Designed Memories: How can the built environment affect memories

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Designed Memories

How can the built environment affect memories

Jared Schneider | Bachelor Of Science (BS) in Interior Architecture and Design 2023-2024 | Western Michigan University
Project Introduction

The inception of this research project finds its roots in a personal narrative of frequent childhood relocations. Recalling each of the diverse homes I once lived in, I found myself in possession of distinctive memories tied to various elements within these spaces. These recollections ranged from the home’s layout, color palette, smell, to the very texture of the flooring. While these residences provided the canvas for memory creation, the triggers for preserving those moments proved to be inconsistent. This curious observation kindled my interest in understanding the nature of memories and how the physical environment of a home influences their formation.

Further exploration led me to uncover the multifaceted encoding processes employed by our brains to convert incoming information into a store-able and retrievable format. This knowledge sparked the interest into how individuals with disabilities or impairments experience the memory-making process. My research unveiled compelling evidence that those with disabilities or impairments face substantial challenges when creating memories.

Memory loss not only strips away the ability to recall but also erodes independence. Daily tasks become challenges, and routines morph into uncharted territory. This loss extends beyond physical limitations, reaching the core of one’s identity. Dependence becomes burdensome, and the sense of self becomes a drifting ship in a sea of fragmented recollections.

This research project aims to demonstrate how well-designed spaces can offer equal opportunities for memory creation, regardless of the presence of impairments or disabilities, fostering a more inclusive and memory-enriching environment for all.

Addressing disabilities and impairments

This revelation prompted a critical examination of residential design, as I noticed that commercial spaces are generally compliant with the Americans with Disabilities Act (ADA) guidelines, yet residential spaces often lack in considering the needs of individuals with disabilities or impairments. Such considerations typically occur as an afterthought or, in rare instances, when customized for the specific user. This state of affairs leaves most residential homes ill-suited for those with disabilities or impairments, thereby potentially limiting their ability to create positive memories.

A comprehensive study of memory necessitates an inquiry into memory loss and the challenge of retaining information. By delving into the vulnerabilities of the human brain and assessing two prevalent theories, the Decaying theory and the Interference theory, we can gain deeper insights into the intricate workings of memory.

This research endeavors to unearth the profound role of encoding in shaping information into memories and the manner in which disabilities or impairments can disrupt this crucial cognitive process. Furthermore, it underscores the potential of designed spaces not only to stimulate memory creation but also to enhance the likelihood of preserving these cherished recollections.
Research Objectives

There are three Objectives that this research is striving to achieve. The first objective being to gain a deep understanding for how memories work, and the process in which the brain takes information and reformats it to be stored. The second objective is to have a strong understanding of how having a disability or impairment can affect the process in which the brain reformats the information.

The third objective is to understand how and why memory loss occurs. Reverse engineer this to come to a sensible way to incorporate a designed element into a space, that can help strengthen the brain improving memory retention.

Key Research Topics

The first research topic is looking into what memories are, learning the types of memory storage, and the different processes there are to encode information.

The second research topic is memory loss, learning how memory loss occurs, how to prevent it, and what can do to help once it has already begun.

Research Methods

1. Web Research
2. Case Studies
3. Expert Interview
4. Precedent Studies
5. Field Visits

Research Sections

1. Memory
2. Memory Loss
3. Disabilities and Impairments

Fig. 5
Fig. 6
Fig. 7
Fig. 8
Fig. 9
What is Memory?
Memories refer to the psychological processes of acquiring, storing, retaining, and later retrieving information.

Types of Memory Storage

Short Term
Short-term memory comprises two components: conventionally labeled as “Short-Term Memory” and “Working Memory.” In short-term memory, the brain temporarily stores information for immediate repetition, like recalling a phone number seen on TV. Working memory involves the storage of information for the purpose of manipulation, such as remembering a set of numbers while solving a math problem.

Long Term
The long-term memory process enables information to persist in the brain for an extended duration, and there are no exemptions from potential risks within the brain. Information stored in long-term memory can endure for a brief period (a day, a week) or extend throughout an entire lifetime. You remember implicit memories automatically, like driving a car or You are aware you are actively trying to remember explicit memories.

Encoding
Encoding is the method by which information is acquired. It involves the intake, comprehension, and modification of information to enhance its storage capabilities.

1. What is Memory?
2. Acquiring Memories
3. Short Term Storage
4. Long Term Storage
5. Encoding

Overview

Neurons, as nerve cells, facilitate the transmission of information to the brain. Synaptic bulbs connect with other neurons, enabling the transfer of information through them, much like the flow of electricity.
Imagine your eye as a camera, and inside it, there’s a special molecule called retinal that helps you see. This molecule can grab onto different types of light. Now, there’s a partner to retinal called cis-retinal, and together they hang out in a protein called rhodopsin. When light comes in, it’s like a signal to the retinal, and it changes its shape. This change makes rhodopsin turn into a super-active form called meta-rhodopsin. Now, this is where the party starts.

There’s a team player called transducin that comes into play, and it helps rhodopsin change some chemicals around. This change, in turn, closes some special channels that usually let sodium in when it’s dark. Here’s the cool part: when this happens, it’s like the signal is telling your brain that it’s getting brighter. This message is sent through a decrease in a chemical called glutamate. So, in simple terms, when light hits your eyes, it sets off a chain reaction that sends a message to your brain saying, “Hey, it’s bright out here!”

1. Examples
2. Receptors of Vision
3. Pros and Cons
Fig. 17


Pros

- Improved Recall Of Visual Information
- Faster Encoding
- Increased Accuracy
- Enhanced Comprehension

Cons

- Limited by Visual Perception
- Limited Capacity
- Misleading Visuals
- Subjective Interpretation

Visual Encoding
Acoustic Encoding

Overview

1. Examples
2. Receptors of Hearing
3. Pros and Cons

Examples of Acoustic Encoding

- Remembering a Warning Sound
- Learning a Foreign Language
- Recollecting a Teachers Lecture

Receptors of Hearing

Let’s talk about how our ears pick up sounds. When a noise happens, it makes waves that go into our ears, making our eardrums vibrate. This vibration then moves through three tiny bones called the malleus, incus, and stapes. The stapes is like a super amplifier—it takes that vibration and sends it to the cochlea, which is a part of our ear filled with liquid. Inside the cochlea, there are layers like the scala vestibuli, scala media, and scala tympani. On the basilar membrane, there’s a cool thing called the organ of Corti, which has hair cells on where the message comes from in the cochlea.

These hair cells are like little sensors for sound. There are two kinds: inner ones talk to the brain, and outer ones help boost quieter sounds. When the sound makes the hair cells bend, it opens some special channels, letting in ions. This causes a change in electrical charge, kind of like flipping a switch. This change helps send a message to the brain through the auditory nerve, using a chemical messenger called glutamate. The brain then figures out what the sound is based on where the message comes from in the cochlea.

Acoustic Encoding

Fig. 21

Pros

- Enhances Multi-Sensory Learning
- Promotes Active Learning
- Supports Learning
- Boosts Memory Retention

Cons

- Susceptibility to Interference
- Limited Capacity
- Similarity Confusion
- Language and Cultural Barriers

Proprioception constitutes an extensive sensory system crucial for understanding the spatial relationships among different body parts and the body's orientation. This system gathers information from various sources, including our eyes (exteroreceptors), muscles, and joints.

Nociceptors act as body alarm systems, signaling when there's pain from heat, pressure, or harmful chemicals, specifically alerting to tissue damage. Markers increase in damaged areas, binding to receptors and triggering the pain signal, whether internally or externally. These systems have specialized channels activated by extreme temperatures or harmful chemicals. Two fiber types, A-delta and C fibers, carry pain messages—C-fibers for hot, pressurized, or chemical-related sensations, and A-delta for hot or pressure-related messages. The alarm systems use chemicals, primarily glutamate, along with substances like substance P, calcitonin gene-related peptide, and somatostatin, working together to ensure our brain receives the pain signal.

The collected data encompasses details about pressure, movement, and the perception of stretching. Subsequently, the brain processes this information to form our "mind's eye," providing us with a mental representation of how our body is positioned and moving.
Tactile Encoding

Pros
- Omni-Directional
- Display 3D Information
- Works with Visual and Acoustical at the same time

Cons
- Low Bandwidth for Information Transfer
- Attention Narrowing
- May be Difficult to Detect Stimulation when Moving

Fig 25
Ways to sharpen encoding

- Using shortcuts to access information may hinder the retention of information beyond the specific shortcut being employed.
- The concept that organizing information into groups facilitates the retrieval of individual items from the group.
- Schemas and chunking can help in remembering information more efficiently.
- Deliberate practice enhances the ability to retain information.
- Consistently practicing a skill enhances the ability to retain information.
- By avoiding the constant mental effort needed to remember trivial details, such as the location of your keys, you can focus better on learning and retaining information that is more important.
- Excessive multitasking among students and young adults prevents focused attention on a single task, resulting in memory encoding failures due to insufficient attention allocation.
- Vitamin B-12 is vital for the health of nerve cells and red blood cells. Deficiency in vitamin B-12 impairs the proper functioning of nerve cells.

Fig. 26

Ways to damage encoding

- Sleep deprivation hinders the brain’s capacity to form new memories during the day. Doctors recommend a recommended 7-8 hours of sleep daily for optimal brain functioning.
- Short-term memory encoding is primarily linked to depression. The presence of depression and anxiety significantly impairs an individual’s ability to perceive and think clearly.
- Short-term use of cocaine, nicotine, and alcohol enhances hippocampus-dependent memory, but withdrawal causes disruptions. Opiates and cannabis initially impair memory, but their withdrawal is linked to memory enhancement.
- Excessive multitasking among students and young adults prevents focused attention on a single task, resulting in memory encoding failures due to insufficient attention allocation.
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Fig. 27
Memory Loss

Overview
1. Theories
2. Memory Failures
3. Alzheimer’s
4. Lewy Body Disease
5. Parkinson Disease

Why do we lose Memories?

