The rooms and spaces we inhabit have a profound impact on our emotions and behavior. As humans, we are uncontrollably affected by our surroundings. Therefore, it is important to design them in a way that will enable us to become our true selves. When your surroundings are no longer clamoring for your attention, you can listen to your own thoughts. This installation takes those facts into consideration and is meant to be a space that helps its viewers rebalance themselves and reconnect with the natural world.

I built and curated this room installation to combine domestic calm with natural forces. The sitting room formation illustrates the importance of "home" and the plants that are envelope the sitting room instill a sense of nature in an indoor setting. I painted small surprises throughout the space to add a bit of childish delight to the way the room is viewed and painted almost everything in similar shades of calming green.

Amelia B.
California

Thoughtful Architecture: The Impact of Design and The Creation of Sacred Spaces

Amelia B.

The spaces we inhabit have a profound impact on our emotions and behavior.[1] As stated by Winston Churchill,[2] "We shape our buildings; thereafter they shape us." The space you are in functions as a sort of background music in your mind, telling you how you should feel and what you should expect. Well-designed spaces can influence emotions and quality of life in a positive way.[3] The specific aspects of buildings (such as high or low ceilings, wall colors, window placement, or lighting) serve many different purposes that may not be the same for every person. People's life experience, temperament, memories, and simple aesthetic preferences affect the way they react to architecture. One person may love low ceilings because they make them feel cozy, but another person may hate them and feel claustrophobic. As humans, we read into minute details in each other's body language and facial expressions, and that tendency trickles over into other types of visual analysis. That's why it's common to personify objects and see faces and figures in geometric shapes and buildings. Our attributing of personality traits and our own memories to inanimate objects is what causes our preferences in architecture. Due to this simple fact of preference, it's impossible to assign a specific set of attributes of architecture to a category of 'good' or 'bad'. The definition of a badly designed building is subjective. Those details are a product of personal opinion. There will always be something to dislike and criticize in every piece of architecture, and vice versa. There are some types of buildings that seem like they would make everyone feel uncomfortable, and some that seem like they would be comfortable to everyone. Neither of those statements are fully true because of the complex and vast variety of the human experience. Therefore, a badly designed building is one that is designed with a sense of *carelessness* for all of those details. It is obvious when an architect designs something with only their next paycheck in mind. For example, in the city of Alameda where I live, there's a housing development that was built a few years ago where all the houses look the same. They look sterile and uninviting, and they have no sense of being 'lived in'. The similarity of all the houses encourages conformity, and the inhabitants had no say in the 'personality' or feeling of their homes. Developments like this are 'bad architecture'. This paper discusses good and bad architecture, and the meaning of those phrases, therefore the theory I am setting forth is simply a combination of my personal preference and this discussion of intentionality in design.

Usually the most significantly draining buildings for the general population are schools, hospitals, office buildings, and retirement homes. These are places that are always inhabited, and play a role in the majority of the population's day to day life. The architects who design those buildings are distanced from the people who inhabit them on a daily basis, so they don't often consider the needs of the majority. Instead, they consider business and money making. It has been proven over and over that everyone benefits from considerate design that balances form and function and serves the people that use the spaces. Certain types of spaces are already intrinsically designed in that way, but most are designed carelessly, with a paycheck and an easily finished product in mind. How much happier could a city be if all of the most-used spaces

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[1] Bond, Michael. "Future - The Hidden Ways That Architecture Affects How You Feel." *BBC News*, BBC, 6 June 2017, www.bbc.com/future/story/20170605-the-psychology-behind-your-citys-design.

[2] "Churchill and the Commons Chamber." www.parliament.uk/about/living-heritage/building/palace/architecture/palacestructure/churchill/.
[Churchill believed that the shape of the Commons Chamber was responsible for the two-party system in Britain and therefore insisted that the building be rebuilt in its original rectangular shape after it was destroyed in the Blitz during WWII.]

[3] Cary, John. "'How Architecture Can Create Dignity for All.'" *TED*, 2017, www.ted.com/talks/john_cary_how_architecture_can_create_dignity_for_all/transcript?referrer=playlist-the_emotional_impact_of_archit#t-795387.

were designed specifically with their inhabitants in mind? People deserve to experience dignified settings that serve their needs and improve their emotional and mental states.

As a professional field, architecture is represented almost completely by Caucasian men. According to The American Institute of Architects,[4] more than 80% of licensed architects are white, and 73% are men. This has a significant impact on the rest of the population because it means that the majority of buildings and spaces have been designed by a privileged sector of society, and are therefore not catering to the needs of people of color, women, those in poverty, etc. Our society would be different if the spaces we inhabit made us all feel included and respected. The feeling of being in a badly designed space, or a space that wasn't designed for you, can range anywhere from mild discomfort to outright indignation over lack of accessibility. There are two different kinds of non-inclusive spaces: those which actively exclude people of certain groups, and those which alienate everyone who inhabits the space. Spaces that exclude certain groups include buildings without wheelchair-accessible doorways or ramps, women's bathrooms that always have a line, and gentrified structures in culturally significant areas. Spaces that alienate everybody are more widely known and include drab, uninviting hospital rooms, office buildings, schools, retirement homes, and government buildings. In places like that, you can *feel* the lack of emotion in your surroundings. That's why a trip to the doctor's office or the DMV is so draining. As stated by architect Daniel Libeskind[5], "...we can tell when somebody does something just for a quick buck. We can feel that carelessness and the silence it produces." Beige walls, no windows, no plants, a single ticking clock… No wonder everyone hates going to those types of buildings. So what happens when someone does it right?

Thoughtfully designed spaces make an objective difference in quality of life, emotional state, and economic gain. A study[6] by Sheffield University for NHS Estates compared patients in the newly refurbished wing of Poole hospital with those in the older wings of the hospital. The patients in the newly designed space were reported to require less medication than the others and were discharged on average two days faster. Another study[7] in a Pennsylvania hospital compared patients with windows that looked out on natural landscapes with those who had views of the city, or a brick wall. The patients with views of greenery had shorter stays, fewer negative evaluations from nurses, fewer doses of medication, and lower rates of post-surgical complications. The same positive results happen in schools. A study[8] in California analyzed the test scores of over 21,000 students and controlling for other variables, it came to the conclusion that students with the most natural light in their classrooms made 20% more progress on math tests and 26% more progress on reading tests in a year than their counterparts in rooms with fluorescent lighting. Another study[9] done by PricewaterhouseCoopers showed that capital

[4] Shugoll Research. *Diversity in the Profession of Architecture*. The American Institute of Architects, 2015, www.architecturalrecord.com/ext/resources/news/2016/03-Mar/AIA-Diversity-Survey/AIA-Diversity-Architecture-Survey-02.pdf.

[5] Libeskind, Daniel. The Emotional Impact of Architecture. Cable News Network, 20 July 2017, www.cnn.com/style/article/daniel-libeskind-architecture-emotions/index.html.

[6] University of Sheffield, School of Architecture (1999) The architectural healthcare environment and its effects on patient health outcomes: a report at the end of the first year of study. University of Sheffield, School of Architecture in association with NHS Estates, Poole Hospital NHS Trust and South Downs Mental Health Trust.

[7] Ulrich, R. (1984) View through a window may influence recovery from surgery. Science, Vol 224 (27), April 1984, pp 420–421.

[8] Heschong Mahone Group (1999) Daylighting in schools: an investigation into the relationship between daylighting and human performance. California: California Board for Energy Efficiency Third Party Program.

[9] Pricewaterhouse Coopers (2000) Building performance: an empirical assessment of the relationship between schools capital investment and pupil performance. Research Report No 242.

investment in school buildings was the greatest contributor to improved staff and pupil morale and effectiveness of learning. It has also been proven by CABE[10] and the Office of the Deputy Prime Minister (ODPM) in 2001 that well-designed public spaces in cities provide many economic, social, and environmental benefits. Having well-thought-out public spaces of good quality leads to an increase in public morale and activity, higher rental levels, lower maintenance costs, enhanced regeneration and increased public support for the development. Good design also makes a difference in rent and financial performance. A Chicago study[11] showed that 'good' architecture for commercial offices (measured by architectural awards) increased rent significantly in a way that could not be explained by other factors. Another survey[12] for the University of Nottingham explained that high employee satisfaction and functional quality leads to the highest investment rates in corporate buildings. These results prove that considerate design objectively improves many aspects of life for the people who interact with the spaces and the people who own them. There are many types of buildings and spaces that need these improvements but can't obtain them because of renovation costs, lack of government support and attention, strict building codes, and complexity of projects.

Not every structure in the world is designed with capitalism in mind. There are a few types of structures that our society places a priority on to have proper design and renovation. That includes religious spaces (such as churches, temples, mosques, and synagogues), museums and other hubs of art or knowledge, and each person's own home. Each of these spaces is already fit to serve its inhabitants in terms of functionality, emotional state, health, and aesthetic enjoyment. These structures are sacred, but not necessarily in the religious meaning of the word. They are highly valued and inspire reverence and respect in those who interact with them.

