Interlace: Designing an Inclusionary Architecture for Alzheimer's Sufferers

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Interlace: Designing an Inclusionary Architecture for Alzheimer’s Sufferers

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Professor Mine Hashas-Degertekin P.H.D.
and to the
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by

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Thank you to my family for supporting me,

To my friends for strengthening me,

And to my advisor for guiding me.

Without all of you, this would not be possible.
This thesis intends to address the increasing challenges the Alzheimer’s disease poses for our growing American population. The research begins by looking at the brain as a combination of components which make up the individual. Following this, the research compiles information on the Alzheimer’s disease and its symptoms, followed by an analysis of the built environments effects on the condition.

Through analysis of precedent cases and the combined Alzheimer’s research, I chose to propose an experimental community in which those with Alzheimer’s can live a life with greater autonomy while simultaneously slowing the progression of the disease. I place this community within an urban setting, to allow for ample interaction with non-patients.

The summation of my research brought me to take the stance that through communal architectural intervention, built to include careful triggering of perceptive senses, such as smell, touch, sight, and hearing, the project seeks to evoke cognitive responses, decrease medication dependency, and impart greater inclusion into the lives of Alzheimer’s suffers. This thesis results in my prototypical approach to creating such a community.
Chapter 1: Contexts of the Mind and Alzheimer’s
Introduction

“Mens sana in corpore sano.” This Latin phrase translates to: “a healthy mind in a healthy body.” The mind and body are inseparable components within the human existence, with the mind representing the intangible and the body representing the physical realm of experience. These two parts, the intangible and physical, are shaped throughout life, and experience periods of both growth and degradations, particularly through the aging process. It is through the aging process that we can especially see that the degradation of the mind often follows the degradation of the body. But what happens when the degradation of the mind precedes and surpasses the deterioration of the body?

The collection of cognitive impairment diseases that we commonly refer to as Dementia is an increasing issue throughout the globe. As our population rises, so too does the rate of diagnosis. Those with Dementia diseases such as Parkinson’s, Huntington’s, or Alzheimer’s experience deteriorations of the mind which then cause impairments in the physical realm. These impairments cause great difficulties in traversing through life, and especially the built and natural environments. Alzheimer’s disease especially poses a difficult threat to one’s experience of the world around them.

Nearly 44 million people worldwide have been diagnosed with Alzheimer’s, a disease that is among the top ten leading causes of death in America. Projections suggest one in three seniors in the U.S. will develop the disease within their lifetime, and the average life expectancy after an Alzheimer’s diagnosis is four to eight years. Worst of all, we unfortunately do not yet have a cure for the condition.

Though we may not have a cure, people are still living with this disease, and care facilities actively seek to treat those who suffer from Alzheimer’s. With statistics suggesting that the number of people who suffer from Alzheimer’s is projected to grow, especially as life expectancy continues to grow in the developed world, Alzheimer’s care is quickly becoming more important than ever before. Now is the time we must begin to make decisions about how we may live when our minds are less able.

Alzheimer’s care facilities in the U.S. offer important treatment opportunities, as well as security and safety. Unfortunately, these services can also be incredibly costly, and unless one has long-term care insurance, they can also be unavailable. In addition to this, those who do have the funds to pay for Alzheimer’s care may not wish to be uprooted from their communities and placed in unfamiliar environments.

The future of Alzheimer’s care must accommodate aging in place, so that patients can receive treatment within their communities. While aging in place allows for a high level of independence and autonomy, it can unfortunately come at the expense of safety and security. A form of Alzheimer’s care that combines both the strengths of traditional care and the autonomy of aging in place may establish the Alzheimer’s care of the future.

Introducing a new typology of Alzheimer’s care, capable of being
affordable and safe is the aim of this thesis. This form of care will be the
product of its predecessors, the impending threat of the increase in Alzheimer’s
sufferers, neuroscientific and psychological data, and architecture as a means
to shape the world around us. The architecture of this new typology becomes
invaluable as a means to noninvasively protect, guide, house, and provide within
the community, as well as to shape the psychosocial environment.

At the very least, the architecture of this new community must
provide spaces of residence, healthcare, food provision, general shopping, and
recreation. The architecture of these spaces must also integrate the principals
from neuroscience and psychology that can allow for the most comfort, safety,
and autonomy in the Alzheimer’s patients. It is the intent of this thesis to create
such a community for those with Alzheimer’s, that allows for greater autonomy,
uncompromised safety, and an architecture that stimulates the mind and body.

THESIS STATEMENT

Through communal architectural intervention built to include careful
triggering of perceptive senses, such as smell, touch, sight, and hearing,
we can evoke cognitive responsiveness, decreasing medication dependency,
and imparting greater inclusion into the lives of Alzheimer’s suffers.
Memories are neither true nor false - what one person perceives as truth may only be a fragment of actuality or even a multiplication of it.

The city’s outlook on perception is one of acceptance; it knows that truth can be subjective, and chooses to embrace this. A visit to Olvidar, the city of fragmentation, is best done with a loved one, so that your experiences may be shared and expressed, revealing a closer glimpse at the full truths of the city.

This model represents my initial understanding of the Alzheimer’s condition. The topography shaped onto the artifact is based on the topography of my thesis site. The human figures along the model, shown at different scales, represent the diversity of the individual, each viewing life from differing places. The large orbs represent events and actions. When viewed from the mirrors along the artifact, which represent distortions of memories and perspectives, the viewer will be caused to question which orbs are reflections and which are tangible objects - "what is fact, and what is fiction."

With Alzheimer’s, no two people’s experience of the disease will be identical. One’s own symptoms may be shaped by one’s own pre-existing personality and experiences. One’s truth becomes another’s lie.
1.1 Understanding the Mind

Alzheimer’s is a cerebral disease, born in the mind before its effects spread to the physical realm. Considering this, it made sense to first attempt to understand the brain before seeking to build a framework behind which I could add to the existing knowledge on how to care for those affected. This intent led me to look into the field of neuroscience as a key source for not only understanding how the brain functions, but also for learning what structures are included within its design.

My research revealed that the typical human brain is compartmentalized into multiple regions, each responsible for different functions and aspects of one’s being. Some areas are responsible for the generation of a person’s personality, while others control things such as one’s intellect. Some areas are even more prone to be affected by the Alzheimer’s disease. Those areas are:

- The Frontal Lobe
- The Temporal Lobe
- The Parietal Lobe
- The Occipital Lobe

Each of these regions is responsible for different aspects of a person’s being, such as language, memory, intelligence, and perceptive processes.

Imagine your mind being a television show, acted out by many different characters. In this scenario, the characters are actually the different regions of the brain, and each character portrays different traits, bringing unique and invaluable qualities to the show. Each region is important, because those unique characteristics that they bring to the show cannot be replaced by the addition of new characters. For example, once the Temporal lobe, responsible for one’s memories, suffers irreparable damage, those memories will either become distorted, or fade entirely. In this way, the preservation of these individual regions of the brain is incredibly important to the shaping of a person’s being.
Parietal Lobe
- Language

Occipital Lobe
- Visual Information

Frontal Lobe
- Intelligence
- Judgement
- Behavior

Temporal Lobe
- Memory

Author Figure 1: Sections of the Mind
1.2 Thinking Fast and Slow
Daniel Kahneman | 2011

My search for understanding about the human mind brought me to the book: Thinking Fast and Slow, by Daniel Kahneman, a former Princeton University professor of psychology, as well as the 2002 recipient of the 2002 Nobel Prize in Economic Science for his collaborative work on the study of decision making. Kahneman’s book introduced the idea that human brains have two types of operations: those that act as responses, requiring almost no action from the individual, and those that one deliberately engages in response to situations that cannot be handled by the first operation type alone. Kahneman refers to these two operation types as System 1 and System 2, respectively.

This body of work suggested to me that of the two systems, System 2 is most likely to be the one impaired by the Alzheimer’s disease. This is because while the first system is adept at understanding perceptive information on a base level, the second system is responsible for cognition, or in other words, things that can be understood on the basis of thought and experience. Once one’s thoughts and memories begin to fade due to Alzheimer’s, their System 2 faculties begin to wain as well.

