

Retail Design and the Visually Impaired: A Needs Assessment

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Abstract

This study represents a first attempt to investigate the need for universal retail design in Canada. Specifically, the research objectives were to expand understanding of the unique challenge of visual impairment and the shopping experience of visually impaired consumers, and to identify gaps in retail design in order to better serve the visually impaired community.

The researchers conducted three focus group interviews with a total of 17 informants recruited by an independent consultant who was affiliated with a visually impaired advocacy organization in the Greater Toronto Area in Ontario, Canada. Data were transcribed and then analyzed using QSR NVivo 8.

Findings suggest that mobility is the biggest daily challenge facing visually impaired consumers. Retail shopping involves significant effort at every step of the process for visually impaired shoppers, including getting into the store; judging product quality; distinguishing colour; reading labels, store signage, and receipts; negotiating store layout and fitting rooms; dealing with store lighting; and interacting with sales associates. This paper identifies visually impaired shoppers' needs for universal retail design, discusses implications, and makes recommendations to policy makers and industry practitioners in the defined fields.

Keywords

needs assessment; shopping experience; universal retail design; visually impaired

Introduction

Vision loss is a detrimental effect of aging that impacts physical, social, and psychological aspects of people's lives (Moore & Miller, 2003; Pelletier, Thomas, & Shaw 2009). Approximately 3.6 million Canadians are diagnosed with disabilities, including 648,000 people with visual impairment or blindness, many of whom are elderly (Government of Canada, 2004). In the U.S., more than 3 million Americans over age 40 live with blindness and low vision (National Eye Institute [NEI], 2004, 2008). Without a doubt, the prevalence of eye disease increases with age; the American cohort with blindness or low vision may reach 5.5 million by 2020 (NEI, 2004).

Using North American criteria, blindness is defined as the maximal visual acuity in the better eye being equal or less than 20/200, while low vision is classified as maximal visual acuity in one eye equal or less than 20/40 (Maberley et al., 2006). It is important to note that only a small fraction of the Canadian population is blind; the majority of visually impaired persons live with low vision (Maberley et al., 2006). As a rule, most people adjust reluctantly to predictable changes in vision as they enter middle age: they purchase reading glasses to compensate for the inability to focus on small print, need increased light levels for improved contrast perception,

and find it more difficult to drive at night due to hindered glare recovery from oncoming headlights (Carter, 1994). However, with advancing age, other serious forms of eye disease and vision loss may occur, including macular degeneration, which typically impacts central vision; cataracts, which manifest as reduced glare recovery and decreased visual acuity; glaucoma, which initially presents as a loss in peripheral vision; and diabetic retinopathy, whose symptoms include overall decreases in visual acuity, colour perception, and the ability to adapt from dark to light (Castor & Carter, 1995; The Eye Diseases Prevalence Research Group, 2004; Rosenberg & Sperazza, 2008). Some of these symptoms may be improved with surgery or medication (Pelletier et al., 2009) and resulting vision loss may be offset by using handheld magnifiers, specialized glasses with tinted filters to reduce glare, large print computer software, voice synthesizers, and audio books or other talking devices (Castor & Carter, 1995).

Loss of vision correlates to reduced quality of life (Allen, 1989; Jackson, 2006; Misajon et al., 2005; Moore et al., 2003; Pelletier et al., 2009). Persons with visual impairment have an increased risk of falls and associated injuries (e.g., hip fractures), medication mistakes, social isolation, and depression (Carter, 1994; Jackson, 2006; Pelletier et al., 2009). These issues have critical significance now that our society includes more than 4.6 million Canadians over the age of 65 (Statistics Canada, 2009).

Traditional design processes for products and the retail environment focus primarily on the mainstream market, with little attention to the needs of aging baby boomers and the disabled community (Coleman, 2001; Kaufman-Scarborough, 1999). As people are living longer (Statistics Canada, 2007) and more people are living with some type of disability (Government of Canada, 1981), incorporating universal design principles into design practice has become increasingly necessary. Universal Design (sometimes referred to as Inclusive or Accessible Design) is defined as “the design of all products and environments to be usable by people of all ages and abilities to the greatest extent possible” (Story, 2001, p. 10.3). Ron Mace is accredited as the originator of the term “universal design” (Ostroff, Limont, & Hunter, 2002). As a polio survivor, he was confined to a wheelchair from the age of 9 onward, the challenges he faced inspired him to become an architect and an advocate for accessible design which he believed was critical to independent living (Ostroff et al., 2002). Market accessibility is one of the key principles of Universal Design (The Center for Universal Design, 2010) and forms the core justification of this study.