Religious gathering spaces have always been designed with a specific purpose in mind. They inspire emotion and awe in those who view them, even if the viewer is not religious. In Western religions[13], such as Christianity, Islam, and Judaism, the service is congregation-based and the gathering space is communal. Therefore, the churches, synagogues, temples or mosques are designed with a large open space where the congregation can assemble and hear the main speaker. Each aspect of the space has a symbolic meaning; mosques are situated parallel to Mecca, synagogues face toward Jerusalem and most churches and cathedrals have a cruciform ground plan. High ceilings give an "upward movement" feeling to the room and large windows bring in lots of natural light. They are meant to have an atmosphere of mystery and immateriality, and be an "earthly heaven". In the early days of Christianity, cathedrals were the biggest and most visually stunning buildings that people had ever seen before. To the average person in medieval times, it would have seemed like a miracle in itself. In those churches as well as modern day ones, the layout of public and private space is meant to convey the hierarchy of the religion itself. The ordinary churchgoers are situated in the larger main area and the holiest objects and places in the church are in the back, with barriers in place to keep the average person away. After the Protestant reformation, most of that messaging was done away with and churches became bare and simple to reflect the idea that the only important thing was God's

[10] CABE and DETR (2001) The value of urban design. London: Thomas Telford Publishing.

[11] Hough, D. and Kratz, C. (1983) Can 'good' architecture meet the market test? Journal of Urban Economics Vol. 14 pp 40–54 and Vandell, K. and Lane, J. (1989) The economics of architecture and urban design: some preliminary findings. Journal of Urban Economics Vol. 17 (2) pp 1–10.

[12] Rouse, J. M. (2000) How do profit-generating organizations measure and manage the costs and benefits of architecture and design when investing in properties for their own business use? MBA Dissertation: University of Nottingham.

[13] Bychkov, Oleg. *Religious Architecture*. www.web.sbu.edu/theology/bychkov/architecture.pdf.

word, and not the ornate decorations. Eastern religions[14], such as Buddhism and Hinduism have different layouts in their temples, They have a more individual processional practice; daily worship is a journey from one's home to the temple that ends in individual meditation or prayer at the center point of the temple. Therefore, there is no large interior space in their temples and shrines, just processional pathways that guide the worshipper in a circular route to the center inner sanctum where the most important religious imagery is situated. The center point is the most important because that's where the soul is believed to experience transcendence or salvation. Because of this, many cities and areas around temples are built in a mandala form, with geometric patterns radiating out from a center point. No matter what religion a gathering space is built for, the structure always feels special because of the care and effort that went into the design. The buildings have the power to inspire awe and worship in those who view them, even secular or atheist visitors. "...we may experience something at odds with our practical secularism: a peculiar and embarrassing desire to fall to our knees and worship a being as mighty and sublime...the purpose of their ethereal walls to make metaphysical stirrings not only plausible but irresistible even within the soberest of hearts." [15] Anyone inhabiting the space can feel that emotion, so it carries a very different atmosphere than the aforementioned doctor's offices and DMVs. That feeling of care and deliberation is very important in making the spaces we inhabit feel good.
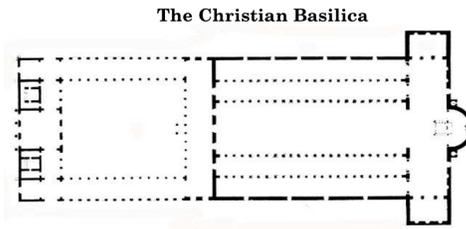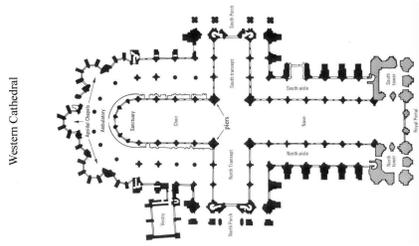
Museums, especially art museums, are designed very carefully to display the art pieces as well as possible. These spaces also feel sacred because of the combination of well-curated art and well-designed rooms. Museum layouts combine informational dimension (the way the objects are portrayed) with social dimension (the way visitors move through the rooms and perceive the art). When the space is designed so you view the rooms and objects in a sequence, it accommodates visitors' movement and the arrangement of objects but controls the pattern of exploration. When the spaces are designed in a grid, it's impossible to visit it in an orderly way, so it maximizes randomness in patterns of exploration and gives the visitor more control. When the spaces are designed around an axis, the viewer is forced to view sub-spaces, then return to one main space over and over. Visually interesting exhibits create relations between objects and produce a new way of seeing them, instead of reproducing a preexisting space and restricting relations between objects. Every exhibition should encourage slowing down and delaying the rhythm of your perception of the objects.
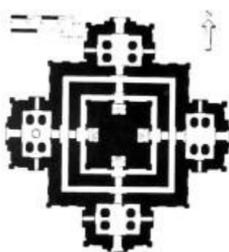
Figure 15 Ananda Temple floorplan
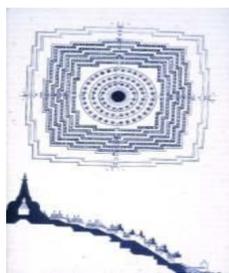
Figure 11 Borobudur floorplan