Kahneman also covers a concept called “flow” within his book. Flow, as Kahneman describes it, is a state in which people are able to expend effort for periods of time without calling on their reserve of will power, as though without effort. This state of hyper-focus, I suspect, may be of benefit as a form of treatment in Alzheimer’s care. Similar to how it is recommended that the elderly take part in puzzle solving to maintain mental strength, I could foresee the built environment becoming a flow inducing source of stimulation, used to strengthen patients’ cognitive abilities.

“Anything that occupies your working memory reduces your ability to think.”
(Kahneman, 2011)

“The operations of System 2 are often associated with the subjective experience of agency, choice, and concentration.”
(Kahneman, 2011)

“Cognitive work is not always aversive, and people sometimes expend considerable effort for long periods of time without having to exert willpower. [...] This state of effortless attending, and the name he proposed for it, ‘flow’, has become part of the language.”
(Kahneman, 2011)

Achieving a state of flow makes it possible to maintain focus on otherwise taxing activities without being required to exert self-control. Because self-control and other voluntarily effortful activities draw from the same pool of mental energy, removing self-control from the equation allows for actions to be conducted with greater efficiency and increased success; however, a world where everyone was able to focus on tasks without self-control would be devoid of empathy. Instead of introducing an entire world where flow is activated, it then becomes more feasible to introduce controlled spaces for the activation of flow, as a sort of cognitive therapy. Similar to most forms of therapy, these could be introduced frequently instead of constantly, allowing for flow to become a state of treatment.
“People who experience flow describe it as ‘a state of effortful concentration so deep that they lose their sense of time, of themselves, of their problems.’”

(Kahneman, 2011)

“All variants of voluntary effort - cognitive, emotional, or physical - draw at least partly on a shared pool of mental energy.”

(Kahneman, 2011)
System 1

System 1 faculties are the types of functions that go into effect without explicit direction to do so. This can be as simple as breathing, and as complex as making judgements from first impressions. Think of it as your REACTIONARY SYSTEM.

Among these characteristics of system 1 thought, consider sympathy. Sympathy is a function of system 1 thinking; therefore, it may be possible to associate fond memories, with one's orientation of "home." The emotions that arise from sensing something familiar are a representation of system 1 thought. They activate without your conscious effort to make them do so.

The cognitive senses: Hearing, smell, touch, sight, and taste can be useful stimuli in activating one's system 1 faculty. So while cognition is an act of system 2, the stimuli themselves may be associated with system 1.

System 2

System 2 functions are deliberate, and require effort. This system of thought can be trained, and is the means by which we can exert effort to solving a problem or recall information.

When you can understand something as having two meanings, that is because your System 2's functions have been engaged. This is why, for example, you can look at the image to the left by Salvador Dali, and see both Dali's wife Gala, and (if you squint your eyes) Abraham Lincoln.

Similarly, smelling something from your past may simultaneously be capable of returning fond memories, while activating one's sense of smell. If left to the devices of system 1 alone, the mind might not be capable of understanding a connection between the cognitive senses and memory. We rely on system 2 to understand the connections between our memories and situations, items, and people we may encounter.

System 1

**System 1 Faculties**

- Breathing
- Making judgements from first impressions

**Benefits**

System 1 functions are effortless, or require minimal thought. Even with minimal effort, they provide stimulation to the mind.

**Examples**

- Seeing
- Orienting

**Downsides**

Requires a stimulant, or catalyst to go into action.

System 2

**System 2 Functions**

- Deliberate
- Require effort

**Benefits**

System 2 actions can resolve problems which would require contemplation and memory.

**Examples**

- Problem Solving
- Second Guessing

**Downsides**

As system 2 functions may occupy the working memory, these functions draw on a limited reserve of effort, resulting in a reduction of one’s ability to think will stimulating system 2.
Regions of the Brain (Related to Alzheimer’s)

FRONTAL LOBE
- Intelligence
- Judgement
- Behavior

PARIETAL LOBE
- Experience Driver (Reaction)
- Experience Shaper (Stimulate)

TEMPORAL LOBE
- Memory

OCCIPITAL LOBE
- Visual Information

OTHER REGIONS
- Experience Shaper
- Impressions
- Intuitions
- Intentions
- Feelings

SYSTEM 2
- Problem Solving
- Self-DIRECTION

SYSTEM 1
- Effortful Response
- Complex Problem Solving
- Subjective Experience of Agency and Choice
- Conscious Reasoning
- Deliberate Focus
- Preference

- Effortless
- Simple Comprehension
- Involuntary Reacter
- Instinctive Feeling
- Detection of Tone
- Trainable
- Perception of Space

Author Figure 78: Regions of the Brain
The regions of the brain each bear the responsibility for different characteristics of the individual. Some characteristics align more with system 1 forms of thought, while others align more strongly with system 2 thinking. As the frontal, parietal, temporal, and occipital lobes relate to judgement, language, memory, and processing of visual information, all which rely on cognitive processing, these regions align more with system 2 functioning.

Those various other regions, ones that allow for us to experience the world through perceptions absent of effortful response, align with system 1 functioning. These regions may be enormous, and include capabilities for processing the senses, such as taste, smell, touch, hearing, and sight. The regions also allow for involuntary reactions and intuitions, such as breathing or responding to something frightening by flinching. Regarding the previous example, the functions of system 1 are trainable.

Repeated stimulation of system 1 functions, such as the senses, can yield increased intuitive responses. What this means for the field of Alzheimer’s research is that actions can be trained to be performed well and safely on impulse alone.
1.3 What is Alzheimer’s

By now, we have developed a basic understanding of the workings of the human brain, at least in terms of the general categorical systems. If we look at System 1 and System 2 as they relate to each other, System 2 can only act as a response to information and situations which System 1 cannot handle alone. System 2 can also give meanings to items and situations in relation to one’s memories and experiences. This may be crucial in designing for Alzheimer’s as it suggests that elements we include in the built and natural environments can stimulate memory and emotion.

We commonly understand Alzheimer’s as a disease that causes one to lose memories, but the condition is actually much more than this. The disease is part of a disintegration process within the brain, and results in many symptoms.

Indeed, difficulty remembering is a part of the Alzheimer’s disease, but more specifically, there exists a difficulty in remembering short term information. While portions of long term memory may remain largely intact, Alzheimer’s progressively causes an inability to create new memories.
The development of Alzheimer’s is a physical one. It begins in the brain, afterwards the mental effects extend outwards, alter one’s way of life. As stated earlier, the mind is composed of different regions, each responsible for the individual piece that create a person’s being, such as intelligence, behavior, and memory. These regions physically exist in the brain, and thus, can take on literal damage, such as scaring and cellular death.

Alzheimer’s is characterized, not only by the symbolic decaying of the brain, but also by the literal degradation. Portions of the brain take on damage, scar, atrophy, and die, resulting in the loss of function in its various regions.

More specifically, the brain of a person with Alzheimer’s takes on damaged caused by itself in an attempt to protect itself. The mind of most humans will begin to develop amino acids (proteins) called amyloid beta particles. Normally, the brain can release chemicals to destroy many of the amyloid beta particles as they develop, and is able to keep them at manageable levels, however, when the particles are not sufficiently controlled, they overrun and gum-up the connections in the brain. These connections in the brain, called synapses, are where knowledge and memories are housed.

As amyloid beta particles begin to build up within the synapses of the brain, amyloid plaques form, causing lost memories and impairment of cognitive functions. The brain emits chemicals to remove these plaques, but the chemicals also damage the brains neurons, leading to cell death. This is the process of Alzheimer’s.

A Mind Under Attack

The Biological Perspective

As amyloid beta particles begin to build up within the synapses of the brain, amyloid plaques form, causing lost memories and impairment of cognitive functions. The brain emits chemicals to remove these plaques, but the chemicals also damage the brains neurons, leading to cell death. This is the process of Alzheimer’s.

The synapses are the meeting points between the brains neurons. Every time that you learn something new, your brain forms new connections and thus becomes less susceptible to developing Alzheimer’s. Those who are more cognitively active, frequently learning new things, are less likely to develop Alzheimer’s, as their brains are often creating new neurons whose synapses have not been taken over by amyloid plaques.
Amloid beta particles become plaques

Plaques overrun the synapses of the brain

The brain releases chemicals to remove the plaques

The brains neurons become die

The brains neurons become damaged

Microglia chemicals (meant to remove plaque)

Author Figure 6: The Chemical Process
1.4 Symptoms and Statistics

The symptoms of Alzheimer’s are numerous. This disease is the sort that cannot have any one set of symptoms prescribed to it, as every person experiences Alzheimer’s differently. Because of this, only a short number of symptoms are listed, yet it may be useful to put these symptoms in perspective.