Over the last 25 years, society has become more aware of the barriers facing people with special needs. For example, since the federal government published its *Obstacles: Report of the Special Committee on the Disabled and the Handicapped*, municipal building codes now require ramps and elevators for improved accessibility to public buildings (Government of Canada, 1981). More recently, the provincial government introduced the *Accessibility for Ontarians with Disabilities Act, 2005*, which promotes barrier-free living (Government of Ontario, 2005). Nevertheless, persons with visual impairment are significantly limited in their abilities to travel alone and unaided (Golledge, 1993). Moreover, as Kaufman-Scarborough (1999) pointed out, truly inclusive shopping access requires more than merely widening the doors; it is only “achievable through a balancing of legally required architectural attributes, moderated by adjustments in terms of actual merchandise, displays, and specific store environment created by each retailer” (p. 505). In this sense, retail design should be looked at from a “servicescape” perspective (Bitner, 1992) which considers the store’s physical surroundings as a holistic element underpinning both the customer’s and the store employee’s experience. Inclusive design sends positive messages to disabled people, messages which tell them “you are important,” “we want you here,” and “welcome” (Napolitano, 1995, p. 33).

Literature Review

Environmental psychology theories recognize the impact of the retail environment on shoppers. Two paradigms may be applied to explain and organize shoppers' emotional, cognitive, and behavioural responses to the retail surroundings they encounter. Mehrabian and Russell's (1974) emotion-cognition-behaviour paradigm is considered classic but has faced challenges in recent years. This theory posits that emotions are antecedents of cognition, which in turn lead to two contrasting forms of behaviour: approach and avoidance (Donovan & Rossiter, 1982). Approach involves a desire to stay, explore, and affiliate, while avoidance comprises the opposite behaviours. An alternate theory states that cognition elicits emotion (Lazarus, 1991). In other words, upon entering a given environment, a person first evaluates the external and internal cues in terms of his or her own experience and goals; once such an appraisal is made, an emotion will result (Lazarus, 1991). The cognition-emotion theory has received empirical support in retail atmospherics (Baker, Grewal, & Parasuraman, 1994; Chebat & Michon, 2003) and serves as an overarching conceptual framework for the current study.

The retail environment is an important factor in consumers' evaluation of the products and services offered, because shoppers may assign aesthetic and instrumental values to the formal, expressive, and symbolic qualities of store environments (Fiore & Ogle, 2000). Therefore, a retail environment may influence consumers' inferences about merchandise, service quality, and store image (Baker et al., 1994). A number of studies suggest that ambient and social cues are significant atmospheric elements that influence consumers' affective states in store environments and impact their shopping and purchasing behaviour (Baker, Levy, & Grewal, 1992; Bellizzi, Crowley, & Hasty, 1983). Ambient cues refer to physical and auditory aspects of store environments, such as lighting, music, colour, and display, whereas social cues correspond to factors such as the number and friendliness of employees.

Beyond the impact of a retail store's physical environment on shopper behaviours and perceptions of merchandise and services, perception may also be internalized and influence shoppers' self-perception. This is true for sighted and visually impaired shoppers alike, but is more significant for visually impaired people due to the unique challenges they face in their daily lives. Symbolic interaction theory addresses how individuals come to understand their world and the process of developing this understanding (Solomon, 1983), and is used as another point of departure for this study's data analysis. The theory assumes that people interpret the actions of others and respond accordingly (Solomon, 1983). The process of interpretation involves the use of symbols which can be traced to shoppers' perceptions of how they interact with the retail environment they encounter. According to Blumer (1969), symbolic interactionism is based on three fundamental premises. First, human beings respond to things (e.g. encounters with others) according to the meanings that the things have for them. Second, the meanings of such things are derived from the social interaction that one has with one's fellows. Third, these meanings are handled in, and modified through, an interpretive process that a person uses when dealing with the things he or she encounters. Therefore, meaning is central to people's actions; it is socially constructed and derived by people as they interact (Blumer, 1969).