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[14] Cooler, Richard. *The Sacred Geometry of Perfect Forms in East and West*. Northern Illinois University, www.niu.edu/cseas/_pdf/lesson-plans/topical-overviews/sacred-geometry-ew.pdf.
[15] Botton, Alain De. The Architecture of Happiness. Penguin Books Ltd, 2014

Generally, the space that the art is held is also regarded as art, so everything, from the building itself to the bathrooms and maps, is designed well. In art museums "...the space *represents* rather than presents; the way objects are put together means something other than the objects themselves." [16]

The best example of a space that is designed thoughtfully is each person's own home. Our homes are generally the spaces we have the most control over, and the most important spaces for each one of us.[17] Because of this, you can tell a lot about a person by seeing the space they choose to inhabit and the way they choose to present it.[18] Our homes carry our identities and remind us of that while we inhabit them. However, as humans, our identities shift quickly and unpredictably so our homes need to shift as we do, or risk stagnation. As philosopher Alain de Botton stated, "We need a home in the psychological sense as much as we need one in the physical: to compensate for a vulnerability...We need our rooms to align us with desirable versions of ourselves and to keep alive the important, evanescent sides of us." [19] A person's home feels like a home to them because it holds the version of them that they view to be the 'true version', and reflects their internal thoughts and values.

My bedroom has always felt like a significant indicator of my identity, values, and interests during any given time in my life. When I was younger, rearranging my room and decorating it in different ways was the biggest amount of change I could realistically perform in a reasonable amount of time, and it made me feel like a better version of myself. I shared a room with my sister until I was 10, so in that room, the only space that was fully mine was my bed and the wall right above it. I tried my best to make that small space as "me" as possible. When I got my own room in fifth grade, I went a little bit crazy with decorating it because I was so excited to have more space. It got really cluttered, but I absolutely loved it. When I turned 13, I decided I needed to change my room again so it would feel like a "teenage" space. In the summer between seventh and eighth grade, I bought a few cans of paint and some brushes and set out to paint my room light purple. My mom suggested that we could just get a painting company to do it for me, but I wanted to know that I was capable of transforming my space in that way. It felt like a pivotal point in my life at that point. I painted the whole room myself in a couple weeks and then rearranged the furniture afterward, too. Now, whenever I get in a creative rut or I feel like I've been stuck in the same routine for too long, I rearrange my room a little bit. It makes me feel like I have control over my surroundings, and that makes me feel more at home. If it's exactly the way I want it, it's a space that's built for me and therefore gives me emotional and mental satisfaction. Obviously, not all spaces give off the same feeling of being comfortable and welcomed. But why shouldn't they?

It has already been determined that one's perception of architecture is completely subjective, and based on a multitude of memories and personal experiences. This fact makes it somewhat difficult to pinpoint the exact 'right way' to design a building. Should it reflect the architect's preferences, or the preferences of the population of the area or the inhabitants' preferences? Each of those perceptions could lead to entirely different structures being built. Generally, the most important requirement for 'good' architecture is careful consideration for the

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[16] Carliner, Saul. *Modeling Information for Three-Dimensional Space: Lessons Learned from Museum Exhibit Design*. Bentley College, Feb. 2001, www.core.ecu.edu/engl/henzeb/7701s06/ftp/ethnog2.pdf .

[17] "The Psychology of Home Decor." *UT News | The University of Texas at Austin*, 7 June 2013, www.news.utexas.edu/2013/06/07/the-psychology-of-home-decor/.

[18] Desira, Rodianne. *The Psychology behind Making a House a Home*. University of Malta, 1 Jan. 1970, www.um.edu.mt/library/oar/handle/123456789/6945.

[19] Botton, Alain De. The Architecture of Happiness. Penguin Books Ltd, 2014.

fine details of a structure[20], in a way that is clear to viewers. All architectural spaces should be considerate of their inhabitants, in terms of functionality, emotional state, health, and aesthetic enjoyment. Architecture objectively has the power to encourage physical, emotional, and mental responses in those who experience the structures. In order to be fully considerate and thoughtful while designing and constructing the spaces where we live and work, we must be open to the fact that we are uncontrollably affected by our surroundings.

