

USER PERSPECTIVES OF ACCESSIBILITY AND USABILITY OF A PERFORMING ARTS THEATRE

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Abstract: Older adults often have limitations due to normal ageing, which interfere with their ability to attend theatre performances. Mobility, visual, and hearing impairments can limit the experience older adults have as they engage in these cultural offerings. In this study, 20 older adults (age range 65-78 years; 15 females, 5 males) perspective of the usability and accessibility of the physical environment before and during a musical performance was studied for one urban performing arts theatre. Participants completed a self-assessment questionnaire, identified accessible features, barriers to access, and made suggestions for improvements. Results showed that the participants had mixed experiences, some participants mentioned accessibility limitations in the built environment, and others regarding communication access. Most participants would recommend the theatre to others. Following up on the recommendations will improve theatre access for any individual with mobility, visual, and/or hearing limitations.

Keywords: universal design, older adults, aging.

Introduction

According to the Centers for Disease Control and Prevention (2020), two in five adults over the age of 65 live with a disability. Older adults have a higher incidence of disabilities than the general population, because typical ageing leads to a progressive decline of visual and auditory perception, motor, cognition, and memory functions (Krampe, 2002; Kraus, Lauer, Coleman, & Houtenville, 2018; Tye-Murray, 2020).

In fact, a majority of older adults have mobility (22%), hearing (14.6%), and vision (6.6%) difficulties (Kraus et al., 2018). Mobility limitations of older adults typically are associated with well-described pathological and neurochemical abnormalities in brain tissue that result in a variety of functional effects (Rowe, et al. 2006) impacting reaction time, posture, balance, and motor performance (Kattenstroth, Kolankowska, Kalish, & Dinse, 2010). These changes inhibit older adults' ability to participate in physical activities they previously enjoyed. Hearing loss increases with age and accelerates over time so that the hearing loss becomes noticeable when older adults enter their seventies (Tye-Murray, 2020). The slowly declining hearing impacts communication, social relationships, and enjoyment of sounds such as nature and music. Visual difficulties also impact older adults' ability to participate in some activities. The eyes undergo several physical changes with ageing, leading to declines in visual acuity, colour, contrast sensitivity, and poorer accommodation, amongst other visual limitations. These limitations result in difficulties with reading and navigating in environments with low lighting (Tye-Murray, 2020). The combination of all of these limitations often co-occurring in older adults further limits older adults' functioning (Crews & Campbell, 2004).

This higher rate of motor, hearing, and vision limitations also interferes with social participation (Crews & Campbell, 2004). Sustained interpersonal relationships and engagement in social and productive activities are important components of successful ageing (Rowe and Kahn, 1997) and enhance social, cognitive, and emotional well-being (Carr, Weir, Azar, & Azar, 2013). One of the events that fosters social engagement, belonging, and social well-being is theatre performances (Meeks, Shryock, & Vandenbroucke, 2018). The

importance of the arts to foster healthy ageing was the focus of the *Summit on Creativity and Aging in America* which highlighted health and wellness in the arts, lifelong learning in the arts, and age-friendly community design (National Endowment of the Arts and the National Center for Creative Aging, 2016). All the areas identified in the report enhance older adults' engagement and participation, but age-friendly community design, through the use of universal design specifically, allows for inclusivity. Their engagement and participation are facilitated when motor, hearing, and vision limitations are not interfering with the expected outcome of theatre attendance.

According to the United Nations (2006), all individuals in the community must have access to institutions for the performing arts as a basic human right. Older individuals, especially those with age-related disabilities, are often excluded from participating in social and cultural activities (Chen, 2013; Gallistl, 2021). Theatres have begun to recognize that accessibility is essential. Some theatres now include productions where American Sign Language, closed captioning, or a reduction in sensory stimuli are made available (The Hanover Theatre & Conservatory for the Performing Arts, 2021a).

In addition, the application of Universal Design (UD) principles afford access to all individuals in the community. UD is based on the concept that the design of environments should benefit all individuals regardless of their ability or age. The Center for Universal Design defines UD as “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” (1997, para. 1). Products and environments are accessible without stigmatizing individuals needing accommodations because the intention in the design was to embed accessibility. The seven principles of UD are as follows: equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort and size and space for approach and use (Center for Universal Design, 1997). One well-known example of UD is curb cuts that allow any individual using a wheelchair, using a stroller, or walking independently to access the sidewalk without difficulty.