Symbolic interaction theory can be used to analyze visually impaired shoppers' interaction with store design as well as store employees. The symbolic messages visually impaired shoppers receive from their shopping experience may form their perception of how retailers view them (or do not view them) as valuable customers, and this perception may in turn positively or negatively impact such shoppers' self-perception. In addition, visually impaired shoppers may respond to the retail environment based on the interpretation of their experience. This psychological impact is an important aspect of quality of life among the visually impaired; therefore, it deserves serious attention among the public, and in particular policy makers and industry practitioners in the defined field.

The selection and purchase of clothing by visually impaired people has been the subject of research studies in Hong Kong, the United Kingdom, and the United States (Bradley, Hopkins, & Bailey, 2000; Frency, 2000; Kaufman, 2000). Difficulties reported include inadequate sales service, poorly communicated clothing details and pricing information, as well as awkward store navigation when compared to sighted cohorts. There clearly was a dearth of information related to the visually impaired experience within the Canadian apparel market.

Consequently, this study represents a first attempt to investigate the need for universal retail design in Canada. Specifically, the research objectives were to expand understanding of the unique challenge of visual impairment and the shopping experience of visually impaired consumers, and to identify gaps in retail design in order to better serve the visually impaired community by making recommendations to policy makers and the industry practitioners in the defined fields.

Research Method

Data Collection

Three focus group interviews were conducted with a total of 17 informants recruited by an independent consultant who was affiliated with a visually impaired advocacy organization in the Greater Toronto Area in Ontario, Canada. Each focus group consisted of 5-7 informants and interviews were held at office boardrooms close to the participants' residences. The focus group sessions were facilitated by one of the researchers and audio recorded.

Focus Group Questions and Informants

The open-ended questions focused on how visual impairment impacted daily life as well as problems encountered with clothing and shopping. Demographic information was collected via a questionnaire. Each focus group session lasted approximately 90 minutes. The audio-recorded data were later transcribed and analyzed using QSR NVivo 8.

The focus group participants were about equal in gender representation (8 women, 9 men), the majority (58.8%) were between 41-60 years of age, and 64.7% lived with a partner, relatives, or friends. Most of the informants (88.2%) had obtained a high school diploma and 52.9% had earned postsecondary degrees, including 11.8% with a graduate degree. About 82.4% were unemployed, and the majority (58.8%) had an annual income of less than \$20,000 (see Table 1 for more detailed demographic information).

Findings and Discussions

The Unique Challenge of Visual Impairment

All informants reported that mobility was the biggest daily challenge they faced. Because they were not able to drive and depended primarily on public transportation for moving around, the range of places they could go and stores they could shop in was limited. One informant's comments described this typical situation of being visually impaired:

Well, it's mobility. I think that about all of us at some point have lost our [driver's] license. You live a lot happier life with that concept of being able to go to the front door and hop in the car and drive down the street. It takes a long time, I think, to put that urge away, I guess, and then you have to figure out all sorts of alternatives to achieve that same goal...and to try not to get the feeling of being marginalized out of the main stream....So...you sort of feel that you could do pretty much what you did before if you could get there.

Shopping Experience of the Visually Impaired

In addition to mobility challenges, going shopping involved much more significant effort at every step of the process for the visually impaired; as one informant told us, simply finding the entrance is an arduous task:

The experience is...you know, like, losing part of my sight. Now it's really hard for me to take the city bus; walking a distance, I can walk, but the thing is, it's getting from the bus stop to the store, especially if there's some construction there, you know [XX mall] where they change everything around, so it's like, where do we go? You don't know where you're supposed to stop the bus...and it's more extra walk too, because you know I have to get off at the light, and so now you don't know if you should walk left or right...for an opening to where you want to go [in the mall].