Forgetfulness may arise from inattention or occur when the brain fails to strengthen a memory sufficiently for storage. Research proposes two primary theories explaining why memories tend to be forgotten:

- Decay Theory suggests that memories weaken over time without regular recall or practice, similar to a neglected building deteriorating without maintenance. To keep memories strong and stable, it’s essential to revisit or practice them regularly.
- Interference Theory suggests that when the brain receives new information, it can replace old information, leading to difficulties recalling the previous details (i.e., forgetting an old password after creating a new one).

Types of Memory Failures

- Transience occurs when memories may become harder to access over time, either due to the natural aging process or damage to the hippocampus and temporal lobe.
- Absent-mindedness involves lapses in attention leading to forgetting tasks.
- Blocking occurs when memories are temporarily inaccessible, also known as “tip-of-the-tongue syndrome.”
- Suggestibility refers to the incorporation of misinformation into memories, often triggered by leading questions.
- Bias occurs when memories are distorted due to your knowledge and belief systems.
- Persistence is the condition where undesired memories, as seen in post-traumatic stress disorder, cannot be forgotten.
- Misattribution is the act of attributing memories to an incorrect source or mistakenly believing you have encountered something you never experienced.
Overview

1. Theories
2. Memory Failures
3. Alzheimer’s
4. Lewy Body Disease
5. Parkinson Disease

Alzheimer’s Disease

1. Theories
2. Memory Failures
3. Alzheimer’s
4. Lewy Body Disease
5. Parkinson Disease

The presence of beta-amyloid protein accumulation outside neurons and the formation of twisted strands of tau protein inside neurons are distinctive features.

Symptoms and Signs of Alzheimer’s

Early signs often include challenges recalling recent conversations, names, or events, along with feelings of apathy and depression. Subsequent symptoms may involve communication issues, forgetfulness impacting daily life is a common early sign of Alzheimer’s dementia, often accompanied by repetitive questioning and increased dependence on memory aids or family assistance for previously independent tasks.

Challenges in planning or problem-solving may involve difficulty adhering to plans, handling numerical tasks, following familiar recipes, managing bills, concentrating, and increased time to complete tasks compared to before. This may include difficulties in driving to familiar places, organizing a grocery list, or recalling the rules of a favorite game. Things not happening immediately, occasionally forgetting their current location or how they got there, in judging distance, and difficulties determining color and contrast may arise, leading to issues with tasks such as driving to retrace their steps, and may even accuse others of theft, particularly as the disease advances.

Depression, fear, or anxiety. They may easily get upset in various settings, including home, work, with friends, or outside their comfort zones.

What causes Alzheimer’s?

The characteristics are accompanied by the loss of neurons and damage to brain tissue. Additionally, changes such as inflammation and atrophy of brain tissue occur.


Lewy Body Dementia

Overview
1. Theories
2. Memory Failures
3. Alzheimer’s
4. Lewy Body Disease
5. Parkinson Disease

What causes Lewy Body Dementia? 
Lewy bodies are clusters of the protein alpha-synuclein that form abnormally in neurons. If these clusters develop in the cortex of the brain, it can lead to dementia, known as dementia with Lewy bodies or DLB.

Signs and Symptoms of Lewy Body Dementia?
Difficulty with attention, planning, multitasking, problem-solving, and reasoning is common. While memory problems may exist, they might not be readily apparent in the early stages.

Challenges with visual and spatial abilities, including difficulty judging distance and depth or misidentifying objects, may arise.

Fluctuations in concentration, attention, alertness, and wakefulness can be unpredictable.

Visual hallucinations are common in individuals with LBD, occurring in up to 80%, often in the early stages.

Changes in movement, such as tremors or muscle stiffness, are referred to as parkinsonism.

Sleep disturbances, encompassing rapid eye movement (REM) sleep behavior disorder where individuals act out dreams, irregular sleep patterns involving excess or insufficient sleep, and restless leg syndrome, can occur.

Depression, diminished interest, anxiety, delusional thoughts, and other shifts in mental health can occur.

Heightened sensitivity to temperature, dizziness, diminished sense of smell, and other alterations in the body’s automatic functions may occur.

References:
Fig. 30
Diagnosis
Positron Emission X-Ray
Single-Photon Emission CT Scan
Sleep Study

Fig. 31
Diagnosis and Treatment
Treatments
Antidepressants
Cholinesterase Inhibitors
Antipsychotic Drugs


What causes Parkinson’s Disease?

Clusters of the protein alpha-synuclein emerge in the substantia nigra, a deep area in the brain. These clusters are believed to contribute to the degeneration of nerve cells producing dopamine. As Parkinson’s disease advances, alpha-synuclein can also accumulate in the cortex.

Signs and Symptoms of Parkinson Disease?

Parkinson’s has four main symptoms:
- Tremor in hands, arms, legs, jaw, or head
- Muscle stiffness, where muscle remains contracted for a long time
- Slowness of movement
- Impaired balance and coordination, sometimes leading to falls

Other symptoms may include:
- Depression and other emotional changes
- Difficulty swallowing, chewing, and speaking
- Urinary problems or constipation
- Skin problems

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Fig. 32: Diagnosis

Neurological Exam

MRI

DaT Scan

Fig. 33: Diagnosis and Treatments

Treatments

Deep Brain Stimulation

Physical Therapies

Massage Therapies
Aiming for around eight hours of sleep each night is crucial for memory consolidation, discarding unnecessary information, and promoting essential growth hormones for neuronal health. Neuronal decline can begin in our 20s, emphasizing the importance of ensuring adequate sleep for cognitive well-being.

Maintaining brain health relies on social interaction. Engaging in stimulating conversations with friends and family keeps our minds active and challenged. Additionally, socializing triggers the release of serotonin and oxytocin, fostering stable moods and encouraging positive thinking.

Regular exercise promotes both physical and mental well-being by triggering the release of dopamine in the brain, associated with pleasure and motivation, thereby reducing stress and anxiety.

Challenging activities like learning a new language, playing chess, or solving puzzles maintain optimal brain health by promoting mental activity and engagement, leading to improved overall functionality.

Our brain health is influenced by our diet. Choosing nutrient-rich foods like fruits, vegetables, and whole grains supports optimal function, while limiting processed meats and sugary drinks can reduce the risk of diseases like Alzheimer’s.

Sleep deprivation hinders the brain’s capacity to form new memories during the day. Doctors recommend a recommended 7-8 hours of sleep daily for optimal brain functioning.

Short-term memory encoding is primarily linked to depression. The presence of depression and anxiety significantly impairs an individual’s ability to perceive and think clearly.

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Vitamin B-12 is vital for the health of nerve cells and red blood cells. Deficiency in vitamin B-12 impairs the proper functioning of nerve cells.
Precedent Studies

Overview

1. DIY SOS Home
2. SO & SO Studio Home
3. Heritage Community
Project Overview

Erected in February 2018, this dwelling was meticulously crafted to cater to the needs of a family confronting impairments and disabilities. Stuart, a single father grappling with multiple sclerosis—a condition impacting the central nervous system, leading to difficulties in speech, writing, and walking—is the focal point of this unique household. Lin, Stuart’s mother and primary caretaker, has navigated life with legal blindness since her twenties. The family is further comprised of Stuart’s 15-year-old daughter, Lauren, who also calls this specially designed residence home.

Projects Three Core Objectives:

1. Enable Stuart to navigate the home effortlessly in his wheelchair.
2. Grant Lauren the autonomy to have her personal space.
3. Facilitate Lin’s permanent relocation into the home, ensuring accessibility for her visual impairment.

How They Achieved these Core Objectives:

1. Repositioning the front door and staircase to create the necessary space for wheelchair maneuverability.
2. Incorporating voice-activated windows, blinds, and lights for seamless accessibility for both Stuart and Lin.
3. Utilizing minimal loose furniture pieces and diverse textiles in Lin’s room.
4. Adding an extra kitchen specifically for Lin to alleviate any concerns about the placement of items.
5. Establishing distinct “zones” within the home through the use of various flooring types.
   - Tile
   - Carpet
   - LVT
Project Overview

Constructed in 2018 for a woman with visual impairment, this residence was meticulously crafted using the principles of “natural adjustment and way-finding.” During the space planning phase, the designers collaborated closely with the end user to map out the customary paths she navigated, promoting an intuitive organization that minimized the time required for the client to familiarize herself with the layout of the home.

The residence is designed with a central spine corridor strategically incorporated to eliminate any maze-like confusion and optimize efficiency in navigation. This central pathway seamlessly connects through three entry points—the garage, front door, and patio—providing convenient access to all exits throughout the home.

Employing the concept of a “simple glyphic language,” wherein images or figures convey words, they harnessed this linguistic approach for way-finding. Utilizing a combination of stone and wood in the flooring, they ingeniously devised a series of symbol combinations to craft their unique and intuitive language.
Since 1945, Heritage Community has established a lasting legacy of dynamic senior living in West Michigan, demonstrating a commitment to delivering exceptional personalized care for seniors and families. Nestled in one of Kalamazoo’s historic neighborhoods, it stands as the sole locally-owned, non-profit senior living residence in the region. Guided by values of honor, community, and purposeful living, their mission is to empower you to continue embracing life to the fullest. That’s why, at Heritage Community, they provide diverse care options tailored to your preferences and needs, all while accommodating your financial considerations. The choice is yours to make, as their devoted staff ensures that, regardless of your selection, you experience freedom, comfort, and peace of mind in the seasons to come.

Nestled within the heart of Heritage Community, a haven awaits those seeking a respite for their sensory well-being. Here, a meticulously crafted sensory room stands as a testament to the commitment to providing a holistic and nurturing environment for the residents. This thoughtfully designed space is dedicated to accommodating a multitude of sensory needs.

