

Implications

VOL. 05 ISSUE 08

www.informedesign.umn.edu

A Newsletter by Informedesign. A Web site for design and human behavior research.

Wayfinding Design: Hidden Barriers to Universal Access

Patricia Salmi, Ph.D.

Access to communities and activities is of vital importance to all members of a community—including those with disabilities. In increasing numbers, people with disabilities of all types are living and working in community settings and accessing the goods and services available there. Since community settings must accommodate an increasingly diverse population, it is critical that they be designed to be as inclusive and universally accessible as possible, addressing the requirements of a wide range of physical, sensory, and cognitive abilities and needs.

While policies such as the Americans with Disabilities Act (ADA) of 1990, Title III, have served to encourage building codes that assure physical access to and within public settings, they have done little to insure universal access to all users. Universal access is an integral part of universal design and includes more than addressing physical barriers. It is critical to look beyond physical barriers in the built environment to uncover the hidden barriers to universal access. One hidden barrier to universal access is inadequate and inappropriate wayfinding information.

Cognitive Mapping and Wayfinding

Wayfinding (the process individuals use to navigate in unfamiliar surroundings) is necessary to living one's life and is something that most people do every day. Wayfinding information is instrumental in finding a desired destination.

Wayfinding and cognitive mapping are inseparable and most humans carry many cognitive maps in their head at any one time. The cognitive map is a person's internal spatial representation of points, lines, areas, and surfaces that are learned, experienced, and recorded in quantitative and qualitative forms serving to spatially orient the wayfinder (Golledge, 1999). Without the process of cognitive mapping and the subsequent development of cognitive maps, individuals would need to re-learn wayfinding information about a particular space each time they visited it. Furthermore, cognitive maps assist the wayfinder in determining paths in new, never visited spaces because individuals can apply previously learned information from a particular environment to a new but similar environment.

Why is understanding the concept of a cognitive map and what goes into developing one important to designers of the built environment? Buildings with design features that help build a robust cognitive



IN THIS ISSUE

Wayfinding Design:
Hidden Barriers to
Universal Access

Related Research
Summaries



Informedesign[®]
Where Research Informs Design

map for individuals can be highly important to wayfinding, particularly as it applies to remembering a space if the wayfinder revisits it. They can also assist in returning people to their point of origin. Robust cognitive maps are important to people with intellectual and cognitive disabilities as well as to persons with poor memories or those who become easily confused.

In addition, building a robust cognitive map is critical to building evacuation in emergencies. When people are distraught, which is particularly true in emergency evacuations, they tend to remember distinct features in the built environment that can help them exit and provide excellent reference points for communicating with emergency first responders.

Hidden Barriers to Wayfinding

At first blush, building owners and managers, architects, and interior designers might think that their buildings offer appropriate wayfinding information by providing maps, directories, and signage, or even a staffed information booth. However helpful this might seem, to a growing number of people these wayfinding devices are often inaccessible and inadequate.

Why are common wayfinding aids difficult to access for so many? For the person who does not read, or reads in a language other than that used to convey building information, signage and directory information that is provided in an all-text format is a barrier. If the building information is not conveyed in formats accessible to a wide range of abilities, access to the 'contents' of the building becomes limited (Salmi, Ginthner, & Guerin, 2002; Salmi & Guerin, 2007).

Maps are often provided in shopping malls and building complexes as a wayfinding aid. However, many people have difficulty reading a two-dimensional map. A map is a graphic, abstract interpretation of three-dimensional space and the information contained in it must be translated to the actual space.

This is a task that is virtually impossible for a person with certain cognitive impairments.

Building directories, often paired with maps, present a different sort of difficulty to people with cognitive impairments or to the non-reader. Finding a specific medical office amongst a listing of many similar offices in a large medical building can be a daunting, if not impossible, task for someone with mild dementia or a traumatic brain injury. For the non-reader, the non-English reader, or person with dyslexia (a reading impairment), directories that only provide text offer no source of help at all.

Key Factors in Better Wayfinding Design

What are the key factors that contribute to universally improved wayfinding for all members of a community, including those with intellectual and/or cognitive disabilities? The following details a number of ways that architects, interior designers, graphic designers, landscape architects, and building owners and managers can better articulate wayfinding for all users of the built environment.

Spatial Organization

Spatial organization or building layout is considered the first major component in wayfinding design because it not only defines the wayfinding problems of future users, but also affects the ease or difficulty users will experience in comprehending and cognitively mapping the setting (Arthur & Passini, 1992). Key points to look for in spatial organization include:

- Design **architectural features** into the building that define different areas such as archways, columns, varied ceiling heights, and differentiated fenestration. These distinct architectural features help in creating orientation points in a cognitive map (e.g., remembering to take a left at the large, columned archway).
- Ensure that a larger building has **destination zones**. Examples might include a food court in

a shopping mall, a central atrium space, or an office cafeteria. Destination zones can be useful in designating areas for meeting another person, for orienting to a specific location or retracing a path, and for sheltering in place during emergencies. Destination zones can also provide orientation points for giving directions during emergencies, and they should be clearly marked and discussed during emergency evacuation practices.