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[20] Such as location, inhabitants, purpose, aesthetics, etc.

A Guide to Creating Sacred Spaces

These rules have been compiled from a multitude of resources [details cited in footnotes], and are intended to serve as a baseline for the redesign of the most used and most frequently thoughtlessly designed spaces in our society. Once redesigned, these spaces should fit the below definition of a 'sacred space'.

Sacred spaces are those that are fit to serve their inhabitants in terms of functionality, emotional state, health, and aesthetic enjoyment. Each inhabitant or visitor should feel comfortable being in the space and have a natural respect for it. It should be clear that the space has been carefully curated with consideration of the purpose that it will perform and the people that will be using it.

1. Offices[21]
   a. room for each employee to focus in a quiet environment
   b. an outdoor view and natural light for every employee
   c. at least two places for employees to go on breaks; one inside, one outside
   d. functional, clean bathrooms, coffee machine, cubicles, etc
   e. either colorful walls or colorful art prints
   f. comfortable desk chairs for every employee that do not cause back issues
   g. flexibility in working location, whether in the building or at home
   h. meeting spaces available to be used for collaboration
   i. accessible for all employees

2. Schools[22]
   a. an outdoor view and natural lighting for each classroom
   b. spaces that encourage balanced group work and solo work
   c. class sizes of 25 students or less
   d. functional, clean bathrooms, lockers, classrooms, gym, etc.
   e. space for creativity in academics, not just one model of success
   f. accessible for all students

3. Medical buildings[23]

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[21] "The design of the workplace impacts performance, employee engagement, and innovation. With three in four U.S. workers in less than optimal workplace environments, their struggle to work effectively has resulted in costly productivity losses, stifled innovation, and decreased worker engagement, according to Gensler's Workplace Index...employees who choose the when, where, and how's of their workdays are much more satisfied across a number of verticals. They also score workplaces as being high on work-life-balance and innovation."

[22] "An ideal school environment attracts teachers who are knowledgeable, care about student learning, and adapt their instruction to meet the needs of their learners... decreases absenteeism, suspensions, substance abuse, and bullying, and increases students' academic achievement, motivation to learn, and psychological well-being...mitigate the negative effects of self-criticism and socioeconomic status on academic success...also lessens teacher burnout while increasing retention."

[23] "If you've ever been wheeled into an ER room on a stretcher and spent hours staring at a windowless gray wall, you're already aware that traditional hospitals haven't exactly been designed to be comforting. Qualities like natural light, views to nature, and quiet and clean patient rooms all contribute to a positive patient experience...bringing some pleasure -- simple pleasures -- to people who are having a really hard time...reduced stress has been shown to shorten patient stays."

<ol type="a">
an outdoor view and natural lighting for each room/patient
either colorful walls or colorful art prints
a clean and comfortable lobby space with entertainment options
Rooms that offer enough privacy for each patient and their family/visitors
quiet rooms, lobbies, and hallways
comfortable furnishings
staff rooms close to patient rooms
greenery in hallways, lobbies, etc
accessible for all patients

4. Commercial buildings (store, restaurant, hotel)[24]
<ol type="a">
displays that draw the eye
natural light and greenery
well-coordinated lighting, fixtures, displays, and colors
a layout that encourages a clear path through the space
adequate space to avoid bumping others
clean and well-maintained
accessible for all customers

5. Civic buildings (libraries, theaters)[25]
<ol type="a">
comfortable seating
proper lighting (dim, warm light for theaters and natural light for libraries)
adequate aisle space
proper sound (carries well for theaters, doesn't carry well for libraries)
inviting lobby
accessible for all patrons
both collective space and solo space available

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[24] "From the moment someone steps into your store to the time they decide to check out (or leave your store without making a purchase), smart design decisions make a significant difference in regards to whether you make a sale or not...Retail design...can be the difference between a space that is appealing and a store that is instantly forgettable...will give staff pride in their workplace and boost their overall productivity which has a knock-on effect in boosting their morale." "...what makes or breaks a restaurant is not necessarily the food. It's the design...decor, lighting effects, and where to place the kitchen that can mean the difference between an enjoyable dining experience or not."

[25] The aesthetics of a theater are often as important as the production taking place therein...can change the entire mindset of an audience before a single note of an overture is played and before a single line of dialogue is spoken." "good design...will maximize the total utility and educational benefit, minimize the need for future improvements, make subsequent expansions easier, and reduce ongoing operations and maintenance costs...more than a collection of books. It serves as an interactive multimedia center designed to support learning and social cohesion."

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