As you step into this sanctuary, you’ll find yourself enveloped in a haven of tranquility. Textured furniture, carefully chosen for its tactile appeal, invites you to experience the comforting touch of your surroundings. The air is gently infused with the scent of burning candles, casting a soft and soothing ambiance throughout the room. This creates an atmosphere reminiscent of the familiar comforts found within the walls of one’s own home.

Every element of this sensory room is meticulously curated to foster a sense of calm and security. The overall design is a symphony of elements working in harmony, carefully orchestrated to replicate the intimate and reassuring feeling of being in one’s personal home.

Each room is adorned with a personalized case situated on its exterior, tailored uniquely for every resident. Within these cases, a concise biography detailing the resident’s identity and life story may be encapsulated, or alternatively, a symbolic photo representing them. This thoughtful approach not only facilitates residents in effortlessly locating their assigned rooms but also provides caretakers with convenient means to acquaint themselves with the individual nuances and histories of each resident.
The site is located on the corners of EG Ave and N 28th St in the Comstock Chartership within Kalamazoo County, Michigan. The conditions of the site are very flat as it is currently being used 26 acres of agricultural land. The site is located close to many restaurants and two grocery stores as well as many utilitarian shops, like Menard’s, Discount Tire and a Urgent Care Facility.
Demographic
Population: 15,229
- Annual Income: 39,272
- Median Household Income: 74,451
- Poverty Rate: 5.9%
- Number of Households: 6,132
- Persons Per Household: 2.5
- Mean travel Time to Work: 20.1 Min
- Number Of Housing Units: 6,407
- Median Value of Housing Units: 198,700

Geographical Mobility: 12.1%

Sex, Race and Ethnicity

Climate

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Situated amidst two established neighborhoods, the location enables residents to engage in numerous social interactions with their neighbors from these adjoining areas.

The vicinity of the site includes a diverse range of restaurants such as Applebee’s, Los Amigos, Qdoba, Penn Station, and many others. This proximity facilitates community residents in connecting with each other.

The site is situated in close proximity to Gull Meadow Farms, a family-friendly destination offering a variety of enjoyable activities like corn mazes, wagon rides, and even an apple cannon. This provides an opportunity for residents to engage with fellow community members.

Down the street, you’ll find two distinct churches, each offering a welcoming community that residents can become a part of. These places of worship provide not only spiritual enrichment but also serve as hubs for social connections and shared values.
Maintaining mental activity is essential for enhancing memory retention, and the recreational room at the Heritage Community Memory Center serves as an excellent illustration of this principle.

The ability to foster community growth is a notable advantage when conceptualizing a socially focused community. The design of Palm Jebel Ali serves as an outstanding illustration of a layout that does this.

Establishing a sensory-rich environment is vital for memory retention, exemplified in the SO & SO Studio home through diverse flooring finishes for delineation and a tactile-rich atmosphere.

Distinguishing spaces through the choice of flooring materials can be beneficial for individuals with visual impairments, aiding them in navigating and understanding their surroundings. The DIY SOS home serves as a notable illustration of this principle.
Square Foot Analysis

Ranch Style Home:
Total Square feet: 1,800

Duplex:
Total Square feet: 3,000

Recreation Center:
Total Square feet: 2,600

Adjacencies

Fig. 72
Fig. 73
Fig. 74
Fig. 75
Fig. 76
Fig. 77
In this version of the duplex, the utility and laundry rooms are positioned in close proximity, sharing a common wall for electrical and plumbing connections. Situated adjacent to the dining room, this arrangement could potentially lead to noise disturbances if residents are doing laundry during dinner.

In this duplex design, the utility and laundry rooms are positioned back to back, facilitating a shared wall for both electrical and plumbing components. This configuration is situated beside the half bath, promoting streamlined plumbing connections.
Iterations Cont.

This is the first iteration of the ranch-style residence, opting for a central spine layout inspired by research findings indicating its benefits for individuals experiencing memory loss.

In this version of the ranch-style home, the utility, laundry, and storage areas have been situated at the rear, ensuring natural privacy when guests are present.

This version places the garage at the rear for a more secluded entrance, conveniently positioned next to the kitchen to minimize travel distance when unloading groceries.

In this iteration, a more linear layout is adopted to emphasize the concept of a central spine in the home’s design.

In this version of the recreation center, the seamless circulation of space is facilitated, with the lobby serving as the central hub of the building.

In this version of the recreation center, the indoor pool takes center stage as the focal point upon entering the building.
Bubble Diagrams

Recreation Center

Duplex

Duplex

Ranch Style Home
Evaluation Process and Methods

Who will be Evaluating the work?
During the design phase, I plan to seek input from a diverse group consisting of professionals and regular users. This team will comprise individuals such as Amy Beach from Heritage Community, Jen Iocca from Tender Care, and Tony and Darlene Iocca.

How will the work be Evaluated?
Throughout the design iterations, I will engage in meetings with the individuals to present my concepts using a combination of stereo panoramas and a tangible model. This approach will provide my evaluators with a comprehensive experience, allowing them to visually and physically engage with the spatial designs. Following the review by all evaluators, I will compile the feedback received and use it to delve into various spatial design alternatives until reaching the ultimate design solution.

Evaluating Elements

Functionality
Assessing a space’s functionality in the design phase is crucial for an optimal user experience. This involves analyzing spatial layout, emphasizing accessibility, and allowing smooth circulation to support its intended purpose. This enhances overall usability and user satisfaction.

Experiential
In designing a space, evaluating experiential factors is ideal for creating a memorable user experience. Consideration of lighting, acoustics, materials, and sensory elements shapes the ambiance. Looking at spatial flow, comfort, and the emotional impact of design choices ensures that the space aligns positively with its users, boosting engagement and satisfaction.

Sensory
When designing a space, assessing sensory elements is vital. Under the impact of experience, this involves analyzing spatial layout, emphasizing accessibility, and allowing smooth circulation to support its intended purpose. This enhances overall usability and user satisfaction.
The integration of soft pastel colors serves the purpose of fashioning a visual environment that is not only visually gentle but also ensures ease of legibility. By opting for these subtle and muted tones, the design aims to mitigate any harshness that might be associated with bolder color choices. The result is a harmonious and aesthetically pleasing palette that maintains a delicate balance between a soothing visual appeal and the practicality of clear readability.

Color is employed to denote the areas where different sensory systems will be applied: tactile areas are represented by yellow, acoustical areas by green, and visual areas by blue. Utilizing every surface serves to enhance the sensory richness of the space.

Employing solid and bold colors allows for effortless readability within the image, ensuring a distinct separation of various areas designated for the implementation of different sensory experiences. This deliberate choice of vibrant hues enhances the clarity and differentiation of each sensory zone, contributing to a visually organized and easily comprehensible composition.

Adopting the soft pastel colors from the previous iteration, the furniture has undergone a transformation to a solid yellow shade, accompanied by a reduction in opacity. This adjustment not only contributes to a visually soothing experience but also places emphasis on the furniture selections by subtly upping their intensity. The result is an eye-friendly ambiance that strategically highlights and brings attention to the chosen furniture pieces.

Fig. 89

Fig. 90

Fig. 91
The living space is presented with a distinctive entrance featuring a rock wall, complemented by a moss-paneled wall. Various fabrics are strategically incorporated, offering an enriched tactile experience and a diverse range of visual senses. Additionally, the ceiling is equipped with a speaker system, providing an acoustical sensory dimension to the overall atmosphere.

Expanding on the features from previous iterations that cater to tactile and acoustical senses, this version introduces a change in ceiling height. The addition of a clear story not only enhances the visual experience, creating a more sensory-rich environment but also allows entry of more natural light into the space.
Expanding on the variety of ceiling options, this iteration incorporates a vaulted ceiling, maintaining the heightened ceiling from the previous version while introducing a different visual effect.

Utilizing a model offers a tactile method to explore different furniture layouts. Integrating this with a stereo panorama provides both a hands-on and visual perspective when examining the space.
Prototyping

In this version, seating for four people is arranged in a corner, ensuring seamless circulation through the space. However, it’s important to note that this iteration is not compliant with ADA accessibility standards.

In this version, seating for five people is arranged in a corner, ensuring seamless circulation through the space. However, it’s important to note that this iteration is not compliant with ADA accessibility standards.

In this version, seating for six is accommodated in a layout designed for effortless circulation through the center of the space. It’s noteworthy that this iteration is ADA-friendly, adhering to accessibility standards.

In this version, the seating arrangement accommodates six individuals while facilitating smooth circulation throughout the space. Notably, this layout is more ADA-friendly due to the absence of a coffee table in front of the couch.
Design Response

Overview

1. Floor Plan
2. Living Room
3. Bedroom
4. Dining Room
5. Kitchen
6. Back Patio

The floor plan incorporates curves to help with navigation. This design approach, often seen in places like casinos, allows users to move seamlessly through the space without having to consciously decide on directions, instead flowing naturally with the space's circulation.
The living room leverages its integrated curvature to enhance visual interest, complemented by a variety of materials and colors within those materials to bolster visual encoding.

The living room is designed to be ADA accessible, featuring a range of materials including stone, wood, carpet, moss and a mix of fabrics. This design not only enhances tactile and visual experiences but also serves a tertiary purpose by improving acoustics through moss paneling on the walls.

During the day, the clear story windows and regular windows provide natural illumination. At night, artificial lighting from ceiling can lights and end table lamps brightens the space. The strategically placed can lights also assist with way finding.

The living room is designed to meet ADA accessibility standards, offering an easily maneuverable and spacious layout.

The living room has speakers installed on the walls to aid in acoustical encoding.

The living room features a variety of materials like carpet, wood, stone, moss, leather, and canvas to enhance tactile encoding.
The bedroom incorporates a variety of materials like carpet, wood, stone, and moss to enhance tactile encoding. This continuity in materiality from the living room fosters a sense of familiarity in the space and contributes to the feeling of being at home.