- Provide **spatial overview opportunities** so that individuals can view a building's layout from various vantage points. Spatial overview opportunities help build a better cognitive map, allowing people to learn quickly about various parts of a building, including exits and corridors that lead to exits, as well as paths that lead to destination zones and/or places of shelter within a building. Spatial overview opportunities not only permit greater and more rapid knowledge of building layout information but also allow for greater ease in understanding exiting locations, thus reducing the possibility of errors during building evacuation.
- Consider the **overall layout** of the building. Is the layout confusing? Is it easy to get lost? Research has underscored the importance of spatial layout in wayfinding. Symmetrically laid out buildings—while



Spatial overview opportunities build better cognitive maps.

Confusing layouts benefit from designating destination zones and the judicious use of color, lighting, landmarks, and signage to clearly mark paths and exiting areas.

seemingly straightforward in plan view—can prove confusing when translated to three dimensions unless the sides are clearly differentiated.

Landmarks

Landmarks are another important cue in wayfinding design. Many people with different types of cognitive disabilities as well as those who cannot read at all or who cannot read the native language



Distinctive landmarks provide wayfinding cues.

rely on landmarks to mark and remember a path. Additionally, the use of landmarks is important during evacuation and provides useful and accessible building information to people with disabilities. Desirable characteristics of landmarks that help mark a path and make the space memorable include the following:

- Landmarks that are **distinct in shape, color, and appropriately illuminated** are memorable, serve to orient people in the space, and provide directional egress information. Distinct destination zones; kiosks; and large, unique artwork, photographs, and/or sculpture can be used as landmarks, especially if there is an interactive feature. Architectural features such as decorative columns, archways, and unique fenestration, used selectively, can also be useful.
- Landmarks should be paired with **appropriate signage** to convey important information and guide evacuation decisions. Furthermore, reinforcing the location of a landmark by combining it with additional sensory input such as sound or smell can be effective in creating a stronger cognitive map. Examples of this might include a popcorn kiosk that emanates the smell of popcorn in a mall or the sound of a fountain or waterfall.

Signage

Spatial organization and landmarks are fundamental to good wayfinding design; however, properly designed and well-placed signage is often relied upon to aid in

wayfinding and is highly useful in communicating necessary information, including desired destinations and exiting locations for building evacuation. Even though signage that is in an all-text format is not universally accessible (particularly for those who do not read or cannot see), signage can be a valuable cue for many, including people with intellectual disabilities. Certain characteristics have been found to be important in directional signage and include the following:

- **Placement of building signage**, including signage to destination zones, restrooms, and exiting information, should be placed perpendicular to the path of travel, above eye level, and appropriately illuminated, taking care to avoid veiling reflections (glare) that impede readability. It is also important to place signage at regular intervals, particularly at decision points, serving to reinforce the traveler. This is especially true in large buildings with long corridors and many visitors, such as airports, hospitals, sports facilities, and other building complexes where the layout is not easily viewable from a vantage point.
- **Readability of the information** is critical to any wayfinding task. All information signage should be readily legible, under many conditions, including adverse ones. The text of the sign should be large, easily readable, and have a high contrast with the background. The signage should be carefully illuminated to prevent any glare that causes the sign to be unreadable. The text should be paired with a graphic image that is clearly understood—a feature that is useful to non-readers. For emergency exiting signage, in addition to signage that is mandated by code, exiting signage should be placed on the wall low enough so that a person in a wheel chair can reach it, and it should contain raised images, text, and Braille that is incorporated into the signage in a consistent manner. This additional exiting signage should be placed in consistent locations.
- **Color** in signage should be used only as a reinforcing cue and related to the environment. For

example, if there is more than one destination zone, use signage that is paired with a graphic and reinforced with a color such as orange. The orange color should be obviously repeated in the destination zone as well as the accompanying exit.

Directories

Informational directories serve to assist the wayfinder in finding desired location and are frequently paired with maps, but not necessarily so. Directories typically require the skill of decoding or reading, often a problem for people with intellectual disabilities who might read at a rudimentary level but have difficulty with densely packed text, as is often the case in many building directories. Recommendations for directories that could serve to make the information more accessible include:

- Cluster information in small groupings of five “items” or less;



Signage text should be paired with clearly understood images.

- Accompany text with graphic information when possible;
- Use a simple color-coding system that coordinates with the map, if a map is used;
- Place directories pertaining to that specific floor on each floor, particularly in large, multi-storied buildings; and

- If glass is used on the directory front, use caution to avoid glare on the glass surface.