Upon visiting an Alzheimer’s care facility, I learned new information from talking with the facility’s staff, as well from observing the patients. I learned that those with Alzheimer’s can often forget not only their memories, but also their sensations. A person with Alzheimer’s may forget that they have not eaten for a substantial amount of time, not only do they forget that they have not eaten, but their body won’t even recognize that it is hungry. This means that without proper observation from assistants, family, or professionals, those with Alzheimer’s may forget to eat and starve.

Additionally, I learned that those with Alzheimer’s may also experience dissociation from their current selves. A person with Alzheimer’s may be in their 70s, yet still think they are in their early adolescent phase. When they look in a mirror, expecting to see the child they think themselves to be, they may become frightened at the sight of the actual, significantly more aged, visage they see before them. People who experience such symptoms may even cry out to their mother and father in hopes of comfort, not knowing that time has passed.

Those with Alzheimer’s may also experience general uncertainty and confusion. This can result in numerous symptoms we associate with Alzheimer’s, such as paranoia, depression, and the lack of ability to navigate their surroundings (wayfinding). Again, any of these symptoms can vary, and a person with Alzheimer’s may or may not experience any of these symptoms, however, these traits are generally considered possible, and are experienced by many. While many of these symptoms can be treated, at least to some degree, it is important to note that Alzheimer’s is a degenerative disease, thus it is possible and likely for additional symptoms to arise.
9 x 8 = ?

Difficulty Solving Problems of Abstract Thought

Mood changes and irritability

Disorientation and wandering

Repetition of one's words

Missing Memories

Depression

Author Figure 7: Alzheimer’s Symptoms
In a way, medical understanding of Alzheimer's is still failure new, as the first diagnosis of Alzheimer's occurred right around the year 1900. What we do know, however, is that our population is beginning to grow more than it ever has before, and people are living longer than their predecessors. With our increasing elderly population, we also have an increase in the Alzheimer's afflicted population.

Statistically speaking, 44 million people have been diagnosed with
Alzheimer’s world wide. Among that number, 5.3 million of those diagnosed are American. This leads to 1/3 of American seniors being diagnosed with the disease. Furthermore, 2/3 of those diagnosed with Alzheimer’s are women. These numbers will potentially continue to increase if proper interventions cannot be introduced.
Dementia is not a single disease in itself, but a general term to describe symptoms of impairment in memory, communication, and thinking. Alzheimer’s is one among many of those diseases to be considered parts of the spectrum of Dementia. 

Specifically, those defining characteristics of the Alzheimer’s disease are memory loss, altered behavior, impaired judgement, and difficulties with communication and comprehension of language, among others. These characteristics can result in any number of symptoms, such as disorientation, changes in one’s personality and mood, and problems comprehending abstract thoughts needed for problem solving.

It is worth noting that Alzheimer’s is the sort of disease which is experienced differently by each individual. One person may have certain symptoms while another may experience different ones.
Alzheimer’s Symptoms

- DEMENTIA
  - MEMORY
  - BEHAVIOR
  - JUDGEMENT
  - LANGUAGE

- PARKINSON’S

- ALZHEIMER’S

- HUNTINGTON’S

- DISORIENTATION
  - SHORT TERM MEMORY LOSS
  - DIFFICULTY WITH FAMILIAR TASKS
  - MOOD AND PERSONALITY CHANGES
  - PROBLEMS WITH ABSTRACT THOUGHT
  - COMMUNICATION PROBLEMS

Author Figure 8: Alzheimer’s Symptoms and Characteristics
“The everyday world of people in the early stages of dementia is characterised by a loss of confidence in their own self-efficacy”

“In a more coherent and predictable environment, dementia sufferers can expect to feel more competent in what they do”

“The more a person begins to lose their sense of identity and will to actively control and shape their environment, the more important their environment becomes for them as a stable and comprehensible background.”

Elderly care continues to advance in both its practice and its theories, particularly in Europe. Perhaps as a combination of various successful healthcare systems, or possibly due to varied architectures, cultures, and mindsets, Europe is experiencing successes and advancements in Alzheimer’s care that arguably surpass those of American Alzheimer’s care. Professionals have revealed that memory and orientation loss are among the first things to go during Alzheimer’s, proving wayfinding to be a significant challenge. Because of this, Europe has taken on various approaches to address these detriments through its Alzheimer’s care. Once a person’s short-term memory fades, that person may increasingly act on behavioral patterns. This means that actions may increasingly follow pattern, rather than logic. This may be why those with Alzheimer’s wander when they are confused, but how can a care facility address this?

Professionals have enumerated three criteria by which they may assess the quality of facilities for dementia sufferers:

1) Optimal built elements of the facility and ward
2) Psychosocial Milieu (environment)
3) The organization of nursing and of how people live together.

The first criteria can include the use of quality elements and equipment that is both essential and beneficial to Alzheimer’s care. The second criteria relates to how the environment effects ones experience, socially as well as mental. The third criteria refers to efficiency of a program organization’s and layouts, considering things like proximity of infirmaries to living quarters. Designing for those with Alzheimer’s, let alone the elderly, brings with it the additional challenge of considering limitations in mobility along with increases in dependence.
“People are influenced in their experiences, thoughts and actions by their environment and where they live. This means that people and their actions are inseparably and mutually linked with their immediate surroundings, a fact that applies to people who are healthy and impaired alike.”

In response to the statistics, it was revealed that the groups most imminently in need of consideration for this thesis are those ages 65 and older of non-Caucasian race. This gives an invaluable starting point for the design, as it provides incite as to what typologies of design have preceded my design intervention. This information shows that we will need to understand the ways in which people in those respective demographics live.

The typical aging process starts with conception and ends with death, filled with a lifetime of occurrences in-between. It is the point right before old age and death that this thesis seeks to focus on, and as such, this thesis looks to assess the different types of elderly care models.
The different elderly care models offer varying benefits and detriments. Some models, such as the nursing home typology, offer qualified professional assistance in secure settings, yet the nursing home model is also unsuccessful, as it restrains interactions for the elderly to primarily those of similar age, and restricts their movements and visitation. Unassisted aging in place models allow for freedom of movement, visitation, and social interaction, yet lack the guarantee of qualified care. Perhaps to address the shortcomings of existing models, alternatives have developed over the years, especially those that seek to provide the elderly with great authority over their own lives. Finding a method that allows for the elderly with disabilities, such as Alzheimer’s, to experience that same autonomy while also maintaining safety is the challenge. To address this problem, we can first look at traditional treatments in Alzheimer’s care.
Traditional Housing Typologies

PRIVATE HOUSEHOLD

RETIREMENT HOME

ASSISTED LIVING

AGING IN PLACE

NURSING HOME

RELATIVE CARE

COMMUNAL FLATS

URBAN-SCALE NEIGHBORHOODS FOR YOUNG AND OLD

Figures 11-17: Traditional Care Typologies

Treatments

MEDICATIONS

SPECIALISTS

ACTIVITIES
Among those medications used in Alzheimer’s treatment, Donepezil, Galantamine, Memantine, and Rivastigmine are very useful. They can help lessen the symptoms of those with Alzheimer’s, yet they can also come with negative costs that are more than just monetary:

- **Donepezil**: Fainting and unusual bleeding
- **Galantamine**: Seizures and fainting
- **Memantine**: Hallucinations
- **Rivastigmine**: Seizures

*Figures 18-26: Medications for Alzheimer’s*
The treatments for the Alzheimer’s disease span from medications and professionals to personal activities. While medications are important in Alzheimer’s care, their troubling side effects, as well as studies showing a correlation between powerful medication and heightened agitation and aggression in Alzheimer’s patients, make one question whether or not they should be limited. Unfortunately, removing medication entirely from Alzheimer’s care does not inspire a positive outcome, even with the alternative treatments listed above still in effect; however, there may still be a way to lessen the amount of medication necessary to treat those with Alzheimer’s.

