MAKE IT OURSELF

EXPLORING CREATIVITY THROUGH TOYS, IMPROV, AND PLAY.

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ACKNOWLEDGMENTS

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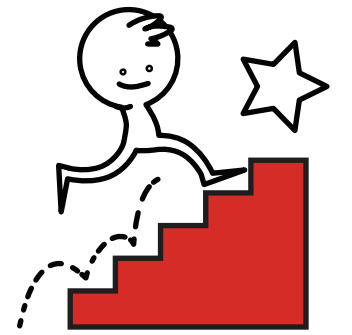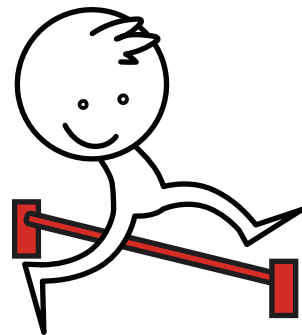
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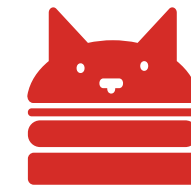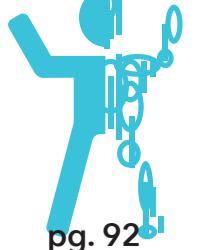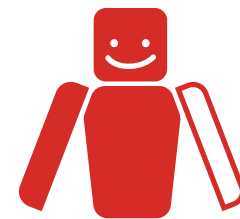
INTRO-DUCTION

THESIS ABSTRACT

Play is an integral part of humanity. Through play, we learn, develop, and share ideas and skills that are essential later in life. Play is embracing the boundaries of a system, interacting with it in a way that brings enjoyment. By this definition, playing with anything means enjoying the process of exploring the possibilities. In a rapidly changing world, we are subjected to never ending streams of data, media, things, people, and systems. We consume vast amounts of information. From personal experience, the rate of consumption far outweighs the rate of production.

As a designer, I wanted to pursue a life of inventing, creating, and making new things for the sake of enhancing the lives of others and myself. Designing and making is a creative outlet; it is the way I share how I see the world. Through improv comedy, I was able to channel random thoughts into (sometimes) funny situations and characters. I became better at playing with the possibilities and communicating those ideas within a team. I learned to let ideas run wild and to commit to making it as real as possible. Through both design and improv, I learned different ways to take in the ordinary and make something extraordinary.

In this thesis, I explore different ways to jumpstart the creative process through introducing randomness to inspire imagination, using rigid systems to accelerate play, and encouraging personal expression to create meaning. Through designing playful objects and interactions, guided by philosophies of improv and the creative process, I construct different ways to enter the world of making, designing, and playing.

Opposite: Here is me, 7 years old, showing off my Lego cowboy rocketship.

"So long, space cowboy"

THOUGHTS ON PLAY AND PROCESS

The activity of play is autotelic, meaning that it is done for its own sake. However, there are many byproducts of play: increased creativity, socialization, and adaptability. Institutions and organizations have tried to capitalize on the products of play, from teachers shoehorning games into math curricula to companies gamifying their products to engage their customers. When done improperly, the underlying lesson is lost in the fog of forced fun, leading to a disconnect between the person and the activity. Integrating play into our everyday lives involves convincing ourselves that fun comes from imposing conscious boundaries and subjecting ourselves to them. We find enjoyment by using the boundaries as opportunities to do something new.

Play is Enjoying Work

Play is being okay with wandering and letting the activity dictate our decisions, not vice versa.

If you treat any object as a toy, the act of using it turns into play.

So in my dad's eyes, this is seen as playing outside.

When I turned 13, I was bestowed the responsibility of mowing the lawn. At first, it was literally a drag: pushing and pulling a hunk of spinning metal into weeds and ditches while gnats buzzed in my face. Because I hated mowing the lawn, I tried to figure out the most efficient way to mow so I can spend as little time and energy possible outside. I experimented with different ways to cut around the trees and gardens that minimized the number of passes. I learned the optimal blade height so the grass stays short but doesn't dehydrate in the sun. I figured that I can use the spinning blade as a fan to blow away yard waste so I can cut down on sweeping off the driveway.

Over time, I became an expert at mowing the lawn, and given the right temperature, it was actually enjoyable. I came to appreciate how smooth and effortless the mower pivoted after strolling the length of the lawn. I learned when the lawn mower would run out of gas, and strategically placed the gasoline nearby so I did not have to walk all the way back to the shed to pick it up. Through fully embracing the process and the limitations that came with mowing the lawn, I grew to appreciate the larger network of things existing throughout and around our property. I felt how far the roots of our trees grew in the grass and where the local moles liked to tunnel. This experience showed me the power of using play to enhance the work. The fun did not have to come from an extrinsic motivation, I was able to make my own challenges and motivate myself through beating my expectations. By making my own fun through doing, I was able to transform a tedious chore into an engaging process.

Dr. Stuart Brown discusses the work-play differential in his book "Play," where we conventionally view work as productive and play as unproductive. Traditionally, society relegates play as distracting, escapism, and lacking in depth, while working is supposed to be our most important purpose. He argues that work and play is not a dichotomy, but a collaboration between mastery and novelty in any activity, from dance to engineering to shaking the crumbs out of a comforter. We bounce between delighting in the novelty of a new activity and mastering the skill of performing it.

Along with filing taxes and applying for jobs, shaking Nilla Wafer crumbs out of blankets is a lifetime skill they don't teach you in grade school.

Take drawing, for example. Through play, I found that I enjoyed drawing new styles of graffiti and cartoons and landscapes; and through drawing further, I improved my technique to enjoy it even more. The cycle of play and work creates a harmonious system of wandering and focusing, daydreaming and producing, lateral and linear thinking that is essential for a creative practice. The benefit of play is the expansion and refinement of working with the creative process.

In my research and projects, I see play as the engine for generating ideas in a personal way. My projects in some capacity invite players to play and interact with the different inputs in order create opportunities for creative thinking to occur.

TOYS ARE TOOLS FOR CREATIVITY

Toys are objects and interactions that invite people to play with them. Whereas other objects have been made to complete a certain task, toys are presented as opportunities for play to occur. And when we do engage in playing with the toy, there is no one way to play with it. The beauty of a toy is in the different ways we express ourselves through the interaction.

In the beginning of the semester, I brought in a couple of Lego sets into my studio as a way to productively procrastinate on writing this

thesis. One day, I was entertaining myself by twirling a Lego disc on my desk, seeing how the spinning quickly fizzled and died. I started to wonder how I could make the disc spin faster and longer. I experimented with adding bricks at different spots to lower the center of gravity while maintaining enough clearance while it spun. When I was finished, I had five different Lego tops, each with their own distinct color and style. Just by having the opportunity and material to play, I was able to explore a curiosity and produce artifacts as record of my thought process. This quick experiment helped me see my Legos as dynamic objects, a system of customizable components responding to user inputs.

In my childhood, I have swallowed more Lego's than I can remember. I have literally sh*t bricks.

Lego is a perfect example of a toy as an accessible form of dynamic media because they invite interaction and appropriation. We ask questions and discover new things about the world through interacting with the toy, as well as appropriate the toy to fulfill a creative expression. Legos are great because they are toys that are about making toys. The play activity is as much if not more focused on the process of making as it is on the finished build. The Lego builder is able to make whatever they want in order to fit their specific playing inclination (limited only by their imagination and constraints of the brick).

I use toys as a medium for integrating play and imagination into our everyday lives. By playing with toys, we also transform the context in which the toy exists into a playground. Playing with action figures in a living room transforms the coffee table into a cliff edge, couch pillows into boulders, and the family dog as a fearsome beast. The projects I discuss in this book range from specifically to loosely defined as a toy, in the sense that they are dynamic objects that invite players to play

and express themselves in different ways. Projects such as Modulus, Tylo, and OmniBlocks are platforms to support various ways of playing with the same object and make it easier to jump in the making process.

IMPROV COMEDY AND COLLABORATION

IMPROVidence at the 2014 Del Close Marathon. Our warmup consisted of chanting "Mayonaisse" for ten minutes. Not my best performance.

The team generating ideas at the start of a long-form. Every player is one part of an ecosystem, linked relationally to the adjacent players. We use these relationships as inspiration for later scenes.

I started doing improv my freshman year of high school. All I knew before I tried out was that you make stuff up on the spot. I had never heard of it before then, and I was astounded to find out that there is a group of people that do the same thing I have been doing all by myself in my head. There is a distinct difference, though. In performing with an improv group, the ideas that come out are not proprietary, anybody can add on, twist, or transform their own bits of information to change the story in a way they see fit. The scene is more important than any one person or idea; being controlling or stingy with ideas most likely leads to a bad scene. I started to see individual ideas and choices (called bricks in improv) in a scene as toys that can be shared and given new meaning. As long as all the players are in agreement, they can add bricks onto their building, and that building can evolve into a cathedral, or a hut, or a fireplace.

A question I get asked a lot is, "How can you practice improv? Doesn't that defeat the purpose of improv?" Practice does not mean a rehearsal like in a play, it is more similar to practicing a sport, where you develop good strategies and techniques to play better later on. Good practice creates a clearer roadmap to correct mistakes during performances down the line. And just like in sports, when everyone knows the rules, the whole team is able to play their position to the best of their ability. Initially, I thought improv was simply saying whatever came to my head. The more I practiced, though, the more I learned that good scenes flourish when there is structure and a system for teamwork.

I saw improv as an opportunity to learn how to make it easier for groups of people to play better together. Studies have shown that during improvised activities, the brain essentially shuts down its centers for censoring and judging itself in order to rapidly make decisions and react to stimuli more effectively. An essential tool for improvising successfully is accepting every decision made, and building off of what has been established. Otherwise, denying too many ideas halts any creative momentum. Good-natured humor plays an important role in helping us be more receptive to each other's input. Naturally, the act of playing is a catalyst for developing new ideas. Similar to how improv is a collection of systems to guide our imaginations, toys are tangible or visual channels for directing our creativity.

This thesis draws heavily on improv philosophies and techniques I have learned over the years to reteach a system for collaboration and flexibility. The Random Inventor Game is inspired directly from an improv game, whereas projects like the Doodle Maker practice observation and adapting to the unexpected. The Laugh Booth uses laughter to encourage collaboration between participants, very much like a comedy performance.
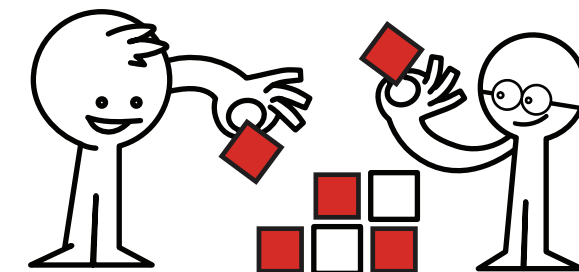
CREATIVITY IS EVASIVE

As an artist and designer, it is hard to not take pride in my work. Producing an original piece or an intuitive design often became a crutch to validate my decision to pursue a career in design. Nevertheless, priding myself in being creative has a downside.

In middle school I started to become more determined as an artist. However, I would often find myself staring at a blank sketchbook page, with a pencil in hand, unable to draw. "Why can't I feel creative everyday?" I realized that the pressure of making something 'good' was holding me back from even starting. This struggle has stayed with me to this day. So I do what anyone would do when they are faced with an unsurmountable challenge: I lower my expectations.

I found that a lot of the ideas I liked the most come from unexpectedly normal places, from half-finished doodles to casual conversations with friends. I felt more creative when I focused on subjects I was passionate about, such as toy design and modularity. Projects such as Blob Squad and YouNits came from developing ideas I knew I could finish. By setting up parameters early on in the project cycle, I was able to focus on the concept and execution of the idea without getting too overwhelmed by uncertainty. Creativity comes when we are passionate, open to sharing ideas, and able to set boundaries. Within groups of people, it can be hard to share personal ideas for fear of judgment. But Blob Squad and YouNits invite personal expression through play, which creates an atmosphere that is more socially and creatively flexible.

Why can't I be effectively creative everyday? Why do some people see themselves as creative, while others do not? How can we develop creativity through play?

Ok, ok, calm down... Let's break down what creativity actually is, and the factors that influence a creative practice.

"When we play, we bounce between delighting in the novelty of a new activity and mastering the skill of performing it."

CONTEX-TUAL HISTORY

**This thesis explores how play can be used to develop creative thinking in others,** starting with making it easier to initiate the act of making something new. I see play as a way to learn more about the world and ourselves, through experimenting and exploring new things. We begin to develop physically, cognitively, socially, and emotionally through playing in different ways with different things. Creativity is defined as the use of imagination in creating original work. I believe that creativity is integral to the human experience: we strive to make or do something new and original as a statement that we are unique and dynamic. Play is a creative activity, we make things up and devise novel ways to inter- act with the things around us. I chose to focus this exploration through the lenses of toy design and improv comedy because they integrate play and creativity in a way that is generative, personal, and playful. Play is inherent in creative thinking: we learn, discover, and explore the world through play. Dynamic media can enhance these characteristics to create more favorable interactions and experiences for creativity and play. The computer and subsequent interactive technology is the ultimate tool for play. It can be programmed to structure, observe, and visualize any number of interactions, becoming the impetus, playground, and archive for creation and experimentation.

Opposite: Just as babies absorb as much as they can through play, I acted like a baby in the contex- tual research phase: bumbling aimlessly, and approaching everything with a look of confusion.

HOW TO BE AN ORIGINAL THINKER
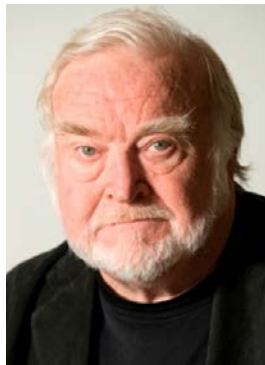
Jacob Rabinow was a prolific inventor, holding over 230 patents. In an interview with psychologist Mihaly Csikszentmihalyi, he describes through his experience how to be an original thinker. The first step is to know a lot about a certain domain of knowledge, whether it is in design, math, philosophy, or juggling. (Csikszentmihalyi, 66)We tend to study and know more about things we are interested in, and the things that interest us tend to be easier for us to understand. "It is difficult to recognize an interesting problem without a good dose of curiosity, wonder, and interest…" says Csikszentmihalyi (Csikszentmihalyi, 72). As we gain more context about our interests, we can formulate our own assessments and draw our own conclusions about the state of that domain. The second step is to "be willing to pull the ideas," or "[play] with the contents of the domain" (Csikszentmihalyi, 66). This step can include combining information from other domains and designing rough drafts, concepts, and prototypes. The important part is that we are materializing our thoughts, physically manifesting, organizing and rearranging ideas in order to make something original. However, original thoughts are not necessarily creative, yet creative thoughts are always original (Csikszentmihalyi, 84). The final step is being able to "get rid of the trash which you think of," and saving the promising ideas to develop later (Csikszentmihalyi, 67). We must not only have the capacity to conceive of original ideas, but also to judge those ideas objectively; seeing how they match up to specific criteria. Sometimes an idea can be new, but "it's not good…it's too complicated…it's not… elegant" (Csikszentmihalyi, 67)." A creative person is knowledgeable, productive, and also critical within their domain of practice. But there are also factors that determine creativity outside an individual's control.

The creative process is a way to break down how we actually develop any creative idea, from experimenting with a waffle recipe to directing a musical. The common belief is that people are born innately creative and some are not. However, there are many factors that contribute to creativity that are outside the control of individual. Individuals are more likely to develop and channel creative ideas when their environment is organized, resources are plentiful, risks are encouraged, and their peers are supportive (Csikszentmihalyi, 42). These things are necessary to facilitate a creative practice.

Top: Jacob Rabinow

Bottom: Mihaly Csikszentmihalyi
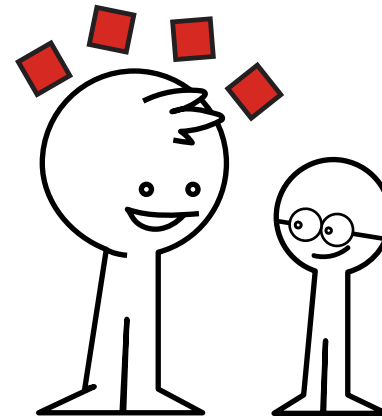
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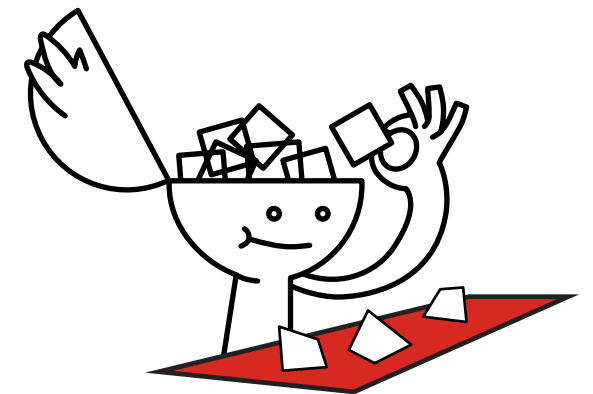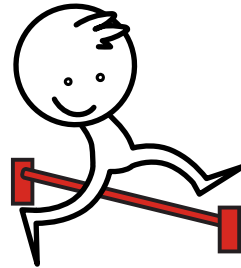

Make your ideas into real, shareable things.

Focus on the promising ideas, toss the bad ones.
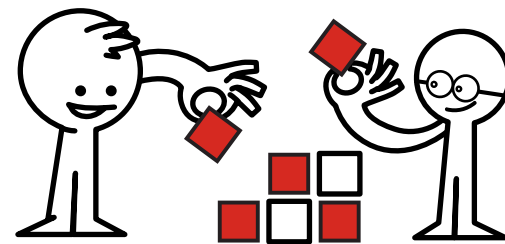
Designing a Creative Space.

1.

2.

1. Make it hard to fail, or easy to start over.

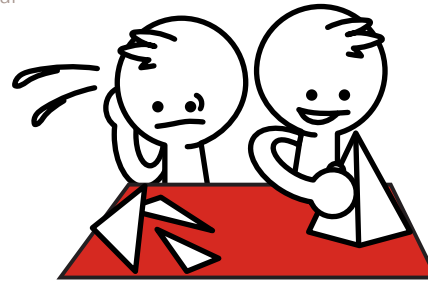2. Organize relevant information so it is easy to share and find.

3. Have ample time and resources to experiment. Plan on making multiple iterations of your project.

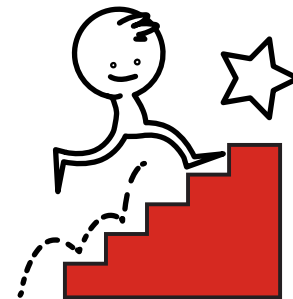4. Set realistic boundaries and goals to focus your creative efforts.

3.

4.

THE NEED FOR CREATIVITY

Even if our creative ideas are small and seemingly trivial, developing a creative habit is a vital part of navigating a complex world. When we are confronted with the unexpected, we need to have strategies for learning, adapting, and expressing what we encountered, so that we and others are better prepared for newer surprises. We need creativity because the world is constantly changing, and we cannot afford to wait on external factors to make conditions more favorable. Creativity is fundamental to making our environment to better suit our needs, as well as adapting to the things beyond our control. Just as literacy is an important skill to gaining knowledge, creativity is essential in transforming that knowledge as an avenue to communicate, empower, and change ourselves.

WHAT IS PLAY?

I define play as testing the limits of what an object, space, activity, person, or system (the ecology of play) can provide. Rather than searching for a definitive stimulus for play to start, the ecology of play shows that a culmination of these factors can inspire and invite people to play. Any of the elements in the ecology of play (object, space, activity, person, or system) can be designed to facilitate play, like toys, playgrounds, games, playmates, or technology. A group of people in a parking lot is not a specified play ecosystem until someone initiates a game of Tag. Then, everyone can be player, and the space becomes the playground. Conversely, a designed object for play such as a baseball bat can be appropriated as an object of damage, transforming the ecology of play into a dangerous environment. As a result, play does not necessarily materialize from one designed thing, but through the network of elements in the ecology of play as interpreted by the player or players (Sicart, 43).

Simply put, play is embracing something and enjoying all aspects of its existence. Play can take many forms and involve different pieces from the ecology of play, from stacking building blocks to playing golf. What differentiates play from other activities is that it is primarily performed for its own sake and enjoyment. Play becomes the way we learn through interacting mindfully with our environments and peers in a low stress environment. Different styles of play emerge as our personalities start to develop, and the way we play reflects the way we tend to live (Brown, 65). When we play, we embrace and absorb the activity, while also producing our own version of that activity. The idea of work can be seen as drudgery. We perform tasks to reach a quantifiable objective, and then move on to the next task. We view work as a means to an end, which can be money, comfort, safety, etc. We view play as a means in of itself, we do it because it is pleasurable. Philosopher Ian Bogost describes how to find fun through working: "Fun is not so much a feeling as an exhaust produced when [you] treat something with dignity." (Bogost, 87). Work can be transformed by play through embracing that work activity and finding ways to enjoy the process. Work and play are often viewed as opposites, divided by the thought that work is useful and therefore important, while play is juvenile and useless (Bogost, 98).

Play is the activity, Fun is the byproduct. We play with things to explore the fun things it can provide.

Fun is novelty.

CONSTRUCTIONISM: NATURAL LEARNING THROUGH PLAY

For more information on how toys, play, and learning fit together, check out Seymour Papert's book *Mindstorms*.

Using play to cultivate creativity is hard to constrain to a single formula. There are so many ways to play and be creative, how can we measure these abstract qualities to test if creativity is present, or if playing actually leads to anything productive? This is where the philosophy of Constructionism comes into play. Constructionism is a way of learning that applies our personal reasons to create and play in order to foster a practice of lifelong learning and creative thinking. It uses the things we are naturally interested in as an avenue for applying, sharing, and refining the skills and knowledge gained from pursuing said interests. Constructionist learning is based on four principles: Peers, Passion, Play, and Projects; without these things, creative learning is hindered. The DIY and Maker Movement is based on this philosophy, and it argues that anybody with an interest in anything should make something to learn more about that interest and develop it even further. As the maker explores and plays, they start to feel empowered by their ability to create, learn, and share things with others. The power of Constructionism is that it accommodates and celebrates our own unique personalities and learning styles; we approach our projects however we want, and we are able to determine our own metrics for success.

Through play, we construct extraordinary circumstances out of normal everyday conditions.

GOOD TOYS ENCOURAGE OUR CREATIVITY

"ANYTHING IS A TOY IF YOU PLAY WITH IT."
-ANDY DWYER, PARKS AND RECREATION

Toys are objects that can be played with, channeling creative expression into the open. A toy is an object, program, or system that invites appropriation for the sake of play (Sicart, 43). We give the toy meaning through our playful interactions, and it turns into a tool for our creativity. A player assigns its own rules and objectives for the toy, as opposed to a game, where its objectives are designed by the creator. Playing with toys is one of the first ways we learn about the world. We replicate and condense culture into a playable medium for the sake of acclimating ourselves to reality while also spurring imagination (Sicart, 42). Toys become the models in which we internalize how things operate, and through play we experiment with those operations to create new possibilities. When we play, we create our own worlds that reflect and investigate our understanding of the world. Good toys are able to facilitate that expression and create new avenues for cultivating and exploring new models of our understanding through play.

If we express our true selves through play, then toys provide multiple avenues into guiding that expression. Play can be seen as simply testing the potential of an object or system, and if a toy is anything that can be played with, then it could be assumed that anything can be turned into a toy if one plays with it. By fully appreciating the things around us for what they are, we can quickly unlock the toy or game in everything (Bogost, 92). In school, I use a pen just for its designed purpose of writing on paper. Out of boredom, I found many more uses for my pen through fiddling with all the parts: the spring clicker on the back can launch it in the air, the point can poke holes in paper, the pocket clip and a rubber band turns into an impromptu dart launcher. Tapping a pen on a desk transforms the objects of function into objects of sound, motion, and rhythm. The appropriation of objects through play begs our attention, and if we listen, everything starts to look a little more like a toy (Bogost, 89).

I also learned that the ball point pen can explode if you chew on it too hard, essentially 'blue-ing' yourself.

"As the maker explores and plays, they start to feel empowered by their ability to create, learn, and share things with others."

CRITERIA FOR A 'GOOD TOY'

The toy designer is responsible for establishing the play system in the toy, The player can expand on that system via appropriating it for personal use, or constrict the system via lack of imagination.

For the sake of simplicity, I am focusing on a narrower definition of toy, as an object or system designed primarily for play. The specific design of the toy determines how effective it is at encouraging play from the player. As it was described to me by a Lifelong Kindergarten researcher at the MIT Media Lab, good play systems have "low floors, high ceilings, and wide walls." This model of play systems can speak to not only the player but the designer of the system. A low floor means a low barrier for entering into play, such as learning how to handle the toy, or finding enough people to play, or where it can be played. If a toy is too confusing or unwieldy, players become less willing to interact with it. A high ceiling represents the way the system provides opportunities for exploration and an increase in skill level. A toy is less effective to the user when it cannot offer anymore stimulation or challenge, which is why we grow out of playing with most of the toys from our childhood. Just like learning new ways to handle and shoot a basketball, good toys are able to respond and accommodate the player mastering the object. It is important to note that the exploration aspect of a good toy also reflects on the player's willingness to challenge themselves and explore new ways to interact with the toy. The wide walls illustrates the openness a system of play should have in order to account for the different ways players play. An overly restrictive play pattern can deter players and squash creative exploration. Therefore, the play system must be open to appropriation by the player, in order for the player to explore what is most interesting to them. When players are able to use the toy for personal applications, the toy is elevated from an object of entertainment to a channel of self discovery and learning. Because we play in different ways, our toys should be designed to encourage appropriation for the purpose of personalized fun.