Maps

The design of maps appears to play a role in their ease of use. As mentioned earlier, maps are often problematic for people with intellectual disabilities, and no doubt many other groups, who simply have trouble translating the two-dimensional information to a three-dimensional space. However, maps can be made easier to read using the following recommendations:

- Maps that are less cluttered and employ anchor points seem to be more accessible;
- “You are here” markings are helpful;
- Noting the floor on the map that the reader is on is also critical when a building has more than one floor;
- Place maps pertaining to a specific floor on that floor, particularly in large, multistoried buildings;
- Clearly key map information to directories for facilities such as public restrooms, strollers, restaurants, telephones, emergency shelters, first aid stations, and information kiosks. Make the graphic large enough and easy to understand. Use color as a reinforcer for this information, not as a primary cue; and
- Use lighting that does not produce glare on the map surface and yet lights up the information so that it is readable for those with low vision.

Color and Lighting

Color and lighting are both useful in wayfinding design. Color can act as a reinforcer in wayfinding design and should never be used as the primary source of wayfinding information because there are a number of people with color vision deficiency, a malady that affects at least 8% of males and 2% of females. Lighting (both electric and natural) is also useful in wayfinding to highlight various architectural features and illuminate maps, signage, and landmarks. In a more subtle way, it also serves to

highlight a path or warn people away from an area. Judicious placement of lighting can be a very effective way to reinforce wayfinding, especially during emergency exiting.

Conclusion

There are many factors that go into the design of better wayfinding, and this article has covered only some of the variables. Designing buildings with universal wayfinding design principles in mind will serve to make the built environment accessible to the broadest group of users and provide buildings that enable independence to the greatest extent possible.

It is time for our policy makers, specifically the authors of the ADA, to look beyond physical and sensory accessibility issues and address the hidden barriers for people with cognitive disabilities by applying the principles of universal design to wayfinding information. The United States has been a world leader in accessible design. Let's continue on this path by taking the concept of accessibility to a higher level by making communities inviting and inclusive to all members as has been federally mandated. Better wayfinding design helps to fulfill this mandate.

About the author

Patricia Salmi, Ph.D., ASID, is a Research Associate at the Research and Training Center, Institute on Community Integration, University of Minnesota where she has worked for 6 years on projects related to inclusion and accessibility for persons with disabilities. Dr. Salmi is the parent of an adult son with developmental disabilities and has worked as an interior designer for over 20 years.



She is the recipient of the 2003 American Society of Interior Designers (ASID) Education Foundation/Joel Polsky Academic Achievement Award for her master's thesis (see reference below) and the Citation of Special Recognition, Graham Foundation for Advanced Studies in the Fine Arts (2005) as part of the Carter Manny Award competition in architecture for her proposed doctoral thesis (see reference below). Dr. Salmi lectures frequently at national and international conferences.

References

- Americans with Disabilities Act (ADA) of 1990, Part III, P.L. 101-336, 42 United States Congress, III Congressional Record (1990).
- Arthur, P., & Passini, R. (1992). *Wayfinding: People, signs, and architecture*. New York: McGraw-Hill.
- Golledge, R. (Ed.). (1999). *Wayfinding behavior: Cognitive mapping and other spatial processes*. Baltimore: Johns Hopkins University Press.
- Salmi, P., Ginthner, D., & Guerin, D. (2002). *An exploration of critical factors for accessibility and wayfinding for adults with mental retardation*. Unpublished master's thesis, University of Minnesota.
- Salmi, P., Ginthner, D., & Guerin, D. (2004). *Critical factors for accessibility and wayfinding for adults with intellectual disabilities*. Designing For The 21st Century III: An International Conference on Universal Design. Adaptive Environments: Boston, MA.
- Salmi, P., & Guerin, D. (2007) *Identifying and evaluating critical environmental wayfinding factors for adults with intellectual disabilities*. Unpublished doctoral dissertation, University of Minnesota.

Related Research Summaries

InformeDesign has many Research Summaries about wayfinding and other, pertinent, related topics. This knowledge will be valuable to you as you consider your next design solution and is worth sharing with your clients and collaborators.

“Age Affects Wayfinding”

—*Journal of Gerontology: Psychological Services*

“Color Aids Wayfinding for Young Children”

—*Early Childhood Education Journal*

“Interior Signage Design Influences Wayfinding”

—*Perceptual and Motor Skills*

“Navigating the Interior Environment”

—*Journal of Environmental Psychology*

“Wayfinding in Large Hospitals”

—*Environment and Behavior*

“Unreadable Signs Can Cause Problems for Older Adults”

—*Journal of Interior Design*

“Using Plans to Analyze Visibility”

—*Environment and Planning B: Planning and Design*

Photos Courtesy of:

Patricia Salmi, University of Minnesota



InformeDesign[®]
Where Research Informs Design

The Mission

The Mission of InformeDesign is to facilitate designers' use of current, research-based information as a decision-making tool in the design process, thereby integrating research and practice.

Creator:

UNIVERSITY OF MINNESOTA

Founding Sponsor:

