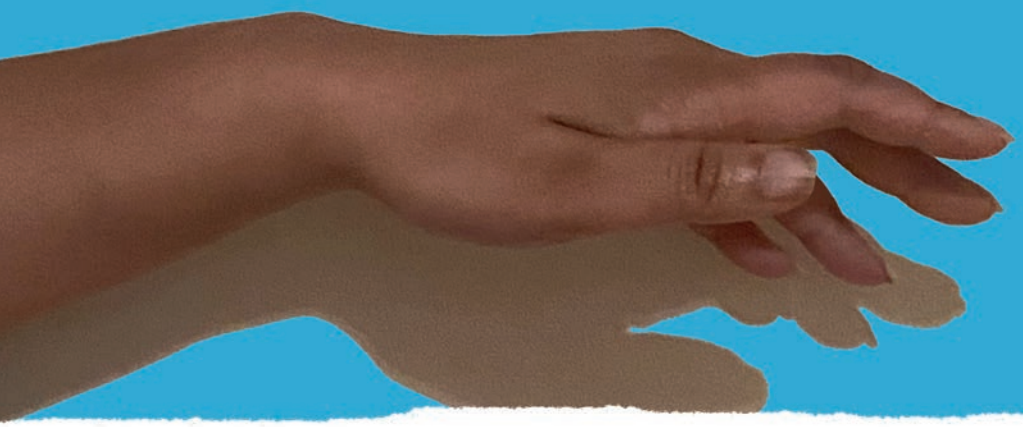
TWO WAYS OF KNOWING



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Abstract

We live internally and we live externally. We have experiences thatare visible to others and experiences that are invisible, concealed. In my life, there is often a threshold, an in-between, a liminal space. To live here means to live between Eastern and Western cultures, between being an artist and a designer, or between being a student and a teacher. As I move through life and interact with the threshold, I discover that it can be beautiful. Or, at times it can be awkward. Certainly, it is challenging, and on occasion, it is everything at once. Growing between two cultures, two spaces, from an early age, fostered in me a fascination with the in-between, the liminal space, the threshold. It also fostered in me a desire to nourish growth.

The artist in me looks at these projects and sees my growth. The designer in me looks at them and sees the construction of opportunities for growth, to send nourishment outward. As I construct my dynamic media projects and try to do this, I attempt to connect with others. Based on personal experience, qualitative research, and developmental psychology, I create spaces that physically and viscerally absorb my audience as well as activate their imagination.

Introduction

A movement between spaces

I've always been fascinated by the connection between external and internal. When I say external I refer to the world around us—what we see, hear, smell, touch. When I say internal I refer to the things we can't see, hear, smell, or touch, at least not initially. The latter might include emotions, thoughts, personal experience, dreams, maybe even illness. But, what fascinates me the most, is when those worlds collide. It's an intimate topic, an intimate place. I've quickly learned at DMI it can sometimes be an area that makes people uncomfortable, which makes it crucial for me to consider.

This discomfort, when acknowledged or realized, may help us move forward, learn, and grow. Psychotherapy as developed in the western culture might be an accurate example of this movement, for *some*. In therapy a patient may talk about thoughts, experiences, feelings. As they talk out loud, they bring forth, an inner, intimate experience. In that same space, the therapist might share thoughts, experiences, guidance or advice with a patient. The patient may perceive the suggestions as a new awareness, though every individual responds differently in different situations. In an ideal and rather oversimplified scenario, the patient integrates an old pattern of behavior with a new awareness, having learned something that helps them move forward.

This doesn't just happen in a therapist's office. The expression of something internal that people can't see doesn't just happen through language. People make art, music, experiences, places, products, etc as a response to thoughts, feelings, problems, necessities. An example in the opposite direction might be when an individual immerses themselves in nature some way—a walk through the woods, going on a hike, listening to the sounds of the ocean. Experiencing nature out in the world can often promote a calming or peaceful effect within people.

What I'm describing in all of these examples is a movement between two spaces, internal to external, and external to internal. Any description, definition, or experience related to this movement is subjective. However, it is a movement that is integral to being human and something we all experience in different ways. As we change and grow, this movement back and forth continues with us.

If internal and external are two separate spaces, then there's a third space as well, the in-between. It's a liminal space, neither here nor there. It acts as a threshold. It could be the moment you decide whether or not to talk about something. Maybe the liminal space is the processing of an experience that shifts your perspective on something. Maybe it's the act of mixing paint before you put brush to canvas. Maybe it's the Gatorade you drink before you kick a soccer ball. I am not an athlete, but that is definitely what it looks like in Gatorade commercials. The point is that this liminal, transitional space could be a lot of different things.

This movement, and these spaces captivate me. You can call all of it psychodynamic, you can call it spiritual, you can call it existential. but I call it simply unavoidable.

When my sister and I were young, we had a lot of unstructured play time. In the first house my parents owned, we didn't have a lot of furniture, for a little while. It made two little girls very happy, because it left two whole rooms dedicated to chaos.

Inside we played hopscotch, danced, hula hooped, caused general mayhem. At one point we even had that fisher price kids basketball hoop inside– if you're a child of the nineties you know

VCR footage 1991

VCR footage 1991

My sister and I playing outisde

Roller blading on our street

what I'm talking about. When we spent time in those rooms it was like there was no inside or outside, just liminal play space.

At that time my parents were fairly busy. Our dad worked long hours, and our mom spent most of her time watching us, as well as taking care of the house. Around the time I was born, our paternal grandparents came to live with us. Needless to say we had a full house. When we were little, our liminal play space was probably a blessing for everyone. It was a safe space where my mom could keep an eye on us, let us have fun, and not worry too much. When we got a bit older, my sister and I spent a lot of time outside. Sometimes it was a nice breather from a slightly packed and very busy household. We rode bikes to our friends' houses, climbed trees, and played "pretend", like many other kids.

Once there was a more sepearted inside and an outside world for us, the space in-between became the doors. We used our imaginations on both sides.

We spent time outside building homes for fairies using sticks and leaves. Moss served as a welcome matt. One of my funniest memories, is probably something my mother would not want me writing about because it makes us sound like Dickensian orphans, which we were not.

When my mom would take us shopping, my sister and I would go looking for objects for her "Thing" collection. Yes, her "Thing" collection. It was made up of treasures like broken zip ties, fallen clothing tags, bottle caps, anything we deemed worthy enough to

2014

2022

be included. We looked for hours around the floors of Sears and Macys to kill the time. Yes, the “Thing” collection was sort of trash, but very well curated trash made up of mostly plastic packaging materials.

My sister used to go home and make things out of the thing collection. Things became other things. I joined in.
All the while my parents were constantly doing things that needed to be done and never complained. We had a fun filled childhood, but like all children, we grew up. As we grew, we looked to our family to learn how to function in the world.

We learned to work hard, not complain, and that family came first. Those were the values I grew up adopting and living. I still believe in them. However, living by only those values stopped working for me fairly soon.

I am South Asian. Both my sister and I were born here, in Boston. My parents, as well as my grandperents, grew up in India. As my sister and I have grown, we have had to learn how to navigate between two different cultures, two different spaces.

Western culture in general tends to be more individualist, while Eastern cultures are more collectivist. Individualist cultures focus on the individual. In these cultures, society values people who are independent, assertive, self-reliant, strong, which you are considered if you have all those characteristics. Collectivist cultures value characteristics like self-sacrifice, being dependable, generous, helpful to others. In my opinion, those expectations are stronger if you identify as a woman, or are deemed a woman by your family. These two dichotomies are not mutually exclusive. Today we live in a global world. Eastern practices and philosophies

have made there way to the West, vice versa. Ultimately, every person, every family behaves differently. This is an important aspect of my experience however because I grew up feeling this difference.

My parents grew up in a homogenous collectivist culture, but my sister and I grew up as a minority, in a collectivist culture, within an individualist culture. Perhaps, they were intermingled, it's hard to say.

For my sister and I, growing and succeeding in life has meant learning to fit into both cultures, and learning to switch between the two. My sister and I have had to face and solve problems which our family simply could not help us with. They didn't know how, and sometimes, they could not even see them.

The point is, not only was our life map going to look different, we would have to learn how to read it on our own. Sometimes that has meant clashing with predominantly individualist culture at work, school, friend groups, or clashing with collectivist culture in family, family-friend gatherings, or other settings.

In fact I learned overtime that complaining, communicating when something is not working for you, taking breaks from working hard, sometimes putting myself over others, were all actions that were actually quite essential for me to succeed, here, now, in 2023 as an adult and a brown woman in the U.S, and they're skills everyone needs. These skills have helped me obtain and succeed at jobs, maintain healthy and important relationships. But I had to learn how to do these things as an adult. Many people do.

My sister and I, like many people living between two cultures, have had to build an in-between, a threshold, a liminal space for ourselves, because constantly jumping between two spaces is

exhausting. We had to understand what our own values and goals were, separate from either culture, but also pulling from both. We needed and wanted to learn how to feel grounded in ourselves when we felt pulled between the two; when we felt like we weren't fitting into one; when we got so caught up looking around to make sure we weren't following the wrong rules of one that we forgot about the present moment entirely. This meant learning to intentionally move out of an internal space– our minds, and into an external space–the physical world around us.

Everybody has to shape and build their lives in ways that help them grow. In order for me to do this in life, I needed to think creatively, because there was no model. So, I used my imagination. In order to make it through my own growing pains I needed to be supported. At times I needed to be pushed. I became what I like to call, a life nerd, obsessed with learning life skills, ideas, and actions that would help me handle the challenges I faced, and help me support myself.

As I keep building and growing, I often think of the time my sister and I spent playing. I think of the power our imaginations gave us to look for treasure on the Sears department store floor and build houses for fairies. I've had to learn new skills in life, but I've had to remember old ones too. Growing and shifting between cultures are movements. They are the movements that have shaped my life, and they are the movements that have shaped my work at DMI.

In his book, Playing and Reality, pediatrician and psychoanalyst, Donald Winnicott, explores human nature and growth in terms of childhood development. He describes an outside and an inner world that humans have, but he claims there is a need to acknowledge a third part of human life, "an intermediate area of experiencing, to which inner reality and external life both contribute....it shall exist as

a resting place for the individual engaged in the perpetual human task of keeping inner and outer reality separate yet interrelated" (Winnicott, 2005, pg.3).

L I M I N A L

Of, relating to, or situated at a sensory threshold: barely perceptible or capable of eliciting a response

Of, relating to, or being an intermediate state, phase, or condition: In-between,transitional

Merriam-Webster

1

Media That Moves

The work that has influenced me.

My closest friends have been my mentors, my guides who helped me grow. I have always admired their authenticity, rowdiness, their ability to unapologetically be themselves, maybe it's what attracted me to all of them in the first place. They made space for me to exhibit these behaviors too. Together we built a safe space. They helped pull me out of survival mode when I couldn't do it myself. They did this with their empathy, with their silliness, with their introspection, and with their vulnerability. When I was with them, I celebrated these parts of life, embraced them. But moving these abilities, these parts, with me through the threshold to different spaces was strange. For a long time, I felt I had to be two different people in two different spaces; someone who fit collectivist culture, and someone who fit individualist culture. Learning to move what I wanted through the threshold took experimentation. It took courage and fear. It resulted in validation and rejection. Ultimately, it strengthened me, but this was learned, and learning took vulnerability.

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“From the Latin word cor, meaning heart — and the original definition was to tell the story of who you are with your whole heart. And so, these folks had, very simply, the courage to be imperfect.”

– Brene Brown

The Power of Vulnerability

In 2011 I was sitting in my college dorm room when I stumbled on a TED talk by Brené Brown. It was titled *The Power of Vulnerability*. I had never seen the words vulnerability and power put together.

At the time she gave the talk, Brené was a PHD candidate in the field of social work. She started her talk by sharing her interest in the messy topics of life, as well as her personal urge to organize them. “Lean into the discomfort of the work,” she shared as a common saying within her field of study. She quickly followed it with her own thought process, “I’m like, knock discomfort upside the head and move it over and get all A’s. That was my mantra.”

This was a mantra I definitely lived by, but I only consciously realized it in that moment. When she declared how obvious it was that this wouldn’t work, it was immediately followed by a roar of laughter from the audience. I was hooked.

Brené walked her audience through her research into human connection. She wanted to understand it, “to hack it”, in her own words. What surprised her, was that when she spoke to people about human experiences like love, belonging, connection, they actually ended up speaking about heartbreak, exclusion, disconnection.

> “I ran into this unnamed thing that absolutely unraveled connection in a way that I didn’t understand or had never seen.”

She calls it shame, the fear of disconnection. We all know what shame is, but I had never seen someone on stage talking about it.

“Everyone has shame, and the only people who don’t have no capacity for human empathy or connection.”

As she continued through her research, she created a moment of silence in the audience when she proclaimed that the difference between people who struggled to feel belonging and connection compared to those who did, is that the latter believed they were worthy of love and connection.