UD design has to a large extent focused on the physical and visual domains. The hearing domain has been limited to electronic materials and ways to

enhance distance learning. Jennings (2009) adapted the UD principles to include guidelines for individuals with hearing loss. She stated that the design of an environment must enable a person to enter a space and to hear “without expending considerable cognitive or physical effort” (Jennings, 2009, p. 253). UD must be applied not only to the built environment but also to the experience of the individual in the built environment. The experience must be enhanced so that individuals are able to participate and to engage (Jennings, 2009).

Jennings (2009) developed Universal Design for Hearing (UDH) and the first three guidelines can be applied to older adults’ access to a theatre environment. The first UDH guideline is to optimize the hearing environment, including attention to reverberation time, background noise levels, and to improve intelligibility. The second UDH guideline is to optimize the interaction between persons or objects to promote better hearing in an environment, for instance distance between speaker and listener or the maintenance of and positioning of objects. In a theatre it may imply optimal seating, use of hearing assistive technology (HAT) and optimal functioning of HAT. The third UDH is to optimize the opportunities for people to choose the type of interaction they need, for example, one on one, or one to many. In a theatre environment it may imply listening to another person, and to hear the performance.

Many public spaces in urban settings benefit from an examination of ways in which to incorporate Universal Design for optimal access of individuals with physical, vision and hearing limitations. The Centre for Excellence in Universal Design stated that a single design should be accessible to as many users as possible without the need for modifications (National Disability Authority, 2014). However, it is impossible for a single design to accommodate 100% of the population, in which case alternative options should be provided. These alternative options may be obtained from the users so that their lived experience can inform the developers to co-produce value and a more accessible and usable environment (Cluley & Radnor, 2020). Users with hearing loss, for instance, added value to an art museum’s docent-led tours. Suggestions to institute regular checks of hearing assistive technology, using clear speech during presentations, and providing written information to supplement the docent’s presentation contributed to a more accessible

experience. Not only users with hearing loss, but also users with English as a second language, or other communication disorders will all benefit from these suggestions (Meyer, Larrivee, Venziano-Korzec & Stacy, 2017).

Although theatres in the USA must comply with the Americans with Disabilities Act to create accessible and usable experiences, for instance, wheelchair spaces, accessible routes, and bathroom spaces (US Department of Justice, 2010), these changes may still not provide the user with a good experience. In addition, there is no research available on how users perceived theatre accessibility and whether their needs were met. Therefore, the purpose of this project was to investigate how older adults, most with self-identified limitations, perceived the accessibility and usability of the same theatre. This is the only performance arts theatre in a medium-sized city however, the investigation may benefit all performing art theatres.

Methodology

This project was approved by Worcester State University's Institutional Review Board (1920-0003). The authors received a 2019-2020 Faculty Scholarship/Creative Activity Grant through their institution.

Participants

An email describing the study was sent to community-dwelling older adults over the age of 65 who were known to the researchers. The investigators contacted the participants by phone or email and provided them with verbal and written descriptions of the study. Through snowball sampling (initial participants recommended additional participants, Portney & Watkins, 2015), a total of 20 community-dwelling older adults agreed to participate in the study (age 65-78 years; 15 females, 5 males). The participant pool was limited by the grant's funding for theatre tickets. The participants did not have known medical diagnoses but self-identified with at least one limitation in mobility, vision, or hearing typical of older adults (Table 1). All participants were able to attend the theatre production and lived within 30 miles from the urban setting.

Table 1. Participant Characteristics.

Self-Identified Limitations	Number of Participants	Percentage
Mobility	3	15
Hearing	1	5
Vision	7	35
Hearing and Vision	4	20
Mobility and Vision	1	5
Mobility, Vision and Hearing	4	20
Total	20	100

Instruments

A demographic questionnaire was used to learn more about the participants. Information was gathered about age, gender, and self-identified limitations in the areas of mobility, vision, and hearing. The Accessibility and Usability Survey, developed by the investigators, consisted of three main sections: mobility, vision and hearing with nominal-type questions (Yes, No, Not Applicable). An additional column was available for open-ended recommendations for any barrier noted. This survey was designed for the participants using the principles of The Community Health Environment Checklist (CHEC) (Stark, Hollingsworth, Morgan, & Gray, 2007).

Procedures

This was a descriptive, quantitative survey study with open-ended recommendations regarding the participants' perceptions. All participants agreed to attend the same theatre performance on a weekend afternoon. Although the theatre staff were aware of the study, they were unaware of the specific chosen performance. The specific procedures included the following:

- One month prior to the performance, each participant received and signed the informed consent. They also received a complimentary

parking pass, a demographic questionnaire, and the Accessibility Survey.

- One week prior to the performance, participants were reminded and encouraged to review all three sections of the survey. Participants were asked to arrive 1-hour before the performance to determine the accessibility of the theatre. They also were asked to plan to stay after the performance to evaluate their experience.
- On the day of the performance, the participants met with investigators and were debriefed on the surveys. The participants' tickets were in various sections of the auditorium section of the theatre to provide different perspectives of the performance. All participants were able to complete the survey before, during, and after the performance. They then returned all surveys to the investigators at the end of the performance.

Results

The data were analyzed using IBM® SPSS® Statistics (Version 27; IBM Corp., Armonk, NY) for the nominal-level data (Yes, No, Not Applicable), and frequency counts and percentages were generated. Open-ended recommendations were reviewed and categorized into codes (positive or negative) in Microsoft Word. The results in Table 2 summarized the features the participants identified as accessible and usable.

Table 2. Accessible and Usable Features Identified by UD Principle.

UD Principle	Perception by Older Adults
Equitable Use	Helpful employees Elevator was available
Flexibility in Use	Helpful employees
Simple and Intuitive	Bathrooms were accessible
Perceptible Information	Hearing Assistive Technology available Clear speech used
Tolerance for Error	Ushers friendly and helpful Located seat easily
Low Physical Effort	Opened doors easily
Size and Space for Approach	Sink, soap and paper towels easily accessible

Their perceptions were grouped according to UD principles. It was noticeable that the theatre employees were one of the reasons why the UD principles of equitable use, flexibility in use, perceptible information, and tolerance for error were perceived positively. These helpful employees and ushers contributed significantly to the accessibility and usability of the theatre. The availability of an elevator, bathrooms with accessible features such as sink, soap and paper towel dispensers at the appropriate height, doors that are easy to open and availability of HAT indicated the universal design principles of simple and intuitive, low physical effort, and size and space for approach and use were identified as accessible and usable. These features also added to the previously discussed principles of equitable use and perceptible information.

In Tables 3 and 4, the participants identified the barriers they experienced as well as suggestions for improvement of the accessibility and usability of the theatre.

Table 3. Barriers and Recommendations for Performing Arts Theatre: Built Environment.

Locations	Barriers Identified	Recommendations
Outside walkways	Not smooth	Paving needed
Main Lobby	Very noisy	Improve acoustics
	Difficult to manoeuvre	Improve flow of traffic
	Minimal seating	Increase seating options
Hallways	Very crowded area	Remove obstacles
	Difficult to navigate	Improve flow during intermission
Balcony	Very steep staircases	Ability to self-disclose about limitations during purchase transaction
	No tread on stairs	Add treads to stairs
	No handrails	Designate ushers to assist
	Carpet pattern was distracting	Change carpet pattern
Bathrooms	Not enough single use bathrooms	Modify existing bathrooms

Table 4. Barriers and Recommendations for Performing Arts Theatre: Communication.

Location	Barriers	Recommendations
Verbal Communication	Non-functioning HAT*	Designate employee to check HAT*
	No open captions	Provide captioning
	Difficult to hear ushers	Retrain ushers on clear speech
	Oral announcements hard to hear	Provide written announcements
Visual Communication	Font on playbill too small	Increase font and format
	Poor signage from carpark	Relocate signage
	Elevator sign not clearly visible	Improve size, contrast, font and location

*HAT = Hearing Assistive Technology

Some of the participants felt that there were not enough bathrooms available during the intermissions. The doors were also heavy and there was no single-use bathroom. The recommendations for improvement were mainly focused on more available bathrooms, the need for handrails to balcony seats, smooth pathways, and decrease the noise levels in common areas.

One communication barrier identified by the participants was that even though HAT were available, some were not functional. A recommendation was that a specific employee should be allocated to check the technology before each performance. Other communication limitations included a lack of open captions available and the small font size of the playbill making it difficult to read. In addition, although the ushers were typically described as very helpful, some of the participants mentioned that ushers were not easy to hear and that they should receive training to speak more clearly. Participants also noticed that the signage from the car park and in the theatre could be improved.

The results in Table 5 show that as a group, all participants, except for one individual with vision limitations, rated their theatre experience positively (93.8-100%).

Table 5. Older Adults' Perception of Accessibility and Usability.