The bedrooms are designed to meet ADA accessibility standards, offering an easily maneuverable and spacious layout.

The bedroom utilizes a range of natural light sources such as a skylight, clear story, and window to enhance visual interest, complemented by a variety of materials and colors within those materials to strengthen visual encoding.

Speakers are mounted on the walls of the bedroom to assist with acoustical encoding.

This bedroom is designed to be ADA accessible and features a variety of materials such as stone, wood, carpet, moss and a mix of fabrics. These materials enhance both tactile and visual experiences. Additionally, the moss paneling on the walls serves a tertiary purpose by improving acoustics.

During the day, natural light from the clear story, window, and skylight brightens the room. At night, artificial lighting provided by ceiling can lights and bedside lamps illuminate the space.
The dining room features a range of materials like wood, stone, and nylon to enhance tactile encoding. This continuity in materiality from the rest of the home fosters a sense of familiarity in the space and contributes to the feeling of being at home.

The dining room is designed to meet ADA accessibility standards, offering an easily maneuverable and spacious layout.

The dining room is ADA accessible, featuring a mix of materials like stone, wood and a mix of fabrics. These materials enhance both tactile and visual aspects, providing comfort and aesthetics while meeting accessibility standards.

Speakers are mounted on the walls of the dining room to assist with acoustical encoding.

During the day, natural light from clear stories and sliding doors illuminates the space, while at night, ceiling can lights provide artificial lighting. These lights also serve to assist in way-finding.
The kitchen is ADA accessible, featuring a mix of materials like stone, and wood. These materials enhance both tactile and visual aspects, providing comfort and aesthetics while meeting accessibility standards.

The Kitchen has speakers installed on the walls to aid in acoustical encoding.

The kitchen utilizes its integrated curvature to enhance visual interest, complemented by a range of materials that follow this curvature and incorporate colors to enhance visual encoding.

The Kitchen is designed to meet ADA accessibility standards, offering an easily maneuverable and spacious layout.

During the day, natural light from clear stories and sliding doors illuminates the space, while at night, ceiling can lights provide artificial lighting. These lights also serve to assist in way-finding.
The back patio incorporates a variety of materials like wood, stone, and nylon to enhance tactile encoding. This continuity of materials from indoors to outdoors fosters a sense of familiarity in the space and contributes to the feeling of being at home.

The back patio is designed to meet ADA accessibility standards, offering an easily maneuverable and spacious layout.

The back patio leverages its curved structure to enhance visual appeal and strengthen visual encoding.

Speakers are mounted on the walls of the back patio to assist with acoustical encoding.

The back patio is ADA accessible, featuring a mix of materials like stone, and wood, and nylon. These materials enhance both tactile and visual aspects, providing comfort and aesthetics while meeting accessibility standards.
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Memory:

Topic: How Memory Works


Abstract: Memory is the ongoing process of information retention over time. Because it makes up the very framework through which we make sense of and take action within the present, its importance goes without saying. But how exactly does it work? And how can teachers apply a better understanding of its inner workings to their own teaching? In light of current research in cognitive science, the very short answer to these questions is that memory operates according to a “dual-process,” where more unconscious, more routine thought processes (known as “System 1”) interact with more conscious, more problem-based thought processes (known as “System 2”). At each of these two levels, in turn, there are the processes through which we “get information in” (encoding), how we hold on to it (storage), and how we “get it back out” (retrieval or recall). With a basic understanding of how these elements of memory work together, teachers can maximize student learning by knowing how much new information to introduce, when to introduce it, and how to sequence assignments that will both reinforce the retention of facts (System 1) and build toward critical, creative thinking (System 2).

Synthesize: This source gave me a good idea of how memory works, teaching me about the dual process theory, encoding, memory storage, and ways to improve memory recalling. This being from a reputable source like Harvard University I was able to get a good base understanding of the general ideas surrounding memory and gave me avenues in which to further research.
Abstract:
As we grow older, we all start to notice some changes in our ability to remember things. Maybe you’ve gone into the kitchen and can’t remember why or can’t recall a familiar name during a conversation. You may even miss an appointment because it slipped your mind. Memory lapses can occur at any age, but we tend to get more upset by them as we get older because we fear they’re a sign of dementia, or loss of intellectual function. The fact is, significant memory loss in older people isn’t a normal part of aging—but is due to organic disorders, brain injury, or neurological illness, with Alzheimer’s being among the most feared. Most of the fleeting memory problems that we experience with age reflect normal changes in the structure and function of the brain. These changes can slow certain cognitive processes, making it a bit harder to learn new things quickly or screen out distractions that can interfere with memory and learning. Granted, these changes can be frustrating and may seem far from benign when we need to learn new skills or juggle myriad responsibilities. Thanks to decades of research, there are various strategies we can use to protect and sharpen our minds. Here are seven you might try.

Synthesize:
This source was published in March of 2020, in which it goes over 7 different ways a person no matter the age can strengthen their memory. This source being from a reputable university like Harvard I was given the opportunity to expand my knowledge in how to strengthen your ability to recall memories.

Topic: Memory Encoding

Abstract:
What is Memory Encoding? Memory Encoding is the initial learning of information. It is how the information coming from sensory input is changed into a form so it can be stored in the brain. Encoding is transforming internal thoughts and external events into short term and long-term memory. This is the process in which the information is processed and categorized for storage and retrieval. It is a crucial first step in creating a new memory. Memory encoding converts the perceived item or event into a construct that can be stored and recalled later from the brain. For example, when we see a new object, such as a word, our retina sends the visual signal to the brain through the optic nerve. Then it goes through a lot of twists and turns before reaching temporal and parietal lobes. The job of these structures of the brain is to let the person knows that this information is a word. This journey of information is just the initial step which is known as memory encoding. The information has to go through this process so that it can be understood in a meaningful way. There are many types of encoding which we will discuss later in this article.

Synthesize:
This source goes over the types of encoding as well as some of the problems that can have a negative effect on encoding. This was published in September of 2023 allowing me to gain a solid base of knowledge in this area, allowing for further exploration into different types of encoding.
Topic: Walking through doorways causes forgetting: Further explorations

Citation:

Abstract:
Previous research using virtual environments has revealed a location-updating effect in which there is a decline in memory when people move from one location to another. Here we assess whether this effect reflects the influence of the experienced context, in terms of the degree of immersion of a person in an environment, as suggested by some work in spatial cognition, or by a shift in context. In Experiment 1, the degree of immersion was reduced by using smaller displays. In comparison, in Experiment 2 an actual, rather than a virtual, environment was used, to maximize immersion. Location-updating effects were observed under both of these conditions. In Experiment 3, the original encoding context was reinstated by having a person return to the original room in which objects were first encoded. However, inconsistent with an encoding specificity account, memory did not improve by reinstating this context. Finally, we did a further analysis of the results of this and previous experiments to assess the differential influence of foregrounding and retrieval interference. Overall, these data are interpreted in terms of the event horizon model of event cognition and memory.

Synthesize:
This source was published in 2011 and therefore was further out of date than wanted. It goes over a case study about people's "location-updating effect" and how some people lose their ability to remember things when moving through thresholds. This was a very interesting source but will most likely not be used.

Topic: Can design influence memory?

Citation:

Abstract:
Have you ever rushed across your house to get something from another room, but by the time you got there you completely forgot why you were there? This might seem like a trivial question for architects, but it might have more to do with architecture than you might think. Your memory appears to be affected by how many doorways and rooms you go through. This sounds absurd, but a recent study published in The Quarterly Journal of Experimental Psychology has been able to measure this effect at several different levels of environmental immersion. The study comes out of Norte Dame Psychology Professor Gabriel Radvansky's lab. Much of Professor Radvansky's work explores how spatial organization can influence the mental narratives we construct to learn, retain and apply information. Radvansky believes, "many architects already intuitively grasp many of the concepts work examines, but research could further improve their understanding of how spatial design affects a building's users."

Synthesize:
This source was published in 2011 and therefore was further out of date than wanted. It goes over environmental immersion and how when moving from one room to another people have tendencies to forget what they are looking for. This was a very interesting source but do to the time frame in which it was published it will most likely not be used.
Topic: Architecture: Space, Place, and Memory

Citation:

Abstract:
This short essay discusses the dialectic relation between architecture and memory. The essay points out how architecture captures past and present memory. Spatial imagery and creative architectural design have an impact upon our reasoning and upon making sense of the world. Living in a society has an impact on received traditions and the continuing legacy of collective memory passed on from one generation to the other.

Synthesize:
This source was published in 2015 which put its around the limit of usable information. It talks about how architecture captures past and present memories. While the article was interesting and I learned somethings, I did not find it to helpful for my research and thus it will most likely not be used.

Topic: Physiology, Sensory Receptors

Citation:

Abstract:
The human body can achieve an understanding of the world through its sensory systems. Sensory systems are widespread throughout the body including those that detect the world directly from the outside (exteroceptors), those that detect information from internal organs and processes (interoceptors), and those detecting sense of position and load (proprioception). Sensory receptors occur in specialized organs such as the eyes, ears, nose, and mouth, as well as internal organs. Each receptor type conveys a distinct sensory modality to integrate into a single perceptual frame eventually. This information is achieved by the conversion of energy into an electrical signal by specialized mechanisms. In this report, we will discuss a basic overview of sensory systems, focusing on sensory receptors.

Synthesize:
This source was published in August of 2023, and goes over the different types of receptors in tactile encoding. It was a very helpful source in which I was able to further my knowledge in tactile encoding. This being published recently allowed me to gain knowledge in this area as it is known today.
**Topic: Difference Between Exteroceptors And Interoceptors**

**Citation:**

**Abstract:**
The human body contains two different kinds of sensory receptors called interoceptors and exteroceptors, both of which are essential for receiving and sending sensory data to the brain. On the surface of the body, exteroceptors are specialized nerve endings that react to external stimuli like touch, pressure, temperature, and pain. The body’s deep-lying interoceptors, in contrast, are nerve endings that react to internal stimuli such as variations in blood pressure, pH, and oxygen levels. In the domains of anatomy, physiology, and neuroscience, it is crucial to comprehend the distinction between exteroceptors and interoceptors because it clarifies how the body perceives, reacts to, and maintains internal homeostasis.