PLAYING WITH (THE DESIGN OF) BALLS

I have found that a 'good toy' is one that is easy to understand, scalable in complexity, and easy to appropriate. The ball, in whatever form, presents itself as one of the most effective toys, because of these characteristics. To the player, the basic interface of a ball is simple to grasp how it works: it can roll, bounce, balance depending on different
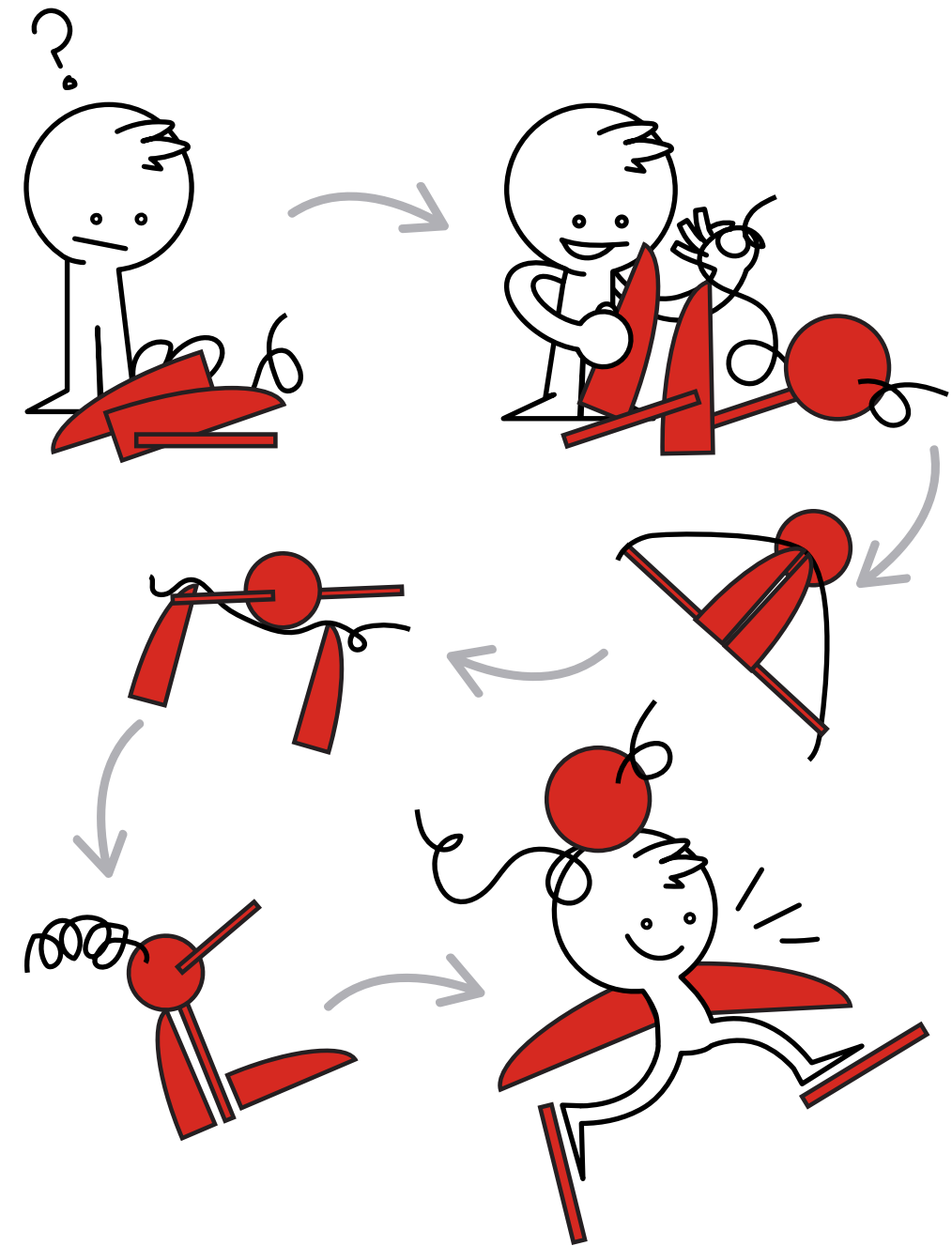
Toys start play, play develops creativity.

interactions. From a designer's perspective, making a ball can be as easy as crumpling up a sheet of paper, or as precisely engineered as a golf ball. The simple form of a sphere can be made out many types of materials, in different sizes, and still be recognized as a 'ball.' Through mastering the basics of the ball, we become aware of how it interacts in the context of other factors, such as the ball material, surrounding environment, and potential players. We are able to play more deeply by being aware of how these external agents affect and connect us to the ball. Think about how a professional athlete is able to fully use their body, the field, and the unique design of the ball in harmony to play a game, compared to someone who has never played sports before. Both can have fun and love the game, but as the beginner masters the basics of playing, the intricacies in the play system come to light. How we use the ball in play is up to us as much as the designed material, size, and context determines the interaction (Sicart, 44).

In mastering the form of the ball and the system of play it exists, players display their unique personality and explore their tendencies through what we call style or strategy. From reserved and precise, to bombastic and explosive, playing styles develop constantly through playing and understanding that we are how we play (Brown, 65).

IMPROV: PLAYING WITHIN STRUCTURES

Improvisational comedy, or improv for short, is a theater form that utilizes quick thinking and teamwork to create comedic scenarios, characters, and stories based off a certain stimulus, such as a word from the audience. The allure of improv is the thrill of spontaneity, but there is a lot of preparation and training in generating a climate conducive to creativity. While technically you can make anything up on stage and
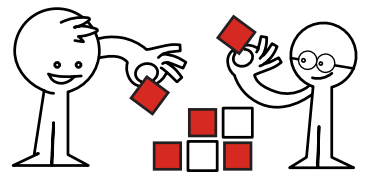
call it improv, there are techniques and strategies in place for teams to improvise cohesively and to find the comedy more efficiently. The foundation of improv is listening to your partner, acknowledging them, and building on top of their ideas to create something collaboratively. These rules are implicit in how we naturally play, and the power is in its application for other creative fields. Improv exercises one's skills in observation, adaptability, recognizing patterns, empathy, and teamwork. The process of improvising onstage is a microcosm of the creative process: conception, exploration, ideation, and execution are displayed within minutes of receiving inspiration for a scene.

USING IMPROV TO PLAY BETTER

In the design field, we are taught to use creative thinking to solve problems and communicate them. However, there is no singular way to reach a creative idea, and the path is almost always unclear in the beginning stages of creating. Many scientific and artistic innovations seemingly come from nowhere, from Mendeleev using playing cards to organize the periodic table, to Alexander Fleming discovering penicillin from moldy dishes. While we cannot purposefully design 'accidental' innovation, we can see that there are prevalent principles that can lead to discovery, such as observation, curiosity, playfulness, and courage. Coincidentally, these ideas also form the basis for practicing improv comedy.

Players must be able to observe i.e. listen and accept the bricks of information laid out in the scene. Once something interesting presents itself, such as a weird character or oddly specific detail, the team must be curious to follow where the interesting thing can lead (called the 'game' of the scene). Improvisers are trained to mentally ask themselves questions repeatedly, from "If this is true, then what else is true?" to simply "Why?". The answers to these questions are answered through the choices they make in the scene, pointing them towards the game. The playfulness starts when players start to explore the humor to create comedy, which in turns creates more opportunities for exploration. They are able to generate new ideas that reflect and heighten the game, building a scene that takes a life of its own.

Think of bricks as ideas that we use to build a story. It is important to accept other's bricks and build on top of them with your own, using a 'Yes And' mind set. Don't tear down your partner's bricks!

And it definitely takes courage to pursue the silly or the unconventional route. Whether it is a success or failure, the end result will have

been something no one has ever seen before. The courage plays a large part within the scene, in committing to a weird decision, and in also supporting a teammate's actions. I have been in improv scenes that end up falling flat, and all the creativity seems to seep out of my head. During those times, I abandoned my commitment to the scene for the sake of a quick laugh from the audience. A good improviser does not have to be funny all the time in order to make comedy, but they do need to be honest to their character and committed to their scene partners. A scene loses its momentum once people start to break character and ironically point out the weirdness. Courage is also needed in between performances, to deliver constructive criticism to each other for the sake of improvement.

Practicing improv provides a framework for a safe yet exciting creative space. It is safe in the sense that there is almost no harm done for flubbing a scene. Improv teams build trust through supporting each other. When one person initiates a scene by calling everyone to dinner, the team supports that decision by acting like they are about to eat a meal together: smelling the food, placing imaginary napkins on their laps, acting extra hungry, etc. Through observing each other's reactions to being called to dinner, the team establishes a base reality, or shared agreement that what happened in the scene is factual (Besser, 17).

We are able to take greater creative risks when we feel safer. We can create a safe space by making communicating clearly and encouraging each other.

Within any improv scene, trusting in each other at the start allows individuals to take more creative leaps later. The exciting part comes in when a player or even the whole team makes a creative risk. For instance, instead of actually eating dinner, the players exaggerate the activity of preparing for dinner: replacing the tablecloth, figuring out the ideal seating arrangements, to even making new dishes on a potter's wheel. The dinner scene becomes a scene about a family obsessed with making a perfect meal and never actually starting one. Alternatively, after establishing the dinner scene, a player may suggest that the main course is a bit dry, and a teammate replies "Well, it's my first time cooking sober." The scene about dinner turns into a scene about how one person is a better cook when they are drunk, leading the players to convince the sober friend to relapse into alcoholism to make a better dinner. In both of these examples, the team was able to find an interesting thing and expand it into a richer and funnier situation (Besser, 67). In improv comedy as well as design, we observe a certain detail in a system and transform, condense, and expand that into something that can be communicated to an audience.

Without experimenting and pushing the boundaries of weirdness, we tend to come up with a flat, unoriginal, obvious product.

Improv (re)teaches us how to play well with others.
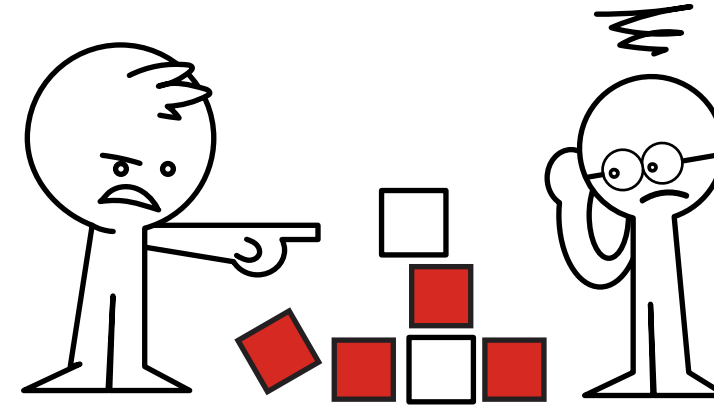
Group projects fail when we have unclear goals, miscommunication, and a lack of trust in the team. We tend to blame others for the group's mistakes.

Improv provides techniques to help groups collaborate consistently, such as listening, trusting, and supporting the other.
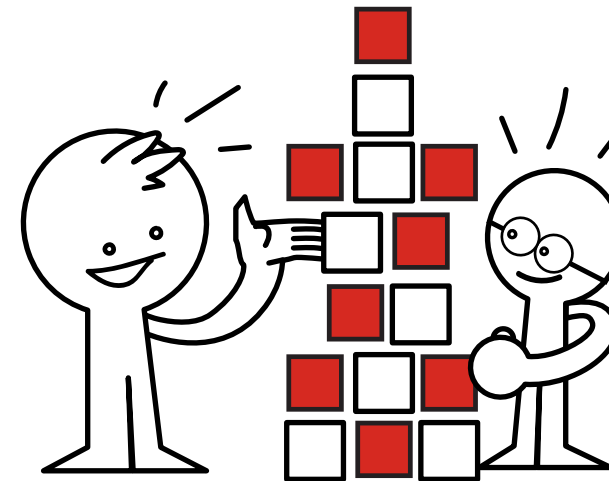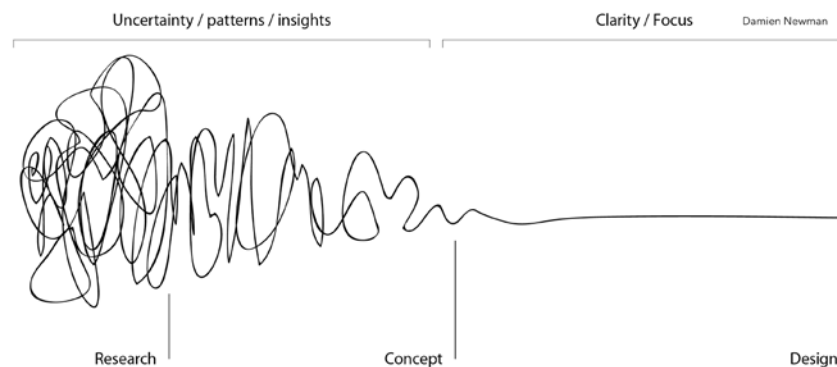

By pursuing a shared goal and supporting the other, groups can create things that surpass what any one person could achieve.

THE STRUCTURE OF IMPROV REFLECTS THE DESIGN PROCESS

"ACCIDENTS, LIKE CREATIVITY, ARE PROPERTIES OF SYSTEMS RATHER THAN OF INDIVIDUALS."
- MIHALY CSIKSZENTMIHALYI

This is a famous diagram illustrating the design thinking process. Below is an illustration of how UCB lays out a basic improv scene.

Practitioners in both disciplines cast wide nets to build a foundation of information. Once an idea seems promising, they heighten and refine that concept until an objective is reached.
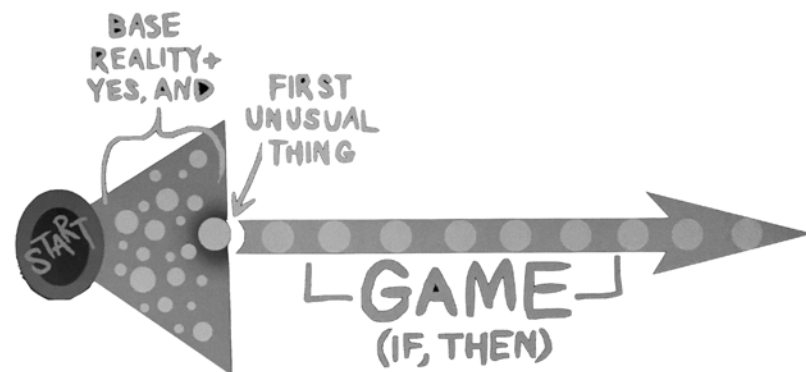
The design thinking process is derived from the creative process, focused on designing products and services to solve a problem or fill an opportunity for improving a way of life. Design thinking holds the steps of researching, testing, and refining a project together; which can take anywhere from hours to years to complete. Just as the end product of design thinking is a good or service, the end product of an improv scene is an engaging story. I have found that I can draw similarities between the structure of an improv scene to the structure of the design thinking process. By comparing these two creative systems, I hope to shed light on ways others can use improv to clarify and invigorate their creative practice. People who do not think of themselves as creative tend to see creativity as a murky, nebulous landscape; hard to reach and difficult to navigate. However, improv can provide a system to reach new ideas quickly and organically.

Inspiration

An improv scene starts with fielding a suggestion that can jumpstart a scene. It can be a one word suggestion, non-geographic location, or the last text sent on someone's phone. The podcast Improv4Humans often uses Youtube videos or questions from Twitter followers to inspire scenes. With design thinking, the first step is finding an opportunity, which can be an observed problem or situation that can be changed. Both systems require listening and observing to what was provided.

Gathering Information

After receiving the initial seed for a scene, players start to build a base reality (Besser, 36). The team lays down bricks (improv term for bits of information provided by characters in the scene) to create a foundation for the scene. The popular "Yes And" strategy is used in this stage; meaning improvisers agree to their partner's bricks (saying "Yes that is true"), and adding onto that idea with another brick (saying "And this is also true"). This normally includes who is in the scene, where they are, and what they are doing. The base reality can easily be established in under a minute: the Upright Citizens Brigade (UCB) Comedy Improv Manual provides exercises to establish a base reality with the first three lines of dialogue. The research process in design thinking requires learning more about situations related to the opportunity, through primary and secondary research. After establishing the who, what, and where, both systems explore the why and how things come about. In improv, this is called justification (Besser, 129), where players justify why they are doing what they are doing. They are simultaneously creating and discovering the base reality, just as design research is creating a

Use "Yes And" to find a concept to explore.

Once a concept is found, use "If Then" to explore and flesh out that concept.

structure to look at the problem through uncovering information (Leski, 61).

Tracking and Ideating

Once enough bricks are laid out in a scene, the improvisers can start to see where their scene is building up to. The base reality situates the players and audience in a shared reality, but the game of the scene is found through discovering the compelling brick that makes the audience laugh or sit forward in their seats. The game of the scene is the single idea that makes the scene funny. In the Substitue Teacher sketch by Key and Peele, the game is that Mr. Garvey takes attendance insisting that the students pronounce their names his way. This sets the pattern for the rest of the scene, with Mr. Garvey growing increasingly frustrated with the class' pronunciation of their own names.

"Jay-Quellin… Where's Jay-Quellin at? No Jay-Quellin here?"

"Um, do you mean Jacque-line?"

"Okay. So that's how it's gonna be…"
--
We begin to catch on to a pattern and settle into a groove.

After enough research is gathered, designers start to track the collected data, finding patterns and identifying potential ideas to test. Reflecting back on findings informs the designer's approach to ideation and testing. The base reality creates an environment for funny things to happen, allowing them to play in the ideation stage. For improvisers, ideating means exploring the game of the scene, looking at the different possibilities the same game can play out. This stage invites the participants to experiment with the structure they created through research, pushing the boundaries and producing new things with the same bricks.

Refining the Pattern

After the game is established, the improvisers explore the game by asking internally "if this unusual thing is true, then what else is true?"

(Besser, 113). Following "Yes And" allows for an influx of new ideas in the scene, but at this stage, it would make the scene convoluted by introducing more bricks that can distract from the game. Therefore the "If this, then that" strategy is established to refine and explore the game, which is the focus of the scene now. Heightening the game is important in engaging the audience, just as a story builds up to a climax. Improvisers are looking for ways to heighten game in ways that are increasingly absurd and funny, which holds the audience's attention. In design thinking, the ideas are tested through making a prototype, and refined by judging them based on how well they satisfy the opportunity. Designers are looking to heighten the design in a way that optimizes the solution to the problem. If a feature detracts from that goal, then it must be refined or removed. Commitment to the concept is a key attribute in designers and comedians.

"If one of y'all says some silly-ass name, this whole class is gonna feel my wrath. Now Dee-Nice-"

"Do you mean Denise?"

"SON OF A B--"
--
The pattern is always heightening, pushing the concept to surprise and delight the audience.

Final Product

The great thing about improv is that once a scene is over, it only exists in memory. Characters, dialogue, environments, and stories vanish once someone wipes (ends the scene). The scene ends when the game is heightened to an extreme, or the pattern if the game is broken or changed. The final product of an improv show is a performance; the inception, development, and execution of one or many stories is experienced in minutes. Improv is a theater art form in of itself, but it is also a tool for testing ideas. Many improvisers from UCB take their improv skills to develop characters and sketches for TV shows and movies. The comedic and creative skills gained through practicing improv is a byproduct of playing with ideas with other people. The design thinking process is used as a structure for product development, and practicing through that framework only strengthens the ability to perform it. Even if the output of design thinking or improv is a new app,

Mastery over a system or tool helps us to create better products.

or a waffle, or a scene about an alcoholic chef; the product of experiencing and practicing these structures is being better at observing, trusting, collaborating, experimenting, and producing.

A good improv scene and a good design process is a balance between: exploring/focusing, constructing/deconstructing, acting/listening, responding/planning. Within an organization and individuals, we oscillate between synthesizing our choices, ideas, and actions and analyzing them. I believe that both improv and design thinking give us a blueprint to utilizing those functions in a way enhances the creative process in a collaborative way.

Chance occurrences present themselves throughout the creative process. Improvisers are built to respond and recover from mistakes, unplanned happenings. On a similar note, designers typically pivot, experiment, and adapt in the ideation/refinement process, but lose that flexibility in the execution and testing.

It seems that creativity flourishes and productivity decreases when the pressure is low, and creativity is stifled but productivity is heightened when the pressure is high. Pressure can change depending on available resources, such as time, material, manpower, creative license (Csikszentmihalyi, 34). The right balance of pressure and limitations can unlock creative breakthroughs, while too much or too little of anything leads to creative stagnation or burnout. The best designers/improvisers use the inherent limitations to enhance their creative practice, transforming supposed obstacles into building blocks. (TJ and Dave is an improv form where only 2 players perform the parts of multiple characters) (Gravid Water is another example, where one person can only recite rehearsed lines from a well known play, while the other player has to improvise their own dialogue.) Without these limitations and challenges, we are limiting ourselves to the obvious solutions and the easy punchlines.
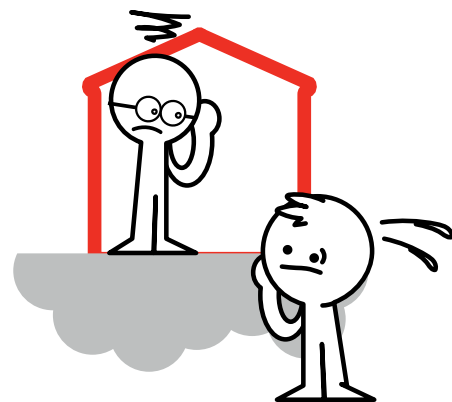
Both design and improv comedy represent designated arenas for people to come together and imagine new possibilities and alternate realities. They both involve participants to collectively work towards achieving a specific and shared goal. The work needed to attain said goal is creative: it requires deep dives into and lateral leaps between domains of knowledge to reach an innovative yet approachable experience. Play is an integral part of creative work because through play, we view any and every bit of information as of equal importance. When we are playful, mistakes, successes, distractions, and relaxation are all seen as opportunities for growth and exploration.

In the following chapters, I will show how my interest in toys and passion for improv led me to learning more about the nature of creativity and play.
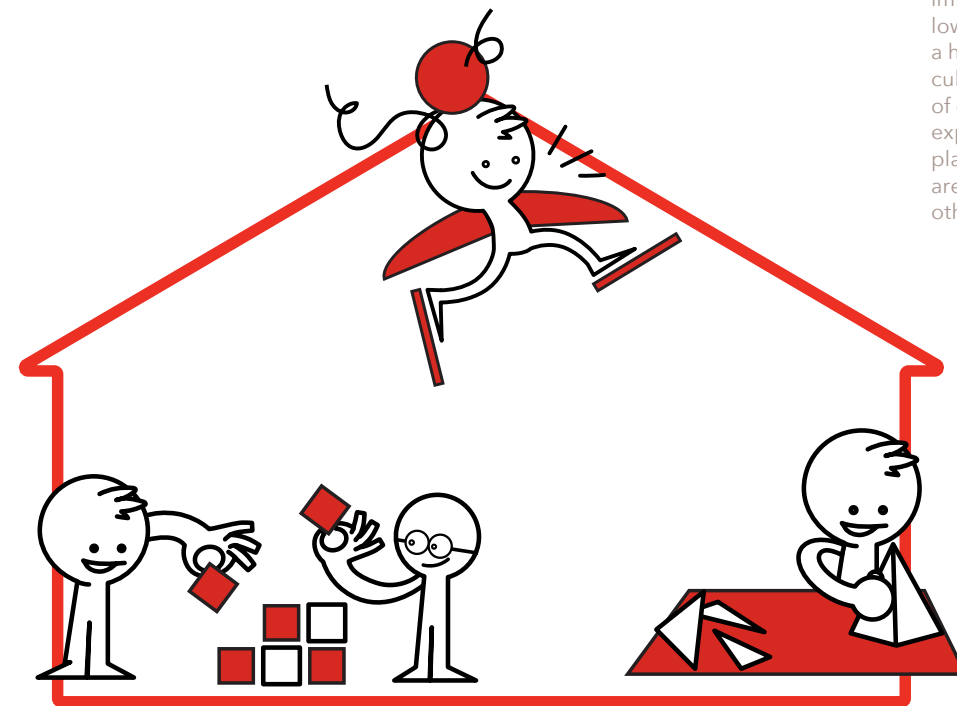
UNEXPECTED FUN

INTRO-DUCTION

All of the projects in this section utilize randomness in order to interrupt our preconceptions, to introduce a fresh element to keep our minds on our toes.

Our brains are built to recognize patterns and make connections in order to create sense of the world, from using myths to explain natural phenomena and recalling scenes from a movie whenever a familiar scenario happens in real life. Unexpected Fun is focused on bringing together unpredictable elements in order to challenge players' preconceptions. The fun comes out of the process of combining these elements to create meaning.

The combination of random elements puts the focus on our efforts to create a connection. The concept of bisociation (as opposed to association) by Arthur Koestler is described as the intersection of two different domains resulting in a new idea that can exist on both planes simultaneously. He has found examples of bisociation in science, art, and even humor. The pun is a common but popular form of comedy that bridges two subjects with a word or phrase. My go-to pun is:

Pro-Tip: Bisociation is a fancier term for cross-pollinating ideas. Use it whenever you run out of buzzwords at your next meeting.

"WHAT KIND OF FRUIT DOES A GORILLA SLEEP ON?"
"AN APE-RICOT."

Alternative Pun
Q: What does a cheer-
leader drink before a
game?

A: ROOT beer
(I will also accept
POM-POMegranate Juice)

The punchline connects two ideas: primates (ape), and sleeping (cot) through a third idea: apricot. It's not the cleverest joke, but the fun comes from our brains trying to comprehend two disparate meanings at once. In trying to make sense of a nonsensical situation, we laugh to release the tension.

In improv, scenes and games mostly start with a suggestion from the audience. This suggestion becomes the seed in which a scene grows. If the improvisers performed with a word already in mind, their playing becomes less off the cuff and more planned. The one word suggestion involves the audience in the performance, putting the focus on the performers actively building a world without any preconceived notions. The unexpectedness activates the creativity.

When confronted with the unexpected, we are invited to go on a journey that leads us to a place we did not know existed. The improv scene is only interesting and funny if the audience does not know what to expect at the end. The improvisers themselves should work to keep their performance fresh, challenging their own expectations. We play with toys because they have the potential to delight us and give us fuel to create our own discoveries. On Sunday afternoons, I used to make forts with army men in the sandbox with my brother and friends. Once we finished building, we turned on the hose and watched our construction slowly dissolve into the mire. We would narrate the destruction as it happened, exclaiming as water rushed through the trenches and engulfed our favorite figurines. As much as we planned the scene in the sandbox, the way the fort disappeared was always different, and our schemes grew more complex over time.

The goal of these projects is not to expect perfectly formed ideas every time, but to warm up the mind and lower the threshold for creative opportunities to occur. The first few scenes of improv practice are going to be bad, and the first sketches will be rough. However, by persevering through bad scenes and drawings, we start to improve our skills and end up with something that was creative, personal, and surprising. When engaged in a creative process, anything can inspire creative direction. The Random Inventor Game (RIG) and Doodle Maker

encourage us to look at the randomness and create connections, no matter how absurd. The case studies Motion Paint and Twitter Bot are experiments in dynamic media that delight the users with surprising elements.

The building blocks for creative ideas are already here: the way we connect them is the basis for a creative idea. Creativity is creating something new out of the things we already have.
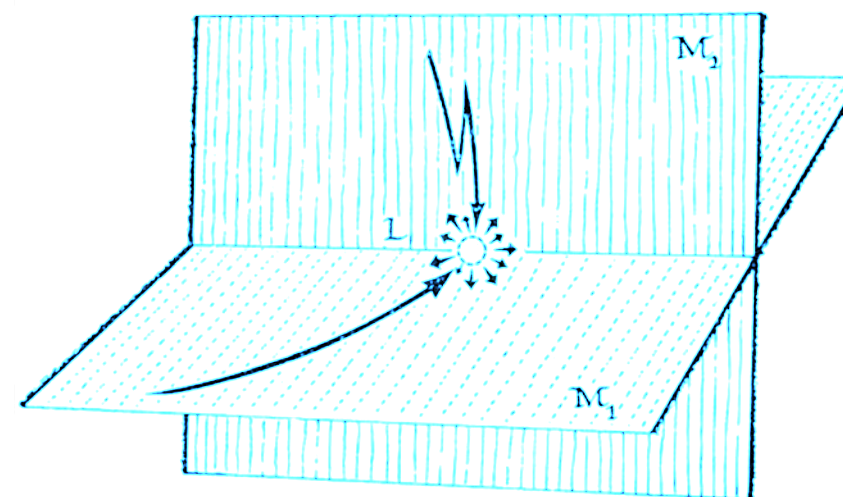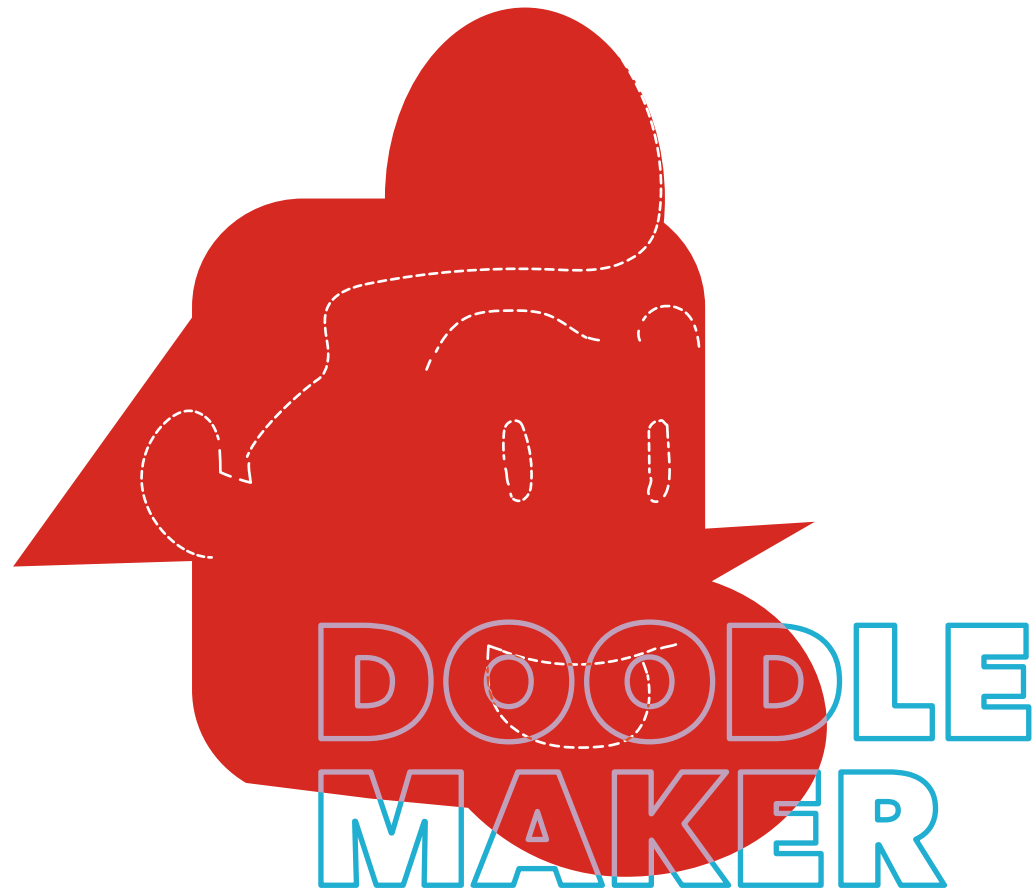

Diagram by Koestler illustrating the concept of Bisociation.

'L' is the creative idea that exists on the intersection of both domains of knowledge 'M1' and 'M2.'

How can we accelerate these intersections?

"CREATIVITY IS CREATING SOMETHING NEW OUT OF THE THINGS WE ALREADY HAVE."

THE PROJECT

The Doodle Maker is a drawing program that produces random white shapes to create a silhouette, or a proto-doodle on a computer screen.

The player uses a Wacom stylus and drawing tablet to mark the composition in two different line styles: a thick white stroke, or a thinner black line. The player uses the silhouette as a point of inspiration, sparking their imagination to draw something using what they see on the screen. New doodles are generated by clicking on the 'New Doodle' button,

and saved into the program folder through pressing the 'Save' button. The buttons for saving and changing the line style are built as physical buttons on the drawing surface, programmed through an Arduino. The objective for designing the Doodle Maker is to create a streamlined way to generate dynamic compositions that disrupt the way we usually draw.

INSPIRATION

As a compulsive doodler, I find myself falling into the same drawing habits. My cartoons usually started with a face, then expanding to a hairdo and maybe arms and hands. I gravitated towards drawing the same things because I was familiar with drawing those things from a certain view, like guys in suit jackets, hamburgers, big teeth, cubes. I felt my drawing process was stagnating.

There was a common drawing game students played through middle and high school, where one would draw random scribbles and pass it to their friend. They would then have to transform that abstract scribble into a meaningful representation of something. I had an unspoken goal to make the scribble comprehensible while drawing as little as possible, to integrate the randomness with the latter drawing so as to display both parts equally. This practice encouraged me to decipher the scribble as if it were an archaeological artifact, and I was the explorer re-imagining the parts that were lost to time.

The visual and imaginative searching was institutionalized by psychologists with inkblot tests. (Poorly verifiable) Psychoanalyses were carried out by showing patients a series of and abstract inkblots, and asking them to interpret what they see. The meaning they interpreted from the random shapes was noted and determined whether or not the patient was psychologically sound. Psychotic diagnostics aside, the idea of

"What do you see?"

"A Master's Degree? No wait, two lizards eating the USS Enterprise!"

"Fascinating..."

making meaning out of meaninglessness struck me as an important part of the creative process. As a creative species, it is an unavoidable trait. The synthesis of random material into a collective system by our brains is a skill that should be celebrated and cultivated.

A strategy for character design is to focus on the silhouette of your character, using the outer shape to speak first about the nature of your design. The silhouette acts as a structure for the pose, proportion, and personality of the drawing. Our eyes are initially drawn to identify the edges and spots of drawings with the most contrast, hence a distinct silhouette is important in creating dynamic and unique drawings. I was interested in designing a system that would generate silhouettes for me, reducing the chances of me falling into repetitive patterns again.

Character design silhouette by Francis Vallejo.

CONCEPT

Players can draw as much as they want on any given doodle, nor does the program require players to draw on every doodle that is generated. The doodles created can be ignored, it is up to the player whether or not they choose to develop a doodle further. There is no eraser brush or an undo button to encourage players to adapt to the markings on the screen, made intentionally or unintentionally. The limited color palette and minimal brush selection emphasizes the unrefined, warm-up nature of doodling, where too many options can distract from the drawing process itself.

DESIGN PROCESS

My first prototype consisted of a rectangle, ellipse, and two lines randomly generated to represent a torso, head, and limbs for a figure. I made a couple of drawings that felt static in composition, probably due to the limitations of the primary shapes. I then decided to add another ellipse and a non-rectilinear quadrilateral to create more diagonals that offset the balance and created more dynamism in the composition. This version pushed me to venture outside of my standard drawing patterns; I was drawing less conventional poses and more absurd characters, which I enjoyed. The pointedness of the quadrilateral made for interesting silhouettes, but the fact that it made very distinct features became a weakness on this program. In light of this, I added a random bezier curve to give the outlines some graceful curves and to cover up some of the points and straight lines. The current version
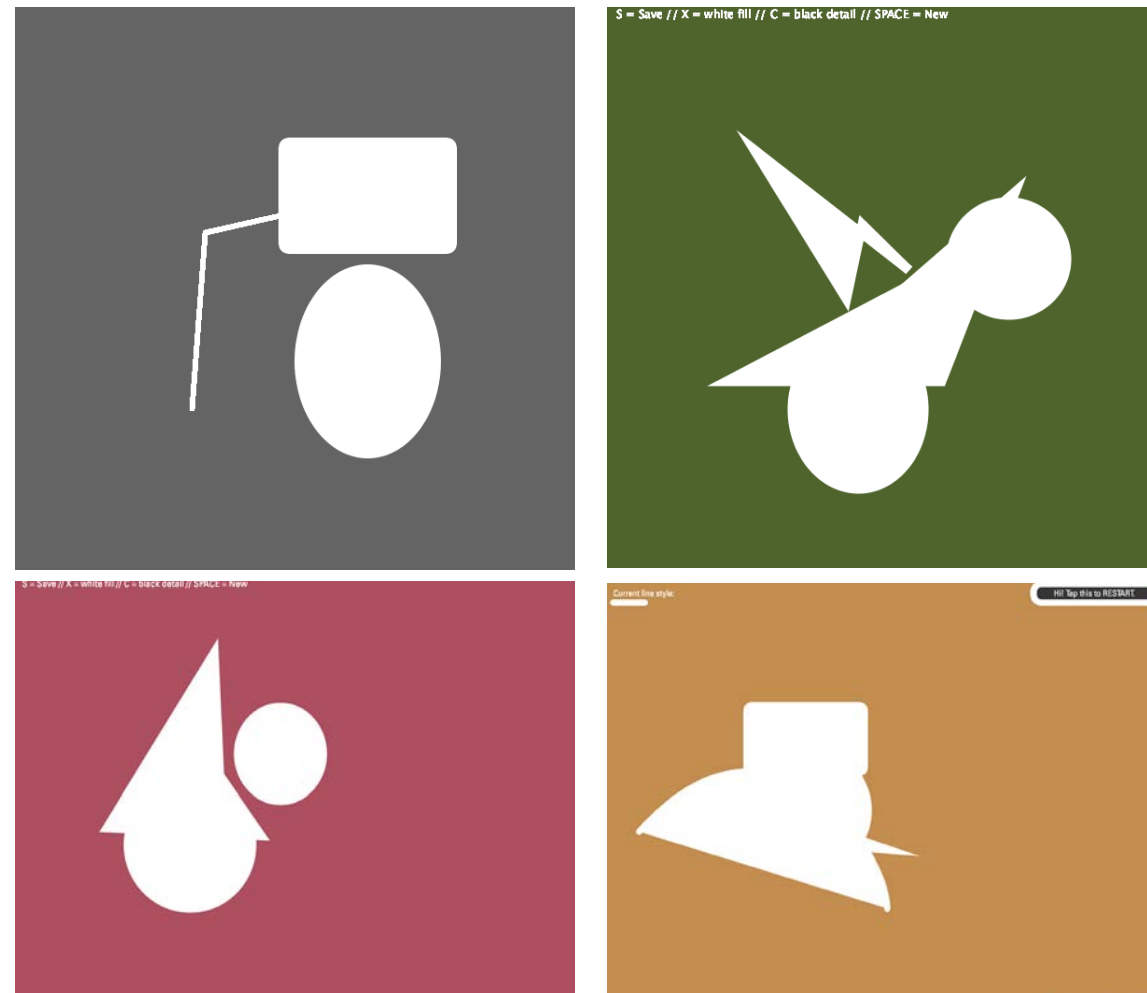
combines two ellipses, a rectangle, a quadrilateral, and a bezier curve to create a dynamic silhouette.

I found it fun to document a doodle before I mark it, as well as several times throughout the drawing process, so later on I can see a progression of my sketches.

I used the buttons from a template I designed for another project, which I remade with corrugated plastic and aluminum foil and connected it to a Makey-Makey Arduino. I used copper wire and tape to craft a makeshift circuit board on the underside of the drawing surface. The plastic board obscured the buttons that came with the Wacom tablet, so as to direct the users to focus on only the save and brush buttons.

The randomly generated silhouettes.

The top left box is one of the first versions, the bottom right is the latest.

Turn the page to see what I added to these doodles.

CONCLUSION

Playing with the Doodle Maker resulted in me exercising a new way of critically looking at my drawings by searching for a way to turn it into something meaningful to me. The Doodle Maker trained my eyes and mind to find significance in a mix of insignificant shapes. If I did not see something at first, I found myself tweaking the picture in little ways until I eventually saw something recognizable emerge out of the mess. I wanted to design the Doodle Maker to encourage thoughtful yet fast drawings. Players are not expected to make polished pieces, but rather focus on getting over the creative hump of finding something interesting to draw.

Even in their limited scope, the brushes proved to be fairly versatile. The white brush is used for blocking out rough shapes, as well as for covering up black lines on a white background. I have also used the white and background to create rough highlights, and drawing with the black on just the colored background loosely implies some atmospheric perspective.

I noticed that my drawings changed, and I was surprised by what I saw and drew from the random shapes. Although I still am drawing human figures, the poses and expressions varied widely, from old women to space ships to giant ducks. From any given picture, the more I drew, the more opportunities I saw to define the picture. Sometimes, mistakes led to funny discoveries.

After I tested it by myself, I distributed it through my website to share with others. I set up this project at the 2017 DMI Fresh Media Show, and observed how others interacted with the full installation. It was interesting to see how others worked something out of the proto-doodle that I did not see as obvious. I showed a friend a proto-doodle and the picture that came out of it. Where I saw the outline of a tank, my friend saw a round man with a trapper's hat. Even though we are given the same things, and can interpret different meanings based off our personal perception.

In terms of next steps, I am interested in building a web-based version that is more accessible to users, so it can be easier to share drawings and save them for possible development. I noticed that the nature of the shapes I programmed influenced the outcome of the drawings, many of the outlines I saw turned into birds or portraits of people with big noses. In future versions, I would include ways for the user to
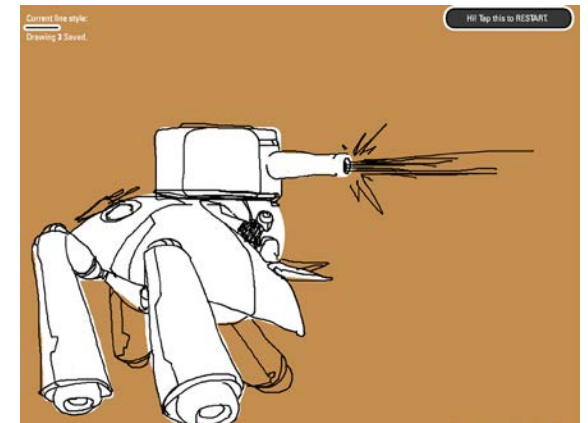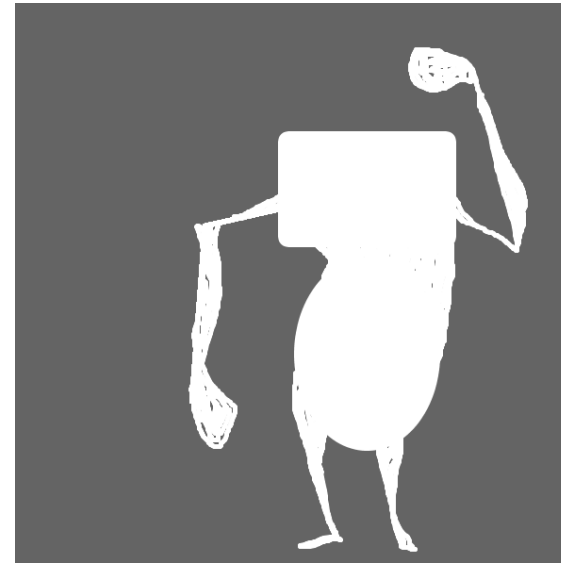
Opposite: 'Blockman', 'Hedgehog', 'Fallen Cosmonaut,' and 'Spider Tank.'

Below: The physical interface inspired by keyboard shortcuts.

customize their own parameters on the front end, through a physical or digital interface. Ideally, they would be able to choose the types of shapes and the width of the brushes to gain slightly more control over the doodles.
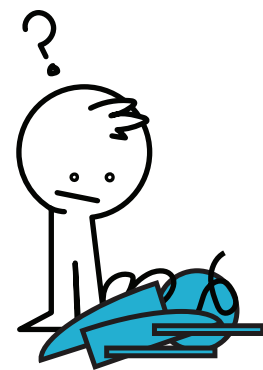
Collection of doodles from Fresh Media 2017.

It is interesting to observe how each person approaches and explores the doodles differently.

RANDOM INVENTOR GAME (R.I.G.)

THE PROJECT

RIG is a party game that invites players to invent products inspired by two topics selected by the group,

such as 'Places to Relax, 'Pets,' or 'Office Supplies.' Once the topics are chosen, players write one word related to each topic on a card and puts each card in the corresponding pile. The piles are shuffled separately and the top card from each pile is revealed.

Players then have 2 minutes to draw as many inventions that connect the two words. When time is up, players take turns sharing their inventions with the group, and the group judges if the idea is valid or

Opposite: Rules for an early paper prototype for RIG.

Can you think of any product ideas that combine a 'Drill' and a 'Chicken' ?

Let's Play... Random Inventor!

1. Choose 2 topics to explore (they can be nouns, verbs, or adjectives)

tools   foods

2. Write down 5 words relating to each topic on index cards.

hammer / drill / saw / screw   salad / burger / apple / chicken
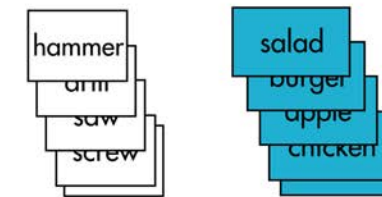
3. Shuffle the cards for each topic and place them face down in 2 piles.

4. Flip over one card from each topic.

drill   chicken

5. Draw as many product ideas that connects the two words in 2.5 minutes.

drill + chicken = ?
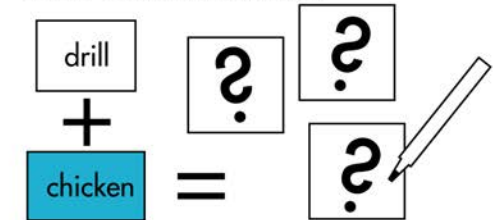
6. When the time is up, the round is over. Players go around and share their ideas. The group decides whether those ideas are valid. Each valid idea is worth one point.
-If 2 or more players have the same idea, that idea is eliminated.
-The game ends when all the cards are used.
-The person with the most points at the end of the game is the winner.

How to play the Pitch Off!
If 2 or more players have the same idea, they face off against each other in a Pitch Off! They have to answer these questions:

- What features make your invention special from your competitor(s)?

- What are features does your product NOT have?

- Who is your ideal consumer?

- If your invention was in a commercial, what would be the catchy phrase at the end?

not, depending on whether the idea incorporates the two words in a cohesive way. For example, if the two words are 'Goldfish' (from the Pets category) and 'Stapler' (from Office Supplies), potential ideas can be a stapler shaped like a goldfish, or a stapler designed specifically for goldfish to use. Players are awarded a point for each valid idea. After all players have shared their ideas and tallied points, two more cards are flipped over, and a new round starts.

If two or more players have the same idea, they can enter a Pitch-Off, where they get a chance to distinguish their inventions from their competitor, detailing best selling features, tag lines, brand message, etc. The other players can vote on which player wins the Pitch-Off, who scores a point, while the loser of the Pitch-Off receives no points for that idea. The game ends when one player receives 10 points, or when all the cards in each pile are used.

INSPIRATION

"WHERE DO NEW IDEAS COME FROM? THE ANSWER IS SIMPLE: DIFFERENCES. CREATIVITY COMES FROM UNLIKELY JUXTAPOSITIONS." -NICHOLAS NEGROPONTE, CO-FOUNDER MIT MEDIA LAB

RIG is largely inspired by the improv game called Dueling Salesman, or the Ad Game. A group of improvisers is split into to teams and given two words by the members of audience. Those two words are combined to be the name of a product which each team has to devise an ad campaign for. The game has three rounds for each team to pitch their product to the audience, using improvised infomercials, testimonials, tag lines, and even jingles to convince potential customers that their product is worth buying. The audience gets to choose which team has the best product by round of applause.

I thought that the Ad Game would be a great foundation for a party game because it encourages groups of people to create wacky things in a matter of minutes. It touches on similar points relating to the concept of bisociation, in that it directly involves combining two unlike

things together to create a new idea. In the realms of art, technology, and science, creative breakthroughs come through introducing a principle of one domain with the practices of another. Biomimicry is a good example of applying principles of the natural world to improve or reinvent how we conduct everyday life. Breaking the boundaries between domains leads to new connections we thought do not normally belong together.

Party games like Apples to Apples and Scattergories provide opportunities for people of all creative levels to think laterally and play with ideas for the sake of having fun. Part of the fun is being able to challenge our minds to make connections between things that we normally do not care about. In a way, games suspend the hierarchy of important and unimportant ideas, making them equally important although inconsequential after the game has run its course. Scattergories questions the way players categorize ideas by combining words in terms of their first letter with more relatable groupings like 'Sharp Things', or 'Reasons Why You're Late.' Apples to Apples alters the way we describe things by starting with an adjective and asking players to submit nouns that best embody that adjective. Pop culture, science, literature, and the everyday topics are shuffled together, with each idea being just as valuable as the next one.

These games incite disorder and improvisation to create fun, through players trying to make the best of out of a system that is unpredictable. It is fun when they play the game well, and it is arguably funnier when players fail. Because both outcomes are still fun, players are more likely to play again and enter a creative, playful space. The friendly competition motivates players to take small creative risks in order to win, so in the process of reaching the highest score, players are developing skills in observation, adaptability, and listening.

Games like these use time as a boundary for managing creativity and ideation.

Creative ideas need a variety of sources to grab inspiration from.
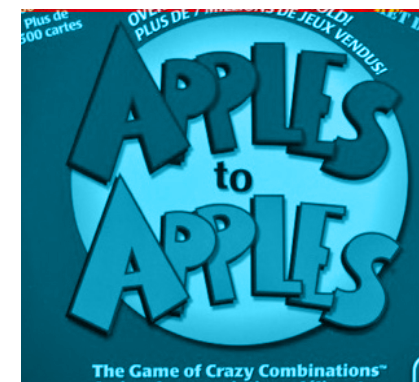
CONCEPT

In the same vein of the creative process, RIG follows similar steps from research to execution, albeit in an improvised manner. The initial goal or opportunity is provided in the objective, which is to design a product inspired by two words. The categories to inspire words were derived from the Scattergories prompts, because that system provided interesting ways to categorize ideas while still allowing for players to personalize their word choices. Choosing the topics and inserting the words inspired by those topics can be seen as amassing data, or research. The ideation phase begins when the cards are shuffled and players start to draw different ideas based off the first two cards flipped over. Finally, the testing phase comes in the form of sharing and testing the ideas with peers, as well as participating in Pitch-Offs. The iteration and refinement cycle restarts with every round until the cards are finished.

The Pitch-Off makes players dig deeper to clarify and specialize the obvious solution.

I liken the Pitch-Off as a gladiatorial face off between multiple players, as it gives them a chance to sharpen their ideas and attack their opponents' products. The Pitch-Off is the antidote to the most obvious solution because it challenges players to specify and distinguish themselves from each other. After a Pitch-off, the best presentation and most refined idea is rewarded, giving the original idea more depth. RIG is a system that creates a space for creative ideas to emerge more frequently through juxtaposing two random ideas next to each other.

DESIGN PROCESS

The game started as a paper prototype, where I acted as a facilitator and player. I used it as a brainstorming tool and team building exercise for a product design studio. The team I was a part of was multidisciplinary, consisting of engineering, business, and design students (just me). I conducted a 20 minute design clinic so all of my teammates can get a feel for the creative and iterative process, and how that carries through in a collaborative setting. I felt that the Random Inventor Game hit a lot of the same points and condensed the design process into a fun activity. As a facilitator, I chose the topics of 'Favorite Toy' and 'Profession' and asked each team member for one word that fell into each category. Within the limited time frame of the design clinic, our group came up with 12-15 different ways origami can be implemented by doctors, Lego inspired tools and spaces for chefs, and spy gear for firefighters.

My teammates remarked that they had a lot of fun and felt that this exercise got their creative juices flowing. However, I wanted this exercise to stand on its own, without the need for a person to facilitate the creative process. Instead of coming up with topics from scratch every game, I compiled a list of topics that can lead players to produce their own word banks. Some of these prompts were gleaned from Scattergories such as 'Things that Grow' and 'Sports Equipment', and I added my own to focus more on contemporary trends, such as 'Millennial Slang' and 'Popular Mobile Apps.' In order for RIG players to produce ideas for inventions, products, and services, the prompt topics should encourage a balanced mix of tangible ideas ('Head wear' and 'Places to Relax') with intangible conditions ('Bad Habits' and 'Emotions'), and popular culture ('Children's Stories' and 'Celebrities'). The curated topics are broad enough to foster diverse ideas, yet focused to direct efforts towards specific products.

The next step in this project is developing a digital version to replace the idea generation and card shuffling steps to save time and paper, while also capturing pictures drawn on the Post-Its during the ideation phase. The mobile interface design is friendly and clear, guiding the players through the rules like I did as a facilitator in my earlier tests. The interface streamlines the manual steps of choosing the topics and inputting words through laying out potential topics and organizing player suggestions for the word banks. The app shuffles the words and picks two terms from each bank for players to start drawing ideas, keeping time for each round. After time is up, the app will be able to keep track of each player's scores, as well as store pictures of all the ideas grouped by round. This way, players can look back on their ideas if one was particularly funny or thoughtful. RIG can be played with a group using only one mobile device so players can focus on the innovation rather than the technology.

Rejected Topics:
'Dead Pets'
'Movies I Haven't Seen'
'Species of Grass'
'Prime Numbers'

Opposite: Screens for RIG as an iPad App. It keeps track of score by taking pictures of the Post-Its. Each player is a different color.

CONCLUSION

The Random Inventor Game provided a platform for generating new ideas in a structured and rapid way. As a physical exercise, it helped non-designers think outside the box and give them a crash course for the product ideation process. After testing the first iteration with business and engineering students, I observed that they were more willing to think together and express creative ideas more openly. When I play-tested RIG with a group of students at Northeastern University, they felt that the Pitch-Off was particularly successful, and suggested it be a permanent part of the game as opposed to an optional variant.

I found that RIG can be used as a solo brainstorming activity as well as party game. As a game, it is easy to design with the end in mind when the objective is clear. The easiest and most relatable objective (for me) is a product design because of my background in industrial design. Although I have not had time to explore this area, players can assign their own objectives to invent. Instead of a product, players can design characters, apps, and even brand names.

However, there still needs to be more testing for the mobile interface, as it is still in a conceptual phase. I would like to explore this game further, and develop it into a digital board game and creative tool for groups and individuals.

Players discuss their product ideas for "Lipstick + Stroller".

Mark describes a stabilization process for applying lipstick while walking with a baby stroller.
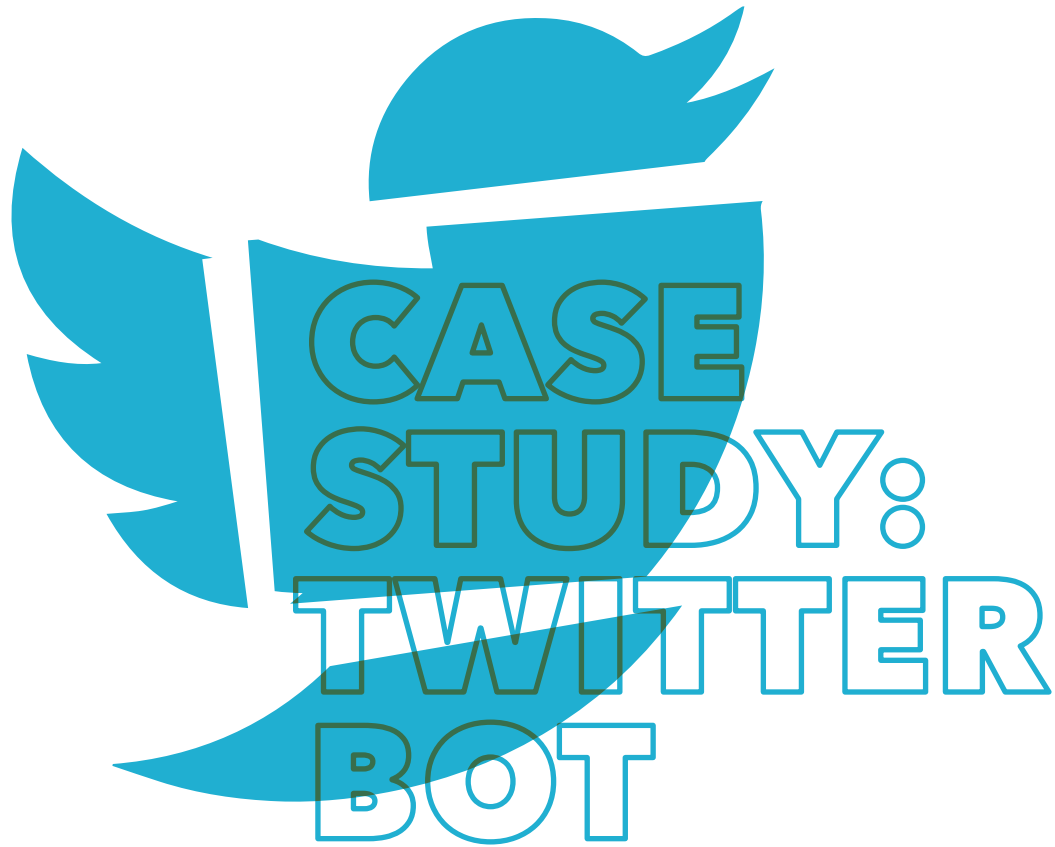
1.	Animals	1.	Items in this room
2.	Things that are cold	2.	Fictional Characters
3.	TV shows	3.	Magazines
4.	Things that grow	4.	Kinds of Candy
5.	Things that are black	5.	Items you save up to buy
6.	School Subjects	6.	Footwear
7.	Musical Instruments	7.	Headwear
8.	Authors	8.	Things that hold
9.	Bodies of Water	9.	Something you hide
10.	Cartoon Characters	10.	Crimes
11.	Countries	11.	Sticky Things
12.	Holidays	12.	Awards
13.	Clothing	13.	Modes of Transportation
14.	Games	14.	Spices/Herbs
15.	Sports	15.	Bad Habits
16.	School Supplies	16.	Toiletries/Cosmetics
17.	Tools	17.	Celebrities
18.	Things that are Hot	18.	Cooking Utensils
19.	Things in Downtown	19.	Park Activities/Things
20.	Fears	20.	Types of Allergies
21.	Wishes	21.	Medicine
22.	Sports equipment	22.	Jobs
23.	Breakfast	23.	Games
24.	Gifts	24.	Chores
25.	Toys	25.	Halloween Costumes
26.	Non-Geographic Location	26.	Weapons
27.	Literary Genre	27.	Things that are round
28.	Hobbies	28.	Exercise terms
29.	Parts of the Body	29.	Things you replace
30.	Things on sale	30.	Things found in a desk
31.	Politicians	31.	Vacation Spots
32.	Excuse for being Late	32.	Ways to relax
33.	Bouncy Things	33.	Stressful Things
34.	Things in a park	34.	Money Words
35.	Things in the office	35.	Things you wear
36.	Non-Living Things	36.	Things you throw away
37.	Popular Apps	37.	Occupations
38.	Items in this room	38.	Appliances
39.	Fictional Characters	39.	Outdoor Activities
40.	Magazines	40.	Types of Drinks

Here is a set of topics to start your own RIG. Choose one topic from each column and write down five entries that belong in that category. Combine a random entry from one category to the other and start inventing!

CASE STUDY: TWITTER BOT

THE PROJECT

The @rando_reacto Twitter bot is a program that strings together random words from a spreadsheet to create some form of a statement, then posts it to twitter under the handle @rando_reacto. The program is a template based off twitter bots created by Darius Kazemi, an Internet artist specializing in generators and bots. I initially created @rando_reacto to be a random reaction gif generator, then transformed it to generate design-thinking click bait headlines. Currently, it is called New Eats NYC, and it creates random restaurant names along with their specialty dishes.

CONCEPT

This exercise was a way for me to explore how computing can facilitate the creation of interesting narratives and situations simply by shuffling the data it is fed. The reaction gif became a popular part of Internet culture because gifs were able to convey specific yet relatable qualities, such as emotions, through the web. I wanted to transform the format of people using technology to share stories into making the computer itself an automated storyteller. By having the computer create something new out of a stable system, my objective was to design an avenue to create stories through dynamic media.

DESIGN PROCESS

The first iteration mimicked meme reaction gifs, which is pairing a gif to a statement describing a given situation, such as: MRW (My Reaction When) my bf brings me coffee at work [insert gif of an excited person]. I found that this version created a lot of non sequitur statements, and the program had no way to post embedded gifs. My workaround was to post a link to a random gif through http://replygif.net/random. This choice lessened the effect of the reaction because viewers had to click on the link, which redirected them to a new page and removed the accompanying reaction statement from view. Example:

"MFW MY FLABBY PARTNER FORGOT ABOUT MY NEW JOB TO SINGING KARAOKE #CLIMATECHANGE HTTP:// REPLYGIF.NET/RANDOM"

The second iteration was called Design World, and it posed questionable statements regarding new research on random topics. It involved asking how a social issue can be solved in a similar way to another topic, adding an expert's opinion on the end. For example:

"NOWADAYS, DO WE MAKE FALLING ASLEEP DIFFERENT FROM RIDING A BIKE? OFFICER JOANN YANG THINKS

IT'S A BIG DEAL: #DESIGN"

The hashtag was important to enter into community conversations, as I quickly learned that there are bots that automatically retweeted me as long as #innovation or #designthinking was included anywhere in my tweet.

The current iteration is called New Eats NYC, which randomly generates fake restaurant names, two paired dish specialties, and the street corner it is located on. I focused on including lots of different ingredients to combat the repetitiveness of previous versions. Mocking a foodie account gave me more freedom to imagine restaurants and dishes that sound plausible, but very experimental. Example:

"SUMMER SPOON RETURNS WITH CRISPY CASHEW WAFFLES MARRIED WITH LIME COMPOTE.   22ND & 62ND #YUM"

FINDINGS

Through the different iterations of @rando_reacto, I found that I gained a better understanding of structuring syntax and content to balance the variety of the words with the clarity of the tweet as a whole. As I made more versions, I was able to balance the flow of the statement with word variety so that the tweet makes grammatical sense while not becoming stale. With Design World, the tweets posed humorous or even insightful situations. With New Eats NYC, the syntax allowed for imaginative dishes and trendy restaurant names to stimulate the imagination. Unfortunately, the automatic posting broke when I updated the spreadsheet, so I have to post tweets manually after running a randomization preview script. I used this project as a case study because it encapsulates the creation of new ideas through balancing structure and randomness to create humorous stories.

New Eats NYC @rando_reacto · Jan 23
Bancroft Ramen takes the cake with tart calamari Pad Thai stuffed with walnut hash browns.   61st & 39th #goodeats

New Eats NYC @rando_reacto · 5 Dec 2016
Mr. Yaya blends together unique mozzarella sashimi filled with bacon brownies. 47th & 59th #food

New Eats NYC @rando_reacto · 5 Dec 2016
Rusty Counter dabbles in bitter mozzarella chili on top of citrus sorbet.   59th & 7th #delicious

New Eats NYC @rando_reacto · 5 Dec 2016
Broadway Harvest introduces boneless cucumber burritos and bottomless berry mochi. E 37th & 43rd #delicious

New Eats NYC @rando_reacto · 30 Nov 2016
Olive Bunny makes mouth-watering artichoke salad with a smear of clove chutney. 62nd & 71st #vegan
♥ 1

New Eats NYC @rando_reacto · 30 Nov 2016
Pan Spoon dishes out crispy okra rolls whisked with apple yogurt. E 42nd & 26th #healthyfood

New Eats NYC @rando_reacto · 30 Nov 2016
Deluxe Rose is known for its late-night quinoa panini covered in blueberry paste. 20th & 26th #delicious

New Eats NYC @rando_reacto · 29 Nov 2016
Southern Bay debuts their umami popcorn bibimbap covered in chocolate biscuits. W 46th & 24th #foodietravel

New Eats NYC @rando_reacto · 29 Nov 2016
Lucky Flavor offers fresh quinoa pizza and honey rolls.   21st & 33rd #cheapeats

New Eats NYC @rando_reacto · 28 Nov 2016
Harlem Burgers delivers heavenly cashew bento boxes deep fried in ginger dressing. W 2nd & 1st #foodie

Foods I would try:
-calamari Pad Thai
-bacon brownies
-bottomless berry mochi
-honey rolls

Foods I would avoid:
-artichoke salad
-clove chutney
-okra rolls
-quinoa pizza

Southern Bay debuts their umami popcorn bibimbap covered in chocolate biscuits. W 46th & 24th #foodietravel

New Eats NYC @rando_reacto · 29 Nov 2016
Lucky Flavor offers fresh quinoa pizza and honey rolls.   21st & 33rd #cheapeats

New Eats NYC @rando_reacto · 28 Nov 2016
Harlem Burgers delivers heavenly cashew bento boxes deep fried in ginger
dressing. W 2nd & 1st #foodie
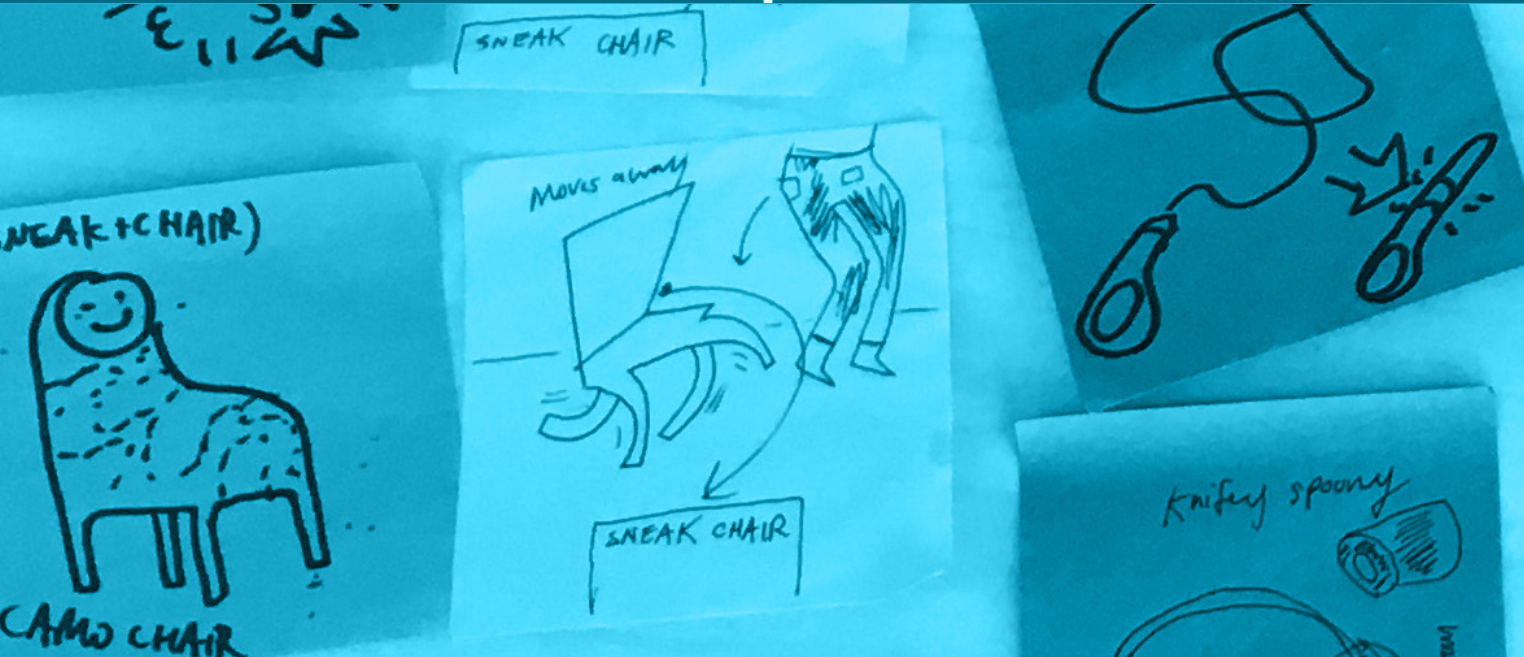
"When confronted with the unexpected, we are invited to go on a journey that leads to a place we did not know existed."

"CREATIVE SYSTEMS"

INTRO-DUCTION

WHAT IS A CREATIVE SYSTEM?

A system is a set of connected things or parts forming a complex whole, or more abstractly: a set of organized principles or methods according to which something is done.

A creative system is a system that involves participants to innovate, create, and test new ideas.

Any given thing is composed of systems and/or existing within a system, whether they are concrete or conceptual. The thesis document you are reading is a system of pages (or screens) filled with words and images to convey the idea that I know what I am talking about. That same book (yes, this one) is also one part of the DMI graduate program, which in turn is one part of the Massachusetts College of Art

and Design. The system as a whole relies on each part in order to fulfill its function. As a result, it is important for the parts to work well together or else the system fails, whether it be gears in a wristwatch or in-laws during Thanksgiving. The effectiveness of a system lies in the way each part supports each other. While each module has a specific function, it becomes a detriment to the system if it cannot cooperate with its neighbors.

Contrary to popular belief, play is not freedom, but rather making your own set of rules and exploring the possibilities within those constraints. Play is a balance between rigidity and fluidity: acting within a system but also pushing the boundaries to discover new systems. Without searching for new possibilities outside the rules, play becomes routine and stagnant. And by neglecting any system at all, play is aimless and shallow.

The projects in this section were designed with the idea that while systems implement and produce the product, the user has space within the system to tinker with the components and develop new structures out of existing ones. These projects are designed systems, but invite the user to create their own objectives to explore, using the projects as a medium for discovery. I tried to make apparent delineations between what I, as the designer, have established as the initial system, and what the player can do to appropriate the system for their own exploration. Tylo and Modulus embody structure through their geometric forms, yet expressive opportunities are facilitated through making it easier to arrange and rearrange the parts to develop new structures. Motion Paint uses simple shapes to inspire and translate organic movement by the user. OmniBlocks takes the familiar system of playing cards and adds new opportunities to create new games.

We learn about systems through play because play treats every module as equal in importance. In playing with toys, we create a system of rules for interacting with the world through that specific object. When playing with a remote controlled helicopter, I try to avoid crashing into the walls and ceiling because that may damage my toy and ruin my fun. However, those same walls facilitate play in a game of racquetball. We begin to learn about the diverse characteristics of our environment and systems through play. A wall creates disruptive air currents that can disrupt the flight of my helicopter, and it also changes the directional bounce of my racquetball. I also learned that swinging limbs can easily punch holes in a wall, leading to an angry mother and a weekend of patching dry wall.

CLARITY IN A SYSTEM

A creative system needs to be clear in order to enable creativity. Without clearly defined parts, it is hard to determine the potential of a system. In an improv scene, clarity is key in moving a scene forward. If two players are on stage and not clearly defining what is going on, the scene stagnates and gets confusing. There are rules set in place to assist players in establishing the who, what, where in a scene within the first three lines of dialogue. By following the rules, players can quickly build on top of each other's ideas to improvise an entertaining story, as opposed to a shapeless, awkward dance scene. In design, without clear objectives or an established system, the final product will be muddled and unclear. This is why we need style guides, design briefs, and blueprints to focus our energies on the act of creating and playing. On a specific woodworking project, I spent half of my time making a jig to in order to cut my wood pieces at a precise angle. The jig is never seen in the final product, but nevertheless it is an integral part of carrying out my design. A system is the scaffolding in which to support the design or creative process. Without the system or scaffolding, we would not be able to reach structures of such complexity or sophistication.

A simple but effective way to clearly define a scene: Establish the Who, What, and Where as soon as possible. It may seem rigid at times, but the structure is needed to move things forward.

(Image from UCB Manual)

MODULARITY IN A SYSTEM

Modularity is a key part of a creative system because it encourages cohesiveness amongst all parts of the system, while being responsive to user input and adjustment. The name Lego is derived from the Danish phrase "Leg Godt," which translates to "Play Well." Lego allows kids and adults to play well with their toys, because their bricks are designed to play well with each other. The bricks adhere to a basic "stud and tube" connection system that enables all pieces to fit into each other, regardless of whether it came from a Star Wars or Harry Potter set. Standardized dimensions and strict tolerances maintain the quality of the system over time and across the spectrum of diverse sets.

In design, modularity is used to create visual or experiential cohesion. Through form or hierarchy, designers create a language that is understood by the users through interaction. If an established creative structure is successful, users can rearrange and modify modules with little difficulty and a low chance for disrupting the form.

Modularity makes it easy to translate, navigate, and manipulate complex structures. When something stands out of a system, it is easier for a user to identify and troubleshoot discrepancies. After an improv show, our team would take time to discuss scenes we enjoyed and parts to improve. Without a shared framework for analyzing success, our feedback would be all subjective, based on our own perception of what a good scene is, instead of following an agreed method to improvise as a team.

A creative system allows participants to design their own playgrounds, or possibility spaces. Through playing with toys, designing products, or improvising, we are envisioning and exploring alternative realities. We need rules and systems to help direct our focus on the task of innovating, and to materialize the abstract ideas we express.
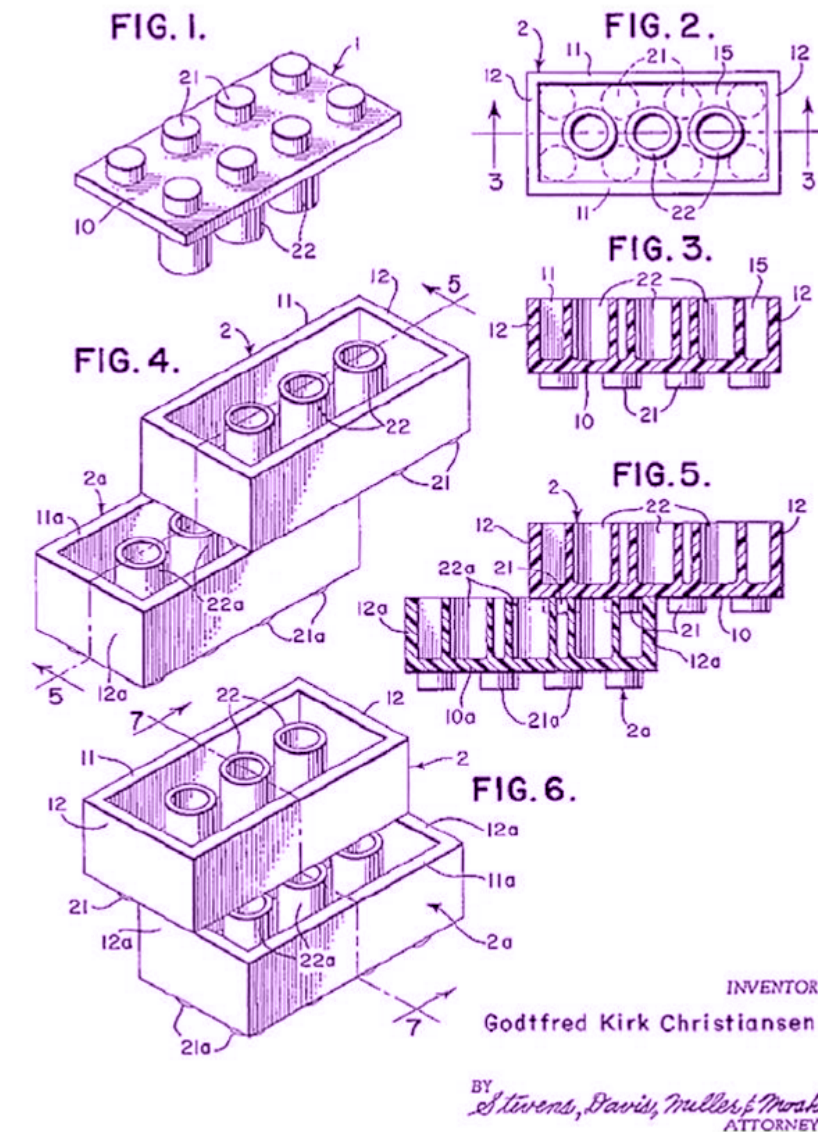
Patent blueprint for Lego's stud and tube connection system. Because of rigid systems, the end products are more reliable and easier to understand.

Below: Products of Procrastination.
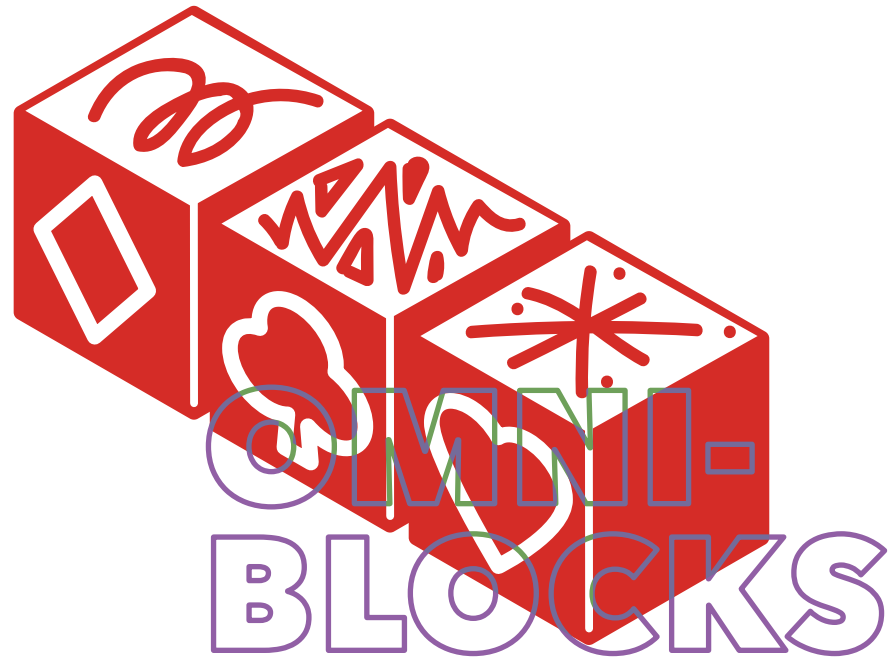
THE PROJECT

OmniBlocks is a set of 52 blocks, 1.5 inches cubed. One face of each block is a playing card, and the opposite side is a marker board.

Players can play classic card games, or create their own games and drawings on the marker board side. They can design puzzles, draw patterns, write notes, and make up their own games.

INSPIRATION

The deck of playing cards has been a staple of human gaming for centuries, as early as 14th century Persia. What struck me about the deck of cards is that we all use the same 52 cards, yet can play so many different games with different people.

The deck of cards can be approached as a system of numbers and suits, with a clear hierarchy and pattern through which rules can be established for playing certain games. Early games like Go Fish and Old Maid are have simple objectives: match the same numbers together, or try to pass the Queen to other players. The same deck of cards lends itself to more complex games such as Poker and Bridge, which involves players bidding and bluffing in order to best their opponents. The materiality of the cards lends itself to other interactions beyond traditional card games, becoming more of a toy than a game. I practiced throwing cards at my brother like Gambit from X-Men, and struggled to make a house of cards taller than two stories.
Playing cards have become a platform for facilitating games, as well as the medium in which games are played.
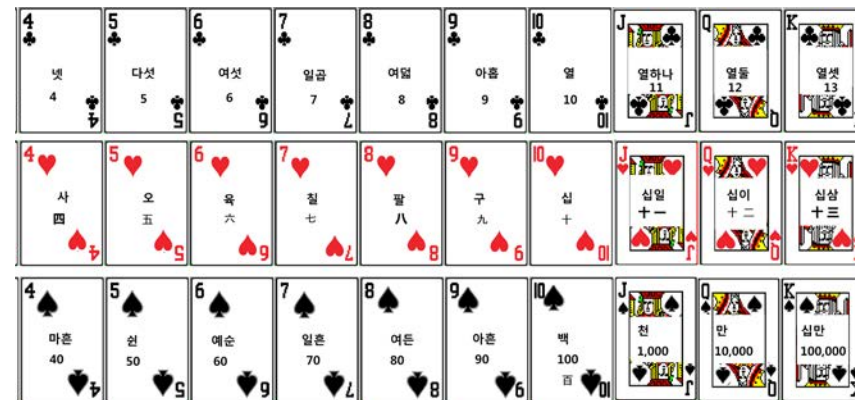
Both House of Cards and a deck of cards are organized and designed with a specific direction for play. Playing with these structures allows us to explore the world through its design.
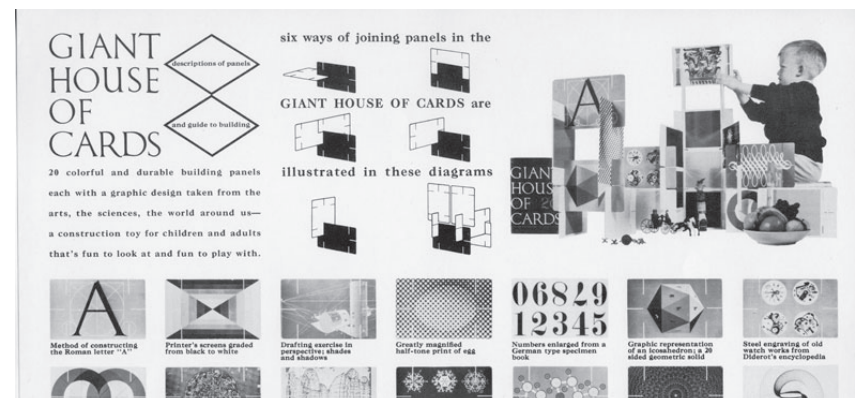
Charles and Ray Eames' House of Cards is a set of cards with six notches that interlock with other cards to build stable, boxy structures. Normally, constructing a house of cards is a difficult and frustrating activity because of the inherent features of a card: its flatness, slick surface, and light weight make it hard to create solid connections. By designing notches in the cards, the Eames transformed these unfavor-

able characteristics into opportunities for building taller and more flexible structures. The inherent material, size, and weight of the cards turn into a positive attribute to construction through simply tweaking the form to make the individual pieces work together.

I also looked at how Post-It notes became a huge part of the creative process. The form of a post it is similar to that of the playing card in size and number. In the same way playing cards structure play and strategy within a group of people, Post Its can hold information and be arranged in a structure to communicate ideas. We use them in design and in the professional world, they are large enough to fit several ideas, small enough to manage multiple notes at one time, sticky enough to post itself on a vertical surface, yet easy enough to peel off and rearrange. They have become an essential tool in our everyday life: a temporary way to communicate a small idea.

In a brainstorming session, the semi-permanence of a Post It is also one of its strengths. Its affordability and accessibility allows us to use it a lot, and invites us to physically manifest as many ideas as we can. Ideas can and will be discarded, rearranged, and reedited during that time. Being able to physically visualize these ideas on paper helps greatly in cataloging and tracking the progression of a brainstorm.

Post-Its are affordable, adaptable, and shareable: attributes of an effective creative tool.

CONCEPT

The original idea stemmed from a curiosity in making a recognizable system something novel through transforming an element of its form. I was interested in transforming a platform to create new forms of familiar games, or even becoming the basis for structuring new types of games. The marker board face introduces a new element of customizability and personalization for game creation and play. This adds to its potential as a creative tool because organizing and revising a system becomes easier when components can be easily switched out and rearranged.

