in braille</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The ability to feel independent</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The ability to touch a label to find the size</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The ability to touch a label to know the price</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The ability to touch a label to know the color</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The ability to touch a label to know the fiber content</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The ability to touch a label to know the country of origin</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>The ability to touch a label to know the care requirements</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

53
The following items relate to your thoughts and experiences AFTER PURCHASE OF APPAREL. Please indicate the importance of each statement using the following scale from not important at all to extremely important:

<table>
<thead>
<tr>
<th>Item</th>
<th>Not important at all</th>
<th>Slightly important</th>
<th>Important</th>
<th>Somewhat important</th>
<th>Extremely important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Braille clothing label is important at home</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>The ability to touch the label to choose what to wear</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>The availability of clothing labels in braille</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>The ability to feel independent</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>The ability to touch a label to find the size</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>The ability to touch a label to select the color</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>The ability to touch a label to know the fiber content</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
</tr>
<tr>
<td>The ability to touch a label to know the care requirements</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
</tr>
</tbody>
</table>

The following questions relate to your experience in selecting clothing.

Have you experienced any problems while shopping for apparel or at home when selecting clothes?
 Boca Yes
 Boca No

If yes - Please explain

Please provide any comments you are willing to share about challenges you have experienced in apparel shopping.
Please provide any suggestion to make your apparel shopping experiences less challenging.

Any additional comment regarding shopping for apparel would like to share?
APPENDIX C-1

LETTER OF CONSENT

Study Title
Identification of attributes preferred on clothing labels for individuals who are visually impaired.

Study Purpose
The purpose of this study is to survey visually impaired individuals to identify their preference of the availability of Braille labelling on clothes product as they are shopping/selecting apparel.

Inclusion/Exclusion Criteria
To be eligible to participate in this study, you must be a visually impaired student or teacher at least 18 years old.

Participation Procedures and Duration
For this project, you will be asked to complete a survey regarding your thoughts and preferences of clothing labels. It will take approximately 10 minutes to complete the survey.

Data Confidentiality or Anonymity
All data will be maintained as anonymous and no identifying information will be requested.

Storage of Data
The responses and data obtained from the Qualtrics survey will be entered into a software program and stored on the researcher’s password-protected computer for three years and then deleted. Only members of the research team will have access to the data.

Risks or Discomforts
There are no perceived risks for participating in this study. You may choose not to answer any question that makes you uncomfortable, and you may quit the study at any time.

Voluntary Participation
Your participation in this study is completely voluntary and you are free to withdraw your permission at any time for any reason without penalty or prejudice from the investigator. Please feel free to ask any questions of the investigator before consenting or during completion of the survey.

IRB Contact Information
For one’s rights as a research subject, you may contact the following: For questions about your rights as a research subject, please contact the Director, Office of Research Integrity, Ball State University, Muncie, IN 47306, (765) 285-5070 or at irb@bsu.edu.
Consent
I am agreeing to participate in this research project entitled, “Identification of attributes preferred on clothing labels for individuals who are visually impaired” I have read the description of this project and give my consent to participate.

To the best of my knowledge, I meet the inclusion/exclusion criteria for participation (described above) in this study.

Researcher Contact Information

Principal Investigator:
Raghad Alali. Graduate Student
Apparel design
Ball State University
Muncie, IN 47306
Telephone: (601)-699-9906
Email: raalali@bsu.edu

Faculty Supervisor:
Amy J Harden, PhD
Interim Associate Dean
College of Applied Sciences and Technology
Director of Graduate Studies
Associate Professor of Fashion Merchandising
Fashion Merchandising Internship Director
Department of Family and Consumer Sciences
Ball State University
206E Applied Technology Building
Muncie, IN 47306
Office phone: (765) 285-5958
Dept phone: (765) 285-5931
Fax: (765) 285-2314
Email: aharden@bsu.edu
Dear [Students and teachers],
My name is Raghad Alali, and I am a graduate student in Ball State's Family and Consumer Sciences – Apparel Design program. My faculty advisor for this project is Dr. Amy Harden (aharden@bsu.edu). I am writing to invite you to participate in my research study about “Identification of attributes preferred on clothing labels for individuals who are visually impaired”.

If you decide to participate in my study, you will be asked to complete a survey with questions about shopping experiences. The survey should take about 5 minutes to complete. Please complete all questions. Your responses are completely anonymous.

If you are interested in this study, please follow this link
https://bsu.qualtrics.com/jfe/form/SV_cU5F2M82iFdR6kd

This study was approved by the IRB

If you have any questions, please do not hesitate to contact me at raalali@bsu.edu.

Thank you for your willingness to participate