Specialists:

- Geriatrician
- Neurologist
- Occupational Therapist
- Psychiatrist
- Primary Care Provider

Activities:

- 20-30 Minutes Physical Activity 5 Days a Week
- Puzzles
- Contact with Animals for Therapy
- Communication and Stimulation
- Regular Reminders of One’s Past

The treatments for the Alzheimer’s disease span from medications and professionals to personal activities. While medications are important in Alzheimer’s care, their troubling side effects, as well as studies showing a correlation between powerful medication and heightened agitation and aggression in Alzheimer’s patients, make one question whether or not they should be limited. Unfortunately, removing medication entirely from Alzheimer’s care does not inspire a positive outcome, even with the alternative treatments listed above still in effect; however, there may still be a way to lessen the amount of medication necessary to treat those with Alzheimer’s.
stimulation, presented in the form of system 1 functions, can activate one’s system 2 faculties, such as those previously stated to bear relations to the frontal, parietal, temporal, and occipital lobes of the brain. By stimulating one’s abilities through language, judgement, behavior, and especially memory, we may be able to benefit those with Alzheimer’s.

Those primary treatments for the Alzheimer’s disease can be categorized as medicines, activities, and specialists. Though medicines and specialists are invaluable to the treatment process for Alzheimer’s, it is the activities which may especially be capable of making an architectural intervention to aid in Alzheimer’s care. Activities such as exercise, social interaction, and sensory stimulation especially apply to one’s experience of architecture and the environment, and thus have a high emphasis placed on themselves throughout this thesis.

The sensory stimulation especially plays an important role, as this stimulation, presented in the form of system 1 functions, can activate one’s system 2 faculties, such as those previously stated to bear relations to the frontal, parietal, temporal, and occipital lobes of the brain. By stimulating one’s abilities through language, judgement, behavior, and especially memory, we may be able to benefit those with Alzheimer’s.
Activity as Treatment

Medicine Activities Specialists

- Exercise and Physical Activity
- Social Activation
- Sensory Stimulation
- Regular Reminders of One's Past
- Puzzles

Author Figure 11: Treatments that Activate System 2
“Fine art, more often than not, is explicitly intended to create emotionally affecting, memorable experiences. Buildings do this too. Buildings never leave us cold: if they’re not affecting us positively, there’s a good chance that they’re affecting us negatively”

-Sarah W. Goldhagen
Architectural theorists continue to study the effects of architecture on not only the built environment, but humanity itself. The works of a number of these theorists have brought about the concept of "phenomenology in architecture." Phenomenology in architecture divorces itself from previous theories about architecture, which primarily saw the discourse of architecture as a challenge of making function that accommodates form or vice-versa. Instead, phenomenology begins to question the ability of the built and natural environment to affect our experience, and to shape us as individuals.

Goldhagen’s writings on the effects of the built environment on quality of life offer key information on how to effectively stimulate cognitive activity through symbolic connections of design elements, looking at the built environment as a combination of elements, rather than as a holistic entity. Pallasmaa, on the other hand, offers insight on the ways that the built environment can have lasting effects on our emotions and memories through the uniqueness of place. Pallasmaa also suggests that the idea of viewing a building as a composition of combined elements is separating us from the reality of an experience, and is instead an attempt at forcing the world to fit the way we process it.

Both theorists, though sharing their findings on phenomenology, can be said to approach the topic with similar yet differing views. While one views the decomposition of experience into a series of elements as a potential benefit to mankind, the other suggests that such a decomposition comes at the expense of reality. This raises the question: should experience be shaped by what our minds can perceive, or should our minds be shaped by the reality of experience.
“Contrary to our internal sense of things, never do we experience the built environment either holistically or passively. Nor can we just stop to take it in. Instead, we assess the usefulness to us of its various components”

-Sarah W. Goldhagen

“Analysis of a work of art is at its most genuine introspection by the consciousness subjected to it. Its meaning lies not in its forms, but in the images transmitted by the forms and the emotional force that they carry. Form only affects our feelings through what it represents.”

-Juhani Pallasmaa

“One of the most important ‘raw materials’ of phenomenological analysis of architecture is early childhood memory. We are used to thinking of childhood memories as products of the naïve consciousness and imprecise memory capacity of the child, something with great appeal but of as little real value as our dreams. But both of these preconceived ideas are wrong. Surely the fact that certain early memories retain their personal identifiability and emotional force throughout our lives provides convincing proof of the importance and authenticity of these experiences, just as our dreams and daydreams reveal the most real and spontaneous contents of our minds.”

-Juhani Pallasmaa
Using direct tactile stimulation, researchers found improvement in short-term and long-term memory in subjects diagnosed with Alzheimer’s disease. They also noticed an improvement in general mood, and in socialization and participation in daily activities.

- Underground Health Reporter

### 2.1 Cognitive Perceptions Through Senses

The senses can be manipulated in ways that evoke both cognitive responses and generally crafted experiences, ones that can be experienced from one person to the next in a similar way. Tactility, smell, hearing, and sight can be especially powerful in the built and natural environment, as they can be very deliberately used to craft semi-scripted results. This is why feeling something soft may make you feel comfortable, or smelling something, like the scent of coffee, may fill you with energy. Our perceptive senses, as suggested through our System 1 and System 2 faculties, have a great influence on our cognitive senses; thus they have a large impact on shaping our experiences.

Take a rose, for example. This is simply an object with no predetermined subjective meaning, yet to each person roses can mean many things. The sight of a rose can bring back memories of prom night, Valentine’s day, or maybe your wedding day: generally happy memories. At the same time, roses can represent apologies for misbegotten deeds and funeral departures. Not only the sight, but also the smell, the touch of a thorn, the rustling in the wind, all of these perceptively sensory qualities can be cognitively understood as well. A rose can resurge memories of joy and sorrow.

Now imagine that the rose is only one component of an entire building, or even an entire city block, carefully chosen to stimulate memory. The result would be a community that enhances the cognitive activity and strength of both healthy and non-healthy Americans.
Certain smells, both in people who are healthy and those with Alzheimer’s, can be used to elevate one’s mood, create calmness, stimulate the mind, and relieve depression.

- Best Alzheimer’s Products

“There’s growing evidence that listening to music can also help stimulate seemingly lost memories and even help maintain some cognitive functioning.”
- Alzheimer’s Association

“Visual aids — especially photos — can help stimulate memories for someone with Alzheimer’s, and this holds true for people in the early stages of the disease as well as those with full-blown Alzheimer’s.”
- Alzheimer.net

“...listening to music can also help stimulate seemingly lost memories and even help maintain some cognitive functioning.”
- Alzheimer’s Association

“Visual aids — especially photos — can help stimulate memories for someone with Alzheimer’s, and this holds true for people in the early stages of the disease as well as those with full-blown Alzheimer’s.”
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- Alzheimer’s Association

“Visual aids — especially photos — can help stimulate memories for someone with Alzheimer’s, and this holds true for people in the early stages of the disease as well as those with full-blown Alzheimer’s.”
- Alzheimer.net
MENTAL HEALTH

“Poor-quality housing appears to increase psychological distress”

Poor daylight increases depressive symptoms

Air Pollution causes behavioural disturbances:
- Self regulatory ability
- Aggression

Helpful design elements that regulate social interaction:
- Furniture configurations
- Privacy

Alzheimer’s patients better adjust to buildings that allow wandering

Knowing that elements of the built environment can generate cognitive responses, and affect the way we experience spaces is important, yet this does not yet fully express the ways in which the environment can have an effect on the human experience nor mental health and Alzheimer’s care. For this, we need to look further into the world of theory.

Through communal architectural intervention, built to include careful triggering of perceptive senses, such as smell, touch, sight, and hearing, we can evoke cognitive responsiveness, decreasing medication dependency, and imparting greater inclusion into the lives of Alzheimer’s suffers.

The built environment may have the means to affect those with Alzheimer’s. In fact, there are many ways in which the places we live impact and benefit our lives. The creation of certain spaces, and the use of different elements can improve mood, stimulate memory, increase recovery, and provide for greater inclusion with levels of independence.
Stained glass’s translucent qualities are excellent for creating a dimming affect on natural light. This helps set a mood of tranquility and enlightenment in religious spaces.

Flowers, with their numerous scents, can be used to evoke senses of calm, as well as resurgence of memories. This happens in the same way that a familiar scent may bring back memories of a specific event, such as the smell of pumpkin pie reminding someone of Halloween.

The tactile quality of stone, as well as its abilities to reverberate sound, block light, and regulate temperatures can create spaces that are calm, cool, and dark. This can be effective in meditation spaces, as well as holy places.

Stained glass’s translucent qualities are excellent for creating a dimming affect on natural light. This helps set a mood of tranquility and enlightenment in religious spaces.
2.2 Effects of the Designed Environment

The De Hogewey Dementia Village in Holland offers a radical alternative to Dementia care, which allows for immense levels of autonomy, mobility, and regular activity. In addition to this, the facility claims that this unprecedented approach to care lessen the need for high-power medication among their patients. This may suggest that increased freedom actually benefits Alzheimer’s patients.

If the success of the De Hogeweyk Village, as a designed facility, is stemming from the increased amount of freedom it allows its patients, perhaps the environment plays a role in this success as well. Patients within the village are, after all, allowed to roam the grounds of the village freely. This raises the question: What elements of the environment can have a beneficial impact on the human experience?

“The Hogewey officials say that after a few weeks, residents improve dramatically, require less medication and become calmer.”

-Dale Archer M.D.

“The natural decrease in agitation and aggression often results in reduced need for high-powered drugs and medicine.”

-Ann Napoletan, Alzheimers.net
DIFFICULTY THINKING
DISORIENTATION
CHALLENGES WITH PROBLEM-SOLVING

COGNITIVE IMPAIRMENT EFFECTS

DEPENDENCE ON OTHERS
IMPAIRED WAYFINDING
FEAR

COGNITIVE IMPAIRMENT IMPACTS

ENVIRONMENTAL BENEFITS

PASSIVE PROBLEM SOLVING
CONSISTENT REMINDERS THROUGH SIGNAGE
WALKABILITY AND MOBILITY

CAUSES OF DEPRESSION IN THE ELDERLY

DECREASED SOCIAL INTERACTION
LOSS OF LOVED ONES
DIMINISHED PHYSICAL ACTIVITY

IMPACTS OF DEPRESSION

INCREASED CARDIAC FAILURE RATE
DECREASED RECOVERY
GENERAL DISCONTENT

ENVIRONMENTAL BENEFITS

INCREASED SOCIAL INTERACTION
PROVIDE MORE VISITATION OPTIONS
IMPROVE ACTIVITY ACCESSIBILITY
PLACE THE ELDERLY FIRST IN DESIGN CONSIDERATIONS

Author Figure 13: Impairments, Depression, and the Environmental Benefits
Environmental Effects on Alzheimer’s Health

- Trees as a natural dampener
- Legible signage
- Prioritize ramps over stairs
- Ample seating options
- Walkability
- Social interaction
- Taste
- Sound
- Sight
- Touch
- Smell
- Emphasize textures
- Carefully choose flower fragrances
- Variety in street network and walking options
- Variety of healthy food options

Author Figure 14: Environmentally Beneficial Characteristics
We can train intuition through repeated stimulation. Intuition can then withstand, even as cognition fails. If this is true, intuition can be trained to act in place of cognition and memory. In other words: System 1 functions can take on the roles of System 2. In theory, this means that those with cognitive impairments, such as Alzheimer’s, will be able to navigate life using intuition and perceptive stimulation.

The built environment can, and does, stimulate us, through touch, sight, sound, and smell, whether we want it to or not. As Sarah Goldhagen says: “Buildings never leave us cold. If they’re not affecting us positively, there’s a good chance that they’re affecting us negatively.” Because the built environment already affects us, a well-built environment would affect us positively, maybe to the point where those with Alzheimer’s can live a “New normal” life among people who are well.
The new normal life would not have all the freedoms that come with well-functioning cognition, but it would provide genuine experience and autonomy that may better treat symptoms of Alzheimer’s, like disorientation, isolation, and depression, providing a radically different lifestyle than any offered in traditional Alzheimer’s care.

Creating a facility for such a space that deliberately stimulates the senses would provide the environment necessary to assess this hypothesis yet would need to have sufficient space to provide for safe freedom of mobility. For this reason, my thesis intent is to create a living-community that deliberately stimulates the perceptive senses yet is embedded within an urban community to prevent depression and isolation in Alzheimer’s patients. The challenge then becomes establishing safety within an urban context.
Atmospheric-Intangibles

Author Figure 16: Results of Environmental Stimulation
“The difference between the novice and the master is that the master has failed more times than the novice has tried.”

-Korosensei
The summation of my research led me to determine a myriad of criteria, both necessary and/or beneficial in Alzheimer’s care. The criteria also expanded to include elements that I believe to benefit inclusive communal spaces for both the healthy and unhealthy. The resultant criteria by which I chose to assess previous design works by then became: Cognitive stimulation, organization of the built environment, Facilities, psychosocial environment, organization, and mobility.

The projects that I chose to evaluate based on these criteria include three facilities designed for elderly and dementia care. It then became my intent to understand which elements within the criteria assessments are currently employed in dementia care, and which elements are not.
<table>
<thead>
<tr>
<th>Cognitive Stimulation</th>
<th>Optimization of Built Environment</th>
<th>Facilities</th>
<th>Psychosocial Environment</th>
<th>Organization</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy</td>
<td>Low Building Heights</td>
<td>On-Site Hospital</td>
<td>Urban Environment</td>
<td>On-Site Nursing Care</td>
<td>Public Transit</td>
</tr>
<tr>
<td>Diversity of Colors</td>
<td>Ample Lighting</td>
<td>Residential Spaces</td>
<td>Affordability</td>
<td>Living Areas</td>
<td>Walkability</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>Large Windows</td>
<td>Restaurants</td>
<td>Integration with Society</td>
<td>Proximity to Civilization</td>
<td>Pedestrian Bridges</td>
</tr>
<tr>
<td>Intentional Sensory Stimulation</td>
<td>Diverse Material Choices</td>
<td>Leisure Facilities</td>
<td>Destination Spaces</td>
<td>Diverse Road Network</td>
<td>Ample Outdoor Seating</td>
</tr>
<tr>
<td>Grocery</td>
<td></td>
<td></td>
<td></td>
<td>Physical Site Boundary</td>
<td>Signage/ Ease of Wayfinding</td>
</tr>
<tr>
<td>Exercise Amenities</td>
<td></td>
<td></td>
<td></td>
<td>Social Inclusion</td>
<td></td>
</tr>
</tbody>
</table>

Author Figure 17: Case Study Analysis Criteria
Hogeweyk Dementia Village

Location: Weesp, Holland  Date: 2009

Hogeweyk is a self-contained village where citizens with dementia are able to co-habitate safely together. The city addresses an issue that we know exists, yet have not found a proper cure for. Statistically speaking, “one in three seniors today die with dementia,” yet we primarily accept this as a fact of life instead of something to be thoroughly addressed. Alzheimer’s has increased by “an incredible 68 percent since 2000.”

- 152 Residents
- 250 Full and Part Time Aids
- 23 Houses
- 7 Housing Category Types
- 4 total acres of land
- Total Construction cost $23.11 Million
- Monthly Rent: $5,987.23

Benefits

Residents are more active and less medicated compared to traditional facilities.
INWARD VIEWS ON THE SITE ARE PRIORITIZED

HIGH PRIORITY OF COURTYARD SPACES

Author Figure 18: De Hogeweyk Priorities
## Hogeweyk Dementia Village

**Location:** Weesp, Holland

### Cognitive Stimulation
- Autonomy
- Diversity of Colors
- Problem Solving
- Intentional Sensory Stimulation

### Optimization of Built Environment
- Low Building Heights
- Ample Lighting
- Large Windows
- Diverse Material Choices

### Facilities
- On-Site Hospital
- Residential Spaces
- Restaurants
- Leisure Facilities
- Grocery
- Exercise Amenities

### Psychosocial Environment
- Urban Environment
- Affordability
- Integration with Society
- Destination Spaces
- Low # of People Per Room
- Social Inclusion

### Organization
- On-Site Nursing Care
- Living Areas
- Proximity to Civilization
- Diverse Road Network
- Physical Site Boundary

### Mobility
- Public Transit
- Walkability
- Pedestrian Bridges
- Ample Outdoor Seating
- Signage/ Ease of Wayfinding

### Author Figure 19: De Hogeweyk Case Study Analysis Criteria
This project has become the most impactful precedent for my thesis, in terms of project scale, provisions of autonomy, and openness to the public. While I do not approve of the sudo-reality that this project emphasizes, I do find great benefit in the projects use of social interaction spaces and open visibility within the community.

21 Points
Residential and Nursing Home Slimmering

Location: Vienna  
Date: 2005

“High-quality dwelling for care-dependent senior citizens in the comforting atmosphere of a green oasis - rather then the common, sterile, hospital-style atmosphere of geriatrics centers as they used to be. The individual wards of the center are designed to conceptually resemble an organic city center, with all its varying and diversified spatial characteristics.”

- The design focuses on creating a “city center” to unite the patients
  - To achieve this, each patient’s room has a window overlooking the central courtyard of the campus
INWARD VIEWS ON THE SITE ARE PRIORITIZED

CENTRAL ALLEY CONDITION IS PRIORITIZED

Author Figure 21: Residential and Nursing Home Priorities
## Residential and Nursing Home Simmering

**Location:** Vienna, Austria

### Cognitive Stimulation
- Autonomy
- Diversity of Colors
- Problem Solving
- Intentional Sensory Stimulation

### Optimization of Built Environment
- Low Building Heights
- Ample Lighting
- Large Windows
- Diverse Material Choices

### Facilities
- On-Site Hospital
- Residential Spaces
- Restaurants
- Leisure Facilities
- Grocery
- Exercise Amenities

### Urban Environment
- On-Site Nursing Care
- Living Areas
- Integration with Society
- Destination Spaces
- Physical Site Boundary
- Social Inclusion

### Organization
- Public Transit
- Walkability
- Pedestrian Bridges
- Ample Outdoor Seating
- Signage/Ease of Wayfinding

### Mobility
- Affordability
- Proximity to Civilization

### Problem Solving
- Problem Solving

### Intentional Sensory Stimulation
- Intentional Sensory Stimulation

### Autonomy
- Autonomy

### Diversity of Colors
- Diversity of Colors

### Public Transit
- Public Transit

### Low Building Heights
- Low Building Heights

### Ample Lighting
- Ample Lighting

### Large Windows
- Large Windows

### On-Site Hospital
- On-Site Hospital

### Residential Spaces
- Residential Spaces

### Restaurants
- Restaurants

### Leisure Facilities
- Leisure Facilities

### Grocery
- Grocery

### Exercise Amenities
- Exercise Amenities

### On-Site Nursing Care
- On-Site Nursing Care

### Living Areas
- Living Areas

### Integration with Society
- Integration with Society

### Destination Spaces
- Destination Spaces

### Physical Site Boundary
- Physical Site Boundary

### Social Inclusion
- Social Inclusion

---

*Author Figure 22: Residential and Nursing Home Case Study Analysis Criteria*
This project is important for its play with light, materials, and visibility. The project emphasizes a central axis for visibility, one that allows for views from all portions of the facility. The program is much more traditional in terms of Alzheimer’s care, and thus influenced my project’s intensive care facility.
Home for Dependent Elderly People and Nursing Home

Location: Orbec, France  
Date: 2015

“The building has been designed to enhance the living and walking areas. Its strength lies in its relationship with the landscape.”

- Uses unconventional colors for a more dynamic experience
- Wants to avoid negatively impacting the surrounding landscape
- Incentivizes Walking

Benefits

Use of color theory as a potential catalyst for memory
OUTWARD VIEWS FROM THE SITE ARE PRIORITIZED

THE BUILDING’S INTEGRATION TO SITE CONTEXT IS PRIORITIZED

Author Figure 24: Home for Dependent Elderly Priorities
Home for Dependent Elderly People and Nursing Home
Location: France

Author Figure 25: Home for Dependent Elderly Case Study Analysis Criteria
This project's use of color was extremely valuable to my thesis. The project prioritizes colors as a method of wayfinding and orientation. It also places an emphasis on visibility from the site outwards. Both of these concepts will impact my thesis.
**Case Study Comparisons**

<table>
<thead>
<tr>
<th>Facility</th>
<th>Cognitive Stimulation</th>
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<th>Psychosocial Environment</th>
<th>Organization</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOGEWYK DEMENTIA VILLAGE</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Residential and Nursing Home Simmering</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Home for Dependent Elderly People and Nursing Home</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

**Total Points**

- **21 Points**
- **16 Points**
- **12 Points**
“And you’ll return to real life. You need to live it to the fullest. No matter how shallow and dull things might get, this life is worth living. I guarantee it.”

-Haruki Murakami
The initial challenge in picking a site for this thesis stems from the fact that Alzheimer’s is a global disease. In this way, the site almost appears as though it could be situated anywhere. Upon reviewing the statistics that I gathered on the disease, I came to the decision that the thesis would have the greatest impact if it were situated in an area where education is lower, and the population is primarily non-white, as these two groups are more susceptible to the disease.

In order to address the issue of social isolation in elderly care, I have opted to introduce my thesis into an urban context, thus allowing for greater opportunities for social involvement, yet taking on the challenge of wellbeing in a less contained area. The way I have chosen to address the issue of wellbeing within an urban context is by creating a large-scale area, essentially a neighborhood, dedicated to Alzheimer’s care within the city. The project then becomes the development of a campus for Alzheimer’s patients, while also inviting non-Alzheimer’s sufferers to experience and even live in the community as well.

The built and natural environment within such a community would passively test and strengthen the mind and body, through promotion of physical activity and engaging uses of materials, paths, colors, terrains, and livable spaces, even making wayfinding a possibility. By providing amenities open to the public, this campus allows for greater social inclusion and visitation, thus revealing that, through architecture, we can include those who cannot remember; back into a world that has not forgotten them.
*Note: No two people experience Alzheimer's the same exact way. The events above are an example of possible progression of the Alzheimer's disease.

By creating an urban scale young-old community which triggers the mind's System 1 functions - through environmental stimulation - we might replace the need for System 2 processes to comprehend atmospheric intangibles and experience inclusion in an environment.
Chosen Site and Demographics

**ON THE OUTSKIRTS OF DOWNTOWN ATLANTA**

**ALONG THE INTERSECTION OF GARTRELL AND JACKSON STREET**

**LATITUDE:** 33.752855  
**LONGITUDE:** -84.374292

*Author Figure 2B: Thesis Site Location*
PEOPLE WITH ALZHEIMER’S DISEASE OR DEMENTIA

POPULATION AGES 65+

NON-WHITE MINORITY POPULATION

AT LEAST
10.71%

LESS THAN
7.7%

AT LEAST
21.25%

LESS THAN
15.85%

AT LEAST
44.7

LESS THAN
22.7%
Site Adjacencies

Existing facilities and spaces adjacent to the thesis location were found to be beneficial to the envisioned thesis community I will be designing. The construction of modern townhomes next to the site suggests a potential home for volunteers who will assist within the Alzheimer’s community. Additionally, a park and recreation center next to the site will assist in creating physical activity and social action spaces.

Furthermore, access to nearby MARTA bus stops and the MLK station provide easy access to Grady Memorial Hospital, as well as the Georgia State University. The university students can then become helpful volunteers within this thesis community.
GEORGIA STATE UNIVERSITY
MARTA
GRADY MEMORIAL HOSPITAL
HIGHWAY I-85
MLK AQUATICS AND RECREATION CENTER
SELENA S. BUTLER PARK
TOWN HOMES UNDER CONSTRUCTION
SAINT JOSEPH’S MERCY CARE SERVICES & DAVIDA DIALYSIS
OAKLAND CEMETERY

GEORGIA STATE CAPITOL

RELIGIOUS
COMMERCIAL
EDUCATION
RESIDENTIAL
MARTA
GOVERNMENT
MEDICAL
INTERSTATE 85
RECREATION

Author Figure 32: Site Adjacent Programs
The chosen site hosts a diverse street network, allowing for a variety in traveling paths along a series of both green and non-green spaces. The challenge of the site is the area’s size. With added size comes added difficulty in traversal. However, the wide variety of transit options offered near the thesis intervention’s location remedies the challenge of traversal.

This project is primarily for those with Alzheimer’s, and those with Alzheimer’s are traditionally characterized as being prone to wander. While wandering poses a challenge, the assistance of dedicated care facility workers, volunteers, and visits from loved ones, will allow those with Alzheimer’s to traverse the city while monitored by an able-bodied attendant.

Directly along the portion of Jackson Street which runs along the thesis site, there exists a MARTA bus line which leads directly to Grady Memorial hospital and Georgia State University. This bus line brings the potential of allowing for easy access to wonderful medical assistance, as well as easy transportation for young student volunteers to aid and interact with the Alzheimer’s patients.
4.1 Observational Site Analysis

The chosen site has both literal context: physical bounds and objects, and intangible context: areas implied by configurations of physical space. Viewing the site as an isolated entity with relations only to those externalities which may benefit life within the context, paths were formed which might help relate those who live in the community to the external world.
Implied primary, secondary, and tertiary spaces are present along the site in the forms of roads and land. Those roads deemed as primary are ones which have immediate contact to the center of the site and allow for circulation to the busiest areas. Those paths noted as secondary are the ones which stem from the primary paths, leading further into programmable space. Finally, those tertiary paths are the previously suggested “busiest areas.”

The primary lands are those I intend specifically to design upon. The secondary lands are those which have already been designed along the site, though not by me, yet may offer beneficial program to the thesis. The tertiary lands offer potential for integration into the thesis, yet would be left to their own devices to grow organically.
The confines of the site offer opportunities for exploration, yet the nature of the project calls for a restriction of that very exploration. To remedy this, entry nodes are introduced along the primary streets of the project. These entry nodes would be akin to the entry points of a gated community, allowing for visitors to enter by simply going through the gate staffed by an attendant. Those patients with Alzheimer’s would be able to pass through the gate if they are attended by family, a qualified volunteer, or dedicated care staff.

Within the project site, paths are created between the nodes, allowing for physical connections between entry points. Simultaneously, these nodes would be created visually as well, making it easy to identify the entry points.
EXISTING AREAS

BUS STOP LEADING TO DOWNTOWN

MAIN CORRIDOR OF SITE

PRIMARY POINTS OF ENTRY

THESIS INTERVENTIONS

DIRECT CONNECTIONS REDESIGN THE LANDSCAPE

Author Figure 43: Thesis Proposal on Simplified Site
Project Form Generation

1. Extrusion of Site Boundaries

2. Division of Site into Program Spaces
   - Park
   - Recreation
   - Retail and Residential (Mixed)
   - Care Facility
   - Alzheimer’s Residences
   - Town Homes
   - Student Volunteer Housing

3. Program Spaces Conform to Program Functions
Program spaces conform to program functions.

Program spaces respond to site circulation.

Additional housing introduced above retail.

Author Figure 44-48: Thesis Project Form Proposal
Through the combination of existing research on the literature of Alzheimer’s care, understandings gained through precedent analysis, and my own understanding, gathered through the thesis project process, this framework was generated as a means to assess the success of the Alzheimer’s care community which I will design.

**4.2 Conceptual Framework**
“Analysis of a work of art is at its most genuine introspection by the consciousness subjected to it. Its meaning lies not in its forms, but in the images transmitted by the forms and the emotional force that they carry. Form only affects our feelings through what it represents.”

-Juhani Pallasmaa
5.0 Form Generated from Site

1. STEP 4 PARTI

2. FORMS ARE CARVED TO CREATE COURTYARDS

3. FORMS ARE BISECTED TO CREATE INDIVIDUAL SPACES
FORMS ARE BISECTED TO CREATE INDIVIDUAL SPACES

ADDITIONAL CONGREGATION FORM ADDED

PEDESTRIAN WALKWAY CREATED

Author Figure 51-55: Thesis Form Development
Thesis Project Along the Site
The result of the site form generation underwent final customizations to allow for the facilities necessary to execute the thesis intent. These spaces were crafted both in consideration of the final conceptual framework analysis criteria, and in accordance with the existing street networks.

The image on the left shows the general forms of those facilities crafted throughout this thesis as integrated with the mass forms of the surrounding context. The orange lines represent secondary and tertiary streets leading near the intervention. The red lines are those primary paths along the thesis project.

The number of lines along each street represent the number of lanes. It is of note that the lane running through the longitudinal center of the thesis project, Williams Holmes Borders Street, was converted from a two lane into a one lane street. This allows for this most primary path to have controlled and lessened traffic, creating easier pedestrian circulation opportunities.
5.1 Site Intervention

The resultant Alzheimer’s facility nests itself along a series of city blocks, taking itself from the scale of a more traditional typology and elevating itself to the communal scale.

By nesting the facility within an existing community, the project is able to utilize the nearby facilities, such as the existing recreation center, park, plethora of apartments, upcoming town homes, and the nearby MARTA bus and train lines.

The facility is then able to meet the needs of those with Alzheimer’s while also providing programs that are not currently present on the site, such as a library, student housing, and additional retail venues. This allows for the Alzheimer’s facility to become an integral piece of the existing community, and will foster interaction between both those with and without Alzheimer’s.
THE COMMUNITIES BUILDING MATERIALS WILL INVITE TACTILE STIMULATION, AS PEOPLE WILL BE ABLE TO WALK ALONG PATHS OF VARIOUS MATERIALS, AND TOUCH WALLS OF VARYING TEXTURES. THE HOPE OF THIS IS THAT BY STIMULATING ONE'S TACTILE SENSES, WE CAN ALSO STIMULATE SMALL LEVELS OF SHORT TERM MEMORY.
The building materials, especially in the residential districts, will be used as a form of wayfinding element. The buildings will vary in their material finishes, thus creating a form of monument which people can see and identify to guide where they will go.
The initial challenge in picking a site for this thesis stems from the fact that Alzheimer’s is a global disease. In this way, the site almost appears as though it could be situated anywhere. Upon reviewing the statistics that I gathered on the disease, I came to the decision that the thesis would have the greatest impact if it were situated in an area where education is lower, and the population is primarily non-white, as these two groups are more susceptible to the disease.

In order to address the issue of social isolation in elderly care, I have opted to introduce my thesis into an urban context, thus allowing for greater opportunities for social involvement, yet taking on the challenge of wellbeing in a less contained area. The way I have chosen to address the issue of wellbeing within an urban context is by creating a large-scale area, essentially a neighborhood, dedicated to Alzheimer’s care within the city. The project then becomes the development of a campus for Alzheimer’s patients, while also inviting non-Alzheimer’s sufferers to experience and even live in the community as well.

The built and natural environment within such a community would passively test and strengthen the mind and body, through promotion of physical activity and engaging uses of materials, paths, colors, terrains, and livable spaces, even making wayfinding a possibility. By providing amenities open to the public, this campus allows for greater social inclusion and visitation, thus revealing that, through architecture, we can include those who cannot remember, back into a world that has not forgotten them.
RESIDENCES
Most design guidance states that the sensory enhancement of the physical environment through visual, auditory, tactile, and olfactory stimuli has a positive effect on mood and behavior in people with dementia.

-Gesine Marquardt, PhD

Throughout the entirety of the proposed thesis intervention, the senses will be both passively and actively stimulated. Deliberate uses of colors and static odors - such as those emitted from flowers - will be paired with the noises of music and conversation among the communities streets and paths. Situational smells, such as the aroma of an ordered dish, or the familiar tune of an old song will offer the possibility for chance encounters to trigger memory and enhance mood.

"Most design guidance states that the sensory enhancement of the physical environment through visual, auditory, tactile, and olfactory stimuli has a positive effect on mood and behavior in people with dementia."

-Gesine Marquardt, PhD
Deliberate Action in the Community

My research in neuroscience revealed to me that the fully functioning human brain has two main systems, one that processes perceptive information, things you see, smell, hear, touch, and another that processes cognitively: things like memories, opinions, and abstract thought. The first system informs the second, able to elicit emotions and memories from even the slightest trigger, yet the second can only act as a response to the first. These responses, triggered by chance occurrences, can ignite the synapses, interlaced in the brains neurons, to bring back the fondest of memories, even for a moment, and maybe lessen the pain of Alzheimer’s sufferers. Maybe architecture can make these chance occurrence, more frequent.