Due to visual impairment, the informants reported that they lost confidence in their ability to evaluate apparel quality and distinguish colour effectively, and to read labels, store signage, and receipts. However, these are all important factors of a satisfactory shopping experience and outcome. One male informant illustrated this scenario about judging quality:

I went to [X store] last year for my winter boots. I found these great Velcro strap boots. They were great, but they were not leather. I've worn them right out. But when I was in Winnipeg in December I saw the very same boot in leather in [XX store]. Twenty bucks for one pair, eighty bucks for the other. Now, I probably would have seen that the twenty-dollar pair really wasn't that good, like, you can't really see inside and see what kind of stitching, and you know, the quality, like, well let's feel it, you know? And all that stuff looks good when it's brand new right? But give it a couple weeks and snow and rain and da da da.

Regarding colour, most informants described an inability to distinguish like shades of colour. They often felt embarrassed for wearing clothes, socks, and shoes that didn't coordinate. With this in mind, they depended on other sighted shopping companions or store associates for assistance. Challenges with reading labels and tags are prevalent among the informants due to small fonts, limited colour contrast between the text and background, and location of the label-tag information.

Those tags are so small...you have to go and ask for the price after [asking for the sizes], but just to find the size you want, that's tough, because the numbers are so small.

Yeah and they're always in amongst the other print too, you can't make them out.

You know, to buy a shirt, you can't see [the tags]. Some days I might be able to hold it in the right spot and see that it says medium or large; other days, you know it gets so frustrating, I can't see it.

The care labels, not only are they small, but being colour coded you can't always tell exactly what each thing is meant for. 'Cause sometimes they have them in yellow, red, or green. 'Cause sometimes I have trouble with the reds and greens. And sometimes just the printing isn't always very clear. You can usually make out where it's made, but the rest of it is very small.

Regarding store signage, informants indicated that letter size, font type, and sign colour, content, and location all presented them with barriers for a smooth shopping experience:

I hate italicized. You know, like they'll do the script where it's all fancy and stuff. It might look pretty, but to us, just simple plain blacks, like Arial or something like that is clearer for us than the other types of print.

It's even the location of the signage; if it's too high up you can't see it. But each one of us are probably different heights, so if you walk into a store and it's at my eye level then I'll see it but if it's higher or lower I won't.

[In some stores, the signs will] be 8½ by 11 and the letters will be an inch, inch and a half, so those are pretty good, they'll say what it is, like men's sportswear or something like that. But if you go in ...[other stores], there are no signs that say what it is, you pretty much have to look at it and say those are trousers on the shelf, I suppose, or shirts, whatever. You pretty much have to see the item to know what it is, as opposed to the sign.

Paying for purchases also created stress for the visually impaired. The issues ranged from an inability to read the receipt, to handling cash and using debit or credit cards. The informants discussed various experiences with checkout procedures:

I favour going with cash now. Because...you just give the money and they give you the change. As opposed to if you go credit card...that process of signing is, could be a challenge....Often they'll put that thing down on the table and you'll have to find the line, to [sign]...so my signature has become very brief now, just an "R" and some squiggles. Probably not on the line. Like, if I work hard or bring the bifocals down and get within range I can see the line, but that's a stressful situation, you know; it's stressful when you have seven people behind you or whatever....We complained about receipts that are really faint, but that's the one thing that I think should be really dark and bold, there should be a huge X that's about half inch, for everybody, and then you can see at three feet without bifocals, you can see the X, and sign next to it.

A number of informants described their concerns about not being able to see the information on sales receipts. They worried that incorrect charges (e.g., due to cashier error or a discrepancy between the price tag and actual pricing in the checkout system) may have been posted on their purchase. Because they would be unaware of this at the time of purchase, travelling back to the store at a later date to get the problem corrected would require considerable additional effort.

Using cash may not be an ideal option, either, as one informant commented:

If you use cash, the only drawback is, and you've probably all have this experience, it happens more in [XX] but it could happen anywhere, where they put the bills on your palm and they balance the coin on top of that? If you make a false move then the coin is all over the place.

With touch screen debit card machines, the informants found punching in their personal identification number (PIN) to be particularly problematic:

The worst problem I just had the other day at a store, and I had to just leave...my order and leave the store, because they had a debit machine, a touch screen. I can't use that. On the Interac machine, okay, I can feel the buttons. And if worse comes to worst, once I punch my code in, I can ask the [cashier], "can you just press chequing for me?" 'Cause sometimes the machines...are all different...Then I push okay, then I cover it and I can feel the buttons. Then I punch in my code, then I push okay, and my order's fine. [With the touch screen machine], I didn't know there was anything on screen. I had to just say no, I had to walk out of the store.