I could have gone in a completely different direction, turning Playing Cards into cylinders or waffles or projections.

DESIGN PROCESS

The OmniBlocks were made by gluing two 3/4 inch MDF boards together, laser etched, then cut on band saw into 1.5 inch cubes. Originally called 'playing cubes,' I played around with adapting traditional card games to a more three dimensional medium. A game of solitaire created sprawling towers and rows of shifting blocks. I became more aware of how I was placing the blocks on top of each other because a collapse can potentially ruin my progress, similar to how a gust of wind can end a card game. I decided to start a new stack of a suit when the tower reaches six or seven blocks high to decrease the risk of a tumble.
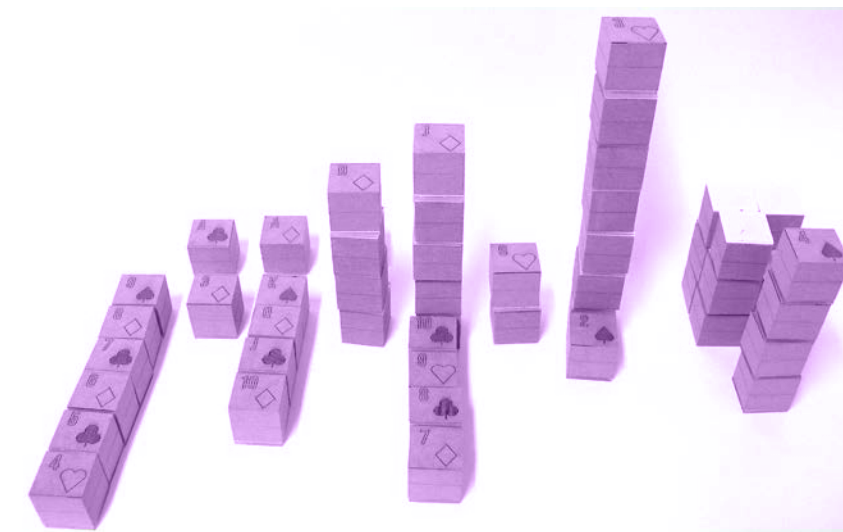
I attempted to make up my own version of solitaire by stacking the blocks card-face down on top of each other in layers of three by four

blocks. I revealed the corner blocks of the top layer and removed them from the stack if the sum of the numerical value was between 15 and 20. I flipped over a block if it is touching no more than three cubes. Face cards that appeared high in the stack are harder to pair, and ended up making towers that blocked access to lower cards.
As the game progressed, I learned to strategically save lower numbers for pairing with face cards in order to stay within the value threshold. The game ended when I could not make any more pairs, and the objective was to end up with the smallest tower as possible. Although it was not the most engaging form of solitaire, it was fun to experiment with building systems and playing them through. The form of stacking layers of blocks definitely influenced the structure of how this version was conceived and played.

The playing cubes were tested with family members during Thanksgiving, and we played a variety of group card games such as Crazy Eights and Hearts. Common card interactions such as shuffling and dealing took longer and involved more hands to handle the masses of cubes being distributed. I was interested in how each player managed and sorted their blocks, some stacked vertically while others laid them in neat rows. The group as a whole had to decide on ways to organize and shuffle the draw pile for crazy eights, and stacking cards in the discard pile became its own game. The way the cubes felt drew similarities to other tile or block based games such as dominoes and mah-jong.

I laser cut plexiglass squares and hot glued them to the face opposing the playing card face to create a mini marker board on each cube. I began to draw eyes, ears, noses, or mouths on each block, and by mixing and matching the facial features I inadvertently created an analog version of the Mii Editor originally found on the Nintendo Wii. I play tested the playing cubes with volunteer workers at the Boston Children's Museum, given their experiences with observing children at play. It was here that Mark, one of the volunteers, suggested the name OmniBlocks because of the variety of games, puzzles, and applications the set can provide. Alice Vogler is the volunteer coordinator for the Children's Museum; she noted that the blocks can unveil activities that "grow with the child." Toddlers may enjoy stacking blocks, while older children may prefer to draw on the marker board side. Parents can use the blocks to teach children card games, counting, and spelling.

I started to experiment with adding augmented reality markers to one of the faces of the OmniBlocks in order to incorporate more ways to play within the system. Each block would have a distinct AR marker

Honestly, it was about as fun as playing Go-Fish (Take that whatever way you want).

Alternative names:
'Playing Cubes'
'Deck of Blocks'
'Swiss Army Squares'
'REALLY Thick Cards'

connected to a virtual 3D model using the game engine Unity. When grouped together in different ways, the AR models could potentially act as digital building blocks for telling stories. For the 52 distinct blocks in a set, there can potentially be 52 different 3D models, almost like a virtual toy collection. Simple models such as a person, house, tree, and car can be grouped and viewed as a domestic play set through a smart phone with AR capabilities. The relatively large number of AR markers presents itself as an opportunity to add wacky and less conventional figures: such as aliens, dragons, waffles, and record players. Even if the AR markers are sized to fit one face of an OmniBlock, the virtual model it corresponds to can be scaled at any size in any orientation. A mountain and a bow tie can be summoned out of the same sized squares, but occupy vastly different spaces. The fun arises from being able to tell different stories through combining a rigid set of elements in various ways.

Mockup for using augmented reality with OmniBlocks. 3D characters are not mine.

CONCLUSION

While this project initially started as a way to tweak the card game platform, the current state of OmniBlocks shows that playing card faces are the least interesting part. The marker board provided more ways for personal expression and play, as people used it for writing notes, playing Pictionary, and even teaching new languages. The card side, on the other hand, were more cumbersome than normal cards, and the novelty of a 'playing cube' wore off sooner than the marker boards.

As a creative system, OmniBlocks were composed of simple modules that facilitated arranging and rearranging bits of information in new ways, whether as cards or drawings. Over the course of several play tests, players used the OmniBlocks in a variety of ways. They decorated towers with abstract patterns, drew giraffes with extra long necks, and designed their own Sudoku puzzles. I found that breaking the marker board up into smaller pieces afforded a different kind of interaction from how we normally use a larger, static drawing surface. Given that dry erase boards allow for faster drawing and erasing, affixing them onto OmniBlocks gave these drawings more mobility and dimension. Drawings do not have to be erased and redrawn in order for them to move in space, they can simply be picked up and arrayed horizontally or stacked vertically.

Overall, I would have liked to explore cross-pollination between the playing cards, marker boards, and AR markers. Currently, each side exists as its own 'game mode,' and players tend to not play with all three faces at the same time. What could help spur creativity in that direction would be to show examples that incorporate two or more sides into one activity that celebrates the distinct attributes of each face. I see the playing cards as representative of systematic thinking, embodying structure and function, while the marker board opens a space for emotional and visual expression. I think a true success in this project would be to observe players creating their own systems of playing and thinking using both sides (maybe three).
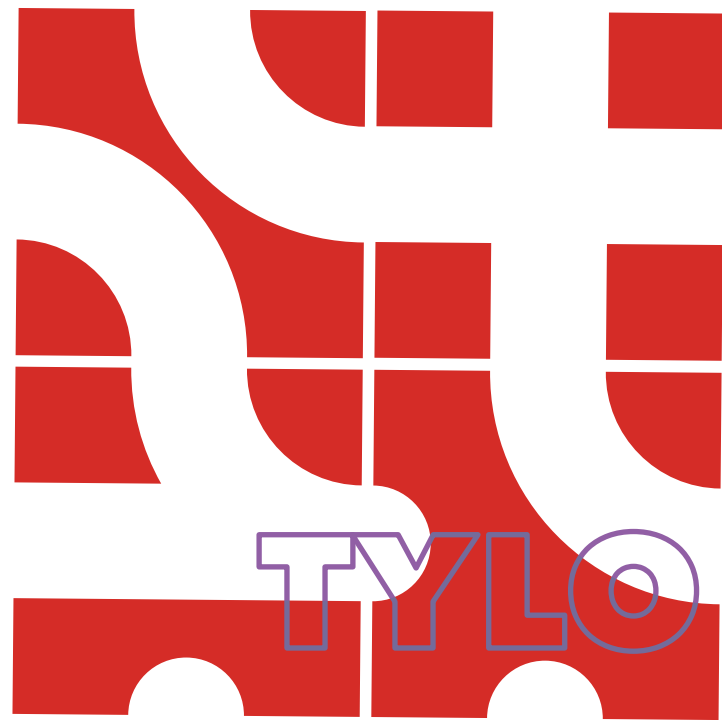
THE PROJECT

Tylo is a toy designed to create seamless patterns using tiles with seven different designs.

The analog version has seventy tiles, or ten copies of each design, that can be arranged in any configuration on a flat surface. The mobile app fills your screen with a 4 x 6 tile grid which can be filled with any tile patterns the player wishes. You can save your designs, tweak the colors, and programmatically randomize the tile order to create spontaneous compositions.

INSPIRATION

Board games like Labyrinth, Carcassonne, and Settlers of Catan utilize modular tile arrangement to create unpredictable landscapes that encourages players to adapt to the uncertainty. The game pieces are essentially building blocks for the board itself. Instead of a game designer designing the layout, they design a system in which players take part in designing the setup differently every game. In Labyrinth, players use the tiles to create mazes and collect treasure, shifting rows and columns to trap opponents and alter their paths. In Carcassone, players place tiles to build fields, castles, and roads to gain the most points by the end of the game. Within these games, experimenting with the board design can become its own source of play, divorced from the rest of the rules that determine a winner or loser.

One could see this genre as 'the salad bar' of board games: getting players to assemble what the designer didn't feel like finishing.
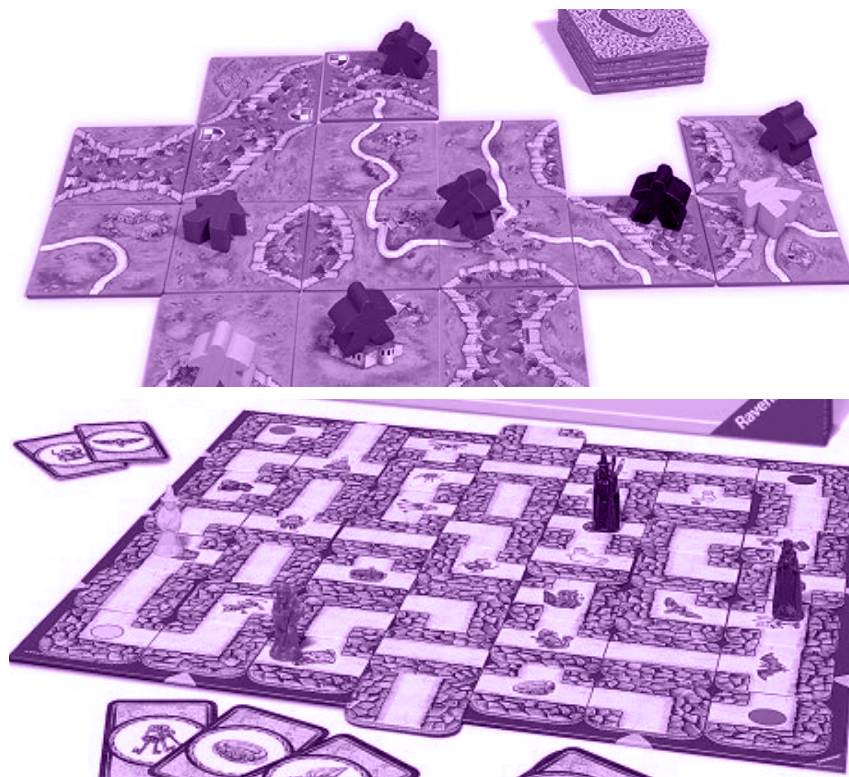
Tiles are everywhere: on the floor, walls, and ceilings inside our schools, bathrooms, banks, and dentist's offices. I entertained myself by identifying patterns or shapes within groups of tiles, mentally blocking out faces,Tetris pieces, or letters. I passed the time at the dentist by staring up at the ceiling tiles, drawing imaginary vectors to connect various

corners from around the room. To me, tiles are appealing because while they are designed to join together, each unit relies on its neighbors to fit in. Collectively, a mass of tiles becomes the thing in which it covers, whether it's a wall, ceiling, floor, or picture. The tiles are almost invisible, only to be noticed if one goes missing. I wanted to explore this relationship between modules and the network it becomes. Sebastian Truchet was a French scientist and inventor who designed tiles for pattern making in the late 17th century. Truchet tiles, as they came to be were squares bisected diagonally to create two triangles, one black and the other white. He started to document all the possible ways he can orient two tiles next to each other, growing into larger sequences and patterns. Complex and ornate patterns arose out of systematically orienting any given tile in specific relation to its neighbors. Even randomly arranged groups create visually interesting compositions.

Sebastian Truchet is the best there is at what he does:

ORGANIZING TILES.
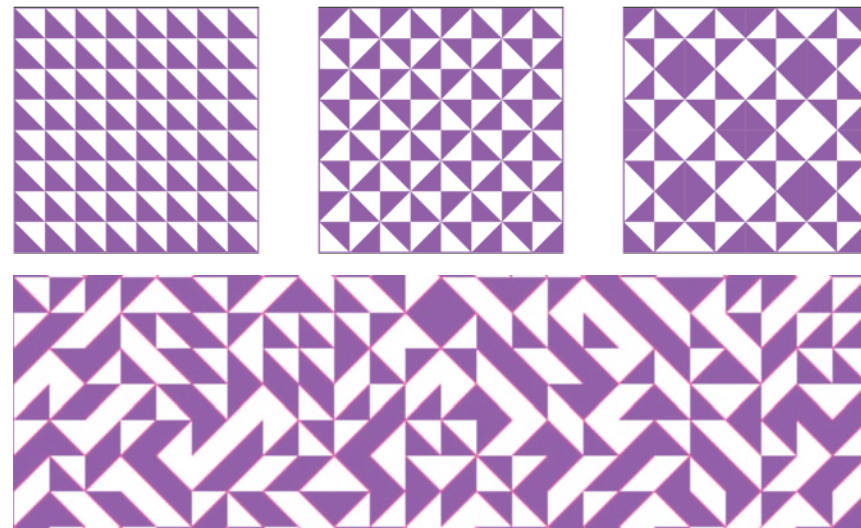
Opposite: Tylo Blueprint. The set was designed with strict rules leading to a cohesive aesthetic.

I call it "Bauhaus Macaroni."
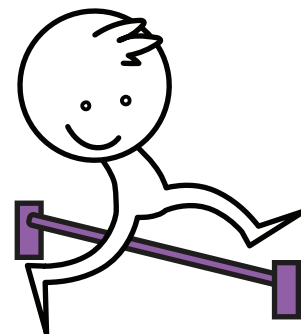
THE CONCEPT

With Tylo, I designed the pieces to lead into each other seamlessly, so whatever arrangement of multiple tiles creates a cohesive shape. By making each tile modular, there is virtually no wrong way to arrange the pieces. The modularity focuses the player's efforts on exploring different compositions rather than trying to figure out how which pieces fit best. Tylo was created as a system for adaptively unique designing patterns and paths using simple shapes. The limited selection of shapes makes Tylo approachable. It invites the user to make as many different patterns given the small set of distinct paths on each tile. Given four sides to each tile, seven path designs, and ten of each design, a simple collection can create millions of unique arrangements. I wanted to explore how simple modules can build into complex networks, given enough time and material.

MATH CORNER!

With 18 different shapes for each tile space (including rotations as separate designs), there are at least 18^{24} unique combinations of patterns on the Tylo App. Adding the color change increases the possible combinations even further.
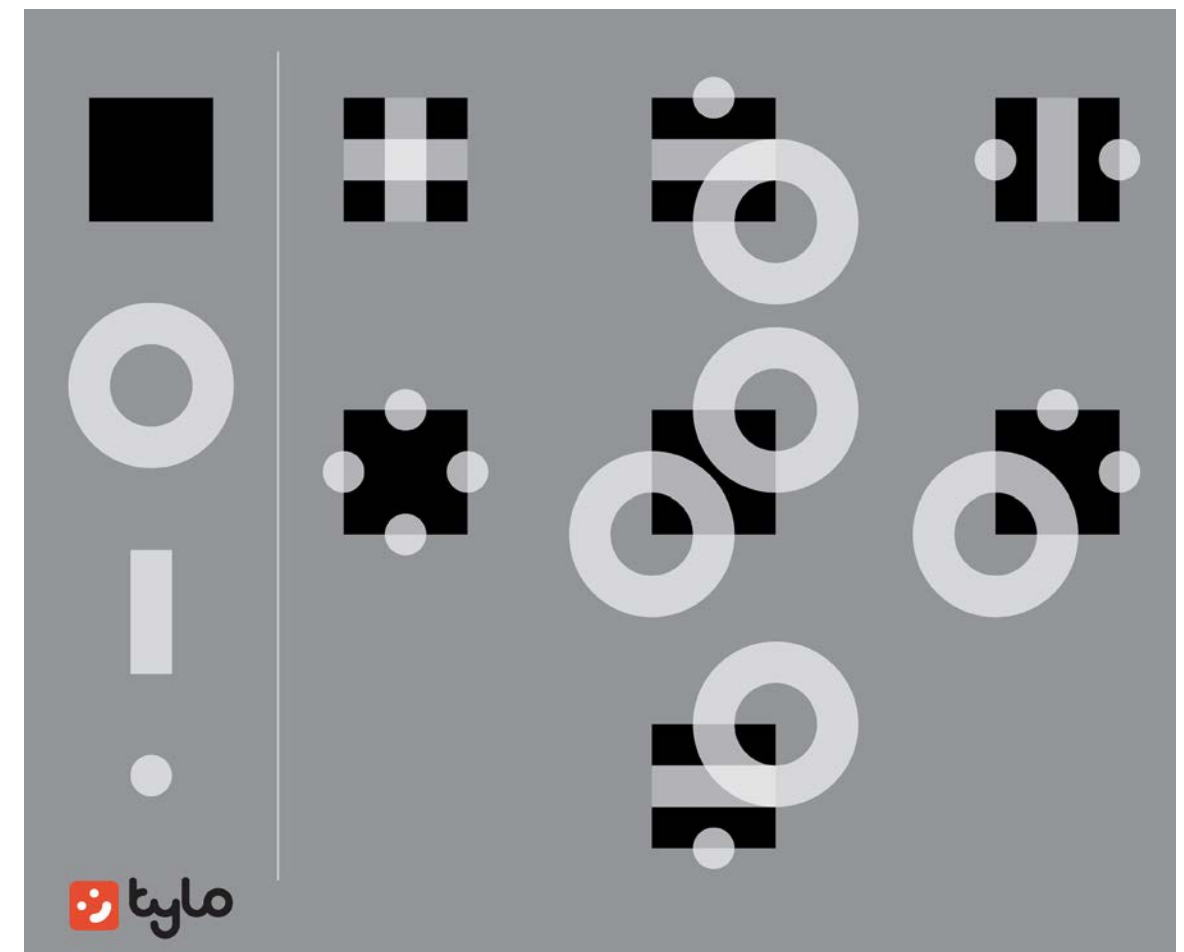
DESIGN PROCESS

The tiles started as vector files, and lived inside an Illustrator file during the summer of 2016. The design of the seven tiles is a visual solution to the question: "How many ways can I connect the sides within a square to each other?" Using only lines and circles as paths, I created a basic form language to ensure uniformity throughout the set. I spent the rest of the summer playing with the tiles on screen: rotating and multiplying large regions of squares while adjusting the colors and scale of each composition.

Next, I laser cut the vectors into plywood, bringing the digital toy into a physical world. Naturally, the wooden version lent itself to a board game aesthetic, and I started to develop a rule set inspired by Labyrinth. Two players face each other and use the tiles to generate mazes that would entrap their opponents and allow them to reach the other side of the game board before the other. Every turn, players can take two actions: moving a game piece one space, sliding a row of tiles to create new paths, or rotating a tile. Players can also draw a random tile and place it anywhere, but that move costs two actions instead of one. The player who can reach the opposite side of the board and back to their home base wins.

I decided to adapt this project into a polished digital experience, with the help of a programmer and graphic designer in Mobile Development Studio, taught by Martha and Pascal Rettig. As part of the class, we fleshed out potential users, optimized the interface for usability, and built our minimum viable product given the one semester time constraint. Tylo version 1.0 was accepted into the App Store on April 6th, 2017, as my first iPhone application. In this version, users are given a 4 by 7 grid of tiles to rotate or replace, as well as a randomize and coloring feature. Players are invited to design shapes and develop patterns on the canvas as they see fit, adapting to new configurations and color schemes.

Opposite: Vector File, Analog Toy, iOS app.

Each version has its own constraints that determines how the system is used.

CONCLUSION

Tylo became a great project for me to explore the unique differences between analog and digital play. The design process also oscillated from digital design to physical prototype testing, and then back to a digital counterpart. Each medium contains inherent constraints that allow for different ways to interact with it.

The physical Tylo set allows players to create patterns in any direction and at any scale. Players are given the freedom to lay out their pieces however they like, from a simple line of four tiles to a sprawling map using everything in the set. I constructed an arena to fit 20 tiles, and found it satisfying to slide entire rows to dynamically shift the design of the pattern. I observed players stacking grids of tiles on top of each other and removing the top layer to reveal another piece. This interaction literally added a new dimension to play with through integrating depth. Intangible attributes also added to the experience, such as the clacking of wood on the table, and the smell of laser char on your hands after playing. Because of the material and physical design, it was harder to pick up the pieces that are in the middle of an arrangement without disrupting the alignment of others. The scorch marks left over from the laser cutter accentuated the edges of each piece, breaking the illusion of seamlessness between adjoining pieces. Cleaning up, sorting, and storing Tylo is a constant reminder of the impediments inherent in a physical toy.

With our interactions growing more digital, these details were glorified as special features, rather than as impediments to the design.

The digital vector tiles and Tylo app provided its own set of possibilities and limitations. As an illustrator file, it was very easy to select a small group of tiles, and make multiples of that selection to quickly create a large scale design. In the app, players, can easily select a tile to switch or rotate its orientation. Changing the color schemes added to the design and play experience. The randomize function allowed players to quickly iterate and find an inspiring pattern to expand and develop. Saving designs makes it easier for players to document favorite patterns and share them with others. However, the app limits players to playing with less than 30 tiles, constrained to the proportion of the phone screen. The small scale makes the design more manageable, but may become more of a limiting factor for players wanting more freedom and higher resolution on the canvas.

As a creative system, Tylo is an excellent case study in exploring how simple rules can build into complex interactions. Tylo is a simple system of pieces that are all compatible with each other, which decreases the

risk of a faulty or confusing interaction. The beauty in this system is that any combination of tiles makes something cohesive and connected, regardless of whether that combination was intentional or not. The physical system allowed for more freedom to design in three dimensional space, while the digital system succeeded in enforcing organization and customization. Playing with Tylo, I challenged myself to design new compositions given the constraints of the system and the medium. While the constraints can be seen as limiting factors to creativity, I learned that abiding by these restrictions leads to a deeper interest in exploring the intricacies of the system.
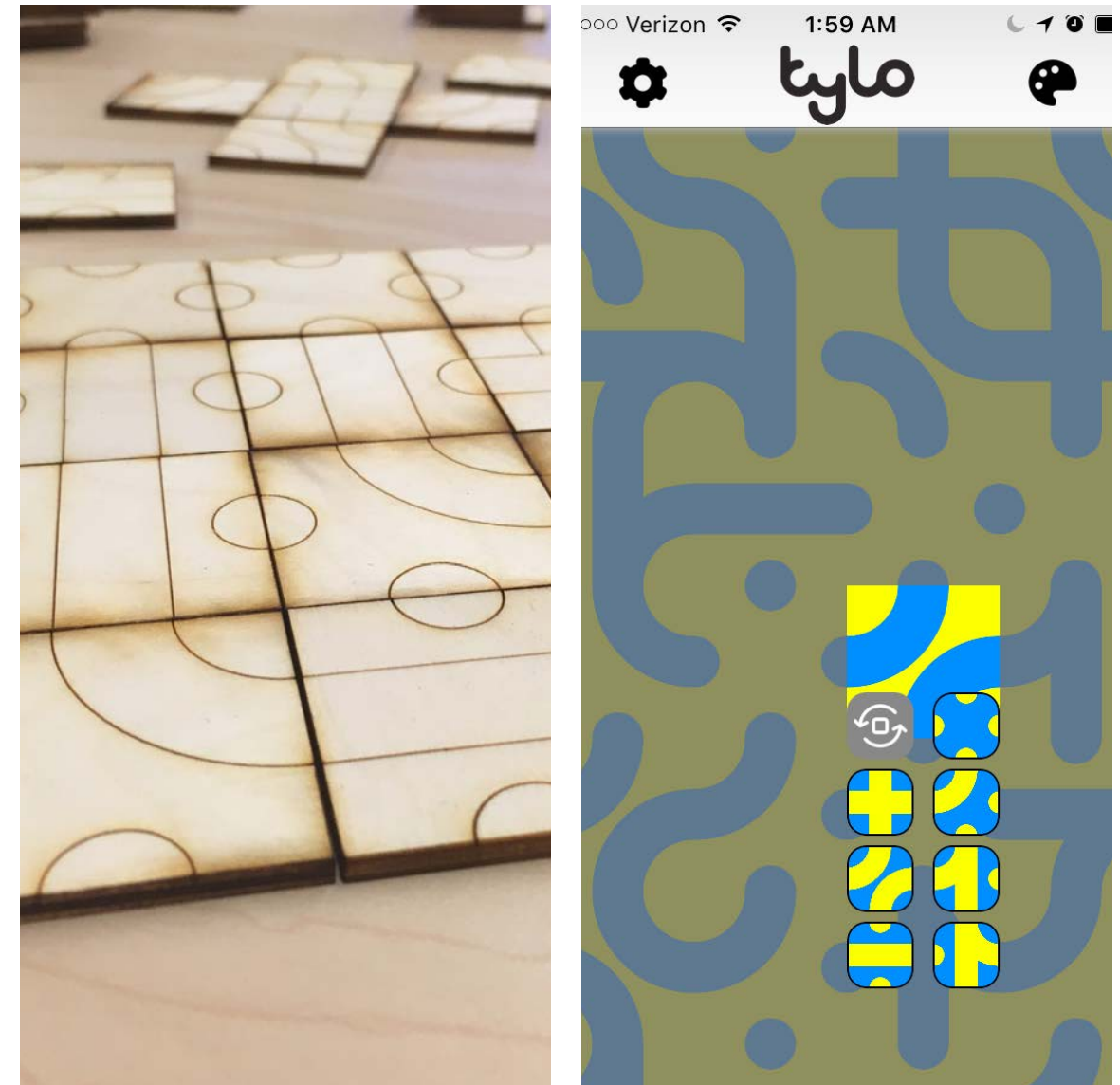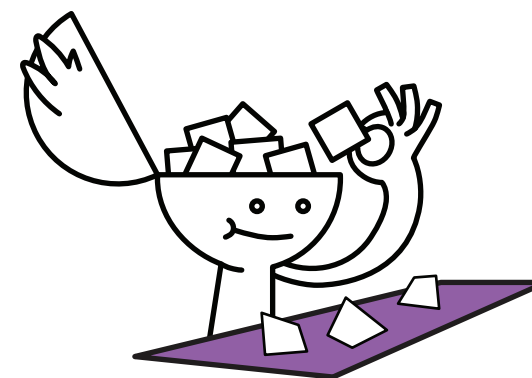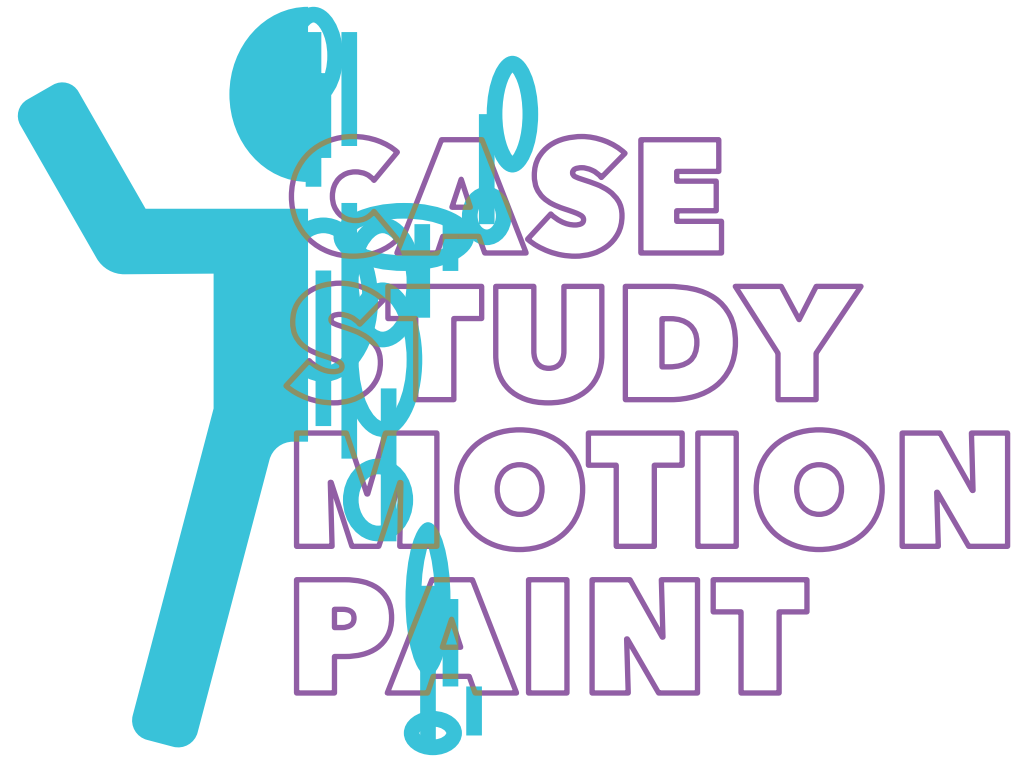
"The beauty in this system is that any combination of tiles makes something cohesive and connected, regardless of whether that combination was intentional or not."
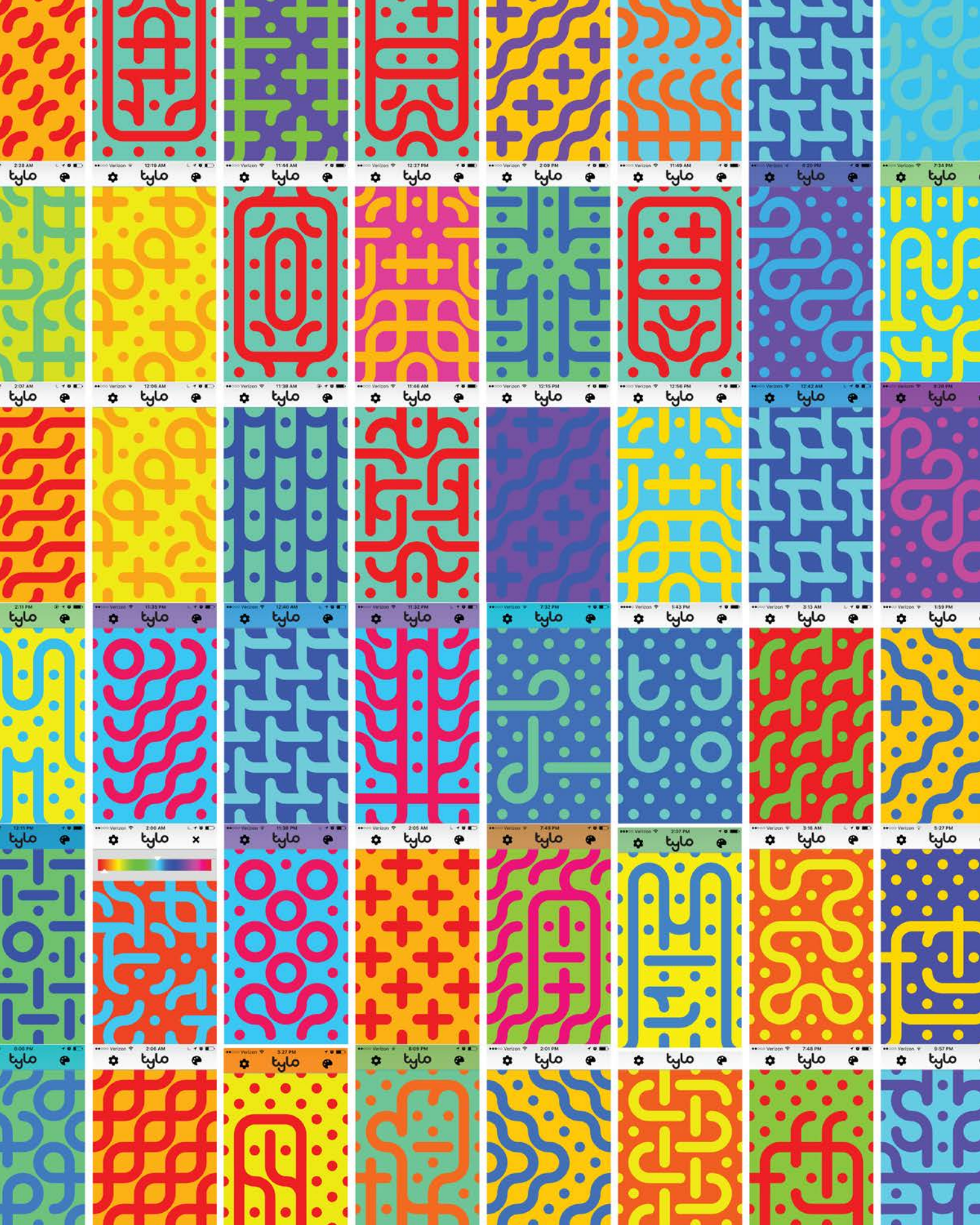
CASE STUDY MOTION PAINT

THE PROJECT

Motion Paint is a Processing sketch that turns a player's movements into abstract patterns on a screen. Motion Paint tracks movement from a camera and translates moving pixels into halos, lines, dots, and colored circles. It invites users to use their full range of motion to design a digital painting. If it senses movement near the upper left corner of the screen, the program saves the painting and refreshes the canvas.

CONCEPT

This project was a final assignment for my Elements of Media studio my first year of DMI, and I wanted to design an installation that delights passersby into interacting with their environment in a harmonious way. The patterns are designed to be very light, so as more people interact with it, it creates a layering effect that maps movement over time. When users realize that they can easily create visually beautiful patterns just by moving, their curiosity leads them to play more.

The temporary lifespan of any given painting encourages quick interactions and more exploration. The disposability of one painting speaks to the larger collection of attempts to try new compositions, patterns, and movements. Because they shapes are abstract and geometric, players do not feel the need to make a painting that resembles something in real life. As a result, players have more freedom to explore how different body motions can create various patterns with different shapes.
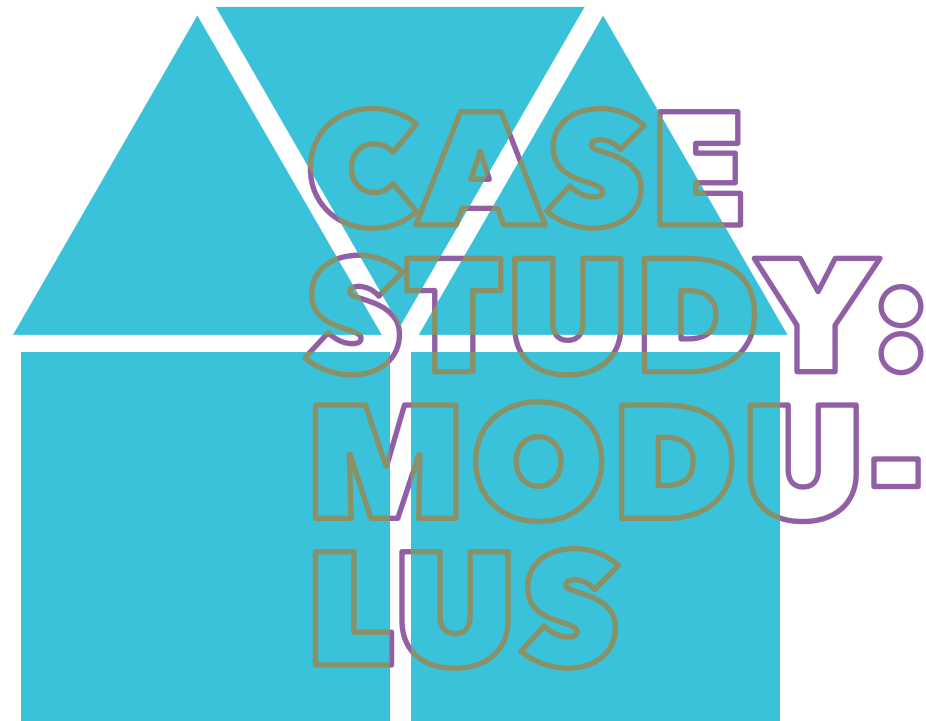
FINDINGS

Through Motion Paint, I explored how one module is not special, but the layering and collection of multiple shapes can build an engaging painting. Exercising restraint in the design of Motion Paint led to users playing with the system with more curiosity, in order to see how far movements translate to the digital canvas.
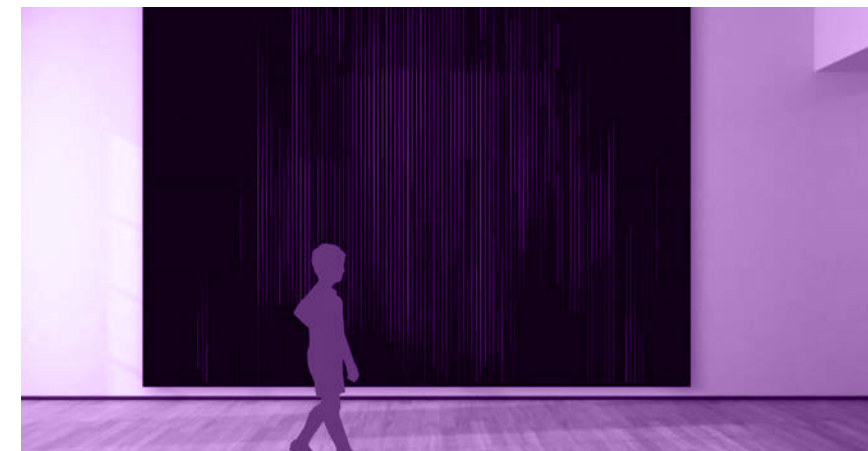
A sole user controls one shape with their body. A group can collectively create a masterpiece... or a mess if you don't understand art.

CASE STUDY: MODU- LUS

THE PROJECT

Modulus is a surface modeling construction set, consisting of only 6 pieces square and triangular pieces joinable by velcro. Players develop their three dimensional thinking and form development through adaptively constructing geometric forms. The shapes can vary in complexity, from simple cubes to sprawling structures. Included are remote controlled light bulbs to put inside and illuminate the designs.

THE CONCEPT

Modulus was developed as a studio project at RISD. We were tasked with designing a product that would inspire mindfulness within a middle school art class curriculum. In observing the class, I saw that the students were taught traditional art lessons, such as still lifes, clay sculpting, and water coloring. As a designer, I felt that there was little opportunity for the students to experiment with modern modeling and design tools. I wanted to design a 3D modeling tool that is intuitive to use, cheap to manufacture, and easy to clean up.

I was inspired by the structure of molecules, and how the simplicity of their connections built up to more complex and beautiful systems. Take water for example. As a liquid, H_2O molecules are simple: two hydrogens attached to one oxygen atom, attracted to each other slightly by polarization, but not enough to form a structure. Under the right conditions, these uniform water molecules freeze into place, creating unique ice crystals. The way these molecules fit together is always consistent, but the output is always different, as seen in snowflakes. I wanted to design a simple set of modules that can be connected to each other in multiple configurations.
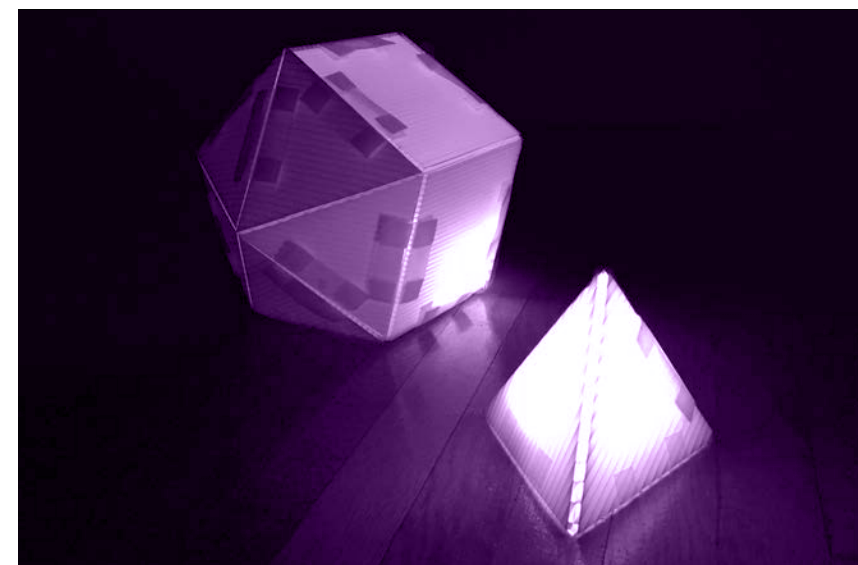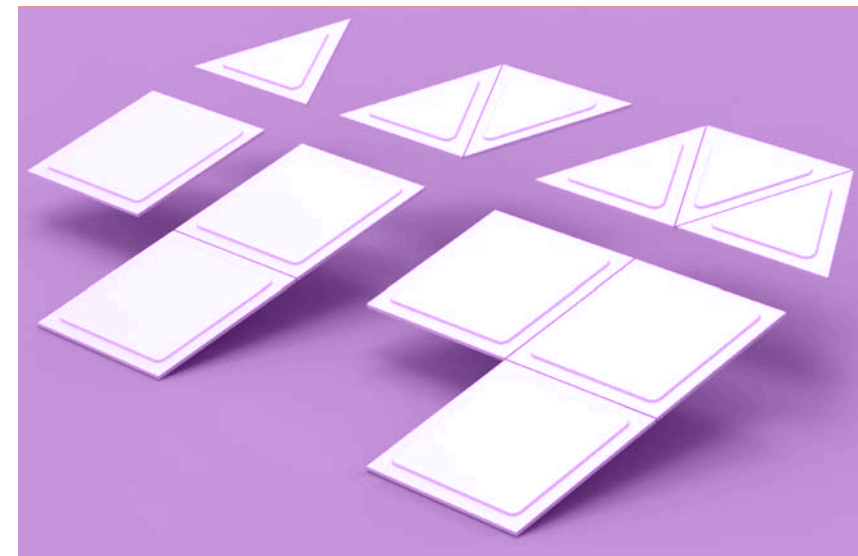
FINDINGS

The first iteration of Modulus was made of museum board cut into 1.5" squares and triangles, joined together by drafting dots. When I tested the first prototypes with middle schoolers, they made simple cubes, pyramids, and balls without having to plan their designs ahead of time. Some of the students started to play together using Modulus to create a variation of bowling. The clean up was also a bit tedious because while the modules were reusable, the drafting dots were not. Players had to peel the dots off each piece before packing everything up.

For the second version, I scaled the modules up to 6" per side, and cut them out of corrugated plastic, which is cleaner and more durable. I experimented with the way the modules connected, from rubber bands, to magnets, to tape, and I settled on velcro patches because they were intuitive to new users and reusable. After several play tests, I realized there was never really an objective that players can work towards. I designed it to be this way purposefully, fearing that showing pre-made examples would limit the possibilities for play. However, without a goal, it is harder for players to start playing in the first place! I had a couple of remote controlled LED's in my room while I was photographing a Modulus model, and I decided to throw on inside and see if there was a change in lighting. Because I used a mix of white and transparent coroplast, the whole model glowed beautifully in the dark. In the next play test, I presented Modulus with the objective of making your own lamp shades, which I felt provided a prompt that encourages making while also being open enough for personal interpretation.

The challenge in balancing a creative system is reconciling open-ended free play, which gives the most freedom to a fault, with guided instruction, which can be seen as diminishing creativity by dictating how a final product should look. In the Modulus project, the guided instruction is almost embedded in the limited pieces and the ways they attach to each other. The free play comes in how these pieces are joined, and what the structure looks like in the end.
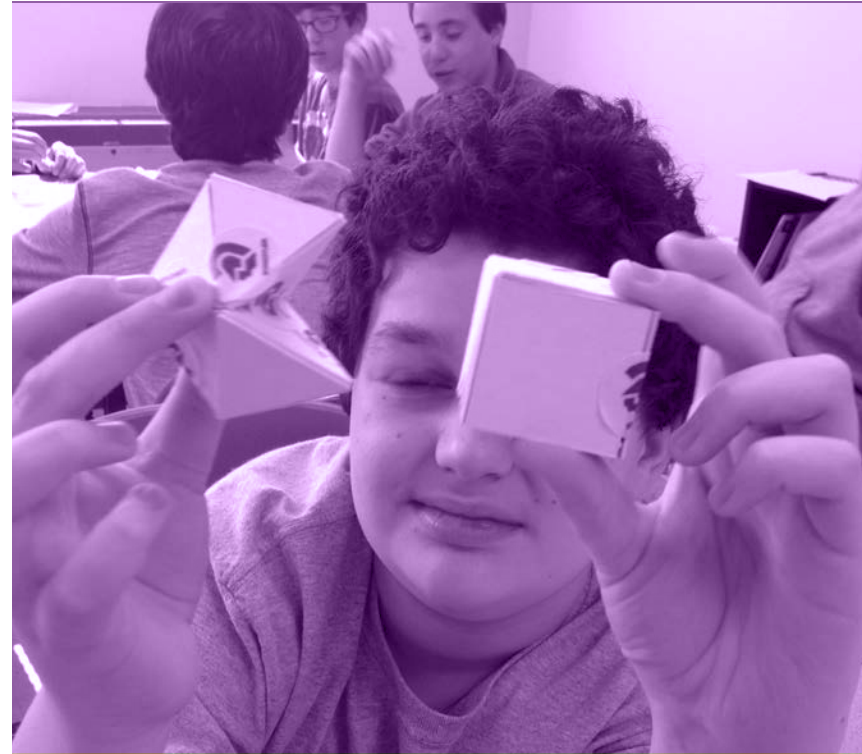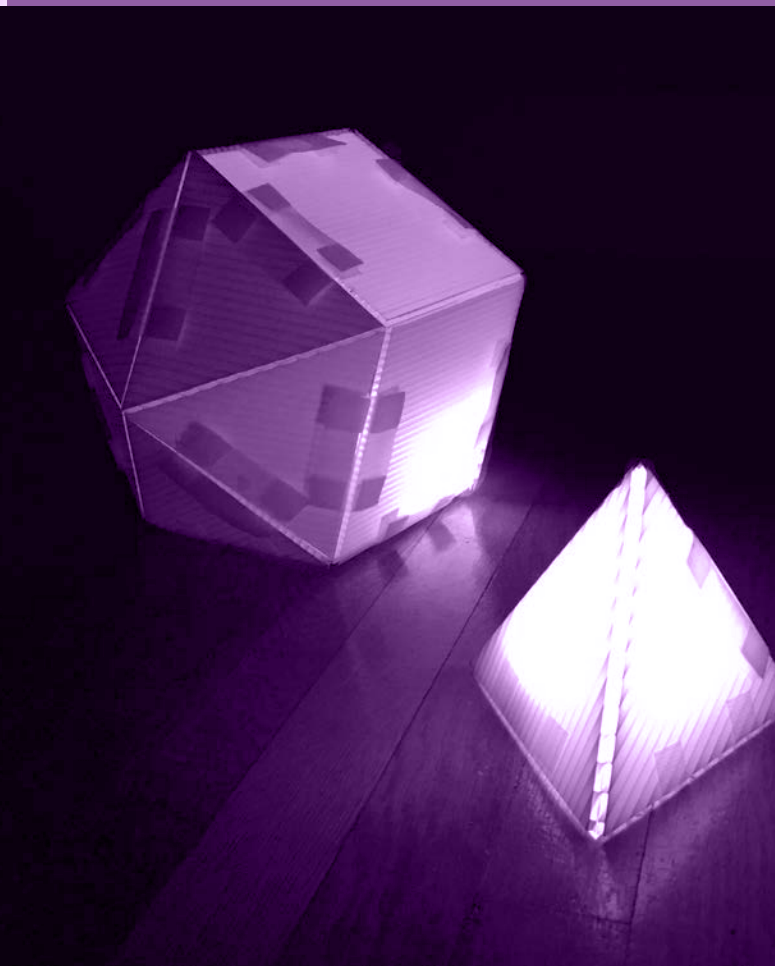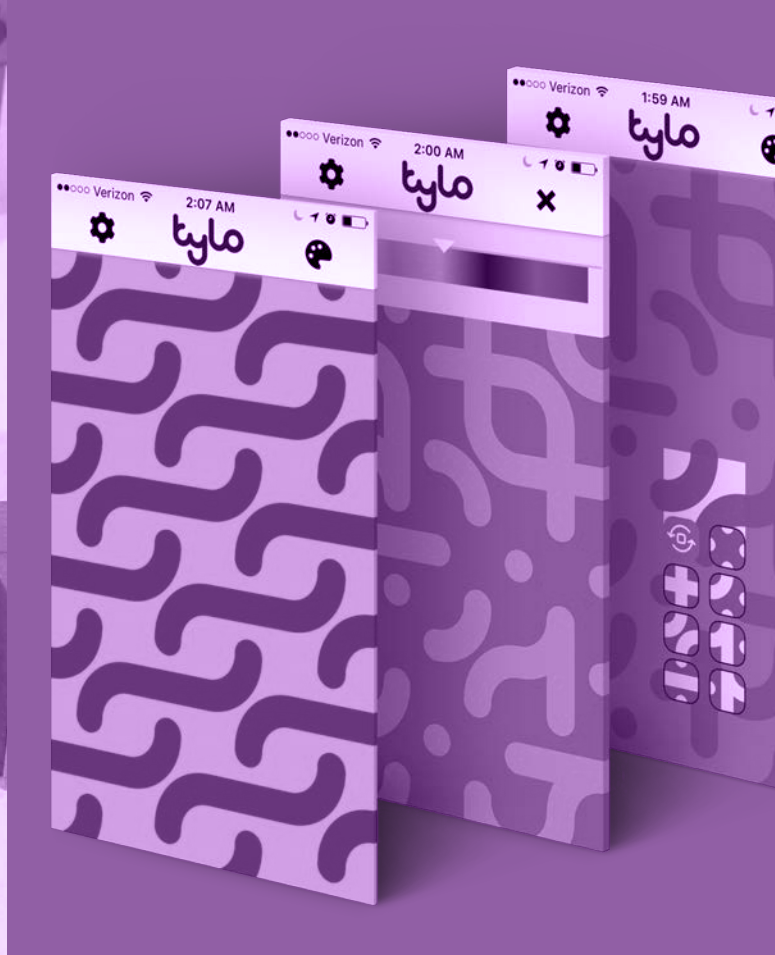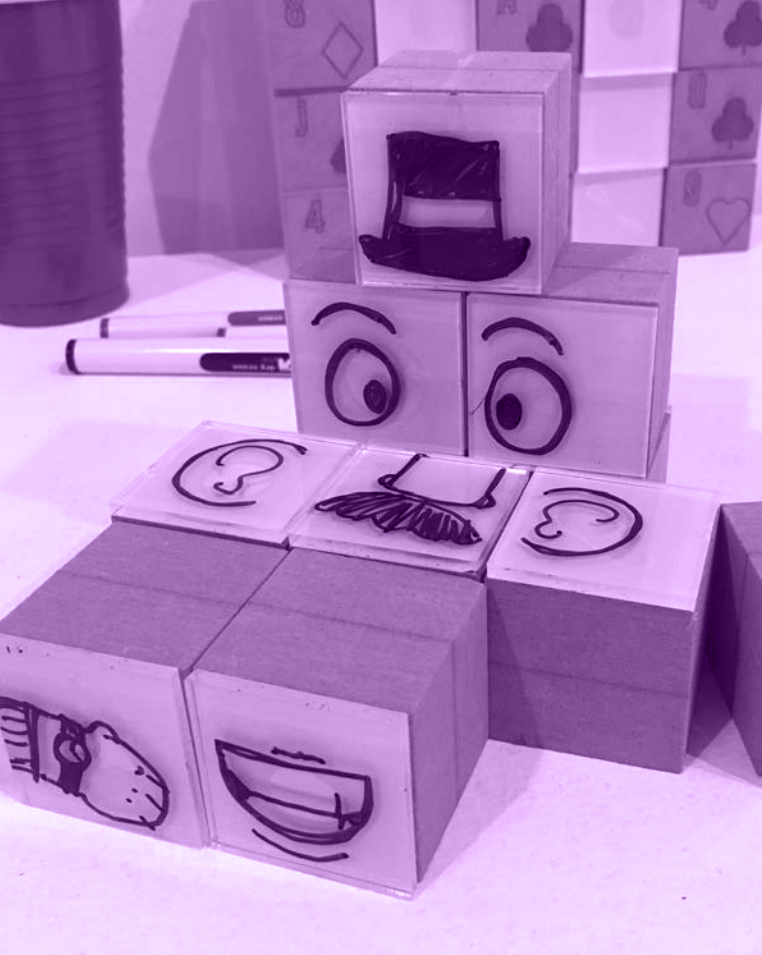

A student shows off his Modulus Pac Man. He was later issued a cease and desist from Atari Corp.

Volunteers at Boston Children's Museum tinker with a super-sized Modulus set. Or are they just tiny people playing with normal sized pieces?

"Play is a balance between rigidity and fluidity: acting within a system while also pushing the boundaries to discover new systems."

"BUILDING OURSELVES"

INTRO- DUCTION

WE ARE WHAT WE MAKE.

I believe that through the process of making, we impart our essence in the final outcome. The projects in this section are intended to be channels for self expression and making sharing something personal with others.

YouNits is a toy and digital platform designed to encourage people to share their toys and subsequently a part of the lives with their friends. The Laugh Booth uses laughter to incentivize sharing personal stories and ideas with a group of people. The Blob Squad is a character creation toy that stimulates improvised stories and creative writing. By making it easier for others to be genuine and share their unique perspectives, my hope is to foster more inclusive and creative communities.