She shared her painfully relatable struggles researching messy topics. There was an undeniable authenticity and it was immensely refreshing, immensely nourishing. In her research she searched for a commonality between individuals who felt a sense of worthiness. She walked us through this process until she finally answered the question. “Courage”, she finally said.

After all this, she finally said the word, vulnerability. Right after that, she dropped the line that made her TED talk YouTube gold, leading to her subsequent acclaim and popularity.

“They (those that believed they were worthy of love) believed that what made them vulnerable made them beautiful.”

Today, Brené Brown is extremely well known. She's written multiple best-selling books, given plenty of well received talks. At one point her talk on vulnerability was one of the most viewed TED talks in the world. Back then however, I had never heard of her. The idea of embracing imperfection, embracing vulnerability, as the thing that gives us feelings of worthiness, belonging, and connection, resonated deeply with me at the time, because they challenged unhealthy and unhelpful beliefs. Her words pushed me in the direction I needed to go at the time. I desperately needed to stop chasing perfection, Brené's talk was a moment that started that movement.

However, a decade later, I realize vulnerability can mean a lot of different things to a lot of different people. Yes, it takes courage for me to choose to be vulnerable in certain settings. Sometimes I've made great connections as a result. Other times I've left hating myself because my vulnerability was rejected. I don't know that any of this has really taught me courage. What it's really taught me, is tolerance, and the ability to laugh at myself. Even more importantly I've also realized that vulnerability isn't always a choice. Sometimes, the best thing I can do for someone is to make sure they can move out of a state of vulnerability.

In 2022, I started teaching undergraduates at Lesley University in Cambridge. In the first course I taught, I watched a student stand in front of the class to give a presentation, lift her notes, and abruptly start crying. All she could manage to say was sorry. She did not feel beautiful or courageous. I think what she felt was shame, and I did not want her to feel vulnerable anymore My students joined in as I assured her it was absolutely fine. They joined in because they intuitively understood what she was feeling, and they empathized. I could never make this student love presenting. What I could do, was try to reduce her shame, and try to help her have tolerance for the discomfort.

I still appreciate Brené's talk, because I have the tolerence to make it through vulnerability when it's not my choice, and sometimes the

courage to allow myself to be vulnerable. This has been a particularly necessary skill as I move through thresholds, because I will inevitably not follow the rules of different cultures perfectly. Sometimes this is intentional and sometimes it's not. So, living with the reality that moving between these spaces will be beautiful, ugly, awkward, challenging, has become a lot easier. The knowledge and acceptance that I don't have to be perfect living between cultures is less exhausting.

GRIS

Developed by Spanish Studio, Nomada, GRIS is a stunning video game that was released in 2018. It is categorized as a “2D side scrolling puzzle platformer” game and is animated in a transfixing ink wash and water-color style by artist Conrad Roset. There are many different descriptions of Gris. Some call it a game, some call it interactive art, some think of it like a movie you can control. No matter how it’s described it is clear that the game hits people in a deeply evocative way.

Gris is a female protagonist that you, as the player, control. We are first introduced to Gris lying face down in what appears to be a large, cracked, stone hand. We watch as she begins to sing, but then quickly loses her voice and falls downward as the hand below her begins to crack and crumble. She tries to move to different areas of this structure only to have them crumble and explode behind her. She falls into a gray ink wash scene. It’s sparse and as the player tries to move her forward, she keeps falling to the ground.

“Gris is a hopeful young girl lost in her own world, dealing with a painful experience in her life. Her journey through sorrow is manifested in her dress, which grants new abilities to better navigate her faded reality. (Steam, 2018).”

The powers GRIS gains in each new level, exist within her simple black dress. One of the first powers she gains is the ability to turn into a heavy stone-like slab. Her dress does this, changing into a cube shape before she crumbles through floors to get lower or stabilize herself so she won’t get pushed by wind. The powers in

her dress are skills she has gained to help her move through her journey. They are a physical, moving representation of growth.

In GRIS the player moves through five levels or stages made up of various challenges and puzzles which must be completed to move to the next stage. The stages in GRIS metaphorically represent Swiss Psychiatrist Kübler-Ross's five stages of grief: denial, anger, bargaining, depression, and acceptance. However, the gameplay, and entire experience of GRIS is also challenging the idea that healing from grief is a linear movement through these emotions (A Good Death, 2021). It does this in several ways.
The first level of GRIS is sparse and gray in color. As you progress through the different levels of GRIS, different colors return to the surroundings. Instead of just shifting from gray to red, red to green, green to blue, etc., these colors blend together as they seep into the surroundings. The layering effect is meant to challenge the traditional recovery model of moving from stage to stage (A Good Death, 2021).

"The red of anger is never really left behind; rather it is blended with green of bargaining, giving it a softer glow, and accented by the blue of depression, creating deep, bruising purples"(A Good Death, 2021).

The one color that never quite blends, is black.

Many platformer games limit a player to moving left and right. In GRIS, the player often moves left and right along a y-axis, representing life's highs and lows. In the metaphorical depression stage, Gris "plummets downwards, diving deep into underground caverns that function both as places of refuge and as labyrinthine traps" (A Good Death, 2021). Oftentimes the player needs to go backwards, retracing their steps moving in circles, again combating the idea that healing is a linear movement. We move Gris through magical settings like deserts, oceans, the night sky, all of which are filled with fantastical creatures. The whole game represents a journey through her inner world, but she's exploring what appears to be external spaces, like a desert or the ocean. The game is a truly unique blend of external and internal. It is a liminal space. Her movement through spaces is a movement through time. Both the style of movement by the player, and the aesthetics of Gris's journey exist as spatial metaphors.

Everything about GRIS, from the physical environment, to the challenges, to the creatures represent the complexity of dealing with sorrow, trauma, grief, whatever you want to call it. We often

see Gris ball up and cry at the end of each level before gaining a new power and being thrust into a beautiful new scene with color blending around us. Crying can feel like relief or catharsis. There is no text or characters who speak. Gris loses her voice at the very start of the game, but somehow, this game has created a language. Grief is the catalyst that sends GRIS on her exploration of growth and self-discovery.

I played GRIS during a time in my life when I felt loss. I was in need of a new perspective on struggle, grief, and feeling fragile, though I didn't know it. GRIS reminded me of the idea communicated through Brené Brown's talk; the belief that what makes you vulnerable makes you beautiful. Gris just did it without words, and through experience. Although it's a mostly visual experience, there is a visceral sensing of the protagonist's experience through the sound, visuals, movement, game play.

In her book Welcome to Wonderland Leane Domash connects creativity and artistic practice to psychotherapy practices. She discusses the term aesthetic imagination in relation to art therapy and the act of creating artwork depicting trauma. She writes "The aesthetic imagination heals. Instead of merely expressing the self, the artist reshapes it. She brings her unconscious thoughts and feelings into the external world and in so doing transforms them. As we experience a work of art, we participate in this transformation" (Domash, 2021, pg.27).

Eric Kandel states that, "Both the artist and the viewer bring creativity to a work of art. What is common to all types of creativity, be it scientific, artistic, or merely a biological process of perception, is the emergence of something original, inventive, and imaginative." (Kandel, 2012, pg. 451)

When interacting with the experience of GRIS, I felt I was moving through my own emotions brought to life in front of me. I felt a connection to the protagonist's transformation. It felt like it was mine. It affected me at a personal level, but it was also the beginning of my interest in Interactive Art. GRIS was a deeply nourishing experience for me. It did not fix my problems, it did not change anything externally in my life, but it prompted an internal shift. It created a safe space for me to interact and express my feelings, giving me a moment of emotional regulation and acceptance.

"The place where cultural experience is located is in the potential space between the individual and the environment (originally the object). The same can be said of playing. Cultural experience begins with creative living first manifested in play." (Winnicott, 1971, pg. 135)

In nourishing me, and helping me move through my own growing pains, I knew it could do the same for others. After I played GRIS, I immediately told my sister to download and play the game. She was also struck, profoundly affected, and mesmerized by the experience. It nourished her too, and built a desire in me to nourish through interaction.

Katamari

Perhaps on the other end of the spectrum compared to GRIS, is Katamari. How in the world do I explain the game of Katamari Damacy. Katamari was developed by Keita Takahashi. Katamari is a joyfully bizarre video game. You are a young prince whose very careless father, The King of the Cosmos, has accidentally destroyed all of the stars as well as earth's moon while drunk with his friends, oops. You play as the young prince, who is 5cm in size. You're sent down to earth with a katamari, a spiky ball. When you roll it around it collects items it hits as long as they are smaller than the katamari. The more items that stick to the katamari the larger it gets. Your task is to use the katamari to collect, well, everything. You begin rolling up small items like batteries, mice, pieces of candy, until you're rolling up giant squids, buildings, land masses. Everything you collect on the katamari is clumped up to form the stars and the moon. I'm not making this up. It's hilarious.

Katamari creates a world with no restrictions. You can roll up people, fish, whatever you want and it's insanely satisfying in its whimsy, maybe even liberating. Each stage however has time limits, with a few specifications of what you need to roll up. It's harder than it sounds and takes practice to move that ball around the way you want it to, depending especially what console you are using.

As your katamari gets bigger, there's an element of surprise when you suddenly discover you can pick up something new. It turns life upside down in a delightful way. There's also a sense of challenge as you must grow in size. When you begin small, creatures that are larger than you kick you around. You're at their mercy. You don't have control. Suddenly, you're larger than them, and you have control.

Time for a little vengeance in the strangest way. It creates a drive to keep going for the next item, all the while you're fully aware of the absurdity. It feels like a parody of how the world works.

In her book Critical Play, Mary Flanagan writes, "play can cure the hypocrisies of adult life" (2009, pg.140). This is the effect both these games have had on me in different ways. GRIS challenged societal standards and stigmas against emotional struggle as well as the ideals I grew up with in my family. Katamari was a parody of a rigid world. In the same book, Flanagan shares philosophies by Dutch historian Johan Huiziga. Flanagan shares that Huizinga believed activities of play "absorb the player utterly in a special time and place set aside for play; 'a closed space is marked out for it, either materially or ideally, hedged off from the everyday surroundings.'" He called it the magic circle. In the media experiences that have nourished me there has been an aspect of imagination, fantasy, maybe make belief.

“Who hasn’t made a wish while blowing out birthday candles? (Hurron, 2012, pg. 94)”

In the 7 Laws of Magical Thinking, Matthew Huttsun talks about the sentimentality we have over objects for personal reasons; a wedding ring, a lucky hat, a ticket stub. He points out that sentimentality for particular objects is equally as illogical as a belief in ghosts, but we wouldn’t be happy with replicas of the items we cherish. His point is that two things that are physically identical have a key difference. One has a nonphysical presence, “a special significance beyond the realm of physics or chemistry” (Huttson, 2012, pg.13).

Both Katamari and GRIS represent a realm outside our expectations of physics, logic, and everyday existence. I believe spending some time in that realm or space can foster imagination and activate expression. There’s being a kid and dressing up like

anything you can imagine, or cherishing a broken zip tie because it's part of your "Thing" collection. I think there is a certain sense of magic in an interaction that surprises you with something unexpected, something that goes against everyday logic, physics, rationality.

Design I/O, 2010

Funky Forest

"Funky Forest is an interactive ecosystem where children create trees with their body and then use physical logs to divert the water flowing from the waterfall to the trees to keep them alive. The health of the trees contributes to the overall health of the forest and the types of creatures that inhabit it. Funky Forest is a collaborative space that supports open play, where children can explore and experiment, setting their own objectives and creating their own stories" (Design I/O, Funky Forest About, 2005).

Funky Forest was developed by creative studio Design I/O. It was an immersive experience. In my work at DMI, I've tried to create experiences for adults that feel childlike, in order to foster imagination. If a child can intuitively navigate an experience, I know I've succeeded. Funky Forest is a representation of tending, cultivating, growth, and community. It's a liminal, developmental space, an experience of collective care. It reminds me of the role community, family, friends play in our growth.

Design I/O, 2010

A Fountain for Survivors

Michael Hull, 2021

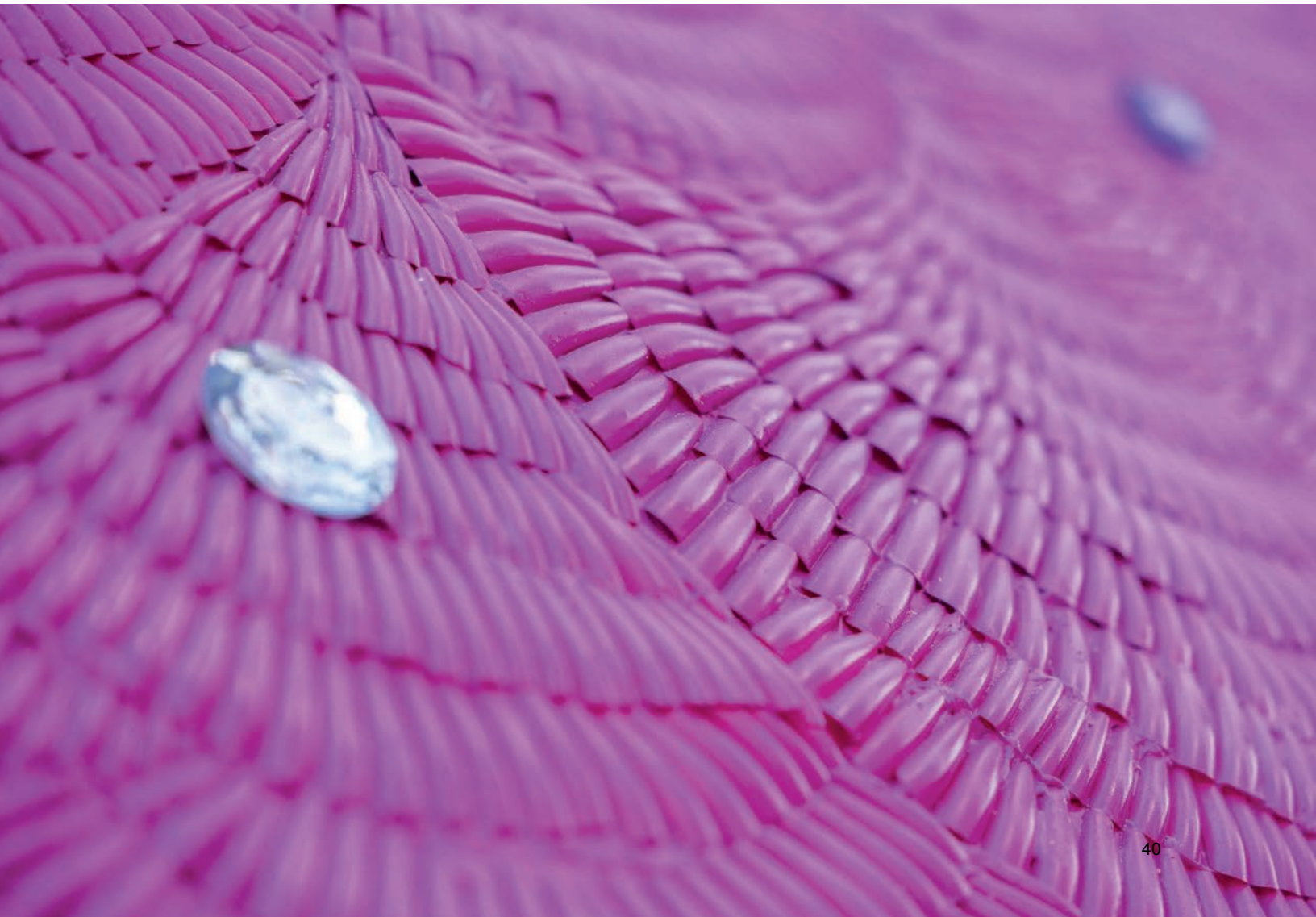
A Fountain for Survivors was a public installation by artist Pamela Council installed in Times Square, New York, from October 14th, 2021 to December 8th, 2021. It was an eighteen-foot-tall sculpture covered in 400,000 acrylic fingernails, which housed a fifteen-foot fountain inside. Described as a “maximalist installation” it featured kinetic illumination. Inside it “welcomed visitors with a range of sensory experiences including heat, sound, and scent” (Times Square Arts, 2021).

A Fountain for Survivors was part of Council’s series, Fountains for Black Joy. They are works that are both personal and political, internal and external, incorporating grooming rituals and nostalgia (Times Square Arts, 2021). A fountain is a public feature. It’s a benign place people congregate and meet. The first thought that comes to mind is the practice of making wishes in a fountain. This piece, and Council’s other fountains elicit feelings of hope.

A Fountain for Survivors is an ode to community. Pamela created a space for a community of people who identify as survivors, and a space that speaks specifically to the black community, celebrating joy within the culture. Her piece creates an internal space that exists in an external space. She uses familiar objects in surprising ways to elicit joy. It’s a piece representing collective care.

Michael Hull, 2021

Michael Hull, 2021



“Adorned and protected by a carapace of hundreds of thousands of acrylic fingernails, this fountain is my dedication and offering to Survivors and is open to the public that is outside in Times Square. On the topic of definition, Survivors know who they are; no one else can proclaim that for you. Conceived and created during a time when we are socially distanced, my goal with this work is to make a temporary monument that mirrors the experiences of masking & interiority that many have known, and which have now become a part of all of our lives. I started working with acrylic fingernails, that Black femme craft and protective style, over 13 years ago, and they have since become ubiquitous. So, I am most excited about the expressions of imagination that this work already has and will continue to inspire.”

— Pamela Council, 2021

The Artist Is Present

Marina Abromovic is widely known for her performance art. She lives the philosophies of the experimental Avant Garde art movement of the 60's and 70's, constantly challenging the definition of art. Some of her work has been more controversial than others, but in her work, she consistently channels herself as a medium.

In 2010 Marina performed The Artist is Present at the MOMA in New York. You can find a video of her performance on YouTube. During this piece, Marina is sitting in a chair wearing a long red gown. She is facing an empty chair, where audience members can sit for as long as they want.

During her performance, Marina showed no visible emotion on her face, but held contact with every audience member that sat across from her for eight hours a day, six days a week, for three months. As one person left, she would look down, blink, then lift her head up for the next (Wandering Coffee Writer, 2019). If you watch clips of her performance online you will see individuals sit across from her and begin to display a range of reactions such as blushing, laughing, and crying. It took an immense physical toll on Marina Abromovic, but she refused to end the performance early. When she explains the work she says that she became "just the mirror for their own self" and that she had never seen so much pain (Cherwell, 2018).

I interpret Marina's description as a moment of transference. Transference refers to the act of directing or redirecting feelings or desires related to one person, toward someone who is not herself. up to receive something non-physical from the person she was making

The Artist is Present. (Andrew Russeth, 2010)

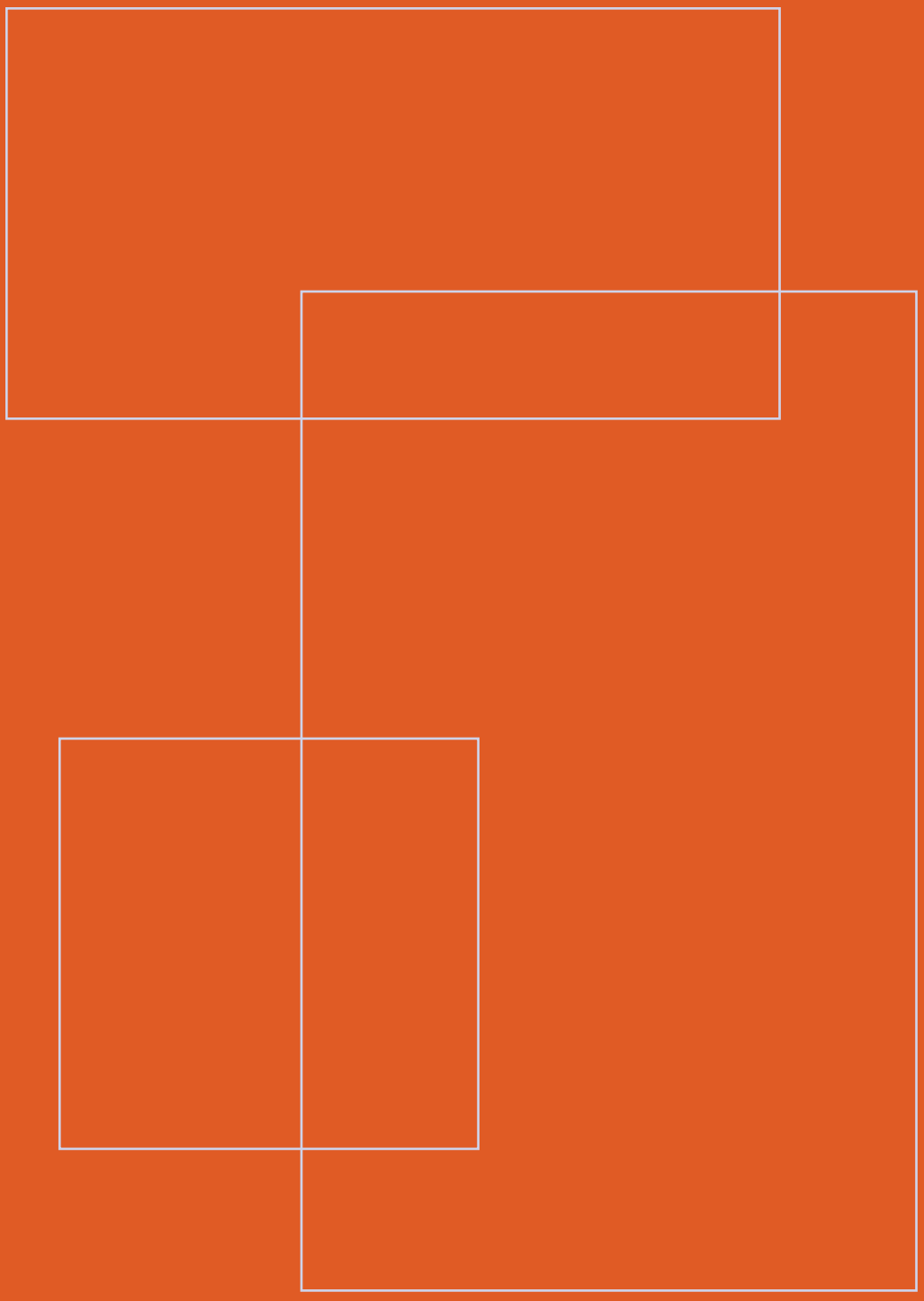
eye contact with. That might be emotions, energies, sensations. As she felt it, I believe the person looking at her saw that she felt it.

It was a powerful experience. Marina used silence to communicate (Cherwell, 2018). She acted as a container for the other person.

"The medium is the body"

—Marina Abromovic, 2010

She is creating a holding space for their internal experiences.



My Design Framework.

All of these works incorporate the themes of liminality, and the transition between internal and external experience. They are all concepts I explore in my work, as well as concepts my users explore as they interact with what I've built. However, there are other elements in the media and works I've highlighted above that have influenced my practice as well. Those elements are: physicality, imagination, and space. If liminality, internal world, and external experience are the concepts embedded in what I make, physicality, imagination, and space act as the tools or building blocks of my design process. These elements influence the choices I make as I build.

1) Physicality

When I design with physicality in mind, I don't just think about the body. I also think about perception, and sensation. Sometimes in my work, physicality translates directly to movement, or tangible objects. However, as I pointed out in GRIS and Katamari, digital and visual representations of tactile, physical, elements can be used in design to create the feeling of being viscerally and physically immersed. Even if we're not physically touching a spiky ball or wearing a dress that gives us unique powers.

"Painting from nature is not copying the object. It is realizing one's sensation." — Paul Cezanne

The quote above has always been one of my favorites. If you are a painter, or you've ever painted, you probably intuitively understand what Cezzanne is saying.

Another explanation exists in Mark Solm's and Oliver Turnbull's The Brain and The Inner World. In their book, Solms and Turnbull explore inner and outer experiences of how we perceive the world. Sensations give us information about our bodies. They are a type of awareness. Humans receive information from the outside world through senses like hearing, seeing, and "somatic sensation" (sensations coming from skin, muscles, joints of the body). But visceral information, or visceral response, is only experienced internally, where it is perceived as emotion (2002, pgs. 108-110).

My own painting from 2013

“Aristotle suggested that there are only five ways of knowing the world, corresponding to the five senses, but there is more than the outer world” —(Solms & Turnbull, pg 106).

Just as there is more than the outer world, Solms and Turnbull claim that there are more than five senses. Emotion is also a sensation felt in the body— a sixth sense. However, “emotion is a perception of the state of the subject, not of the object world” (pg.106).

If you give a baby a stuffed dinosaur while they are looking away, they might touch it and feel a physical sensation in response to the texture. But, they might look at it and jerk back in fear if it appears scary to them. That visceral response is an emotional reaction to the state or perceived appearance of the dinosaur.

If we look back at Paul Cezane’s quote about painting, what he’s pointing out might be more apparent. When we paint, we’re not just

creating an image. We're creating an expression of sensations in a visual format. If I were to paint waves hitting rocks on a shore, I would not just be painting what I see. I would be painting the force of the waves hitting the rocks, the chilliness in the air from the humidity, maybe a feeling of adventure. I would do this using color, value, texture, light, gesture.

As the painter it's important for me to be attuned to those sensations while I paint, because then the viewer may be able to experience those same sensations through the image. Images, or representations of the physical world, even if they are not the exact tangible version of it, can elicit physical sensation in the body. This engages us in what we are doing.
The person viewing the painting in this scenario isn't experiencing their sensations while physically being at that location watching waves hit the rocks. They're feeling the sensations in response to looking at the painting.