Architecture, as a means to shape the world around us, may be the solution we need. One in three Americans are projected to die with Alzheimer’s. If this is correct, either you, or one of your adjacent neighbors in this room will contract this disease. Know that the intent of this thesis is not to cure Alzheimer’s, but to provide an alternative to the traditional care responsible for depression, agitation, and isolation in Alzheimer’s patients, severely lessening suffering. Through communal architectural intervention, built to integrate careful triggering of perceptive senses, such as sight, smell, hearing, and touch, we can evoke cognitive responsiveness, decreasing medication dependency, and imparting greater inclusion into the lives of early to intermediate stage Alzheimer’s sufferers.

What would life with Alzheimer’s be like if the built and natural environment in such a community passively tested and strengthened one’s mind and body, through promotion of physical activity and engaging uses of materials, paths, colors, terrains, and livable spaces, even making wayfinding a possibility. This community would also provide amenities open to the public, allowing for greater social inclusion and visitation, thus revealing that, through architecture, we can include those who cannot remember, back into a world that has not forgotten them.
SOCIAL INTERACTION

SMELLSCAPE

INDEPENDENCE

MATERIAL DIVERSITY

VARIETY OF COLOR

ABUNDANT VISITATION

Author Figure 68: Aerial Residential College
All members of the community: Alzheimer’s patients, health specialists, volunteers, and general residents will have these wrist bands. The color and material of the wearer’s bracelet would match that of the wearer’s home. This will become a valuable wayfinding tool, as the owner will know what to look for if they are lost while returning home.

- For general residents, volunteers, and specialists, real world currency will be linked to the bracelets.
- For Alzheimer’s patients, the prepaid currency included in the fee to live in the facility will be linked to the bracelet, and can be viewed during transactions as a way to know if one has already made the same purchase.
- Access to and from the facility will be linked to the bracelets, meaning that intermediate and advanced patients cannot leave the facility without the attendance of a volunteer, general resident, or specialist.
- The physical health of all occupants will be monitored through the bracelets, so if any danger or injury occurs, medical assistance can be issued immediately.
The first areas designed within the community would be the residential units. These units will each house 1-3 people, depending on whether they are a duplex (shown on the left) or a flat (shown on the right). Those who have early to intermediate stage Alzheimer’s, as well as those with a high susceptibility to develop the disease will live in these units.
<table>
<thead>
<tr>
<th>Color</th>
<th>Authority</th>
<th>Wealth</th>
<th>Nature</th>
<th>Passion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>Residents in the blue areas would be those who worked in industries such as law enforcement. Examples would be police officers, lawyers, and law makers.</td>
<td>These residents would be those of high economic status. The purpose of these combined living spaces is to have people of similar backgrounds cohabitat comfortably.</td>
<td>These residents would be those who had a high affinity for all things nature. Example residents would be park rangers and environmentalists.</td>
<td>These residents would be those who found employment in the arts and entertainment, such as painters, musicians, and actors.</td>
</tr>
<tr>
<td>Yellow</td>
<td>These residents would be those who developed their minds and education for a living, such as professors and research.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange</td>
<td>Residents of the orange zone will be those people who had occupations involving active lifestyles, such as sports performers and physical trainers.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
The final result of this thesis exploration is the creation of a prototypal sub-community within the context of Atlanta. The community houses those facilities which would be necessary to provide an enjoyable yet contained living experience. Where this project diverges from its predecessors is in the choice to have the project situated in a semi-public urban context.

By placing restaurants and shopping centers within the community, those without Alzheimer’s are able to provide a level of interaction with those with the disease. The majority of housing offered throughout the community will house those with early to intermediate stage Alzheimer’s, as their symptoms have not yet reached the level for intensive care. Additionally, the housing offered atop the retail areas will house those with a genetic predisposition to the Alzheimer’s disease, effectively allowing the stimulative treatments of the community to slow their development of the disease, and eventually provide for aging in place.

The Livable Community and the Public

By placing restaurants and shopping centers within the community, those without Alzheimer’s are able to provide a level of interaction with those with the disease. The majority of housing offered throughout the community will house those with early to intermediate stage Alzheimer’s, as their symptoms have not yet reached the level for intensive care. Additionally, the housing offered atop the retail areas will house those with a genetic predisposition to the Alzheimer’s disease, effectively allowing the stimulative treatments of the community to slow their development of the disease, and eventually provide for aging in place.
The intensive care facility would be the area where those whose symptoms have worsened would move to. The facility is still housed on the premise of the community, so the same many of the offered amenities would still be available to those who live in the facility. The facilities ground level houses a small cafeteria as well as administrative and medical facilities. The subsequent floors offer living quarters with views to the rest of the community.
Intensive Alzheimer’s Care Facility

1. Williams Holmes Borders Street Becomes a one-way road, allowing for more pedestrian traffic. This creates a “Soundscape” where noise from the market and pedestrians can guide those with Alzheimer’s.

2. The bus stop along Jackson Street hosts a MARTA bus line that leads to Grady Memorial Hospital and Georgia State University. These allow for regular visits to full service health care and transportation from the student volunteer housing.

Deliberate Stimulation

2. “Smellscape” are created along the walking paths via an array of flowers, stimulating the olfactory senses.

4. Variety in material textures and colors creates both visual and tactile stimulation throughout the residential and market zones.

Social Activation

3. Open greenspaces allow for social interactions between the Alzheimer’s patients and the general public. These spaces can be found throughout the community, but are especially prevalent in the market and residential zones.

Safety

6. By centering the community between the busy Edgewood Avenue and Decatur Street, we allow for more eyes to keep watch over the community. At the same time, the Alzheimer’s patient’s residential zone is nested deep enough that facility workers can stop residents from straying to these streets in a timely manner.
Alzheimer’s poses a challenge which will continue to rise if left unchecked. The research gathered throughout this thesis helped me go from a point of complete ignorance on the topic, to a point of mild understanding. Even still, there exists far more knowledge to be gathered on the disease before a complete form of assistance can be issued, yet I hope this thesis can in some way aid as a solution.

Upon assessing my thesis proposal under that conceptual framework analysis I formed, I found that my proposal addressed nearly every point which I found to be present in a successful Alzheimer’s community of this scale. Therefore, I believe this proposal to be, in some ways, a success.

At first glance, architecture does not seem to be an adequate solution to a problem like Alzheimer’s. Regardless of what I had hoped at the beginning of this thesis, architecture may not provide a completed cure to a medical problem; however, architecture and proper urban planning do have the potential of providing better lives and increased longevity to those who are healthy and unhealthy alike.

It is unwise to underestimate the power of the places we inhabit. These spaces have infinite potential, both to harm us and to benefit our lives. This thesis is my proposal, one proposal, of a prototypical community which seeks to slow the degradation process for those with Alzheimer’s by utilizing the built and natural environments’ potential for cognitive and perceptive stimulation. This thesis looks at the built environment as a series of components, which are able to evoke mental responses, thus keeping the mind active. It is this idea of activating the mind through environmental stimulation, that I hope will aid in the further understanding, and eventual curing, of the Alzheimer’s disease.

5.3 Results

Alzheimer’s poses a challenge which will continue to rise if left unchecked. The research gathered throughout this thesis helped me go from a point of complete ignorance on the topic, to a point of mild understanding. Even still, there exists far more knowledge to be gathered on the disease before a complete form of assistance can be issued, yet I hope this thesis can in some way aid as a solution.

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Visual
Auditory
Tactility
Olfactory

Nature

Deliberate Stimulation

Predictability and Navigation

Program

Social Activation

Safety

Orientation/ Wayfinding
Organization of Facilities
Public transit
Signage and Landmarks
Walkability

Meeting/ Congregation Spaces
Seating
Destination Places
Recreation

Natural Barriers
Locks and Access Points
External Site Barriers
Building Placement
Visibility

On-Site Hospital
Residences
Eatery
Leisure Facilities
Convenience and Grocery

Author Figure 77: Final Thesis Evaluation
External Figures


Figure 5: Gala Contemplating the Mediterranean Sea… (n.d.). Retrieved from http://archive.thedali.org/mwebcgi/mweb.exe?request=record