Why do parents hang mediocre art on their refrigerator? Chances are, it's because they know the artist. My parents taught me and my siblings to be proud of the things we accomplished. I believe we like to be proud of our accomplishments. We attach more significance to the things we actively partake in than the things we can buy or passively experience. Watching home videos brings me more joy than any viral cat video, because I was an actor and I know the cast and crew intimately. Experiences are more satisfying when we contribute to their creation. Anything we make creatively is a reflection of past experiences concentrated and exported via our bodies. We create poetry, drawings, pasta, as a way to answer a question. That question may be "Why do I feel this way?" or "How can I get rid of these foods before they expire?" We search for an answer through the process of making and experimenting with the building blocks we have gathered, whether they are memories, pictures, or moldy onions. The final product is judged initially by ourselves, the creator, by using past experiences as criteria for a successful experience. We make things to express our thoughts and feelings, to learn more about our place in the world.

At the Lifelong Kindergarten Group at MIT, they promote Projects and Peers as two of the four P's of creative learning. Creative thinking happens more frequently when we have a personal stake in the creative process, because we work harder on projects that we care about. Homework during grade school was a serious drag, because I felt no connection between my personal life and the length of line segment AB if line AC = 12 and BC = 5. We retain knowledge better when it is put into context, and if the subject matter matters to us. We must be open to sharing ideas and feedback as well in order to progress creatively; without the personal exchanges, our projects can become one-sided and therefore less effective.

As selfish beings, we don't care about things that don't personally affect us. Now if you told me this triangle was a slice of pizza, I would stay awake during class.
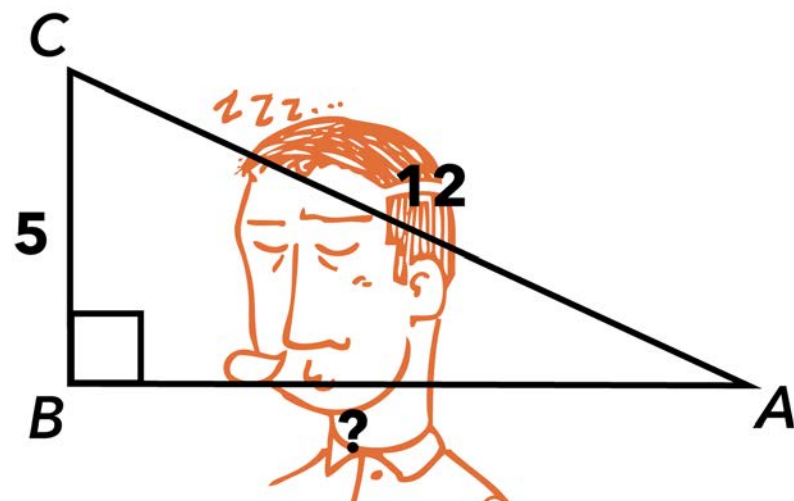
The fridge is often our first gallery showing that serves cheese and wine at the reception.

In improv, we build something together and explore personal truths. Improvisers are taught to play off the top of their intelligence, to think like the person they are playing, in order to bring out the most realistic reactions. The best comedy (and drama) comes from being honest because it is the easiest way to connect with each other. Charna Halpern, co-founder and former director of the ImprovOlympic, writes about honesty in the book Truth in Comedy.

Anchorman stays funny because of the commitment to the ridiculous premise.

If we look past the silly facade, we can see a seed of truth that fuels the narrative. Ron Burgundy (Will Ferrell) is a humorous depiction of manliness in the midst of a shifting social climate.

"The truth is funny. Honest discovery, observation, and reaction is better than contrived invention...real humor does not come from sacrificing the reality of a moment in order to crack a cheap joke, but in finding the joke in the reality of the moment…" [Halpern, 9]

In order for comedians and storytellers to connect to their audience, their fantastical and silly stories need to be anchored by a commitment to conveying a universal truth. Anchorman is an absurd comedy about a news anchor and the over-the-top shenanigans he and his team get into to be the best news channel in San Diego. It is a silly premise, but looking deeper into the story, you find a relatable caricature of a man who has to balance his relationship and career in a rapidly changing culture. We may not relate to the back alley news team brawls, or the jazz flute montages, but we can connect with Ron Burgundy's internal struggle between prioritizing his friendships or career. This underlying truth anchors the wackiness in some form of reality, and the comedy bursts from the tension between silly characters faced with serious situations.

PLAY PERSONALITY

Our true selves: our natural abilities, affinities, and tendencies are reflected in how we play. Dr. Stuart Brown has broken down the different ways we play based on our innate disposition, which he calls our Play Personality. Some people enjoy collecting, traveling, socializing, or being active as their primary source of finding joy. As individuals, our play personalities are usually composed of multiple categories. Play is a balance between discovering and constructing our own identities, while interacting with others doing the same.

In previous sections, I talked about how play appropriates objects and spaces. How these things are appropriated depend on the player's personality and interests. In middle school, the whole student popula-

tion had to take the MSA's or the Maryland State Assessment. For the geometry test, I remember having to bring a protractor, compass, ruler, pencils, and calculator, nothing else was allowed. After finishing each section, I would have nothing else to do except to close my eyes or stare off into space. I started to play around with my math tools: starting with idly twirling my ruler on the tip of a pencil, and ending with constructing a tower using all of the available pieces deconstructed and jammed into each other. As I looked around the classroom, I saw my classmates rolling their pencils on paper half pipes, drawing circular patterns with the compass, and typing random numbers into their calculators. The various ways we use the same objects illustrate how we play is unique, and that toys are objects for us to develop our creativity, in our own way.

Teacher: Use these tools to construct a monument of your worst nightmare

Me: Got it.
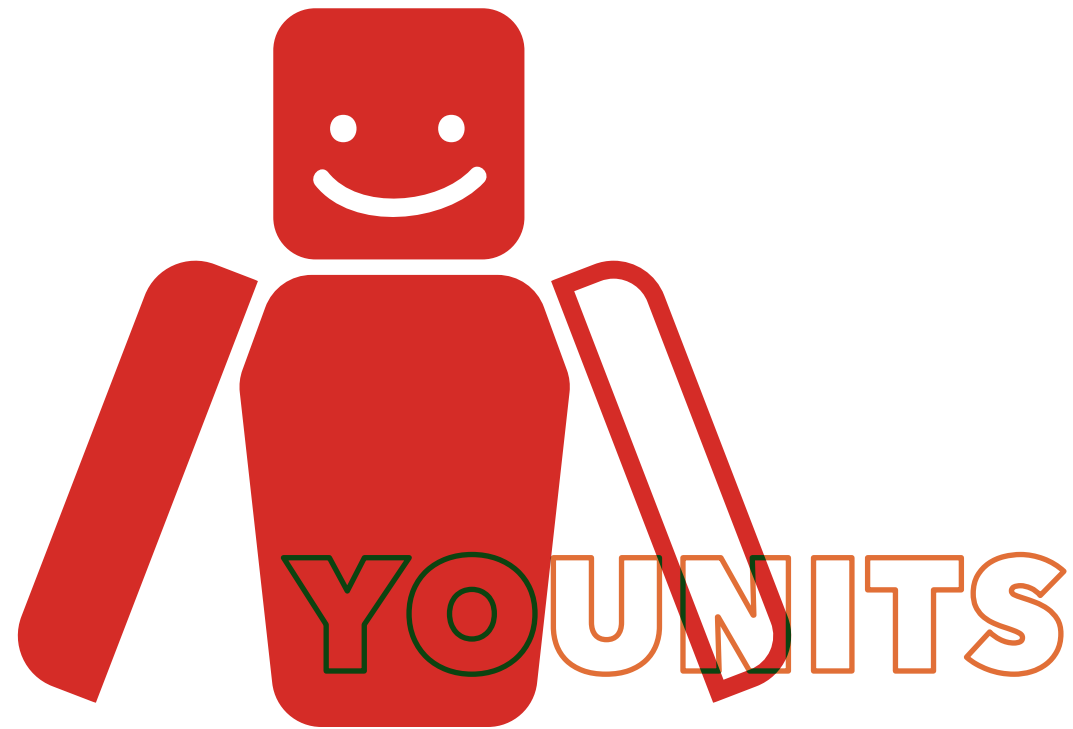
YOUNITS

THE PROJECT

YouNits are a collection of connected figurines, aimed at encouraging players to trade parts of their YouNit with others in order to share experiences and make new memories.

The YouNit figure is composed of seven parts, a head, torso, waist, and four limbs. Each piece contains digital data such as GPS location and the original owner, which is accessed via the YouNit App. The app itself is a portal to visualize the journey each YouNit piece has traveled and allows users to chat with whoever they trade parts with.

INSPIRATION

In our Design Studio II class, we were assigned a project to design a

dynamic media experience inspired by the idea of a perfect human. We were shown a 1967 short film titled The Perfect Human, directed by Jorgen Leth. The film depicts a man and a woman in an all white room, performing mundane tasks such as jumping, eating, and dancing while a narrator describes their actions and bodies in a detached manner.
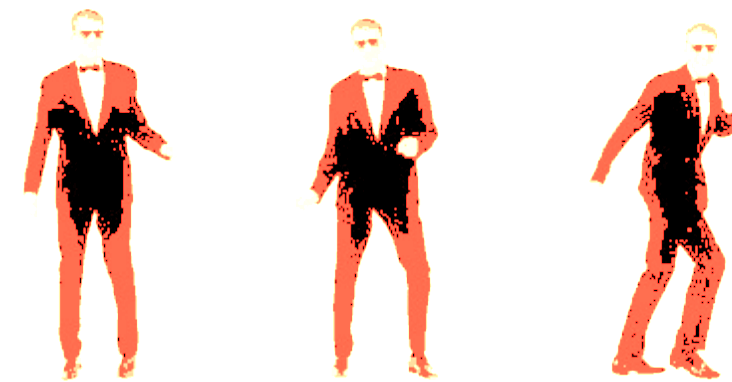
A selection of The Perfect Human's dance moves: "Standing by the Grill" "Passing Gas at a Museum" "Reverse Moonwalk"

I was struck by how the narrator described the humans in the scene. Labeling them perfect in even the most modest of activities seems to imply that humans on display were the epitome of humanity and physicality. However, they were at most slightly above average in their dancing ability. In calling a particular body part or action perfect, without referring to any standard in which the viewer can compare, the narrator humorously becomes the expert on humans. But as human viewers, we know that there are more ideal humans that can jump higher, dance better, or eat food that is more universal. As a result, the film seems to say that the particularities and imperfections in each of is what make us perfectly who we are.

I began to think about what would make us more perfect and ideal as humans. There are many stories and descriptions of utopian societies: devoid of violence, discrimination, sickness, and ignorance. I thought about the current events that were happening around the world: police shootings, the refugee crisis, water contamination. People were being treated as sub-human, less than equal to others with more power and influence. Personally, I believe that in order for these issues to be resolved, empathy and community need to be reestablished as the foundation for a better society. I find that a key to building a relationship with someone is to know more about his/her background, and celebrate the ways they are different from myself.

CONCEPT

My idea of a perfect human is one that shares and builds with others to make a better community. Sharing ourselves with our community builds us into individuals also. The phrases "lending a hand" and "walking in someone's shoes" became themes that I revisited in designing a concept for this project. These ideas revolve around building and understanding relationships between two or more individuals. I think that the action of helping and getting to know someone else is crucial to break the habit of thinking selfishly. By insulating ourselves from each other, we inevitably lose touch with issues that do not directly affect us; it becomes harder to empathize with people who encounter different problems from our own. Building relationships with diverse people helps foster a community that understands life from another perspective, and celebrates the differences that make us unique.

DESIGN PROCESS

I started to wonder how these ideas of sharing skills and ideas can be illustrated in a fun way. I find it easier to tackle heavy topics such as the essence of humanity and constructing utopias when they are approached from a playful and open-ended point of view. Because my interests lie in the potential of toys and play, I thought it would be a fun challenge to try to convey my ideas of the perfect human in the form of a Dynamic Media Toy.

I started to draw a web of words (feelings, actions, characteristics) that I felt made us distinctly human. I thought about our prized intelligence, branching off into sentience, empathy, morality, and invention. Perseverance, love, sacrifice, and trust come from our evolved social skills and our need to collaborate in order to survive. Communication, storytelling, curiosity, abstract thinking allow us to share information and question if there is more to what we already know. On the other side of the paper, I jotted down more terms that I felt were a negative twist to these attributes.

Self-awareness and intelligence can lead to selfishness and arrogance. We can spread lies and propaganda in the same way we convey the truth and good news. Curiosity can lead to fear, trust can turn into manipulation, and love can sour into obsession. This exercise helped me see the darker side to our strengths, and we are able to bond and commiserate over mutual struggles. What is seen as a weakness that
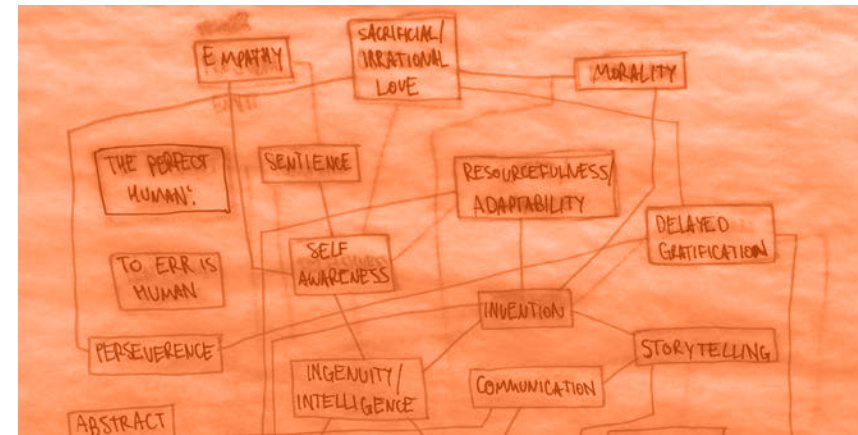
can separate us from each other can also be a rallying point for us to encourage one another to improve. Admitting that we are not perfect is one of the first steps to becoming more perfect.

I then drew a word map of what we as individuals can do with our own bodies, as well as how are body parts are put together and connected. As a whole, we have the ability to play, learn, create, dance, dream, remember, share, organize, and teach. But as individuals, our skill sets are limited (some more than others). The same can be said about the capabilities of our own bodies: we are designed to live with a head, two arms, two legs, and a torso, but some have less than what we perceive as the standard.

The themes of sharing skills and experiences turned into the idea of a modular human, or essentially a human figurine with 7 interchangeable body parts: a head, chest, waist, two legs, and two arms. I named the figures YouNits, which is a combination of the words 'You' and 'Unit,' seeing as that each body part is a module that can be swapped and rearranged to represent us as individuals.
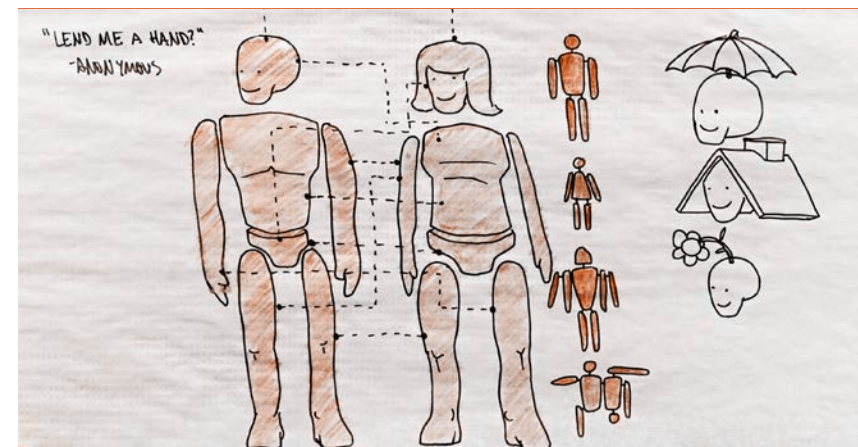

After our bodies and minds, miscellaneous head wear is the defining factor that separates man from beast.

I wanted to weave the experience of my conceptual search into the story of the toy itself. I started to form a personality for YouNits, so users can form an emotional connection and jump-start their own stories. To me, YouNits are curious about the outside world; they love to travel, but need help traversing unknown terrain. Their color comes in a wide variety of colors and patterns, inspired by nature, technology, art, and culture. They are inherently social beings, once several of them meet in one place, they love to swap memories and tell stories through switching out parts. Assembling and disassembling, their individuality is constantly in flux, their being is a collection of diverse and unique experiences. Their identity thrives on sharing and exploring. Ultimately, these YouNits are a reflection of their owner, so I wanted to design a character that is relatable and willing to share.
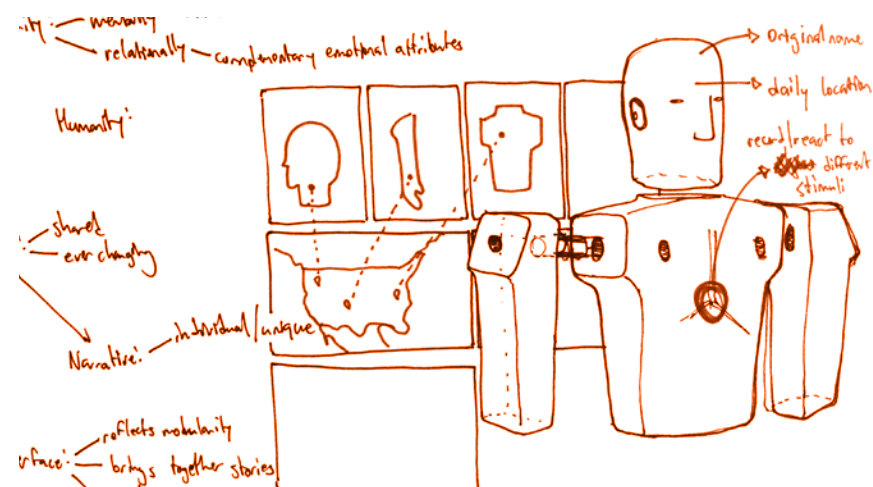
The Sculpey model that was almost too life-like to enjoy removing its head and replacing it with its foot.
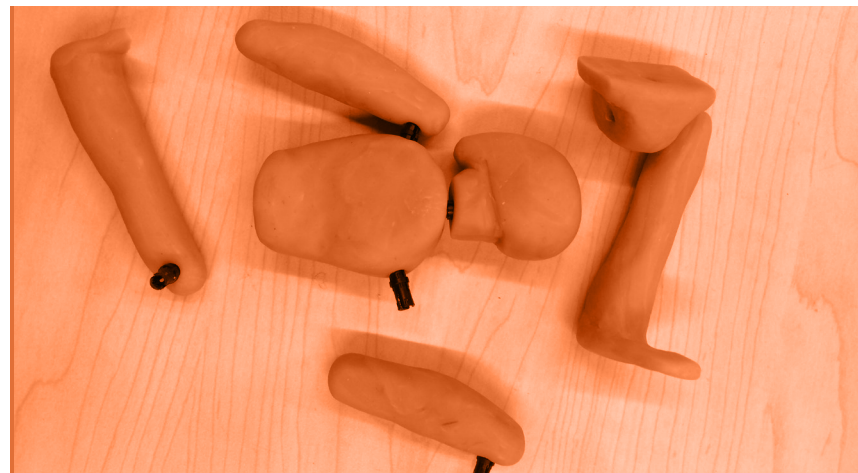

Physical Design

The first sketches featured a male and female figurine, colored as blue and pink, respectively. In the margins, I made thumbnail sketches of how these two figures can mix their bodies together. For example, a body blue head can be built with a pink torso and blue waist, or a pink torso with all blue limbs. I even included a human body with two torsos, three arms, two heads and one leg.

Experimenting with drawing the possibilities made me realize that this can also be a medium for expressing our individual physical identity, along with our place within a community. Someone may not think of him/herself as entirely male or female, and so they are fully capable of designing a figurine that can represent their image more accurately. In this way, the idea of a perfect human is one that is also confident in showing who they are, with the community ready to accept them as is.

The first prototype I made was out of Sculpey, with Lego tube connectors to join the body parts together. The pieces fit loosely, but it was a good enough representation of how one can swap and move parts to make weird rearranged figures, like a teleporter experiment gone wrong.

The second prototypes were designed in OnShape and 3D printed. The figurines share the same sized arms and legs, but the heads, torsos, and waists were designed differently to differentiate the gender. The male figurine had a large cubed head, V-shaped torso, and a smaller waist, while the female counterpart had an A-shaped chest, wider waist, and trapezoid head (to represent abstracted long hair). There were sockets to connect parts to each other in the traditional human form, but I also wanted to create more opportunities for experimentation. I put holes on all sides of the head, the back and front of the torso, on the sides and ends of the limbs. My hope was that these extra connection points would encourage more people to create shapes that were expressly non-human. I found myself trying to make weird forms that could balance in different ways.
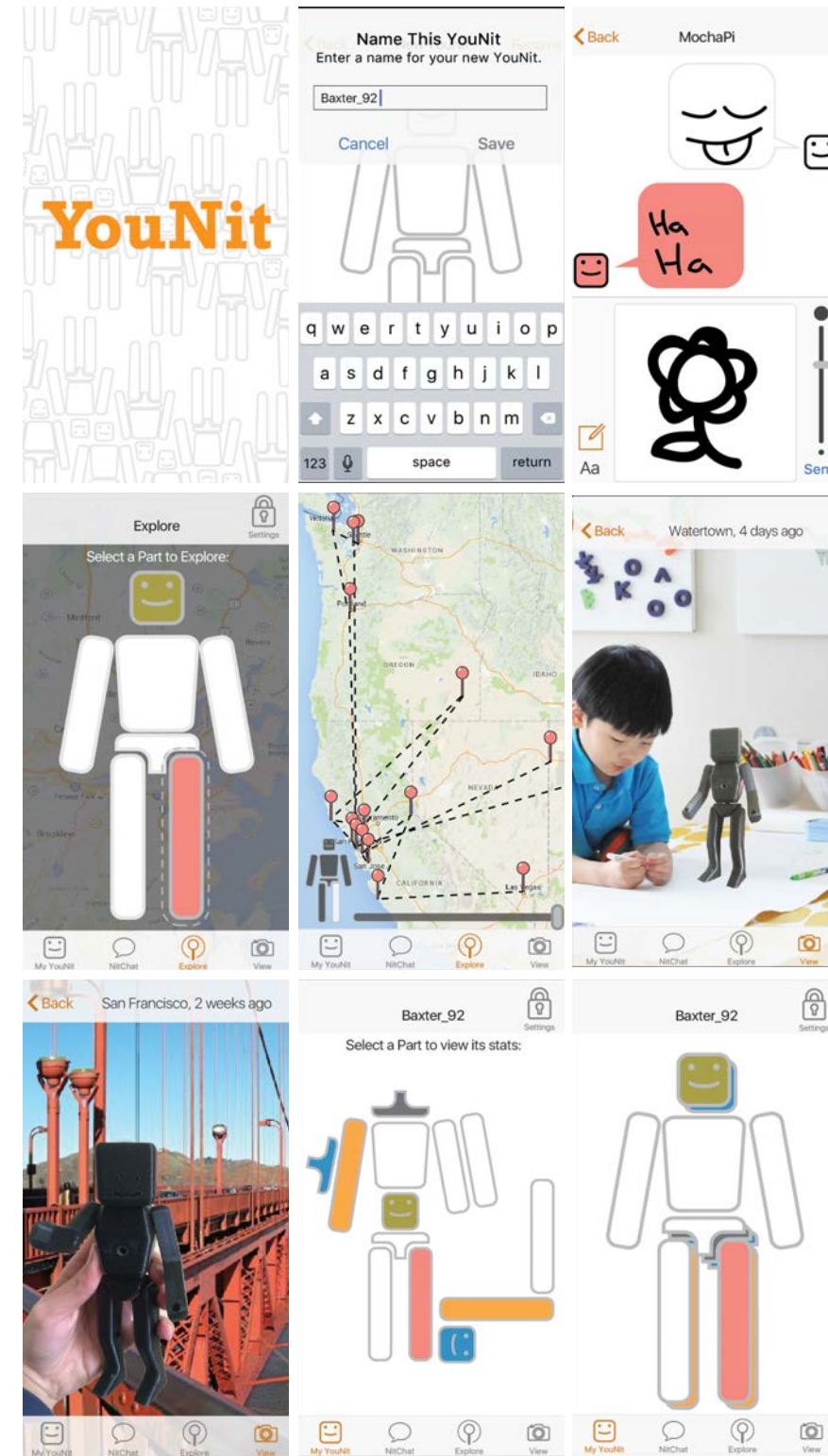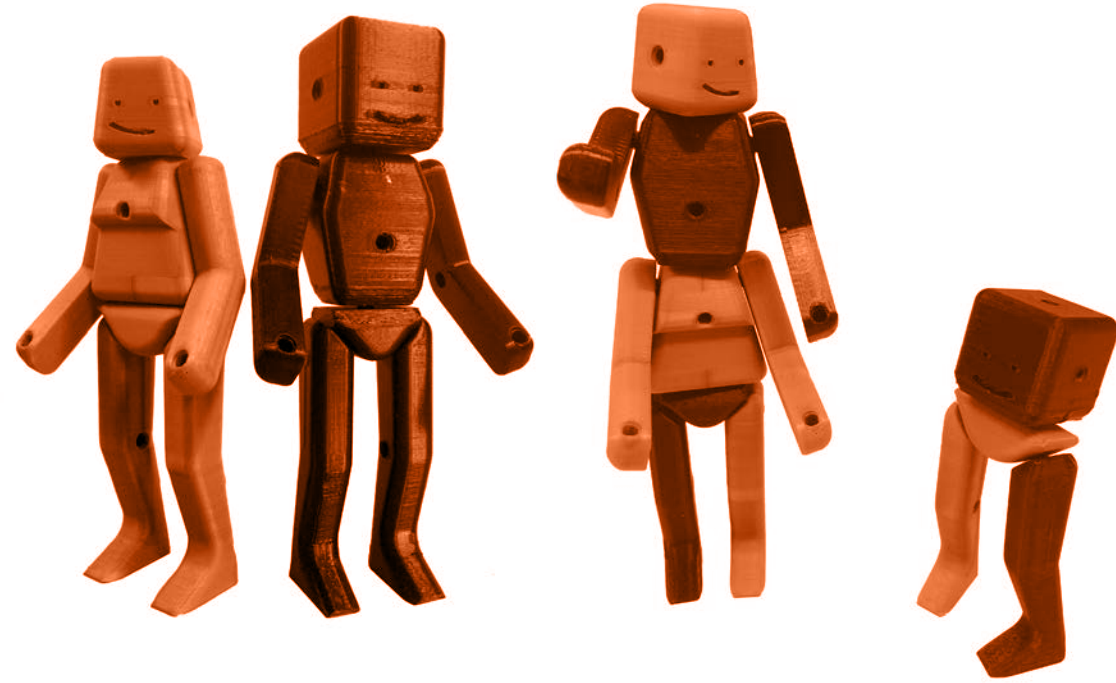
Opposite: The 3D printed forms were fun to mix and match. A YouNit Party commences.

The mobile companion allows users to track where each YouNit piece travels,and creates a pipeline to communicate with those that share traded parts.