As a painter, the deeper I can make that experience feel, the more immersed the viewer will be. That's incorporating and thinking about physicality in design. Some people might view this as sad or less than the experience of being there in person, but I would say not everyone can get to the ocean. Maybe they just want a nice painting of one.

However, physicality through external senses— hearing, somatic sensations, and movement, are also foundational to my work. Exercise obviously entails moving the body, and inevitably focusing on the physical sensations that come with that. This can promote good health, but there's other activities that can also get us moving and focusing on bodily sensation.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Tender Shoots
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Embodied experiences are experiences that quite literally, bring our awareness back to our bodies through our senses. These experiences help anchor us to the present moment (Schwartz, 2017). Proprioception, or kinesthesia, is a term (often brought up in neuroscience) that refers to our ability to sense our movement or where we are physically in space (Taylor, 2009). It's an essential part of our existence, and an important aspect of physicality. When we are disconnected from our bodies, we feel disconnected from ourselves. Another term related to embodied experience is feeling grounded. A dictionary definition of the term grounded from Merriam-Webster is— to be mentally and emotionally stable. Another definition is, "to feel present in your body and connected with earth, time, and place'" (Schwartz, 2017). These are just a few definitions in the English language and the philosophy of grounding exists in all cultures.

In South Asian culture, there are many grounding physical practices that have existed for thousands of years. A few that have become well known in the U.S are Yoga and Reiki. In its origin, Yoga is not just an exercise routine where you finish with some Sanskrit phrases. Instead, it is a complex Hindu philosophy that incorporates moving and positioning the body in different ways, and is an act of healing, meditation, and spirituality. Reiki is a practice that involves a person moving or placing their hand above different parts of another person's body in order to direct energy and facilitate healing. There are long standing beliefs in many Eastern cultures that the human body has its own innate power and healing abilities.

In her book Creative Psychotherapy, Eileen Prendiville, an expressive arts therapist, remembers a discussion she had with a client during therapy when she handed her a ball of clay.

“She says, ‘I can’t think of what to make.’ I say, ‘You can’t think of what to make but your fingers seem to know exactly what they are doing.’ Thus, gradually, she becomes more curious about what she is making, and then she begins to make decisions about it, immersing herself in imaginary play.”

- Eileen Prendiville

In talking about physicality, there's one topic that I never brought up, which is thought. Thought is always active in our minds, but I focus on physicality in my work to help promote balance, fight states of overthinking and disconnection, and promote engagement. In the example above the client was encouraged to allow her fingers to lead her actions rather than her mind. It's an example of how moving awareness away from thought, toward the body can be a powerful act and help us do something we were previously unable to.

Physicality through symbol or image, as well as embodied experience can promote health, well-being, curiosity, immersion, and imagination.

Adobe Stock 2019

2) Imagination

As an adult, I don't imagine as easily as I did when I was a kid. I watched a talk on the power of visualization. It focused on research proving that visualizing the act of succeeding at something could actually help a person succeed. I tried it, but I struggled with visualizing. It felt like lifting a weight in my mind. So, I tried visualizing the act of visualizing, but I couldn't visualize it! When I was little, visualizing, or imagining a reality different from my own, the external reality came naturally to me. For example, I used to build homes for fairies with my sister in our backyard. I used the moss as rugs and sticks or stones for beds. Then I would imagine all the fairies using our homes. This involved both my inner world and my outer world. Maybe visualizing as an adult in the previous example was difficult for me because I was so aware of the fact that I needed to imagine that it became work.

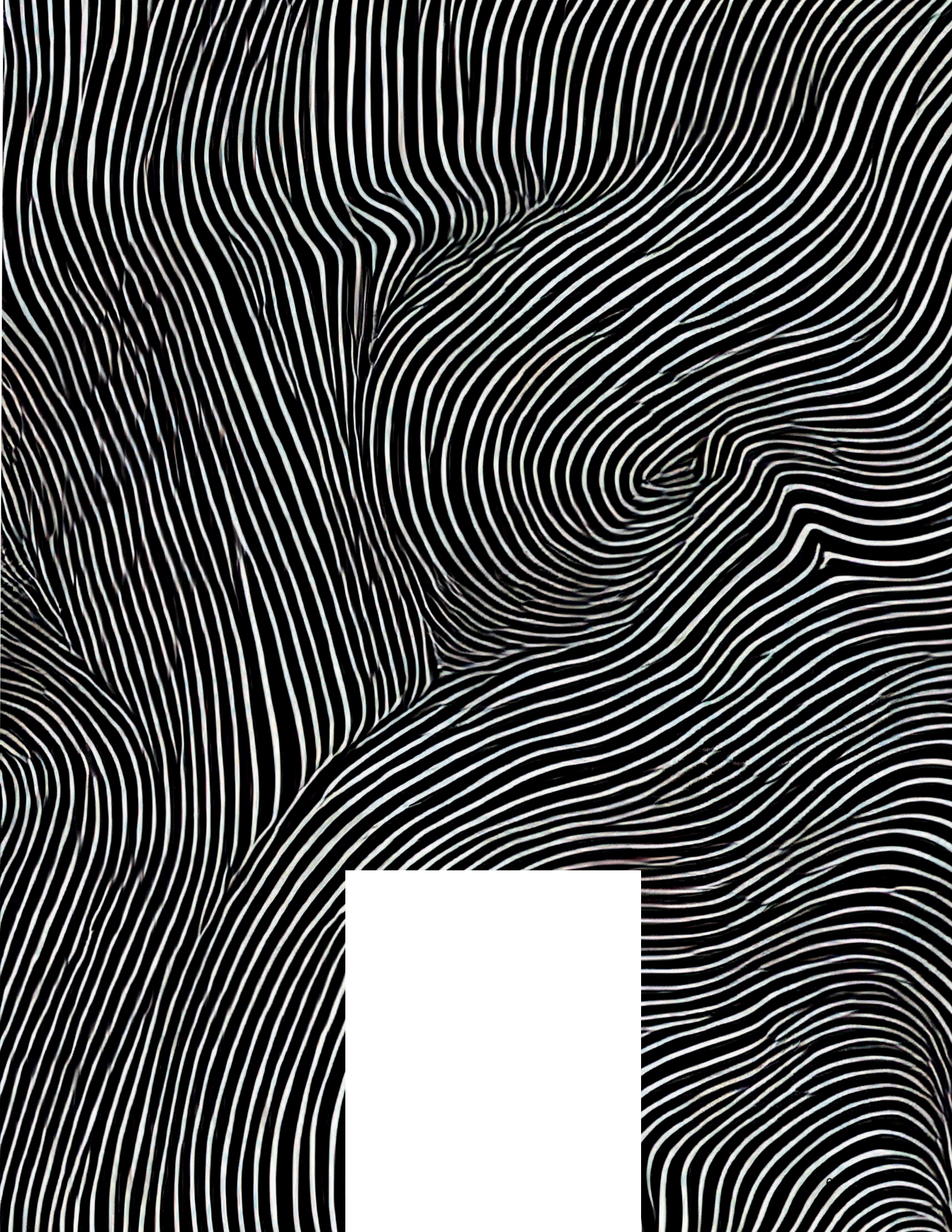
Creativity has become a popular topic in our culture. Plenty of books about how creativity leads to innovation have been published in the last few years. A word I see used less often, except in the context of childhood development, is imagination. One of the few non psychological sources on imagination that I found was a book called Lost Knowledge of the Imagination, by author Gary Lachman. The first chapter of this book is titled "A Different Way of Knowing". Lachman writes about a shift in the 17th century toward more logical and empirical thinking and away from mythical, intuitive or less logical ways of knowing. This happened in the Western world, but Lachman shares that eventually it did spread to other parts of the world. It led to a separation between the two ways of knowing. Logic became the more dominant and culturally accepted way of knowing. The other

became lost knowledge. It shifted the individual's relationship to the world, building societies that preferred one way of knowing, the more empirical one, thus making us use this way of knowing more dominantly. Lachman recognizes that the two can affect one another, and aren't mutually exclusive. They can be brought together to create something greater (Lachman, 2017, pgs. 1–13).

Imagination is essential to childhood development. It helps children understand the world, develop empathy, healthy relationships, and much more. But, in the psychodynamic framework, it is also associated with delusion, anxiety, and other mental health challenges. This might be why I didn't see it used as often for adults. Imagination is tied to our perception of reality, and that is powerful. The term creative has grown to mean much more than just the ability to create something. To live creatively can mean thinking outside the box, breaking rules. It exists outside the norm or the usual. Creativity involves using the imagination. If we didn't use our imaginations we could not be creative.

Donald Winnicott sees creative living as essential, even the reason we want to live. His reasoning is that experiencing culture, what is around us, inevitably means facing systems and rules that we cannot challenge. So, we use something, maybe an object, to express or release a creative impulse. Living a healthy creative life starts with the act of playing as a child. The act of experiencing culture happens between the individual and their environment. Winnicott's theory is that cultural experience, as well as the act of playing is something that exists between the internal and external. It is a potential space, and it is liminal (Winnicott, 2005, pgs. 128–136).

A beautiful fairy home for sale, built in 2023



3) Space

"For every individual the use of this space is determined by life experiences that take place at the early stages of the individual's existence" (Winnicott, 2005, pg. 135).

Winnicott reached a conclusion that the potential space that can encompass play, and creative life, can also be restful. What, or how we experience that space, depends on a person's life experience. Many individuals may have been in environments where, for whatever reason, they did not feel secure enough to play. On top of that we live in a culture where logic has become the dominant "way of knowing" in life.

My work is an attempt to build a playful, secure, potential third space by using imagination and physicality. Play involves activating your imagination, a thing we use when we play. Physicality encourages being in your body, and less in your mind, bringing us to the present moment and grounding us, potentially helping us feel less anxiety. A balance between how much we know and experience through the body, and know and experience through the mind in any moment immerses us and promotes a healthy, restorative liminal space.

My Work

Adobe Stock 2018

Dancing Bols

When I was a kid my sister and I used to dance to Bollywood hitsof the 70's and 80's played out of a bulky, wood paneled speaker placed in the corner of our carpeted living room. We would beg our mom to pull out her box of jewelry and ornaments collected over the years, some of which she had worn herself during dance performances. We would pin plastic flower garlands and fake long braids into our hair, contort our hands to slip on tiny gold bangles, and strap anklets adorned with bells around our ankles. We called those anklets ghungroos, but they go by a wide variety of names in a wide variety of languages, and are made in an equally wide variety of materials, sizes, and colors. No matter what you call them, what they're made out of, or their size, they are always covered in bells.

After tying ghungroos to our ankles we made any and all movements we could to hear the chiming of the bells in time with the rhythm of the song, usually originating from some type of Indian hand drum. As we got a bit older, my sister went on to train in the art of Bharatanatyam, a well known form of classical Indian dance originating in the south of India. You can recognize Bharatanatyam through its heavy emphasis on footwork, bending of the legs and knees, and gestural sign language. A Bharatanatyam performance is always accompanied with live music.

I often joke with people from similar cultural backgrounds that the scariest person on earth is a Bharatanatyam teacher, which might explain why I chose to practice more loosely structured folk dance. Bharatanatyam requires intense training that can continue for years until the teacher decides their student has mastered the style. I'll never forget the sight of my sister's classes. An army of young girls

hovered inches off the ground, knees bent and torsos straight, pounding the balls of their feet in time with their teacher's mnemonic cues for close to an hour.

Eventually both my sister and I stopped dancing, but the practice gave our whole family a cultural community in the South Asian Diaspora. The sound of drums, bells, and feet hitting the ground at the same time is a sound that defines my childhood.

Cultural Context

In response to a John Cage themed project assignment during Design Studio II we were tasked with creating a new instrument. I found myself going back in time to a period when I felt intimately connected to music through dance, a time when my ankles rang out in sound. This was the beginning of a project I like to call dancing bols.

The sound of a traditional ghungroo is distinct. It is a recognizable chiming of small bells occurring in time with footwork, which is occurring in time with rhythm. Culturally, the ghungroo is viewed as jewelry or an ornament rather than an instrument. The tablas (Indian hand drums) or flute you might hear during a performance however, are. Like any other instrument, tablas take a great amount of training to master. Playing tablas involves hitting the drums with different gestures and finger positions. Each of these different positions results in a different sound. The different sounds and hand positions are called strokes. A bol is a rhythmic pattern of different strokes.

There is definitely no practice or knowledge required to "play" or rather have a ghungroo "play" except for the ability to tie or strap it to one's ankle. However, the sound of a ghungroo is so quintessential and iconic in the realm of South Asian performance, it's even

highlighted in popular culture. Songs from Bollywood films begin with the sound of feet and ghungroos hitting ground, accompanied by close up shots of ankles and footwork. This small ornament is actually an integral part of the visual and sonic experience for an audience member or listener.

The “Digital” Ghungroo

As we grow up we become more inhibited, losing some of the joy of play and experimentation we had as children. I created a digital ghungroo in hopes that the user might be able to experience childlike joy and experimentation through gesture or dance, and definitely had a South Asian audience in mind.