**Synthesize:**
This source was published in May of 2023 and talks about two kinds of receptors, Exteroceptors and Interoceptors. I was able to gain knowledge of these topics as they are known today due to how recent this article was published and was very helpful.

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**Topic: Proprioception: Additional Information**

**Citation:**

**Abstract:**
The balance organs in the inner ear are part of a larger sensory system that helps us know where all of the parts of the body are relative to each other, and the orientation of the body relative to gravity. This sense is called proprioception. Our proprioception system also takes in information from our eyes, and from receptors in our skin, muscles, and joints that sense stretch, pressure, and movement. The brain processes all of these sensory inputs, giving us a "mind’s eye" view of how all of our body parts are positioned and moving through three-dimensional space.

**Synthesize:**
This source talks about Proprioception which is the overall nervous system that allows humans to have balance and what is call the "eye". This article also tied in how the proprioception is connected to the receptors in the human body.
Topic: 6 Designer-Approved Ways to Create an ADHD-Friendly Home

Citation:

Abstract:
Diagnosed with ADHD as an adult, I’ve learned that what I need to thrive in my environment might look different to a neurotypical person. As an interior designer, it became evident that the latest design trends don’t consider neurodivergent symptoms. To my relief and surprise, there are easy ways to optimize your home for ADHD while avoiding the dreaded “organization tools” that tend to fall short for us. To give you the best design ideas to make your home more accessible, I turned to Katie Bowen (or @cartoonreject as she’s known to her 422.5k followers on TikTok), who launched ADHD Home TV last summer to make neurodivergence design mainstream. Keep reading to learn how to incorporate home design solutions for the most common ADHD symptoms: working memory, executive function, and concentration issues. (Especially if you’re working from home!)

Synthesize:
This source talks about how to make a ADHD friendly home. After doing some research, touch is important with people who have ADHD this article was found. This source was great for learning how different diseases react to touch and was helpful.

Topic: Tactile Memory

Citation:

Abstract:
Tactile memories are far less studied as compared to other forms of memories (Gallace and Spence, 2009), even though we now know that we can hold short- and long-lasting representations of tactile stimuli just as we do for other senses.

Synthesize:
This source had many different chapters from various books related to tactile encoding and touch. It was a very useful source as I was able to learn some of the more less mainstream topics within tactile encoding.
Topic: Efficient tactile encoding of object slippage

Citation:

Abstract:
When grasping objects, we rely on our sense of touch to adjust our grip and react against external perturbations. Less than 200 ms after an unexpected event, the sensorimotor system is able to process tactile information to deduce the frictional strength of the contact and to react accordingly. Given that roughly 1,300 afferents innervate the fingertips, it is unclear how the nervous system can process such a large influx of data in a sufficiently short time span. In this study, we measured the deformation of the skin during the initial stages of incipient sliding for a wide range of frictional conditions. We show that the dominant patterns of deformation are sufficient to estimate the distance between the frictional force and the frictional strength of the contact. From these stereotypical patterns, a classifier can predict if an object is about to slide during the initial stages of incipient slip. The prediction is robust to the actual value of the interfacial friction, showing sensory invariance. These results suggest the existence of a possible compact set of bases that we call Eigenstrains. These Eigenstrains are a potential mechanism to rapidly decode the margin from full slip from the tactile information contained in the deformation of the skin. Our findings suggest that only 6 of these Eigenstrains are necessary to classify whether the object is firmly stuck to the fingers or is close to slipping away. These findings give clues about the tactile regulation of grasp and the insights are directly applicable to the design of robotic grippers and prosthetics that rapidly react to external perturbations.

Synthesize:
This source was published in August of 2022, and goes over the ideas of object slippage. It talks about how depending on where an object is held on the fingers it can stimulate the feeling of slippage. Due to the article being published recently I was given the opportunity to learn about the topic as it is known today.

Topic: Summary of Tactile User Interfaces Techniques and Systems

Citation:

Abstract:
Mental workload can be defined as the ratio of demand to allocated resources. Multiplesource theory stresses the importance of distribution of tasks and information across various sensory channels of the human to reduce mental workload. One sensory channel that has been of interest since the late 1800s is touch. Unlike the more typical displays that target vision or hearing, tactile displays present information to the user’s sense of touch. We present a summary of different methods for tactile display; historic and more recent systems that incorporate tactile display for information presentation; advantages and disadvantages of targeting the tactile channel; and future directions in tactile display research.

Synthesize:
This Source was published in 2004 by NASA, and it goes over tactile user interfaces. I found this to be quite an intriguing read as I never thought about how astronauts use tactile encoding. This article helped me get a new understanding of tactile encoding; due to the date it was published I will most likely not use this source.
Visual Encoding:

Topic: Visual Encoding

Citation:

Abstract:
This mechanism is essential for transforming visual information, including colors, shapes, and spatial relationships, into accessible data that can be encoded and retained within an individual’s neural networks. Visual encoding is vital in various cognitive functions, such as object recognition, spatial navigation, and visual working memory. Although the brain may not recall each minute detail consciously, it can retain the overall composition, color palette, and emotional impact of a visual experience. Visual encoding is an indispensable component of human learning and memory recall. Without visual encoding, the formation and preservation of memories would become considerably more challenging.

Synthesize:
Because this source was last updated in August of 2023, the ability to understand Visual encoding as it is understood currently was given. This source allowed the understanding of what Visual encoding was and provided examples, furthering the comprehension in this topic.

How to Create a safe home for the visually impaired and totally blind people

Topic: How to Create a safe home for the visually impaired and totally blind people

Citation:

Abstract:
If someone with a visual impairment lives with you — or if you’re facing some level of blindness yourself — modifying your home makes it easier to navigate and safer to live in. Most modifications are simple, inexpensive changes that you can implement right away or over time, depending on your needs. People with low-level blindness — which describes vision that’s 20/70 or poorer and can’t be corrected — can only read the first, second, or third line on the standard Snellen eye chart from 20 feet away. Those with legal blindness have a visual acuity of 20/200 or poorer when wearing corrective lenses, which means they can only read the first, giant letter on the eye chart — or they can’t. Or their visual field — the total area you can see without moving your eyes — is 20 degrees or less, a condition known as tunnel vision. People who have low-level or legal blindness — whether it’s moderate, severe, or profound — can still perceive light and shapes, even if they can’t make out what an object actually is. Total blindness, though, is a complete lack of light and form perception. Roughly 15 percent of all people with an eye disorder experience total blindness. How you modify your home for someone with a visual impairment depends on how you live and the degree of impairment. These tips will help you cover all of the most important bases to ensure you or your visually impaired housemate can get around and locate things easily.

Synthesize:
This source allowed for the groundwork for understanding what vision impairment is and the levels to it, as well as giving examples of home modifications. Because this source was last updated in September of 2021 the concept of the current understanding of visual impairment was provided. This led to a wider understanding of this topic and gave more insight to what needed to be further researched.
## Topic: Designing homes for the visually impaired

**Citation:**

**Abstract:**
People lose their vision for a variety of reasons. Some are born visually impaired while others may suffer a traumatic accident or lose their vision due to an underlying medical condition. In addition to creating a space that is safe, you also want to design a space that boosts independence.

**Synthesize:**
Due to the title of the source, I thought I had found a good precedent study, this was not the case but none the less it was helpful. This article helped me get a understanding of different ways to design a home for the visually impaired going things like paint, flooring, and furniture.

## Topic: Modifying Homes for the visually impaired

**Citation:**

**Abstract:**
For the blind or visually impaired and their caretakers or family members, modifying homes to accommodate their changing needs is important. Changes like removing obstructions, altering colors or adding guides can make life so much easier for them. There are many different degrees of vision loss and every person is different but most can do with low-cost changes to the home. For example, those with low vision will have different needs than those with macular degeneration or those who are completely blind. Here we will go through some of the different modifications that can make life easier for those with varying degrees of vision loss. For those who want to explore this further, this guide on home modifications for the VI community adds additional information here.

**Synthesize:**
This source goes over different ways a caretaker can make a home more accessible for someone who has a visual impairment. This article was published in 2018 and gave me a good understanding of how I could design a home using this knowledge.
Topic: What to know about the different types of color blindness


Abstract: Color blindness, or color vision deficiency, refers to the inability of a person to correctly distinguish certain colors. Many people mistakenly believe that to be color blind is to view the world in only black and white, but complete color blindness is rare. A color-blind person usually has problems distinguishing certain colors, mistaking them for the same color. In our eyes, there are cells known as cones that help us differentiate colors. There are three different types of cones—one allowing us to see red, one allowing us to see green, and another allowing us to see blue. When one has color blindness, one or multiple cone types are either absent or not functioning properly, resulting in them not seeing certain colors or seeing colors differently.

Synthesize: This source was published in 2022 and goes over the different types of color blindness. I found this article very interesting and helped me understand this specific area of visual impairments. Due to this article being published recently I was able to begin understanding the topic as it is known today.

Topic: Experiencing visual impairment in a lifetime home


Abstract: Lifetime home standards (LTHS) are a set of standards aimed at making homes more accessible. Previous research, however, indicates that LTHS do not adequately meet the needs of those with sensory impairments. Now, with visual impairment set to increase globally and acknowledging the recognized link between quality of dwelling and wellbeing, this article aims to examine the experiences of visually impaired people living in lifetime homes. The objectives are to investigate existing lifetime homes and to identify whether LTHS meet occupants’ needs. Qualitative semi-structured interviews were carried out with six visually impaired people living in homes designed to LTHS in Northern Ireland. Collected data was analyzed using interpretative phenomenological analysis identifying three super-ordinate themes: (1) living with visual impairment; (2) design considerations and (3) coping strategies. A core theme of balance between psychological and physical needs emerged through interconnection of super-ordinate themes. Although there are benefits to living in lifetime homes, negative aspects are also apparent with occupants employing several coping strategies to overcome difficulties. Whilst residents experience negative emotions following visual impairment diagnoses, results suggest that occupants still regard their homes as key places of security and comfort in addition to then highlighting the need for greater consideration of specific individual needs within general guidelines.