Due to mobility challenges, visually impaired shoppers often need assistance from family members whom they shop with, as well as from store associates, especially when shopping alone. However, the informants' experiences of interacting with store employees have not been, to a large extent, satisfactory. The issues focused on the following aspects: store employees'

lack of knowledge of the store and merchandise; insensitivity toward the unique needs of the visually impaired shoppers; and perceived reluctance to accommodate visually impaired customers. These issues were illustrated through the following scenarios:

I was in [X store] a couple weeks ago...and they had pop on sale. So, I told [the store associate], "I need...two cases Diet Pepsi, and two cases Coke Zero." The guy comes up and is like, "is this what you want?" It's a bottle of pop! I said, "no. I want the twelve, two twelve-packs." So he comes back and goes, "do you want six bottles of this and six of this?" I'm like, "no!"....So he comes back and he's got the little...bottles. And he's like, "is it these ones?" I'm like, "no. It's in a box. It's square. There's twelve cans in there, and it says 'Diet Pepsi.'"

I have a sister that's totally blind, went to the restaurant....We had a waiter there that she was, you know, trying to talk, and my sister, you know she wasn't paying attention to her. And so...I told the waitress that she's totally blind. So now that she knows that she's totally blind, she was almost eating the food for her. And she's talking louder too.

Well, a lot of it is, what I think it is...a fear on the part of people working in the stores, and a lack of education. They don't know to come forward if they're afraid. I have enough sight, sometimes I almost feel like they duck behind a counter so they don't have to serve you....[The fear] is we're going to ask them for more help than they're prepared to give. Or they're going to expend far too much time for far too little return.

Experiences in the fitting room are also worth noting. The issues identified included seating, paint colour for walls, as well as lighting. Due to mobility and low vision challenges, visually impaired shoppers must engage in a complicated multistep process in the change room before even trying on any clothing: closing the door; feeling around to find hooks for a cane, purse, or coat; feeling around to find a seat because vision loss always results in reduced ability in maintaining balance; and looking for a mirror. If a change room is painted a dark colour and has poor lighting, these first steps become a daunting task.

Issues related to store lighting were most frequently mentioned among the study informants. As a large percentage of visually impaired people have problems with light adaptation, the issues identified included lighting contrast in different areas in a store, with lighting being too dark or too bright. Our informants gave us the following vivid illustrations of the light adaptation problem:

For a lifetime I've had to make these trade-offs....If I know I'm going to go into a place, I wear sunglasses for a bit before, so I'm kind of half dark-adapted before I get in. And then...I'll take my sunglasses off and I'll have a chance of sort of seeing...into the shadows a bit more. So if you...go back to the retail example, if you're walking around the store and there's...a big bright light down on an arrow on the floor, and you're in the bright light, and then you walk out of the arrow and you're in the shadows. And your eyes are going as far as the function of adapting to the light, they're going up and down, they're working hard to try to get...[but they] can't come back...instantly.

[I don't like the skylight in the malls because] when you have bright sunlight and you come in and then you have the glare in your eye and you can't see, or you get shadows from displays that are in the mall concourse.

I find if you're under the pot light exactly, yes you might have good light, but the minute you are off of it then you have light and shadow. And that can really throw you. So as much as I really don't like fluorescent, it maybe gives you a better uniform type of light. But you don't want it too bright.

A lot of the times if you walk into a place they've got the white walls, white floors, white ceilings, fluorescent lights; it just tends to make everything blend together too much, and it makes it way too bright, so then everything goes all wishy-washy and you're squinting trying to see what's around.