Using digital samples of Tabla (Indian hand drums) sounds, I modified a traditional ghungroo to play both random and planned variations of tabla rhythms in response to rotation, height, and speed of movement. When someone puts on the digital ghungroo

they themselves become the instrument. This prototype was designed to be an experimental instrument not for the musician, but for the dancer. In other words, it's a toy.

By utilizing sounds produced by what is considered an instrument, but placing the ability to make those sounds on the ghungroo, both dancer and ghungroo are reframed as instruments. Traditionally, tablas are played with two hands by a musician. I'm not sure if you can consider usage of the digital ghungroo as playing tabla, but the gestures the wearer creates does play tabla rhythms and variations, making the dancer both performer and musician.

One of the questions in my mind that triggered the start of this project was, "What might happen to the dance, if the dancers movement is creating the music?"

Research

This project began with an introduction to the work of American composer and artist John Cage, perhaps best known for his composition 4'33. 4'33 was composed for any instrument, and the score Cage composed instructed the performers not to play their instruments for four minutes and thirty three seconds.

When we were shown a video performance of 4'33 I was not impressed. I thought of my years training in fine arts and wondered, how would my professors have responded if I presented a blank canvas. However, as I individually researched John Cage, I began to recognize and appreciate not only his experimentation, but the philosophies and concepts that guided it. Some of those concepts included ideas like non-intentionality,

randomness, chance sounds, and the idea that all sound is music. One of Cage's experiments that resonated with me involved turning a piano into a percussion instrument by altering the strings. Good or bad piano playing became irrelevant, and so did any resulting insecurities, worries or inhibitions around it. By discarding the rules of an existing instrument the altered piano promoted play.

4'33 is an example of Cage's desire to use chance to create music. In 4'33 there were moments of silence until there were moments of chance sound, like a cough from the audience, or a shifting in a chair. Cage's ideas, like all sound is music, that anything can be an instrument, and that anyone can be a musician were major influences in the development of my project. John Cage felt that the difference between noise, sound, and music didn't exist. He felt that noise and sound, in any capacity, could be considered music. With this framework, actions like tapping a pencil or stirring a pot not only creates music, but it also makes you a musician.

With these ideas in mind, and inspiration from my own life, I began thinking about the ghungroo. I thought about its status as an ornament in contrast to physically feeling and hearing it produce noise through dance. By Cage's standards, and my own, it would be an instrument. If the ghungroo is an instrument, then the way you play it is through dance.

My initial idea for this project was to turn the human body into an instrument through gesture. Originally I had planned on creating anklets and bracelets which would play instruments commonly used in South Asian dance performances, like flute and tablas.

While I was familiar with some instruments commonly used in South Asian music, I didn't know anything about music theory. I needed to gain a basic understanding of music theory so I could speculate on what kinds of gestures made sense to connect to different aspects of sound and music. I knew that it was impossible to learn enough about both Western and Eastern music theory in the time I had, so I began with Western music theory and hoped the knowledge would be enough to help me turn gesture into South Asian inspired sound. I compiled some of this research into a map.

Technology

I had a solid concept for what I wanted my instrument to be, but my next job was figuring out how to make it. To do this I partnered with Massart Professor Fred Wolflink, who helped me find the technological components to bring the experience to life. The following section summarizes those components to provide more insight into both the design process and user experience.

• OSC (Open Sound Control) & iPhone
Fred suggested we use OSC (Open Sound Control) for this work. OSC is essentially a network that can send live data between multimedia devices and programs. It's often used for performances or show control, and also works with MIDI (Musical Instrument Digital Interface), which will be further explained below. I utilized OSC through an app called Syntien on my iPhone which collects data such as the rotation, acceleration, and tilt of a phone as it is moved around.

• MAX Programming

Using the OSC app Syntien on my iphone, we were able to send movement data to Max, a multimedia programming application. When the Syntien app was being used and collecting that data, it was sent to Max, where we could trigger the playing of sounds based on what the live data was doing (in other words, how the phone was being moved around). At this point, I had several questions to answer for Fred before we could move forward.

What kind of sound did I want the gestures to create?
Which gestures did I want to trigger which sounds?
Which variables of movement (rotation, tilt, acceleration) did I need to use to do that?
What was the system? Was it always different? Or does the user know what sounds will occur with what gestures?

• MIDI & Tabla Samples

After some thought, I decided to first focus on rhythm in the form of an anklet before creating any bracelets or incorporating other instruments. I decided to use tablas for rhythmic sound because they are one of the most widely used South Asian drums. Tablas are actually a pair of two hand drums played using combinations of fingers and palms. The smaller drum makes treble and tonal sounds, while the larger mostly makes bass. The different gestures used to play tablas, called strokes, are represented using mnemonic syllables, much like the ones my sister's Bharatanatyam teacher would dictate for footwork.

Once I found decent digital samples of tabla strokes I had to figure out how to incorporate them into the programing. Fred showed me a way to turn the digital samples of tabla strokes into a digital language called MIDI, which is compatible with Max programming.

MIDI is a Western developed standard or language that digital music tools, like synthesizers and some programming applications can use to communicate with each other.

At this point I had my sounds, a way to play them through gesture, but no idea how I wanted this to work or what I wanted the user experience to be like.

Designing the System

Designing the system of the digital ghungroo was the most challenging as well as the most familiar step of the process. It required me to utilize what I knew, dance, but to translate it into something I didn't know, digitally playing tabla using programming.

To begin to figure this out, I strapped my phone to the side of my ankle using a velcro iPhone holder I usually wear around my wrist while running. Then, I danced, and watched what numbers came in from the phone application for rotation, tilt, and acceleration. I had to decide which of these variables would work the best in terms of programming. I also had to decide what variations of tabla strokes would play at what pace based off the movement data.

I danced several different styles, some of which I have no training in, but simply tried to mimic based on youtube videos. Some of those styles included folk, Bharatanatyam, as well as Kathak, which is also a type of classical Indian dance actually accompanied by tabla playing. This practice in movement along with watching the live numerical data helped me answer some of the questions Fred had asked me. It was time to start prototyping.

Iteration 1

Emboldened by John Cage and the endorphins from dancing all week, I told Fred I wanted the tabla strokes to play completely randomly, except for how long each stroke played. I decided to use the data from acceleration. The idea was that increases and decreases in the speed of how I moved my ankle would randomly trigger different strokes. Turns out I wasn't moving my ankle at a huge variety of speeds, only one stroke was triggered. When I tried to move my ankle faster, the random playing of different tabla strokes didn't sound like tabla at all. Iteration 1 was not a pleasant sound to experience, though it probably did align with most with Cage's philosophies.

Iteration 2

By iteration two I knew that creating two bracelets and two anklets playing different instruments was no longer an attainable goal, so I focused on my one digital ghungroo. For this prototype I made the decision to switch the variable we were working with to rotation. I found that there was more variety in the live data, which gave me more to work with on the programming side. Fred and I made another change. This time when there was a change in rotation a series of 8 strokes would play at three different speeds depending on which way your ankle rotated.

I was excited to share my new iteration with the class and receive feedback. To do this, I held my phone in my hand and moved it around to trigger the sounds. The reaction was positive. The sounds being emitted were striking them as pleasing, fun, and musical. Unfortunately, the fun didn't last long.

I put the new system into practice the way it was intended to be used, on the ankle. I was excited to hear a series of strokes that really sounded like tabla being played as I rotated my ankle in one direction. However, when I turned my ankle the other direction, there was no change, because the first series of notes was still finishing playing. The series of strokes that were triggered sounded great, but there was a disconnect between movement and what was playing. It wasn't fun to dance in, and it certainly didn't entice me to move around to see what would happen.

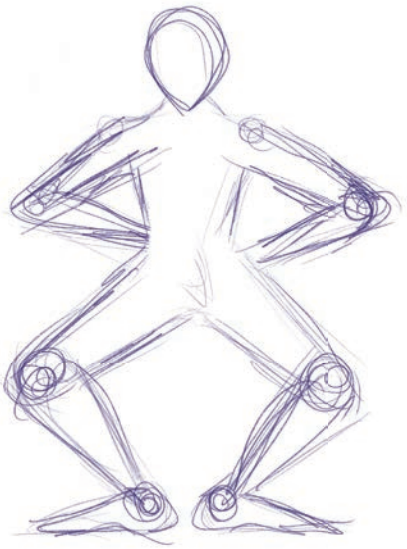
Iteration 3

By iteration three, I understood both the data, and the programming much better. I made ankle rotation trigger random strokes but changed the amount of time they played to improve the sound. I also included a series of 8 strokes to trigger when

the movement hit a certain speed. For this iteration I connected with a family friend who played tabla for a number of years. He gave me information on stroke combinations or styles that corresponded with specific styles of dance. Using this info I was able to make the experience more dynamic. It was a combination of random and predetermined tabla sounds. I tried the system and felt satisfied. I was excited to see what sounds would play depending on how I moved. My most exciting feedback came from my mother, who tried out iteration 3 on her own ankle. When she strapped it on, she came to life. I watched her laugh as she moved around in exaggerated Bollywood style dance movements while tabla strokes sounded. She was playing, and to me, that felt like success.

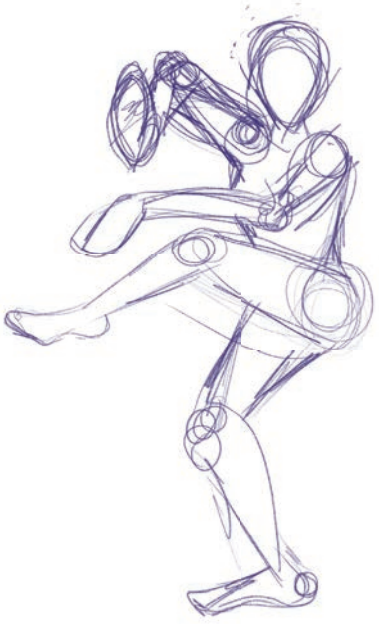
Iteration 4

Now that I had a successful dynamic system to engage with, I had to decide what I wanted this ghungroo to look like. I took a look at the traditional ghungroo, and took a crack at modifying it. I decided to sew on a stretchy pocket on the back of the ghungroo which was not visible, where I could securely slip in my phone. Although the phone was hidden, this physical prototype was bulky from the combination of ghungroo and phone.



Unfortunately I was nearing the project deadline at this stage of the process, and ran out of time to refine the physical aspects of the prototype. While I am satisfied with the experience I designed, the final physical prototype for this project did not end up as streamlined and utilitarian for dance as I would have liked.

Future Iterations



If I were to go back and modify the prototype, my next steps would absolutely include work on the physical design, focussing on comfort for the wearer. Another change I would love to experiment with is attaching physical objects other than bells to make live sound, or perhaps replacing the bells all together with a different material. I wonder how a change in live sound may affect the experience of using the digital ghungroo.

Conclusion

The creation of Digital Ghungroo happened to coincide with an unprecedented remote year due to the Covid 19 pandemic. This brought with it a number of challenges to the design process. One of those challenges was the inability to user test as extensively as I would have liked. While I enjoyed the prototype, the limited user feedback from my target audience makes me question whether this can truly be considered a successful design. What I can feel certain about is what I learned as an artist, maker, and designer through the process.

This process was challenging, exciting, and rewarding. It made me realize the value and creative power in personal experience. It also made me realize the importance of gathering knowledge and perspective from experts in any topics related to your design.

When I began this work I was so focussed on the technological side of building a system that I neglected to think about the physical experience. As a result, I ended up with a physical prototype that was not ideal for the user. Perhaps this was a result of spending a year on zoom, but regardless it has taught me to think about all facets of the user experience even in the initial planning stages.

An aspect I did focus on and think about at every stage of the process was the fact that I was modifying something ancient and traditional. I needed to define and understand what I was making on a cultural level, as well as think about how it would exist in relation to the traditional version. Was I being respectful in using this inspiration? Was this an object that was appropriate to modify in the ways I was choosing to? I felt that it was, however, even though I am ethnically Indian, I did not grow up in the region where the ghungroo is iconic (South Asia). As a result, I knew I needed that perspective to answer some of those questions.

One of my happiest moments came after presenting the digital ghungroo during reviews. A fellow student from India vocalized her appreciation for the project, what I chose to keep/change, and shared that she felt a strong sense of connection to the work. This outcome was possible not only because of my experience, but my ability to run decisions and ideas past family members born and raised in India. This is what I hope other designers can take away from this work. The importance of culturally relevant and diverse perspectives at every step of the design process.

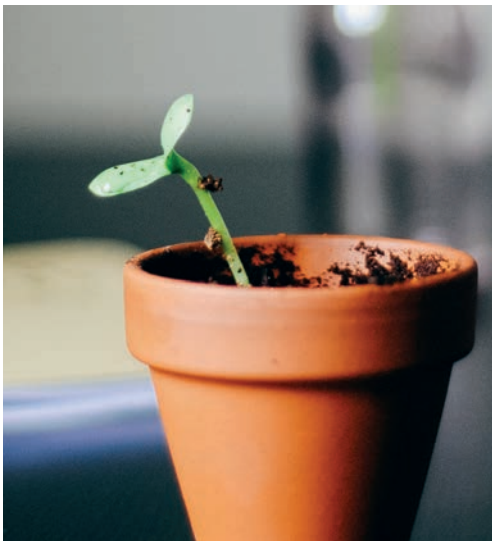
Dancing Bols was a playful project, revolving around experimentation. As I work on my thesis projects as well as defining my work, I'm beginning to notice repetition in my desire to create positive, multi sensory and somatic experiences. This is how I see Dancing Bols fitting into the larger body of work I am creating, and it's a theme I hope to continue designing around.

Tropisms

Some of my most magical dynamic media experiences occurred as a child at the Museum of Science in Boston, Massachusetts. Right away, upon entry there were kids lined up against a wall of curved glass looking at something large and moving. When I finally squeezed in I saw a large metal pendulum, swinging back and forth over a circular plate, with small pieces of metal lining the circumference. Consecutive metal pieces were knocked over, but not all of them. The line of fallen pieces stopped abruptly at some point along the circumference, giving way to remaining standing pieces. As the pendulum swung back and forth, it brushed so close to the next standing piece it seemed like it would knock it down any second. But, each time it swung, it missed. Kids stayed glued to the glass while their parents kept calling them away to keep moving, walking forward to see the other exhibits.

The swinging and missing of the pendulum seemed to last forever. Honestly I don't think I ever actually saw one go down, and I only learned what the entire set up was as an adult. It was a Foucault Pendulum, an experiment developed to display the Earth's rotation. The pendulum is hung from a fixed point, while the Earth below rotates. Eventually, the pendulum would knock down all the standing metal pieces, but it would take hours.

It was so slow, and so enticing. Eventually, I did move along because how long can you actually stare at a pendulum swinging and missing knocking down a piece of metal? If you're a kid, a very long time. The adults, however, never seemed to stick around too long. I'll admit I can't remember if I knew the science behind it or not as a kid, but it was captivating. Here was this swinging ball



and circular set up in what appeared to be an enclosed space, teasing us every time it missed those metal pieces. But we were part of the experiment. It wasn't just the circle below the pendulum that was moving, it was the whole earth.

That's just one exhibit though. There were the stairs that looked and sounded like piano keys as you stepped on them. There was the "Lightning!" show where you could watch bolts of thunder literally fly around the room. I recently learned the name of the room in which this occurred, The Theater of Electricity. What an amazing name. In the animal care center YOU were the hamster. The whole center was set up so kids could move under the animals' homes, looking up through clear tunnels and bubble windows which as I'm writing about sounds very intrusive, but I'm assuming the animals adjusted. All these exhibits were physical. They involved the body they involved moving around, exploration. They evoked a sense of awe, wonder, and imagination. There was an element of surprise or spontaneity, and the knowledge that all this magic was related to the earth. It taught me how dynamic the very ground under our feet can be. Nothing was static or stagnant. I did not understand the science behind a lot of it, but I did know it was related to the earth, and the mechanisms happening around me.

“Plant **Tropism** refers to a plant’s growth in response to different stimuli. Positive tropism means growth toward a stimulus, negative tropism means growth away from a stimulus. We grow while life around us does the same. What do our negative and positive tropisms look, feel, and sound like? Plants have no choice in the stimuli they experience, but we do. This space is an opportunity to explore mutual tropisms between species. Explore the space, put on headphones and hear changes in each plant’s electrical current in response to different stimuli in its environment. At this moment you won’t know if any stimuli, either created by you or from the environment are tied to negative or positive tropisms in the plants. You might know if the interactions are creating positive or negative tropisms in you. Growth is not linear. Some seasons promote blooming followed by seasons of withering, but if the roots of a plant are nourished it will continue to grow. This is a space intended to nourish.”

—Nandini, Srinivasan, Boston Cyber Arts Gallery, 2022

In Spring 2022 I put together an installation piece titled, Tropisms, for the DMI Fresh Media show at Boston CyberArts gallery (now Fifield gallery) in Jamaica Plain Boston. It included a 5x7ft built structure in a corner of the gallery and housed 6 different plants. The space was larger than other projects around it and at first glance the piece seemed almost unfinished. Burlap curtains veiled the entryway while plastic objects in a variety of colors stuck out between spaces in cardboard walls made from broken down boxes. Many of them had “CHEWY”, the pet supply company, visibly advertised on the outside.

It stood in stark contrast to my classmate’s projects around it, many of which were screen based or on small pedestals. When visitors entered this small shelter they would see the collection of plants, some of which were hung, while others were standing. They would see a chair with a pair of headphones hung near it. When the headphones were worn, the visitor could hear an orchestra of different sounds. Following instructions on a written poster hung up inside, they could touch the plants and interact with them, creating a change in the live audio they were hearing. What they were hearing was a sonification of changes in electrical current from within and around the plant.

Fresh Media poster designed by alumni Nick Dipaola class of 2021

In Fall 2020, my very first semester at DMI, I took Elements of Media with Fred Wolflink. It's a DMI elective introducing students to concepts in coding, programing, and simple sensor building. Thanks to Fred's focus on fun and play, my deep-seated fear of code and data was quelled.

Tropisms actually developed out of a project I completed in Fall 2020. The class introduced students to coding, programming, and working with simple sensors through a creative and playful lens. For our final project, we were to use the skills we'd learn to create some sort of working prototype in conjunction with a fake exhibition proposal. Fred, helped us develop our prototypes (and as every DMI student learns, practically everything else we design). The very first version of this project was called Bioelectric Band Practice and consisted of a video of the working prototype, remote/live demonstration in class, and a very simple, fake, exhibition proposal in .pdf format.

As stated earlier, we learned to work with a variety of sensors that responded to stimuli like the push of a button, sound, light, and capacitance. We learned to take this data and program it, or in other words, display it some other way. We could visualize changes in light with changes in color on a screen for example.

I was particularly fascinated by capacitance. It's a very simple type of sensor and tool, depending of course on how it's built, what it's used for etc. Capacitance refers to a measurement of electric charge an object or material can hold, so a capacitance sensor is sensing capacitance. I told Fred in our first meeting that I'd like to use plants as an interface so to speak, that produce sound when touched. We discussed a variety of sensors we could use to do this, like heat, but we landed on capacitance.

Research

My first task was understanding capacitance. Fred told me it would be tricky to work with for a variety of factors. I have a distinct memory of Fred describing capacitance as frisky. He was right on both accounts. Capacitance is affected by things like humidity or other electrical occurrences happening nearby. As a result, measurements of capacitance will change depending on weather, location, temperature. On top of this, I was working with two living materials, plants, and humans. We think of the word electric as something existing externally out in the world, but it's not just around us, it's within us as well, adding to the complexity of working with this data.

If you have ever used a potato to power a lightbulb in your science class then the idea of plants generating electrical current might not surprise you. All biological cells are electrical. Living organisms use electric current or impulses for a range of processes. This is sometimes referred to as bioelectricity(Science Direct, 2015).

We, as humans, are generating electricity all the time within our cells to send information to the body and brain. This process is what allows us to move, think, and do everything that we do. Plants also utilize electrical charge in a vast number of ways, like metabolism.2 Plants don't have brains, or nervous systems, but they do respond electrically to external stimuli, and even send chemical and electric signals to other plants through soil (Standford News Cetner, 2010).

In 2010, researchers at Stanford University tapped into electron activity happening during photosynthesis in algae cells to collect

electrons and generate electrical current. While the actual electrical current generated was tiny, the result was a carbon free energy source in other words plants generated clean energy.4 However, photosynthesis is just one process in plants involving electric activity. Some leaf structures display or generate changes in electricity from simply moving in the wind (Standford News Cetner, 2010).

It's easy to measure electrical impulses in plants, but connecting them to specific functions is much harder5. There is a lot about bioelectric activity in plants we don't fully understand. For years biologists have been studying plant signaling, a term which refers to the conveying of chemical and electrical information in a single plant or between different plants, including between different plant species through the air or soil (Science Direct, 2015).

However not much is conclusively known about the role of signaling in plants. There is documentation from plant biologists of plants changing aspects of their own growth in response to plant signaling.

If you look into bioelectricity, you're bound to see writers, researchers, plant enthusiasts, and more, refer to some of these processes as communication. With a Bachelors in Environmental Science and Studies, I feel a need to highlight that some in the field look at this negatively. It's seen as anthropomorphizing, or giving human qualities to something nonhuman. That doesn't mean that anthropomorphizing is wrong or that we're not allowed to do it. We do after all have imaginations. In a scientific context I respect the perspective of not prescribing emotions and other human attributes to processes like plant signaling. From a personal perspective, I view signaling as communication. I view and connect to a lot of not fully understood biological processes as spiritual. Which is what ultimately led to the framework of Tropisms. I also believe that anthropomorphizing nonhuman entities can help foster empathy, which is especially important in protecting and conserving our environment.

Technology

The entire process of this project differs from others because I didn't really have a plan. I had a vague idea, to sonify electrical changes in a plant, when human and plant made contact– touched. Everything would depend on what the data looked like. The technological components of this experiment are detailed below.

- Sensor & Adafruit Circuit Playground

All DMI students are given a small circuit board, with some sensor capabilities. We used one from a brand called Adafruit. Plants were hooked up to a sensor input on the circuit board, that would sense capacitance. The circuit board was connected to a computer, where the data was sent in numerical format.

- Arduino Software

Arduino software is a simple coding software where we were able to write code which would tell the circuit playground to receive data from the sensor, as well as what to do with that data. Within the Arduino code we specified aspects of the incoming data we wanted to send out to another programming software, MAX Cycling 74', detailed below.

- MAX Cycling 74'

MAX is a visual programming language for working with music and multimedia. It was within max that we were able to translate numerical data into digital sounds. Through MAX programming we built a system where the changes in numerical data, capacitance, could change aspects of digital sounds.

Plants

- Rattlesnake Plant; *Calathea Lancifolia*
- Orchid; Specific plant species unknown, belongs to the *Orchidaceae family*
- Aloe Vera; *Aloe Barbadensis Miller*

Humans

When we hooked up the plant to the sensor, the data we received was all over the map. It was jumping wildly from single digits to the hundreds, to periods of only changing within a range like 30 to 60, but the result was fun. We programmed the data to play simple digital soundwaves, that means soundwaves not produced in nature. The first one we used was a sine wave, a hollow sound. Because of the rapid movements in data the sound came alive. My face must have looked shocked and thrilled when I heard it because Fred was laughing in his zoom camera.

The first iteration of this project began with a small snake plant. Fred had suggested I use copper wire, which is especially conductive, to connect the plant to the sensor. I didn't have any, so I actually used pennies placed on the leaf and held in place by the end of an alligator clip, connected to the sensor. At this point the plant was emitting a random collection of beeps and blips. I touched the plant to experiment, using different gestures, even moving the leaf to see what would occur to both numerical and sonic data. Sound changes occurred and the numbers on the capacitance sensor changed.

The capacitance data was coming in very fast, so Fred and I slowed down the speed of the incoming data. When the numbers coming in were slowed down, we saw that they were moving up and down repeatedly, like breathing. For example, numbers would move through 40 to 55, then down to 40, then back up to 55.

When I touched the snake plant, numbers jumped, into the hundreds. Most likely this was a combination of my electrical charge coming into contact with the plant. When I held a leaf for a while however, the numbers would reduce some and level out in a sense, continuing the rising and decreasing in numerical value- only from a higher range than when a leaf was not held. Additional sonic and numerical changes happened when I my hand along the leaf or held the stem and moved the leaf around.

Different gestures resulted in different sonic outputs. Certain gestures resulted in a series of high pitched and low pitched blips and bloops of the sinewave—as if a robot was speaking to another robot. Some gestures would result in a smoother transition from low pitch to higher pitch.

During this time, we were completely remote due to Covid-19, and I was confined to my house. I was surprised, as a result, to see that simply moving the plant from upstairs to downstairs changed the numbers, though not drastically. I decided for the time being, to keep the experiment localized to my room, to try to keep the data somewhat consistent.

The next step I took was experimenting with different plants. I tried the setup on orchids, pothos, dragon tree, and other species. Plants with higher water content in the leaves, like orchids and aloe vera gave very clear, high numerical readings. Higher water content meant the leaves were more conductive than plants with thinner, dryer leaves, like the snake plant. But, I liked the idea of working with a variety of plants instead of three of the same kind of plant, like a band.

Iteration 1

I decided to continue using the Snake Plant, but also grabbed a small orchid, and an aloe vera. At this point, Fred and I decided to experiment with different sounds. We tried connecting different plants to different types of soundwaves. The sawtooth wave sounded a bit more like buzzing, the triangle wave sounded a bit like a hum. All these sounds would change of course depending on the frequency or pitch, which right now was up to the plant to decide. The frequency was completely determined by the numbers the plant was producing. We simply connected the soundwaves to the plants, but made no adjustments yet to the programming, to the sound.