Synthesize: This source gives me amazing insight into how people with a visual impairment look at their homes and surroundings. Since this source was last updated in 2018 it gave me a good understanding of how people with visual impairments look at the designed environment, giving me different avenues to further research.
Acoustical Encoding:

Topic: Acoustical Encoding

Citation:

Abstract:
Acoustic encoding has emerged as a fundamental aspect of human cognition. It enables the recollection and comprehension of various daily auditory experiences, ranging from conversations and music to ambient noises. For instance, acoustic encoding assists in the retention of specific melodies heard on the radio. Although the brain may not be able to recall each note and chord consciously, it can retain the rhythm and emotional characteristics of the music. Moreover, acoustic encoding is crucial in memorizing more intricate concepts, such as foreign languages. By listening to native speakers and verbally repeating words and phrases, the brain can more effectively encode linguistic sounds into its memory system. Acoustic encoding constitutes a natural cognitive process that enhances the efficiency of information retention. It is an indispensable component of human learning and memory recall.

Synthesize:
Because this source was last updated in August of 2023, the ability to understand Acoustic encoding as it is understood currently was provided. This source allowed the understanding of what Acoustical encoding was and provided examples, furthering the comprehension in this topic.

Topic: Home Visiting Programs for Families of Children who are Deaf or Hard of Hearing: A Systematic Review

Citation:

Abstract:
Prelingual hearing loss greatly restricts a child’s language development, hindering his or her behavioral, cognitive, and social functioning. Although technology such as hearing aids and cochlear implants provide access to sound, infants and children also need habilitation to develop skills. Home visiting is widely recognized as a cost-effective intervention service delivery model. Home visiting programs for promoting language development in children who are diagnosed as deaf or hard of hearing have been in existence for over 50 years, yet there is limited evidence of their effectiveness. This review was undertaken to assess the evidence of effectiveness of home visiting in children with prelingual hearing loss. While many studies have examined early intervention for children who are deaf or hard of hearing, few are published from specific home visiting programs meeting the criteria for inclusion in this review. Studies from specific home visiting program models designed to meet the needs of the target population are needed to examine the effectiveness of promoting language development within the context of a home visiting program for children who are deaf or hard of hearing and their families.

Synthesize:
This article was a whirlwind of information, I had a very hard time understanding what it was talking about for most of the article. Due to the lack of understanding I do not plan on using this for my thesis.
Semantic Encoding:

Topic: Semantic Encoding

Citation:
“Semantic Encoding.” The Behavioral Scientist, 2023. https://www.thebehavioralscientist.com/glossary/semantic-encoding/#--text=Semantic%20encoding%20is%20the%20process%20of%20associating%20new%20information%20with%20existing%20knowledge%20and%20experiences.%20It%20is%20a%20type%20of%20deep%20processing%20that%20focuses%20on%20the%20meaning%20of%20information%20rather%20than%20its%20sensory%20or%20structural%20characteristics.

Abstract:
Semantic encoding is the process of converting sensory input into meaningful, long-term memories by associating new information with existing knowledge and experiences. It is a type of deep processing that focuses on the meaning of information rather than its sensory or structural characteristics. Semantic encoding is an essential aspect of memory formation, as it enables individuals to extract meaning from their environment, relate new information to prior knowledge, and facilitate the retrieval of stored memories. Research has shown that semantic encoding is more effective in creating lasting memories compared to other forms of encoding, such as visual or acoustic encoding, which focus on the superficial characteristics of the information.

Synthesize:
This source allowed for the groundwork for the understanding of what semantic encoding is. Because this source was made in 2023 the concept of the current understanding of semantic encoding was provided. This led to a wider understanding of this topic.

Topic: Semantic Encoding

Citation:

Abstract:
Semantic encoding is a mental process that involves linking meanings or concepts to memories. It can be used to remember information, better comprehend the context of the text, and solve problems.

Synthesize:
Because this source was last updated in August of 2023, the ability to understand semantic encoding as it is understood currently was given. This source allowed a further understanding of what semantic encoding was and provided examples, furthering the comprehension in this topic.
Memory Loss:

Topic: How Memories Are Made: Stages of Memory Formation

Citation:

Abstract:
Memory serves human beings in many complex ways. It enables us to process our environment. Improve behavior. Give context to our lives. Studies of this psychological phenomenon reveal that memory occurs in stages, which gives us valuable insight into the inner workings of the brain.

Synthesize:
This source was very helpful and gave me a great understanding of what memory loss is and goes over two types of theories of forgetting, the decaying theory, and the interference theory. This article also goes over what Psychologist Daniel Schacter calls the “Seven Sins of Memory” which I found to be very helpful.

Topic: Memory Loss

Citation:

Abstract:
Memory loss is unusual forgetfulness. You may not be able to remember new events, recall one or more memories of the past, or both. The memory loss may be for a short time and then resolve (transient). Or, it may not go away, and, depending on the cause, it can get worse over time. In severe cases, such memory impairment may interfere with daily living activities.

Synthesize:
This source expanded my base knowledge of memory loss and also went over different ways that memory loss can occur, from medically induced to a physical injury. I found this article to very helpful and gave me other avenues to further explore.
Topic: 6 Things We Can Do To Prevent Memory Loss

Citation:

Abstract:
Have you ever forgotten where you put your keys or walked into a room and couldn’t remember why? Memory loss is a common problem that can be caused by various factors, including aging, disease, and injury. But that doesn’t mean we have to sit back and accept it. Our brain is a powerhouse that can be kept healthy and sharp through lifestyle choices and activities that challenge it. While there is no sure-fire way to prevent memory loss altogether, there are certain things we can do to prevent memory loss.

Synthesize:
This source goes over 6 things that people should be doing in order to help prevent memory loss. I found this article to be very helpful and I learned some new ways to help strengthen the brain in order to help memory decay.

Topic: Dementia

Citation:

Abstract:
Dementia is a syndrome that can be caused by a number of diseases which over time destroy nerve cells and damage the brain, typically leading to deterioration in cognitive function (i.e. the ability to process thought) beyond what might be expected from the usual consequences of biological aging. While consciousness is not affected, the impairment in cognitive function is commonly accompanied, and occasionally preceded, by changes in mood, emotional control, behavior, or motivation. Dementia has physical, psychological, social and economic impacts, not only for people living with dementia, but also for their carers, families and society at large. There is often a lack of awareness and understanding of dementia, resulting in stigmatization and barriers to diagnosis and care.

Synthesize:
This source goes over what dementia is, different types of encoding failures and introduced me to a new theory on why people forget. I found this article to be very helpful and it further expanded my knowledge in memory loss.
Abstract:
Alzheimer’s disease moves through a progression of stages marked by the severity and types of symptoms seniors experience. In the early stages of the disease, you may hardly notice some of the changes your senior loved one goes through. However, things can quickly take a turn once your loved one enters the combative stage. Learning more about this stage helps you assist your loved one with symptom management while preserving your relationship.

Synthesize:
This source was published in August of 2022 and goes over the combative tendencies someone with memory loss can go through. It talks about what people can do as a care giver, this article was very helpful.
**Topic: Memory Loss**

**Citation:**

**Abstract:**
"Memory loss" is a broad term for any issue with forming, storing or recalling memories. It can happen with acute conditions or it can be a long-term concern. It’s also more likely to happen with increasing age. Some causes are treatable, and there are steps you can take now to help yourself should you or a loved one experience it in the future.

**Synthesize:**
This source goes over two types of memory loss, Acute memory loss, and Progressive memory loss, this article also goes over the first signs of memory loss. I found this to be quite helpful and gave me a further understanding of memory loss and how it works.

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**Topic: ALZHEIMER’S DISEASE FACTS AND FIGURES**

**Citation:**

**Abstract:**
2023 Alzheimer’s Disease Facts and Figures is a statistical resource for U.S. data related to Alzheimer’s disease, the most common cause of dementia. Background and context for interpretation of the data are contained in the Overview. Additional sections address prevalence, mortality and morbidity, care-giving, the dementia care workforce, and the use and costs of health care and services. Better Alzheimer’s disease care requires conversations about memory at the earliest point of concern and a knowledgeable, accessible care team that includes physician specialists to diagnose, monitor disease progression and treat when appropriate. The Special Report examines obstacles and opportunities for achieving better care in an era of new treatments for Alzheimer’s.

**Synthesize:**
This article was published in 2023 and contains over 100 pages of information regarding memory loss, this might be the most helpful source in this thesis. I was able to greatly expand my knowledge in the different diseases that cause memory loss and was introduced to a lot of statistics surrounding it.
Topic: Cerebrovascular Disease


Abstract: The word cerebrovascular is made up of two parts – "cerebro" which refers to the large part of the brain, and "vascular" which means arteries and veins. Together, the word cerebrovascular refers to blood flow in the brain. The term cerebrovascular disease includes all disorders in which an area of the brain is temporarily or permanently affected by ischemia or bleeding and one or more of the cerebral blood vessels are involved in the pathological process. Cerebrovascular disease includes stroke, carotid stenosis, vertebral stenosis and intracranial stenosis, aneurysms, and vascular malformations. Restrictions in blood flow may occur from vessel narrowing (stenosis), clot formation (thrombosis), blockage (embolism) or blood vessel rupture (hemorrhage). Lack of sufficient blood flow (ischemia) affects brain tissue and may cause a stroke.