Self-Identified Limitations	Positive Experience	Recommend Theatre for Individuals with Same Limitations
Mobility	Yes = 8 (100%)	Yes = 7 (87.5%) No = 1 (12.5%)
Vision	Yes = 16 (100%)	Yes = 15 (93.8%) No = 1 (6.2%)
Hearing	Yes = 8 (100%)	Yes = 7 (77.8%) No = 1 (11.1%)

Although the total theatre experience was overwhelmingly positive, at least one individual in each group with a mobility, visual, or hearing limitation felt that the theatre's barriers were significant. Specifically, they noted a lack of signage, lack of smooth walkways, noisy lobby, steep stairs to the balcony, and distracting carpet. Therefore, although most participants would recommend the theatre to others, these few participants would not recommend the theatre to another person with similar limitations.

Discussion

Based on the results of The Accessibility and Usability Survey, the theatre was found to be largely accessible to older adults. Many structural accessible features in the built environment were identified in addition to good customer service support. The participants specifically mentioned the helpful and friendly employees and ushers. These employees have had extensive training by the theatre management (personal communication), but a refresher in using clear speech could assist communication with these older adults. Barriers to access were also identified and recommendations were made to improve the overall accessibility of the building.

Recommendations for improvements were mainly focused on the need for handrails due to the steep stairs to balcony seats, better signage from the car park and in the theatre, smoother pathways, and decrease in the noise levels in common areas. Participants also mentioned the need for improved HAT maintenance, open captions, and a larger font size in the playbill. Using the Accessibility Survey, older adults rated their theatre experience positively. They felt that individuals with hearing, mobility and vision issues may need additional assistance including their recommendations to access and use the theatre.

When considering UD principles in the evaluation of a theatre, not only mobility and vision but also hearing must be considered. The inclusion of all these three aspects will ensure both participation and engagement by older theatre goers. Accessible and usable theatre performances foster social engagement, belonging, and social well-being in older adults, (Meeks et al., 2018), all important components of successful ageing.

Participation and engagement must be enhanced by UD not only in the built environment, also in the theatre experience. To achieve that enhancement, Jennings (2009) suggested that UD must include accommodations on a micro, meso, and macro level.

On a micro level, the theatre must be evaluated by considering the space and what people need to do in it (Jennings 2009, p. 252). The theatre in the study is a historical and renovated theatre building. It was built in 1903 with sweeping staircases, and seats 2,300 audience members in front of the stage as well as on balconies. The building is typical of early 20th-century entertainment architecture. The theatre was renovated and restored in 2008 (The Hanover Theatre & Conservatory for the Performing Arts, 2021b). The retrofitting of this structure led to some of the limitations mentioned by the participants, such as the steep staircases without handrails.

At the meso level, the theatre must be evaluated by considering how people conduct activities within the constraints of the environment, culture, and established procedures (Jennings 2009, p. 252). The participants were able to attend the performance and rated their experience positively, however the environment provided constraints. These constraints were, for instance, noise

levels, limited seating in public areas, and non-functional HAT. Continued training of all employees when interacting with older adults and individuals with disabilities is imperative in providing an accessible and usable cultural experience.

On the macro level, the theatre must be evaluated regarding the “factors within the environment that may or may not be conducive to change and the availability of resources to support change” (Jennings 2009, p. 252). The building, built-in 1904, has limited the opportunities for changes due to available space and structural constraints (The Hanover Theatre & Conservatory for the Performing Arts, 2021b). For example, an elevator had to be installed in a less visible space. The management had to consider priorities such as available space and resources in the retrofitting of stairs and handrails.

At the end of the study, feedback on the perceptions of the theatre’s accessibility and usability was presented to the theatre’s director. The recommendations were favourably received by the theatre director and chief executive officer. Several of the issues were addressed in recent renovations, such as the improvement of the outside walkways and signage. Scheduled training regarding interactions with older adults and theatre patrons with disabilities, specifically using clear speech, will continue for all employees. This is an example where theatre management in collaboration with the theatre patrons’ lived experiences co-produce value, or a more accessible and usable theatre experience (Cluley & Radnor, 2020). Future research should include additional studies that offer more user perspectives about the value and barriers encountered in various contexts and the lived experience of those typically aging, with and without disabilities, as well as other demographic groups.

Conclusion

To facilitate successful ageing and sustained engagement in social and productive activities such as the theatre, older adults’ higher rate of motor, hearing, and vision limitations must be considered. Although theatres must comply with the Americans with Disabilities Act (US Department of Justice,

2010), it is unclear how older adults perceive their own theatre experience regarding accessibility and use. The group of older adults with self-identified motor, visual, and hearing limitations provided useful feedback on their theatre experiences. Their recommendations were in line with the principles of UD, and providing the suggested improvements will benefit all theatre patrons as well as older adults and individuals with disabilities.

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