There were questions I had to address:

- What sounds did I want to plant to make?
- How much control did I want the user to have in creating sonic changes - how much control did I want to give them?
- Could I even create control over data coming from this live, changing organism.

Iteration 2

There were several actions I took to get to iteration 2. One was a lot of gesture experimentation on each individual plant, while observing data changes. The second was adjusting the programming to make the sounds smoother with less rapid changes in pitch and frequency.

Essentially, I was working through code and programming to tie certain gestures on each plant to certain sonic changes. In addition to this, I wanted the plants to only begin playing sound when they were touched.

The result was this:
When the long leaves of the aloe vera were stroked, a sine-wave would smoothly move up and down in pitch, as if you were turning a knob. When you tapped your fingers on the leaves of the orchid, rapid triangle wave sounds in a variety of different pitches would play - almost like a piano. Finally, when you moved around the stems of the snake plant, a sawtooth sound wave would jump around in amplitude and pitch.

This was demonstrated on camera to the class, and finally, a fake exhibition proposal was created. The exhibition was simple. A room filled with plants hooked up to capacitance sensors, functioning in the same way—specific gestures leading to specific sound changes, with the live soundwaves displayed projected on a wall.

I highlighted in this proposal that I wanted my audience to question, what counted as technology? I wanted to challenge the idea that nature and tech are separate entities, and make a statement that nature could be viewed as technology.

Iteration 3

Jump forward two years and I'm sitting at a table with professor Abe Tena and classmate Nick Dipaola discussing DMI's annual Fresh Media show put on at Boston CyberArts gallery— now Fifield Gallery.
The show after all was called Fresh Media, so I decided to pull out the old plant to sound project from the first year.

“Form factor”, Abe kept mentioning. What was the form I wanted this experience to be presented in, physically. Did I want to create a sculpture of a woman holding the plant? Did I want the plants to just be sitting in corners of the room with no one knowing they would play sound until they brushed up against them. I struggled with this immensely but ultimately landed on the idea that I wanted this experience to feel like a sort of refuge, escape, or magical little world in an urban setting which had no indoor plants.

My first sketch was a person sitting down with headphones on, surrounded by plants. My second included the same set up, but it also included a small cardboard box type shelter with a roof that could be taken off, and placed back on again once the individual was sitting down inside. They would still be surrounded by the plants inside, and be able to have the experience through headphones.

I asked for the opinion of a friend who had construction experience. He loved the idea, but convinced me to build with wood, a slightly more stable material. I had little to no experience in building small scale shelters out of wood so we teamed up to put together the tropisms shelter.

We sat and discussed possibilities for shape and what it would involve. With a fastly approaching deadline, we agreed a simple, rectangular shaped room would be the easiest way to go. In a very fun and educational trip to Home Depot, I quickly discovered that lumber was expensive, unusually expensive at the time unfortunately. He reached out to his network of friends, family, colleagues, and we somehow managed to collect enough for a “frame” for the shelter, as well as some material for walls.
I sent pictures of the space to my friend, as well as discussed sizing options with curators of the show. We began building a 5x7 foot

shelter in a garage, eventually taking it apart, bringing the materials to the gallery, and reassembling it there.

When we ran out of wood, I told my horrified friend, I was going to use cardboard. Though it was out of necessity, I began liking the concept. Spaces that feel like shelter can look like anything. What if this shelter looked kind of scrappy? I broke down cardboard boxes from my house - most of which were Chewy boxes for my pup Janie - and brought them to the gallery. I also brought a collection of transparent or opaque “things”. This collection included stuff like plastic folders, old tupperware boxes, a muffin tin, some strange glass cubes from a random bowl in my house that I think were placed there for decoration. I used these materials as windows—

also to my friends horror. Finally, I covered the doorway with some leftover burlap material I found at my house. I placed one large plant next to the entryway. It was not hooked up to any sensor and did not emit any sounds.

Inside, I placed a chair for visitors to sit, and headphones connected to a hidden computer. This was so people could hear the sonic expressions of the plants capacitance changes. I placed plants on the ground, on shelves, and hung a couple to keep that feeling of being surrounded. Colored light filtered through the colored transparent items.

The gallery is located inside a train station. Consequently , the biggest change I made was in the sonic experience, the relationship between plant and human. Electrical currents are swirling all around, changing even more when a train comes through the station. The data was all over the map. I probably could have spent time there and altered the programming so that sound only played when the plants were touched, but there was something very dynamic about all the capacitance changes the environment was creating. So, I decided not to. I decided this time to give the plants some agency.

Instead of digital soundwaves, I selected different instruments. There was some flute, chimes and keyboard. The result sounded like a wild orchestra.

After having worked with the plants a sufficient amount, I was fascinated when some of them suddenly became very electrically active in the gallery, seemingly out of nowhere, and so were my

fellow colleagues working there as well. I would be stapling cardboard to wood when all of a sudden a prayer plant would start playing rapid changes in keyboard notes. I asked someone to hand me a tool and when they came close to a plant it would start playing quiet charms. He stepped away and it stopped. Then he stepped towards it and it started again. It was a little eerie. After reading about the research around plant signaling and bioelectricity in plants, I knew that lots of different kinds of stimuli would affect capacitance movement in plants. Stimuli affect a plant's growth as well. Too much sunlight for a low light plant makes it grow away from the sun. Capacitance changes can occur from wind, and rainfall. All of these stimuli affect a plant's growth in different ways. I added a spray bottle inside the space for people to see if other stimuli would create changes. These

were all seemingly invisible responses to external factors. That's when my brain dusted off an old term I remember learning in an undergrad environmental science course, tropisms.

I also looked up timelapse videos of plants. Plants, after all, move, as they grow toward one direction or another, we just don't see it. What I found was beautiful. Sped up videos of plants within 24 hours showed them dancing and moving around. Flowers opened and closed, leaves waved in different directions. One of my last additions inside the shelter was a small poster with a QR code. Scanning this led to a timelapse video recorded inside a plant store.

Plants don't have a brain. They don't have a nervous system, but they grow. They respond to negative and positive stimuli in different ways, but the goal is survival, the goal is growth. We cater to our little houseplants with care, trying to nourish them to produce new growth.

I wanted this experience to nourish people who entered my small, sheltered space through engagement, curiosity, fascination, imagination, escape.

Conclusion

One of the best aspects in creating tropisms, was the ability after a year of remote schooling, to put together an experience that people would physically interact with. There was joy in that. I did create the experience with the belief that people would think more about the plants, about how their actions might affect them in terms of growth. To be honest I'm not sure how many people really did. What I saw was a lot of smiles, a lot of curiosity and delight when they were surprised by changes in sound. I was glad that the experience was

joyful, maybe nourishing for some, and I'm not sure I would change anything looking back. I did try to give the experience some narrative or context by metaphorically tying the word tropisms to the way in which humans may respond to stimuli. I didn't want to project a more specific idea onto my audience about the meaning behind the metaphor.

How to Build a Door

Fall 2022 was my last Fall at DMI. I had been living with my parents for two and a half years—a mixed experience as most adults who have done this know. In a month or so I would be turning thirty, and was simultaneously facing the reality that I would soon be leaving a community I cherished very much. Learning and making at DMI was the first time I felt like I belonged creatively and artistically. I had a background in fine arts, but was often criticized for jumping around from medium to medium. “Inconsistency”, is what I was told. But, I liked inconsistency. I liked jumping around and exploring ideas in a variety of ways.

After an initial semester of “What the hell am I doing here? And, what the hell is dynamic media?” I fell into a practice, one that felt like a true fit. “I have a place”, I remember telling one of my friends. But, my magical little graduate school bubble was about to pop, and although I tried to fight it by coming up with ideas of projects to build and design, it was time to give in to the reality that I had to focus on leaving. I had to focus on my thesis, bringing myself back mentally, physically, and emotionally to the “real world”. (As I write this I’m laughing to myself.)

Just last night I was on the phone with one of my closest friends, Ally Sass. Ally had just completed her MFA in Playwriting about a year earlier and was struggling with the transition herself. She called me from a gas station—she called it a liminal space and I swear she knew nothing about my thesis. This spurred me to tell her a bit about it.

behind the door or what you might like to be behind the door but you don't have to write it).

When would you open this door?

How do you feel when you open the door or how do you want to feel when you open the door?
Now imagine you can only open the door once a week.

When would you open it?

How do you feel or how do you want to feel?

Now you can open it once a month.

When do you open it?

How do you feel?

You can open the door once a year.

When do you open the door?

How do you feel when you open this door?

You can open the door once in your entire life, past or present.

When do you open the door? How old are you?

Imagine opening the door.

How do you feel when you open the door?

How long do you stay?

When you're ready to leave, return through the door.

Take a few moments before answering the next question.

When you left, did you close the door?

After writing this series of questions which at the time felt like they came out of nowhere, I shared them with my advisor. Credit to him for being completely unphased by the fact that I had not made progress on any of the previous projects I outlined, and instead came up with a bunch of questions about an imaginary door. He loved them, and I felt a sense of excitement.

Iteration 1.0

The first phase of the door project began in written form, as shown above. I began by sending them out to my friends, then my classmates, then some colleagues, and eventually some professors. I was fascinated by the answers, some of which didn't vary too much—like the questions related to when an individual would open the door. However, they were still intriguing to me. I'll admit there was something voyeuristic in getting responses from people I knew. This is how I realized my next step would have to be giving them out anonymously.

I posted the questions in survey format on a variety of online platforms—Reddit, Facebook survey groups for students, and I put up a request for people to do it on Instagram.

I ended up with 50 responses. I had a lot of answers to questions about a door. I sifted through them and shared them with my advisor. I had no idea what to do with all these answers and I kept shoving a pile of 70–80 pages of responses to everyone around me because I was so excited about them. People around me were less excited to read 70–80 pages, which is why i've included them in the next 70-80 pages. Hah I didn't, but here are some random sample responses from a few different question.

Sample Responses

Once a Day: When would you open the door? How do you feel when you open it or how do you want to feel?

"First thing in the morning. Right after I wake up and have brushed my teeth. I make my coffee and then open the door.
Feels like a lil secret, an escape, sort of like exercising in the morning, starting the day off right and feeling like I've taken care of myself, treated myself to something healthy and wholesome.
In the evening, once my day is done."

"Hope. I feel hope."

"In the evening. I'd want to have a full life in reality and then time to explore the door and its endless wonders on my own time. Plus, if I indulged in the morning, I know my mind would fixate on it the rest of my day and I'd be very very far from reality."

"Wonder, light and bubbly in my body, and a sense of calm with a dash of adrenaline."

Once in Your Entire Life Past or Present: When do you open the door? How old are you?

“I’d like to open the door with my parents, so probably 5 years ago when everyone was healthy and adventurous.”

“In this moment.”

My first instinct was to say on my birthday. As a present to “myself! I also like the tradition of opening the door at the same time every year. :)”

When you left, did you close the door?

“Yeah. Softly.”

“No.”

“I left it open a crack.”

Other comments:

“One of the hardest parts was figuring out what was behind the door. Because it changed depending on how much access I had to it. I also wanted to be careful not to read the next question before I finished answering the one I was one, but after a bit, I was able to identify the pattern. The concept reminds me a bit of Monsters Inc. or Narnia. There are so many places you could choose to go, but the control in this series of questions was the door and where it took you, while the access changed.”

“It was sad. I felt longing and belonging at the same time.”

"I felt progressively more sad and less excited about the prospect of going through the door. It reminds me of the movie "About Time", where the main character can go back in time but chooses instead to live every day as if it's the second time he's done it and to cherish every bit. Over each scenario, the door was less enticing and my interest refocused on my life without the door."

In both undergrad and my jobs after undergrad, I spent a lot of time doing qualitative research. Maybe this is why my first instinct was to export all the answers to an excel spreadsheet and try to code them. In qualitative research, coding is the process of compiling, organizing, and labeling your "data" to try to identify themes, connections, ideas. Brené Brown would have done this in her research. I spent three days looking at this spreadsheet, trying to figure out what to code. First I tried categorizing any emotion words— any words that described a feeling or emotion. My goal wasn't to create a pie chart but to represent something about the data in a visual format— data visualization.

In order to do this, I compiled answers in a spreadsheet. Answers were grouped together in response to the questions. Then I highlighted emotional or experiential words that I thought fell into the category of positive or negative: terms like happy, anxious, and calm, were words that described the emotions they felt in each scenario. I stopped doing this almost immediately because positive and negative are subjective and vague terms. So, I tried to broaden the categories into happy, calm, nervous, angry and tried to pick out words from responses that might fall into those categories. For example, peace might go under calm, frustrated with angry. I quickly realized this was not possible. It meant that I was dictating the meaning of answers about the individual's emotional state

in each scenario. The following response is an example of why this would not work, “I started feeling a sense of loss. It continued and at first I felt anxious, but then, the loss felt kind of good.”

Loss in this situation wasn’t necessarily a sad experience. I felt a bit silly after trying to organize answers this way, because I knew human experience and emotion was far more complex than categories.