Synthesize: This source goes over what cerebrovascular disease is, this was a very helpful article as it showcased some statistics, diagnostic tests, and ways it can occur. This article gave a good understanding of what this disease is.

Topic: Frontotemporal Dementia


Abstract: Frontotemporal dementia (FTD) or frontotemporal degeneration refers to a group of disorders caused by progressive nerve cell loss in the brain’s frontal lobes (the areas behind your forehead) or its temporal lobes (the regions behind your ears).

Synthesize: This source goes over what Frontotemporal Dementia is. This was a very helpful article as I was able to learn about this disease, the different types, the differences between this disease and Alzheimer’s, how it is diagnosed, and the treatments.
Topic: What Is Lewy Body Dementia?

Citation:

Abstract:
Lewy body dementia (LBD) is a brain disorder that can lead to problems with thinking, movement, behavior, and mood. Visual hallucinations, or seeing things that are not there, are a common symptom, and tend to happen early on. More than 1 million people in the United States are diagnosed with LBD, which is one of the most common forms of dementia. It is a progressive disease, meaning symptoms start slowly and worsen over time. Although younger people can have LBD, it typically begins at age 50 or older. People with LBD live on average five to eight years — from the time of diagnosis to death. How fast symptoms develop and change varies depending on the person’s overall health, age, and level of symptoms.

Synthesize:
This source goes over what Lewy Body Dementia is. This was a very helpful article as I was able to learn about this disease, the different types, how it is diagnosed, the symptoms and signs, and the treatments.

Topic: Parkinson’s Disease: Causes, Symptoms, and Treatments

Citation:

Abstract:
Parkinson’s disease is a brain disorder that causes unintended or uncontrollable movements, such as shaking, stiffness, and difficulty with balance and coordination. Symptoms usually begin gradually and worsen over time. As the disease progresses, people may have difficulty walking and talking. They may also have mental and behavioral changes, sleep problems, depression, memory difficulties, and fatigue. While virtually anyone could be at risk for developing Parkinson’s, some research studies suggest this disease affects more men than women. It’s unclear why, but studies are underway to understand factors that may increase a person’s risk. One clear risk is age: Although most people with Parkinson’s first develop the disease after age 60, about 5% to 10% experience onset before the age of 50. Early-onset forms of Parkinson’s are often, but not always, inherited, and some forms have been linked to specific alterations in genes.

Synthesize:
This source goes over what Parkinson’s Disease is. This was a very helpful article as I was able to learn about this disease, the diseases symptoms, diagnoses, and the treatments. This helped me get a good understanding of what this disease is and how it ties into memory loss.
**Topic: Diagnosing Lewy Body Dementia**

**Citation:**

**Abstract:**
Lewy body dementia (LBD) can be difficult to diagnose. Talking to both patients and caregivers helps doctors make a diagnosis. It is important to ask the patient and their care partners about any symptoms involving thinking, movement, sleep, behavior, or mood. Certain medications can worsen LBD symptoms — be aware of all current medications and supplements the patient is taking.

**Synthesize:**
This source goes over symptoms of Lewy body Dementia as well as tests that can help diagnose it. This article comes from the National Institute of Aging which allowed for a good understanding of how this type of dementia is diagnosed. This source was last reviewed in July of 2021 which falls in the time frame in which it is usable.

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**Topic: How is Alzheimer’s Disease Diagnosed**

**Citation:**

**Abstract:**
Doctors use several methods and tools to help determine if a person with thinking or memory problems has Alzheimer’s disease.

**Synthesize:**
This source of information was last reviewed in December of 2022 which helped me get a good understanding of how Alzheimer’s Disease is Diagnosed today. With this article I was able to further my understanding of this topic.
Dementia with Lewy Bodies

Abstract:
Dementia with Lewy bodies (DLB) is a type of progressive dementia that leads to a decline in thinking, reasoning and independent function. Its features may include spontaneous changes in attention and alertness, recurrent visual hallucinations, REM sleep behavior disorder, and slow movement, tremors or rigidity.

Synthesize:
This source helped me better understand ways that Lewy Body Dementia is diagnosed as well as gave some insight as to how it can be treated. This article comes from the Alzheimer's Association which allowed me to gain knowledge from a trusted source.

Navigating treatment Options

Abstract:
There is exciting progress in Alzheimer's and dementia research that is creating promising new treatments for people living with the disease. It is important to learn as much as you can about which drugs are available. Talk about your options with your doctor.

Synthesize:
This source helped me better understand what kinds of medications doctors are prescribing patients who have Alzheimer's Disease. This article is written by the Alzheimer's Association which allowed me to gain this knowledge from a trusted source.
Topic: Getting Diagnosed

Citation:

Abstract:
Parkinson’s disease (PD) is a “clinical” diagnosis. This means that an individual’s history, symptoms, and physical exam are used to make the diagnosis. There is not a specific lab or imaging test that can diagnose PD. However, certain tests such as magnetic resonance imaging of the brain (MRI brain), a dopamine transporter scan (DaT scan), or blood work can be used to support the diagnosis of PD or to rule out other medical conditions that can mimic PD.

Synthesize:
This source helped me better understand how patients with Parkinson go about getting diagnosed. This article was published by the Parkinson’s Foundation allowing me to gain this knowledge through a trusted source.

Precedent Studies:

Topic: Designing a House for a Visually Impaired Person and a Wheelchair User

Citation:

Abstract:
In February 2018 I had the privilege of working as the Off Screen Designer on the DIY SOS build in Torquay, which aired last night on BBC1. This was not a standard DIY SOS build. Stuart, a single father, has been suffering with progressive Multiple Sclerosis (MS) for over 15 years and he was living and sleeping in a chair in his living room. His primary carer was his mum, Lin, who has been completely blind since she was in her 20s. Lin would walk from her house to Stuart’s to care for him every day. Lauren, Stuart’s 15 year old daughter, also lived in the house.

Synthesize:
This was an amazing source, that I learned about different ways to use the designed environment to enable someone who is visual impaired as well as someone who is physically impaired. This home was built in 2018 enabling me to get an understanding of different ways to design a space for these impairments.
Topic: Designing a new home for a blind client / So & So Studio

Citation:
teaching-a-blind-client-how-to-read-her-new-home-so-and-so-studio.

Abstract:
Designing a smart space, both elegant and intuitive was the intent in So & So Studio’s recently completed home for a blind woman in Thiene, Italy. When their client was ready for what she called “home” for fifty-five years to change, the designers elected to implement a natural process of adjustment and way-finding for the vision impaired woman to navigate her new space.

Synthesize:
This was an amazing source, that I learned about different ways to use the designed environment to enable someone who is visual impaired. This home was built in 2018 enabling me to get an understanding of different ways to design a space for the impairment.

Topic: Heritage Community of Kalamazoo

Citation:

Abstract:
Since 1945, Heritage Community of Kalamazoo has encouraged and nurtured the passions of every individual who has ever called our community home or visited as a guest. Throughout the decades, the city of Kalamazoo has grown from a collection of city streets to one of West Michigan’s most vibrant and historic neighborhoods. And all along the way, the deep roots of Heritage Community have grown to great heights.

Synthesize:
This source allowed a better understanding of this company before deciding if they would best suit this project and allowed me to get in contact with them for an interview. The interview was very insightful, and this business gave me a deeper understanding of memory care assisted living as it done today.
Appendix

Overview
1. Personal Survey
2. Case Study
3. Interview
4. Programming
5. Codes
6. Functional Needs
7. Passive Design Strategies
Personal Survey
Q: What kinds of treatment were used?

1. None
2. None
3. B-12 Shots
4. None
5. Anti-Depressants
6. Simple mental task
7. Moved to Adult care Facility

Q: What type of treatment helped with the memory loss symptoms?

1. None
2. 24hr Care
3. Medication

Q: What types of treatment helped with the memory loss symptoms?

1. None
2. None
3. B-12 Shots
4. None
5. Anti-Depressants
6. Simple mental task
7. None

Q: How was the person’s memory loss affecting those around them?

1. Can be tough at times to interact in a positive manner while feeling sadness for the condition they are in.
2. They are very unpleasant to be around
3. Horribly
4. Rely on others to help remember important information
5. It is very emotional and stressful
6. Relatively unaffected due to my mom being a stay at home mom and being able to take care of my Grandpa. Otherwise just lead us my family to be a bit more knowledgeable to how to help with day to day tasks.
7. Not affected
8. Made it sad to be around, lost himself overall
9. Hard sometimes, mainly have to remind the person that something either did or didn’t actually happen
10. Frustration
11. I annoy the shit out of people and they lose their patience with me real quick
12. Not too poorly
13. Sadness
14. By making them frustrated and helpless because the person you’re trying to help might not even know who you are and sometimes thinks you’re tricking them. On an up note when some memory’s come back a moment of relief comes with the thought there’s a little bit of them still here.
15. They are prisoners in their own home
16. The person needs a lot more assistance

Q: What kind of treatment was given?

1. None
2. None
3. B-12 Shots
4. None
5. Anti-Depressants
6. Simple mental task
7. Moved to Adult care Facility

Q: How was the person’s memory loss affecting those around them?

1. Can be tough at times to interact in a positive manner while feeling sadness for the condition they are in.
2. They are very unpleasant to be around
3. Horribly
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13. Sadness
14. By making them frustrated and helpless because the person you’re trying to help might not even know who you are and sometimes thinks you’re tricking them. On an up note when some memory’s come back a moment of relief comes with the thought there’s a little bit of them still here.
15. They are prisoners in their own home
16. The person needs a lot more assistance
Q: What advice would you give to someone who knows a person with memory loss?