Conclusion and Recommendations

Environmental psychology literature suggests that retail atmospherics make a significant impact on shoppers' perception and shopping behaviour (Baker et al., 1992; Bellizzi et al., 1983; Chebat & Michon, 2003). This seems to be the case among visually impaired shoppers in our focus groups. Due to the unique challenges of this consumer group, their needs within the retail environment are well defined, but different than the needs of persons with other disabilities (Baker, Stephens, & Hill, 2002). Providing proper accommodation to this unique consumer group not only conforms to universal design principles, but also improves quality of life for the visually impaired. Symbolic interaction theory states that individuals interpret the symbolic meaning they receive from the people and environment they encounter, internalize it, and respond accordingly. Therefore, when the retail environment is designed with reasonable consideration of the disabled community's needs, it may send a signal to this market segment that conveys how retailers, commercial real estate developers, and society at large value them. Based on our focus group study, we identified the following needs and make the recommendations set forth below.

Store Environment

Store layout should be straightforward and logical. Because of mobility challenges, most of the visually impaired informants found it stressful to navigate through stores in which the division of departments is not intuitive and clearly labelled. For example, in some stores, boys' clothing is adjacent to the men's department, which may cause visually impaired shoppers to inadvertently cross into the different clothing section and purchase a wrong-sized item. Aisles should be wide and without obstruction. Though most of the visually impaired shoppers are not in wheelchairs, their vision loss is a significant impediment for moving around freely in a store. Narrow aisles or aisles containing display fixtures or protruding merchandise may pose potential tripping hazards for these shoppers and cause damage and bodily injury.

Signage is critical to help visually impaired shoppers better navigate through a store. It is recommended that signs use large fonts and regular-styled letters, and incorporate strong colour contrast between the letters and background (flashy digital signs and fluorescent colours should be avoided). In addition, clear signage to indicate what merchandise is on the shelf is helpful for this group of consumers. Alternatively, a hand-held scanner that can read (and announce with audio cues) the signs and tags would be especially beneficial.

Checkout procedures should be streamlined with the visually impaired consumers in mind. In particular, "checkout stress" for this group of consumers would be lessened through the use of receipts with a large font and a bold signature line; the proper handling of change by the cashier; the provision of user-friendly debit card machines for the visually impaired; and possibly an audio-enhanced checkout system that announces the price and quantity of merchandise being scanned.

For visually impaired shoppers, the preferred store lighting is uniform, fluorescent lighting that is not too bright. Lighting should be designed as an integral component of the overall store environment. Specifically, there should be colour contrast between general store lighting and walls, floors, and shelves. Using carpets in merchandising areas and tile in walkways helps

define different functions within the store and provides some directional clues for the visually impaired.

Service Personnel

Store associates should be available and committed to assisting visually impaired customers. They need to be knowledgeable about merchandise within the store and receive training on the unique needs of this consumer segment and on how to provide appropriate assistance in a sensible way. They are the frontline people who interact with the shoppers directly and the symbolic message they send plays a critical role in shopping satisfaction among visually impaired customers.

Limitations and Future Research

The findings of this study are based on three focus group interviews conducted with selected members of a visually impaired advocacy organization in the Greater Toronto Area in Ontario, Canada. While these initial data provide valuable insights, inclusion of a diverse population would provide richer understanding. For future studies, systematic sampling is recommended for a more complete understanding of needs among the visually impaired community in Canada.

Additionally, how the retail shopping experience influences visually impaired shoppers' quality of life and self-perception might be another area that merits in-depth investigation. Providing appropriate accommodation for the visually impaired and other disabled communities requires collective efforts from the whole society, especially policy makers and industry practitioners in retail, commercial real estate development, design, and related fields. Future research should look into this dynamic system and explore retail universal design concept from diverse perspectives.

Table 1 Demographics of the Informants

Age	No. Informants
Younger than 18 years of age	0
19 - 40 years of age	2
41 - 50 years of age	5
51 - 60 years of age	5
61 - 70 years of age	4
Older than 70 years of age	1
Sex	
Female	8
Male	9
Household status	
Married/living with partner	5
Living alone	6
Living with relatives	4
Living with friends	1
Education	
Some elementary or high school education	2
High school diploma	5
Some post-secondary education	1
Post-secondary degree or certificate or diploma	7
Graduate Degree	2
Employment	
Yes	2
No	14
Income	
Less than \$20,000	10
\$21,000 - \$ 50,000	6
\$51,000 - \$70,000	1
\$71,000 - \$100,000	0
Greater than \$100,000	0

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