I shared this with my advisor, who found it curious that I was looking at these responses as data. I was trying to make the subjective, objective. I was at a loss. I wasn’t sure where to go next. Thankfully, my advisor had the unique skill of being able to toss out an excess of ideas on the spot. One of the ideas he threw out was to compile the responses into a book, or to somehow collect these responses in person, perhaps filming the process. I liked the idea. I theorized that something about being in person might make the experience more immersive. The opportunity gave me an ability to shape the physical set up of the in person experience. It also eliminated the possibility of distractions that might pop up on a screen.

Iteration 2.0

I filmed four different people in total. Some of them closed their eyes during the experience, and some didn’t, but I let them decide. Their responses were varied, beautiful, and sometimes confusing. Some explicitly informed me that they loved the experience. Two participants seemed uncomfortable, joking around in between answering the questions. It seemed like they were stalling. However, these are just my perceptions. I cannot say for certain they were stalling or feeling uncomfortable. They did not verbalize discomfort when I asked what the experience was like. Instead they said, it was interesting and cool.

Before I asked any questions, I told each individual that they did not have to answer any questions they did not want to, and had the ability to say skip. No one skipped any questions. During this stage, I did not film and ask questions of anyone I did not know. Part of this was simply due to a time restraint with the semester coming to a close, but part of it was that I felt more comfortable asking people I know. I didn't realize it at the time but as I reflect I realize, asking these questions felt intimate for me too. I asked close friends to do this. I had more confidence that they would not feel discomfort in being vulnerable, especially with me. Additionally I felt more confidence in my ability to build a space for them that felt secure. Based on Winnicott's theory around playing and creating, they needed to feel secure in this space to be able to play "make-belief", create an imaginary scenario in their minds, and be vulnerable. They knew me, and there was already trust built up, which I felt would add comfort. Anyone who knows me, knows I don't really enjoy making people uncomfortable. I believe, and I hope, there may have been some comfort there.

"I pictured looking back at the door like the other side, and then I was like ok I gotta close the door. It wasn't easy."

After running this workshop in person, there were themes that became apparent. Everyone mentioned feeling calm at some point in the experience, though some did not feel calm during the entirety of it. The other word that came up was control. Two people shared a similar experience of initially feeling in control when they could use the door more often, to gradually feeling less in control. All the individuals claimed that it changed their feelings toward going through the door. Some said they cherished it more,

or it became more special. Others said it made them anxious. When individuals could only walk through the door once in their life, it could be past or present. They could be any age. So, as a result, the idea of time traveling was built into the experience. Two people talked about going to places that were in the past before that option was given.

At no point did I ask what anyone imagined in their heads. Three participants happened to be very close friends, and immediately divulged these details to me as soon as I stopped recording.
I was given clear permission to share some of these details anonymously. They all brought up the ocean, or the beach. Two of them associated it with calm, and the third with “fun happy times”. Two friends were interviewed back to back on the same day, and eagerly talked to one another about the experience, which made me very happy.

“My door was really thick, made of wood, really old and weathered. And then when I opened it there were dunes and the ocean and then a gust of wind like WOOOOOOOSH”, said one of them.

“I saw the ocean too. Mine was like, had really pretty window with glass on it and I was in a cozy little cabin and when I opened the door there was the ocean”, said the other.

Although there were similarities, each individual went through their own unique series of emotions.

Iteration 3.0

The next step in the project, suggested by my advisor, was to build a door. We discussed the possibility of it being digital. However, in the same way I thought asking questions in person would be more immersive, so would a physical door experience. I will admit, after the labor intensive process of building the Tropisms shelter, I was not exactly excited about building a door. On top of this, I had no idea how to do this, or what materials to use. I came up with a range of ideas. What if the door was simple cardboard or paper mache. What if I used an already existing threshold or door for individuals to walk through. There were more questions to address as well. Where would I put the door? What was the interaction I was going to build between the individual and this physical door? Would they open it and walk over the threshold? Or, would they just look at it? And, why?

Although I did experiment and play with paper mache I felt the most straightforward and easiest option would be to build a traditional wooden door. After an extensive amount of googling, well, doors, I gained some direction, and stumbled upon instructions for how to build a prop door, like the ones used in theater performance. These

doors were free-standing, not hanging from anything above. That meant they were supported by a frame, resting on the ground, holding the door up by its side. The same way they exist in our homes, hinged on one side. The difference is that I would not be attaching this door to a wall. That's where the frame comes in. Luckily, I had a significant amount of lumber left over from the Tropisms shelter that I could easily repurpose to build the frame .

The dimensions and structure of the frame, however, would depend on the door. I didn't have enough lumber to build a door from scratch, so I had to find one. I remember thinking, where

the hell am I supposed to get a door? So, I went on Craigslist and Facebook Marketplace. You would be shocked at the amount of people selling doors!

Looking for a door to buy brought up other aspects I would need to think about. I never really thought of doors as a complex system, but here I was, completely overwhelmed by the details. Some doors were hollow, some had a solid core. Some were hinged on the right side of a door frame, others on the left. They were referred to as left handed and right handed doors respectively. If you stand with your back to the hinge of a door, you either need to use your right or left hand to open the door, hence, right or left handed door. The options continued. Did I want a door that needs to be pushed or pulled? One detail I happened to know is that emergency exit doors are required to be push doors, because it's more natural for stressed people fleeing an area to push something open. They might seem like silly details, but all these aspects would affect the experience.

Finally, getting a door depended on how much money I could spend. I needed to find the cheapest door possible. Another random detail I learned about doors, as it turns out, is that they're pretty expensive. After an extensive search, I found someone who was getting rid of a door for free. So, one day in November I drove out to Cambridge, MA, where a very friendly woman helped me put a door in my car. It was a plain white, wooden, hollow door. On my way home I picked up some hinges from Home Depot, and with the help of a fellow DMI student, brought it up to the fourth floor of Massart, where I built my frame, attached the door, and assembled everything in the graduate studios.
The door ended up being hinged on the right side of the frame– if you're standing outside.

Then I had to face my biggest challenge. What would people do? By answering the questions about the door, people were using their imagination. They were in a different reality in their minds. Interacting with a different door would put them in the external reality, the physical world. If this was supposed to be a potential act of play, of make-believe, how would I extend their imagination into the physical world?

This is the process I landed on. I asked people the same questions in person and filmed them. When they finished answering the questions I turned off the camera. I had them follow me out of the room and walk them just a little bit down the hall. There, just a couple studios over, was the door, with curtains on each side, blocking the studio space inside. I told each individual that this was their door. No matter what they saw on the other side, it was their door. The other side of the door was a studio space that was completely empty, except for a comfortable armchair in the corner, and a small cabinet screwed onto the wall next to it. Below the cabinet was a post-it note pad, and a sharpie.

When we reached the door, I let the individual know that inside, there would be another door (this was the cabinet). Behind it was something the previous person had left them, and they could leave something for the next person to walk over the threshold, through the door. They could spend five minutes on the other side of the door, while I left the studios entirely. At the end of the five minutes I would call them and they would come back through the door.

I asked two people to go through this experience. Neither of them had been asked or seen the questions in any earlier version. They were both people I knew. After the first person finished, I asked if they would sit down and tell me what it was like while I filmed. As

they started speaking, I felt that they were nervous, so I asked would you prefer I turn off the camera. They said yes, and proceeded to talk about the experience more freely. As a result, I asked the next person to write down anything they'd like to share about the experience.

The first mentioned that they had some very serious moments in there, and that they were anxious about me coming back. The second shared that they enjoyed the experience, felt calm, and creative. The first person wrote something on a post-it note, and stuck it on the wall behind the cabinet door, which the next person took. I never looked at what it said.

Conclusion

How to Build a Door was obviously about much more than building a physical door. I had hoped it would foster creativity, a feeling of freedom and empowerment in the ability to travel anywhere in your mind. However, there was an intimacy to this experience, a vulnerability that I had to respect.

The first iteration allowed a person to answer anonymously, because it wasn't an in person experience. The result was anonymous feedback based on imagination of the experience. When the experience changed to be in person, being anonymous was not possible. Forcing or pushing anyone to divulge details about what was on the other side of the door, even what the experience was like for them, felt intrusive. It had the potential to make people uncomfortable, as I saw with one of the individuals who tried it.

If I want to iterate on this project, it is essential to create some sort of system for feedback that allows for anonymity in the final version of the project.

Building in the physical world inevitably brings with it certain limitations. Even though the door was metaphorically magical, I couldn't escape the reality of fire codes. It meant that the physical door could only be placed in a few specific locations. While limitations like these were sometimes frustrating, not allowing me to shape the space exactly how I wanted, they also pushed me to be creative. Except for originally sending out questions online, this was my first project at DMI that was entirely analog, and that was exciting for me.

How can someone build a door? In this situation, it could be entirely imagined as an internal experience, and externally, in its physical form. The experience could be interpreted a number of ways, but I think of it like this. In the first two iterations, there was an internal imagined world and an external world where the door didn't exist. In the final version, however, the door did exist in the external world. The door was a threshold. When someone stepped through, they entered a liminal third space. In this instance it was represented by a room, a studio, on the fourth floor of Massart. The internal world was within the individual, no matter where they were located. The space behind the door existed in-between the internal and external. It was a space to rest, to play, to imagine, and to create— in the form of a message placed behind the cabinet door.

The highlight of the project was building the door. In making the door physical, it felt like I was extending imagination out into the world, because for me, a door represents expansion or movement into another space. I had hoped that's what it would feel like for my users, but in reality I'll never know. It was a valuable lesson—always create opportunities for feedback. There is of course the possibility that instead of expanding the imagination, the door had the opposite effect—limiting it. If I were to iterate on this project, the feeling of expansion over limitation would be a clear goal I'd set out to accomplish.

One observation I can make is that everytime I brought someone to the door, there was a visible or audible expression of emotion—a big smile, a little yelp, even an “oh wow!” Again, I don’t know if these were negative or positive emotions, but the element of surprise was powerful.

When I walked through the door, I felt peaceful. It was my final project at DMI and there I was sitting in my very own liminal space, which felt a little surreal. How to build a door still feels unfinished, but it’s not the physical qualities that feel that way. It’s that a liminal space is not stagnant. It grows with every person so while mine was in the graduate studios at Massart at that moment, I knew that soon I’d have to walk back through the threshold into some new, unknown situation.

Final Conclusion

As a kid my whole world was liminal play. I thrived there. It's where I processed and made sense of the world. But at some point, like everyone, it stopped. Becoming an adult led to my liminal play space feeling devoid of play. It started to feel stressful as I became inundated with thoughts. At some point liminal play space went from helping me process and feel balanced, to scrolling through social media to avoid dealing with internal experience.

This thesis was born out of a desire to get back in touch with, and learn how to shape my liminal space as an adult. To find balance between my inner and outer worlds, my eastern and western cultures, my job and my life. The experiences in this book are personal, but they are also communal.

As adults, our needs and desires are different. In most cases we don't depend on primary caregivers anymore and our growth is now in our own hands. But our connection to childhood is not severed. I still struggle with some of the same things I did as a child. Sometimes when I get scared, or heart-broken, or angry, I feel like a younger version of myself. I still love the same activities as when I was younger. The kid in us doesn't leave. We still benefit from the same activities that brought us joy back then. But as adults, and for some even as children, no one is making a healthy, rejuvinating play space for us. We have to do that.

There is an undeniable power in the in-between, whether you look at it from a psychodynamic, philosophical, or spiritual perspective. We will always have to move between inner and outer worlds, make sense of the events in our lives, process and contain our emotions or visceral responses in the body. It's the same thing we did in the liminal play space, the threshold in-between. In each project I worked on, I learned about myself and more about others.

In Tropisms, the sound of energy moving between internal and external allowed for us to be a part of the movement itself on a deep biological level. In Dancing Bols I nourished myself and my community. I could play with my culture, and through an unexpected response from an object we've grown accustomed to, I was able to engage my whole family. Those belonging to eastern culture, those belonging to the in-between. In How to Build a Door, I finished my work at DMI, and I got closer to the task I didn't know I was doing— to get in touch with, and learn how to shape my liminal space.

We're encouraged to lead our lives and experiences with our minds, not our bodies, feelings, or our intuitions or our imaginations, as Lachman wrote. We're pushed to let go of that second type of knowledge that was so vital to us as kids. This disconnects us from a part of ourselves. Living in a demanding world can lead to burnout, feeling drained emotionally and physically. It makes It's what happens when we're swamped and don't have the ability to step back, regulate our emotions, ground ourselves, rest, play and have leisure time.

Making space for all of that is hard for so many reasons. As artists and designers, how can we support our collective growth? What are the opportunities we provide that might give people what they need, even if it's in small doses? I design with physicality to promote embodied experience. I design with imagination to create systems for spontaneous play. I use space as a way to give people the opportunity to experience all of it; to get in touch with both ways of knowing; to find a healthy in-between, to feel a moment of "whole self".

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