1. Be compassionate and understanding, this is tough for everyone.
2. Don’t worry about trying to get them to remember the past and cherish the time you have left with them.
3. Be there to help and take care of them.
4. When you remember something or think it will be important in the future write it down immediately.
5. Be patient.
6. Patience is key. It tears you apart to watch someone lose themselves, but they have no clue they’re losing themselves and you have no idea what it’s like to forget who you and everyone you are, especially spouses, siblings, children, etc.
7. Encourage to seek medical attention.
8. Cherish memories and don’t take the negative things they say to heart.
9. Take as much time with them as you can and enjoy the memories when they want to share them.
10. Be patient, the right treatment will come along.
12. Be kind. You may be frustrated with them but you can’t imagine how frustrating it is for them to experience. You get a break from their memory issues, they live with it.
13. Seek a doctor.
15. Stay strong it only gets worse.
16. It might be best to find a facility.
Experiencing visual impairment in a lifetime home case study

This case study delves into the firsthand accounts of individuals living in a lifelong home while coping with visual impairments. Conducted in 2018, this research provided valuable insights into the challenges faced by people with visual impairments within their living spaces and communities. The findings have enriched my understanding and inspired ideas for enhancing the design of homes catering to individuals with visual impairments and improving the accessibility of their surrounding neighborhoods.

4 Themes:
- Individual Need
- Challenges of the Home
- Challenges of the Neighborhood
- Negative consequences of the diagnosis

3 Secondary Themes
- Living with Visual Impairment
- Design Considerations
- Coping Strategies.

Quotes:
- “Loss of Independence”
- “Participants expressed that they were happier in their home than being outside in their surrounding neighborhoods and often described difficulties experienced outside their homes:
  “Well, I mean I can only speak for myself but um I’m fine in the house but once I would go outside my own ates um if I don’t have he dog with me, I’m completely lost.”
- “…Value of the participants own home as places as safety, refuge and rest separate from the world outside their front doors.”
- “…Participants voiced concerns with regard to the demand of extra wide doorways required to ensure wheelchair access.”
- Participant 1: “I don’t go anywhere there are stairs…”
- Participant 3 Described how her dog had to walk onto the road due to parked cars on the footpath adding to her sense of unease.
- Participant 3 disliked her home hilltop location in the winter, as she socially isolated and confined indoors due to snowfalls.
- Participant 4 expressed that power assisted doors were too expensive to install...
- Participant 5 expressed her difficulty with the larger manual doors stating: “but as you get older obviously the doors are very heavy…”
- Participant 6 preferred to leave home with the help of family members.”
What is your job title?
Director of clinical services for assisted living and memory care

What do you do?
So here on campus we have two memory care communities and we have two assisted living communities, so I oversee the care of all the residents in those communities. So, it's basically the day-to-day operations.

How Long have you been working here?
Two years and one month.

What interested you into going in this field of work?
I've been a nurse for 20 years, prior to working here, I actually worked in women's health so I did that for 17 years or 18 years and the mission of the particular hospital I worked in was going a different direction so I decided to go a different Ave. and then actually I did go back to school and get my master's degree so I wanted a growth opportunity and Heritage allowed me to do that.

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What is the age range of residents?
I would say the youngest resident we have on campus is 68 and then 94 is my oldest.... well no that's not true. 100 because one of my residents just had their hundred birthday. You never know when dementia or Alzheimer's is going to intertwine our assisted living in memory care as much as we can when we think it's appropriate, but it just depends on where our people are.

Q: What percent of residents have a form of memory loss?
OK so our memory unit over here has 21 bedrooms, 19 of them are full. The one over at Hawthorne has 28, 26 of them are full and then the other two two are separate because they're assisted living so and everyone in those communities technically has some issues Yeah, it's actually a growing issue and concern and because those two buildings are consistently full and of course we always have openings in our assisted living but never have memory care. So, it's definitely a concern here in Kalamazoo County.

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Q: How much does it cost to live here annually?
 Depends. So I have two different facilities, so this is Myelin square facility and I would have to get the updated price, so this is private pay over in this building. But even in the Hawthorne building it's kind of a more affordable option and we take insurances and VA, we take Medicare, Medicaid, milestone senior services. And I will actually get you a price and I can e-mail it to you because they're the exact same care, I mean I do all the training, just one is a more affordable option for the community.

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Programming

FFE:

- The project aims to incorporate a diverse range of furniture, including free-floating pieces that facilitate easy movement. The selected furniture should demonstrate the capability to offer seating for various age groups, including accessible seating options. Additionally, these selections should encompass a variety of materials to create a tactile-rich environment.

Finishes:

- The chosen finishes for this project prioritize both cleanability and durability, ensuring not only aesthetic appeal but also practical functionality. These materials are carefully curated to withstand daily use, promoting longevity and ease of maintenance. Additionally, the flooring finishes play a pivotal role in spatial design, serving to delineate distinct zones within the area. The intention is to create a resilient and well-organized environment.

Environmental needs:

Lighting:

- Harnessing the illumination of natural daylight not only contributes to obtaining a valuable source of Vitamin D but also has the additional advantage of diminishing electricity costs.
- Artificial lighting will be employed to delineate specific zones within the space. In residential areas, a blend of warm and cool lights will be utilized, creating a welcoming ambiance with the warmth and providing enhanced illumination through the juxtaposition of cool lights when necessary.

Acoustics:

- Certain areas within the recreation center, like the gym, necessitate attention to interior surface treatments for reverberation control.
- Residential spaces need specific acoustic considerations to create an environment rich in acoustics, contributing to enhanced memory retention.

Codes

Building Codes

Occupancy:

- Ranch Homes and Duplexes R-2
- Recreation Center
- Recreation, Pool, Lobby, Locker-room, and Gym A-3
- Staff Room B
- Storage S-1

420.4 Automatic Sprinkler system

- Group R occupancies shall be equipped throughout with an automatic sprinkler system in accordance with section 903.2.8

420.5 Fire alarm systems and smoke alarms

- Fire alarm systems and smoke alarms shall be provided in Group I-1, R-1, and R-2 Occupancies in accordance with sections 907.2.6, 907.2.8, and 907.2.9, respectively.

420.10 Group R Cooking Facilities

- In group R Occupancies, cooking appliances used for domestic cooking operations shall be in accordance with section 917.2 of the international Mechanical Code

702.1 Multiple-Use Fire Assemblies

- Fire assemblies that serve multiple purposes in a building shall comply with all of the requirements that are applicable for each of the individual fire assemblies

Residential Codes

1103.2.2 Employee Work Areas

- Spaces and elements within employee work areas shall only be required to comply with sections 907.5.2.3.1, 1009, and 1104.3.1 and shall be designed and constructed so that individuals with disabilities can approach, enter and exit the work area.

1103.2.3 Detached Dwellings

- Detached one- and two-family dwellings, their accessory structures, and their associated sites and facilities are not required to comply with this chapter

1104.1 Site Arrival Points

- At least one accessible route within the site shall be provided from public transportation stops, accessible parking, accessible passenger loading zones, and public streets or sidewalks to the accessible building entrance served.

1105.1 Public Entrances

- In addition to accessible entrances required by sections 1105.1.2 through 1105.1.8, at least 60 percent of all public entrances shall be accessible

1106.2 Required

- Where parking is provided, accessible parking spaces shall be provided in compliance with table 1106.2, except as required by section 1106.3 through 1106.5. Where more than one parking facility is provided on a site, the number of parking spaces required to be accessible shall be calculated separately for each parking facility.
Ranch Style Home: 12 (Residential)
3 Bed
2 ½ Bath
- ADA Accessible Turning radius
Dining Room
- Seating for 8
- Connected to Living Room and Kitchen
Living Room
- Multiple Seating Options
- Connected to Kitchen and Dining Room
Kitchen
- Connected to Living Room and Dining Room
Garage
- Two Car Garage
Utility / Laundry Room
- Washer and Dryer
- Furnace
- Water Heater
- Located on the First Floor, away from bedrooms
Storage

Duplex: 8 (Residential)
2 Bed
1 ½ Bath
- ADA Accessible Turning radius
Dining Room
- Seating for 8
- Connected to Living Room and Kitchen
Living Room
- Multiple Seating Options
- Connected to Kitchen and Dining Room
Kitchen
- Connected to Living Room and Dining Room
Garage
- One Car Garage
Utility / Laundry Room
- Washer and Dryer
- Furnace
- Water Heater
- Located on the First Floor, away from bedrooms
Storage

Rec Center: 1 (Commercial)
Lobby
- Reception Desk
- Lounge Seating
- Acoustical Wall and Ceiling treatments
Staff Area
- Break Room
- Acoustical Wall and Ceiling treatments
- Private Bathroom
- Storage Bathrooms
- Male and Female Bathrooms
- Located Close to Gym, Recreation Room and Lobby
Locker Rooms
- Storage
- Showers
- Men and women Separate Locker rooms
- Connected to Lobby, Pool and Gym
- Tile Flooring (Easy clean ability)
- Bathrooms
- Acoustical Wall and Ceiling treatments
Pool
- Standard Size pool 75ft long, six lanes or 48 ft wide
- Tile Pool and Flooring
- Bench seating located on the perimeter of the space
- Connected to the locker room

Gym
- Assorted weight machines
- Padded Flooring
- Acoustical Wall and Ceiling treatments
- Located Next to Locker Room, Lobby, and Recreation Room
- Recreation Room
- Seating for 20-30 People
- Multiple Types of Seating
- Storage for Craft Materials and board games
Passive Design Strategies

1. Good Natural ventilation can reduce or eliminate air conditioning in warm weather
   - If windows are well-shaded and oriented to prevailing breezes
2. Long, narrow floor plan and help maximize cross ventilation in temperate and hot humid climates
3. To facilitate cross ventilation, locate door and window openings on opposite sides of the building with larger openings facing upwind
4. Screened porches and patios can provide passive comfort cooling by ventilation in warm weather and can prevent insect problems
5. Ceiling fans can make it seem cooler by 5 degrees, thus using less air conditioning
6. Using open-plan interiors promotes cross-ventilation
7. Use plant materials (bushes, trees) on the west side to minimize heat gain
8. Use curvature to aid in way-finding
9. Use artificial lighting to aid in way-finding