Integrated Interaction

The digital experience is in the form of a mobile app that can remember locations where your YouNit pieces have visited, which pieces users have traded, and pictures of YouNits that contain at least one of your parts. Ideally, each part would contain an RFID chip or visual marker that can be scanned by the mobile device, which can remember the type of body part, the original owner, current owner, and geolocation. All of the computing is done through the mobile device, so there are no electronics or batteries needed in the actual toy.

The experience would begin with a consumer buying a YouNit set online or at their local toy store. Upon assembling, they link their figurine to the YouNit app by snapping a photo and naming it. From there, whenever users travel with their YouNit and scan it with their phone, the app starts to form a map of where it has gone. If two YouNit users meet, they can trade one or more parts, and the next time they scan their figurine, it would recognize the traded part and its original owner. A user can also see where their original traded part has traveled.

Who would you pick if you can only have 6 Facebook friends or followers?

Once a trade occurs, the NitChat feature becomes available. This allows users to chat with each other as long as their YouNits contain a part from the other person. The NitChat allows for a close-knit social network with no more than 6 other people, which is the maximum number of parts you can trade without completely disowning a YouNit figure. Limiting the number of people you can interact with at a given time is a departure from traditional social media, where the number of contacts, friends, and followers is almost always growing. I would liken the social interactions to that of a pen pal, as opposed to a sea of acquaintances.

The pictures users take of their YouNit with the app is stored in their YouNit's memories, which gives other users access to browse on the app when they trade parts. Other YouNit's memories can only be seen when a YouNit has their part.

YouNits allow users to tell their stories with an intimate group of people through sharing physical, social, and digital experiences.
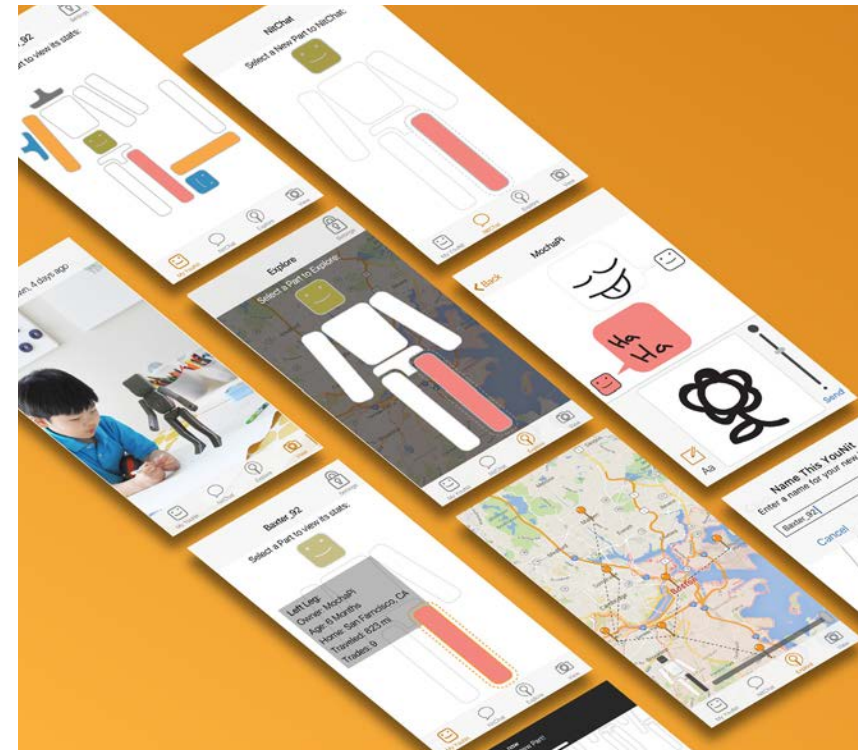
CONCLUSION

Throughout the process of designing YouNits, I was constantly reminded that we are a collection of experiences shared with others. I wanted to reflect that sentiment in the YouNit figurines through modularity, which encourages the swapping and rearranging of limbs with friends. The traded parts serve as a reminder that our lives intersect and affect the lives of our friends, and those memories are inextricably linked.

By choosing who to share our experiences (i.e. through our YouNit parts), we are essentially building an experiential and relational model of ourselves with the YouNit toy. If I shared parts with my family, I would trade a head with my dad because he taught me to observe and appreciate the calm everyday. I would trade arms with my sister and brother because they are always by my side. I would trade my legs with my mom because she showed me how to dance. I would trade my chest with Diana because she has my heart. After all the trades, my YouNit toy is a version of myself that celebrates my unique collection of relationships.

There were some challenges in designing the CAD models, such as

reshaping the torsos, waists, and head so the limbs of both genders can fit at the correct angles. The 3D prints were not the best quality, so the tube connectors were jammed from excess material in the sockets. The figurines were actually printed larger than I expected, originally my estimates were to design 6 inch figures, but they turned out to be around 8 inches.

My hope for this project is to foster empathy in players through sharing their belongings, and providing a window into each other's lives by witnessing where those shared pieces travel with other YouNits. I think this project has helped me change at how I look at our bodies and experiences. YouNits is poised to frame our lives as interchangeable (aka relatable), but unique. The YouNits themselves are more than figurines, but also construction toys, where players can break down the body to build it into something more than human. The extra holes add more opportunities to connect pieces in different ways. The ease in which players assemble and disassemble the parts makes it conducive to play and creative experimentation.

In the future, I would like to design more shapes that represent a wider range of how the human body looks. I wanted to represent bodies that are not normally depicted in toy figures: slimmer and wider frames with different form factors, such as an organic and soft design or an angular and sleek silhouette. The form factors are meant to display a personality metaphorically: users can choose how they feel their personality would look in a physical form. The soft and organic body may come across as more friendly and relaxed, while the angular and sleek form may feel more focused and clean. The faces are currently simple smiles, similar to the original LEGO mini-figure. I would like to also design a wider range of facial expressions in order to convey more emotions than general happiness.

I have learned how to think about keeping a conceptual message clear across digital and physical media. I think it is important to balance the interactions between the mobile interface and the actual toy. There are inherent specialties for each medium. The app can keep track of data and images over long distances and periods of time, while the toy can be felt, carried, and transformed by the user. Although there are differences in the way we interact with each medium, the two should work together to make a cohesive and seamless experience. I was surprised by all the possibilities in mixing just two figures together, it makes me excited to see what others could do with a community of a couple hundred figurines.
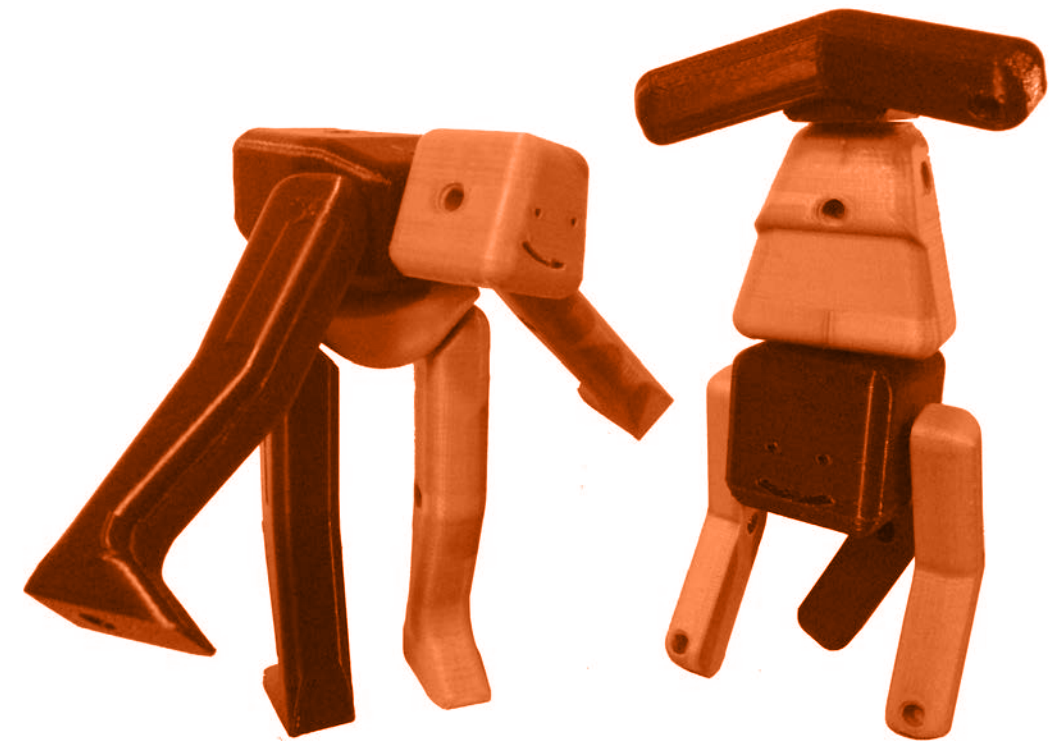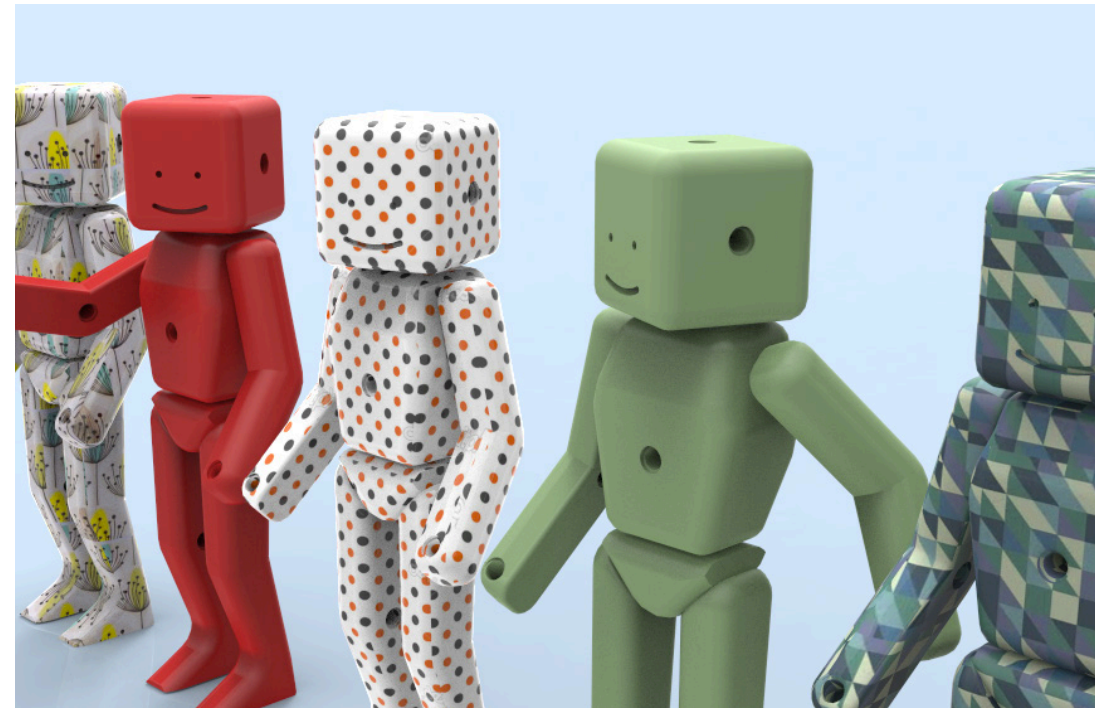
LAUGH BOOTH

THE PROJECT

The Laugh Booth is an interactive installation that asks selected questions for participants to talk about with each other.

When the volume of the conversation hits a certain point, a laugh track is activated and played out loud. The canned laughter in the Laugh Booth is used to get participants to drop their guard momentarily, and more willing to collaborate. Players are allowed to deviate from the initial line of questions, and they can step on the footpad to change the conversation starter for another random one.

INSPIRATION

The Science of Laughter

The Laugh Booth Project aims to use laughter as an incentive to talk more and feel less self conscious about speaking up. This hypothesis mainly comes from an academic study called The Evolution and Functions of Laughter and Humor: A Synthetic Approach (2005), by Matthew Gervais and David Wilson at Binghamton University. This paper explores the concepts of humor and laughter through a biological and psychological lens, arguing that it was a necessary tool to facilitate collaboration and stress relief in primitive humans. They define the foundation of humor as "non-serious social incongruity," or to put it simply: something weird happening within a safe social context. If an occurrence is too weird, it can be seen as unsafe, if it is not weird enough, it is simply boring. Humor is found in the sweet spot of unexpectedness and comfortability. After interpreting something as funny or humorous, our body reacts through laughter as a way to break the tension of encountering the unexpected event.

Humor = Safety x Incongruity
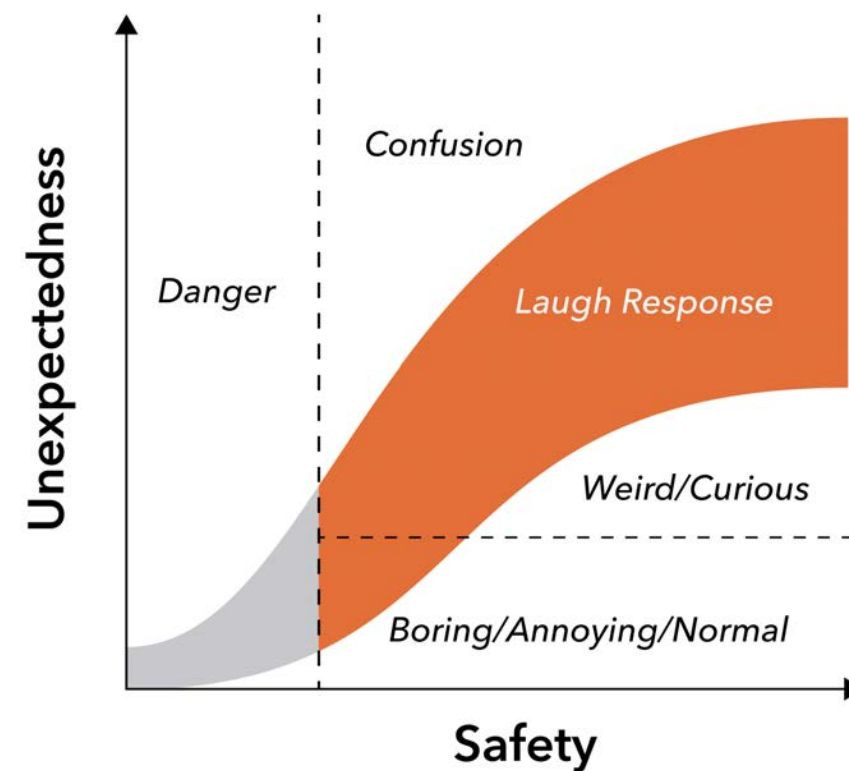
A graph depicting how we perceive and assess social situations. Often times, dissecting humor makes me feel less funny because it removes the spontaneity from real life, putting this caption in the 'Boring Zone.'

Back in the day (2 to 4 million years ago), ancestors of humans lived in stressful times. Nomadic, they hunted and foraged for food, traveling in groups to increase their chances of survival. Before we developed language, laughter existed to communicate a positive emotional message (safety/playfulness) throughout groups, along with crying (pain, sadness), and growling (anger, fear). Laughter being contagious is not a myth, our brains are wired to respond to laughter with laughter. In this way, our ancestors were able to swiftly communicate that their surroundings are safe and they can relax. If we were not able to spread the message of safety, members of the group would be more consistently stressed and irritable, leading to decreased collaboration and shorter lifespans. There are two types of laughter: Duchenne laughter is genuine laughter and elicits a strong positive feeling in those that experience it, and Non-Duchenne laughter, which is forced laughter resulting in a weaker emotional response (think used-car salesman laughing to get customers to relax).

Or think nervous laughter as a response to diffusing social tension.

In studies of primate and human play, scientists observed a universal laughing face: the eyes and mouth are open, and the body is relaxed. This body language signals a playful attitude to peers, inviting them to engage in play activities. Laughter is used to facilitate groups of people into a state of play and relaxation, bringing them into a more collaborative mental state. Jokes are an effective tool to get groups of unfamiliar people to feel more comfortable because the laughter alleviates the stress of unfamiliarity.

There is a universal body language to spread playfulness and friendliness. This friendly picture changes its message if the kids have angry, crying, or stoic expressions.

THE CONCEPT

Upon reading this study, I asked myself, "If I could say anything and get a positive response, what would I say?" This can be a tricky subject, considering the proliferation of hate speech on social media. As a designer, I have to be aware of the negative repercussions of my system. I implemented a visual interface of discussion topics to give structure to interacting with the Laugh Booth.

The conversation starters in this project lay down an initial direction in which conversations can move. I wanted the topics to be open ended, in that each participant is expected to have varying responses. While users discuss their ideal meals or thoughts on the election, the laughter validates their ideas, encouraging them to share more.

An early doodle depicting the Laugh Booth. Anybody can say anything and the Laugh Booth will laugh. What would you say?

DESIGN PROCESS

I retrofitted an old soundboard Processing Sketch from Elements of Media to play laugh tracks instead of drum beats. Here, I can press a number on my keyboard and the program would play a different laugh, from a slight chuckle to a large round of cheering and applause. For good measure, I included an awkward cough and a crowd booing. I had tested this version doing monologues with a partner who would erratically press buttons at odd intervals to mimic a random laugh track. Monologues aside, the results were hilarious on their own, and I found myself laughing at the laugh track laughing during the strangest times. Frank Wolflink helped me build the next iteration on Pure Data Extended, which uses the computer's internal microphone to trigger the laugh tracks past a certain volume level. At first, the laughs coming from the speakers would set off another round laughs, creating a feedback loop of cackling that never stopped. Because of this, we programmed the microphone to not register any sound up to 1500 milliseconds after any laugh track is played, to reduce the chances of a chain reaction. There is also an option to toggle the negative feedback tracks (awkward cough, crickets, booing, offended gasps) and the positive tracks, so players can choose their reactions before playing. I constructed a large square button to replace the space bar and simplify the interaction with the program.

I used Processing to build the conversation starter interface. Originally, users would tap the space bar and a preprogrammed question flashed on the screen. To complement the meandering journey of a conversation, I designed the text to fade out into the background as a temporary stimulus. This puts the focus on the evolving conversation as opposed to the initial question. The questions I chose are intended to elicit personal responses from participants, ranging from "When was the last time you cried?" to "What is your corniest joke?" These conversation starters are meant to encourage people to tell stories and provide opportunities to explain their responses, leading to understanding and empathy.

Initially, the Laugh Booth was intended for one person to monologue, and adapt to the random responses they received. After testing it with myself, I found it awkward to sustain a one sided conversation. I would tell personal stories, but they did not mean anything since I was telling them to a computer that was listening, but not remembering. After bringing a couple of DMI'ers to interact with the Laugh Booth together, I found that it was much easier to talk with multiple people, and the laughter was used to fill in the gaps between the conversation.
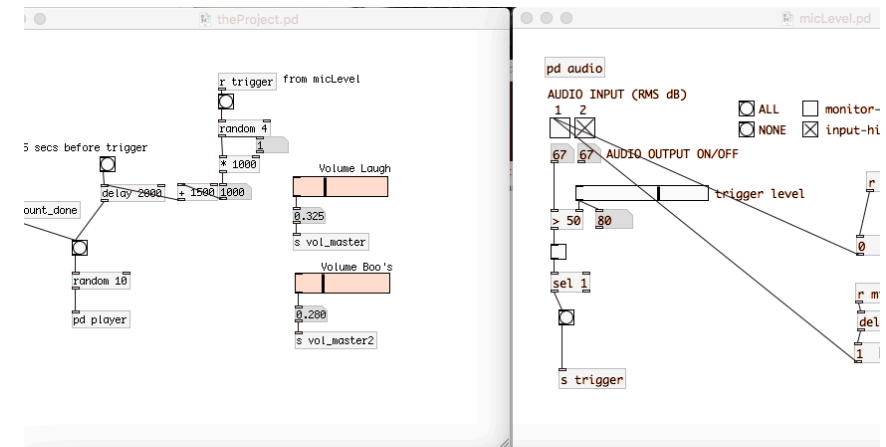
Early prototype using Processing for conversation starters and Pure Data for handling the laugh tracks.

Testing the latest version: "Would you rather fight a horse-sized duck, or ten duck-sized horses?"

The second test for the Laugh Booth was with a student improv group at Northeastern University. The participants were used to performing, so when given a question, they would put on a character and talk constantly. Without any breaks, the program did not have a chance to laugh because of the programmed delay to prevent chain reactions. Here, I realized the importance for natural breaks in conversations, to allow time for the laughter to trigger. The volume threshold was also raised so only the louder parts would set off a laugh track, as opposed to every sound being registered as a trigger. After adjusting

the threshold and asking the group to converse normally at a regular pace, the laugh tracks were timed better and the participants seemed more relaxed. They spent a while discussing what they would do in a potential zombie apocalypse, taking time to ask clarifying questions and justifying their answers with past experiences. All the while, they were conscious of the laughing and booing that would respond to their explanations.

The Laugh Booth was play tested with volunteers at the Boston Children's Museum. Participants played for around 20 minutes, sharing what they do in their free time. It turns out, most of the group loved to go to used book stores and shared their favorites in the New England area. The volume of the Laugh Booth was turned down, so the laughter did not seem to interrupt the conversation, if it was heard at all. This play test seemed to show that the conversation topics mattered more to creating conversation than the laughter, if the people in the group were already comfortable with each other.

Conversation Starters

"Talk about your family."

"Talk about your worst day."

"Tell your corniest joke."

"Talk about Christmas."

"Who is your least favorite superhero?"

"What do you enjoy that no one else seems to like?"

"What would be your famous last words?"
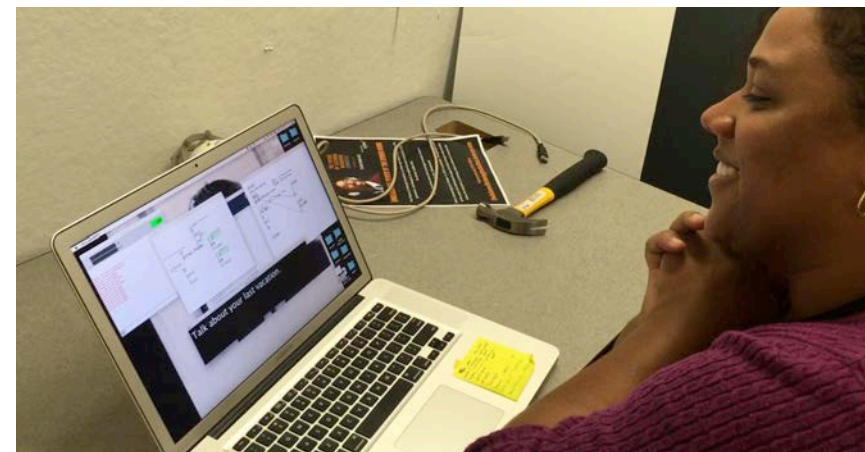
"Favorite scene from a movie."

"What is your plan for the zombie apocalypse?"

"How do you waste time?"

"Talk about your last vacation."

CONCLUSION

Changing the Space of Conversation

Holding a conversation within the space of the Laugh Booth turns something ordinary extraordinary. Anything users say can be met with uproarious laughter or dead silence, so they become more aware of the words they use. Upon saying something and hearing the laugh response, users reflect and connect their words with the laughter and in turn laugh at the social incongruity of the programmed laughter. On the other hand, when users would expect laughter after saying something, an awkward silence can cause a similar social incongruity, resulting in laughter to break the tension.
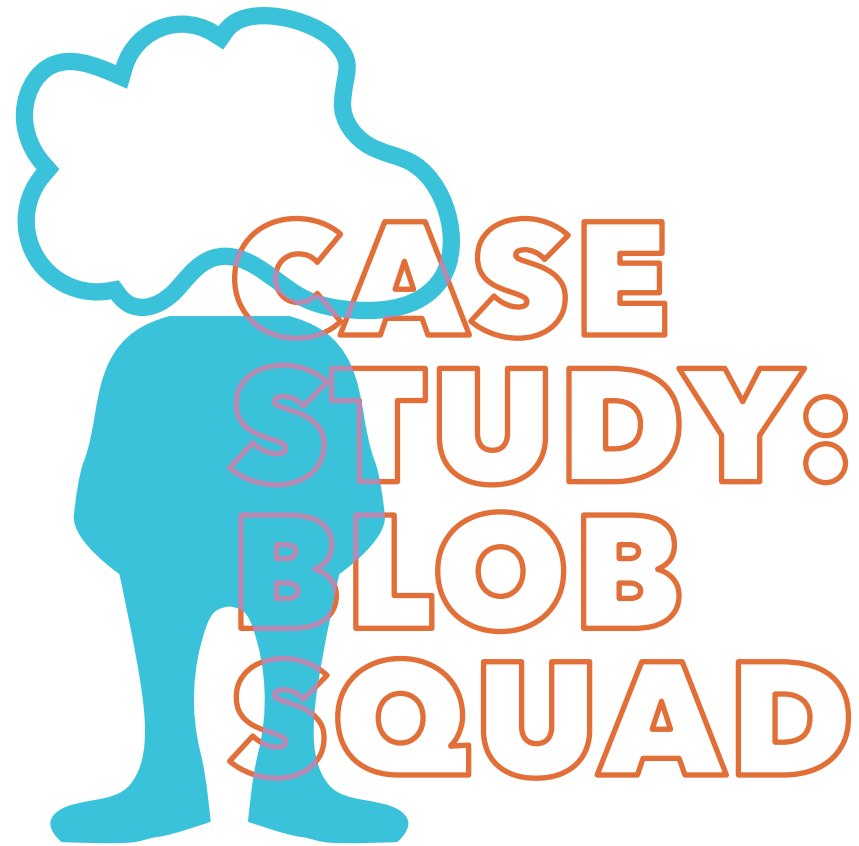
The purpose of the Laugh Booth is not to laugh at each other's ideas, although it is welcomed; it is to use laughter as a social lubricant in order to lower the pressure of judgment from voicing opinions. Using random laugh tracks as a response to volume allows for users to appropriate the system for other uses. I, for example, use it to get wild applause for my whistling. The Laugh Booth is a space that facilitates sharing ideas between participants, no matter how good or bad those ideas are.

In play tests, participants would talk about the conversation topics for longer periods of time, and ask more in depth questions about their partners' stories to receive a laughter response. Expecting laughter in the conversation heightens our awareness of what others are saying, and receiving laughter lowers the anxiety of being judged. These two factors create a space for expressing personal stories and interests, and to help us enjoy the differences that make us special.

The applications of the Laugh Booth go beyond entertainment, there can be practical applications as well, such as public speaking. The laughter can help ease the tension in users with stage fright, and adding boos to the interaction can help experienced speakers adapt to negative feedback.
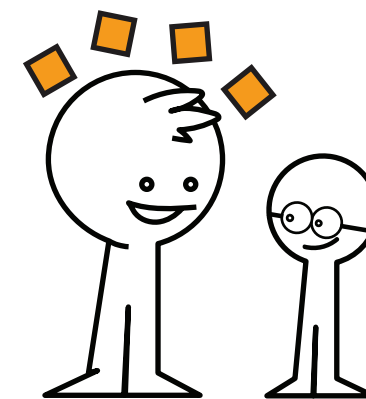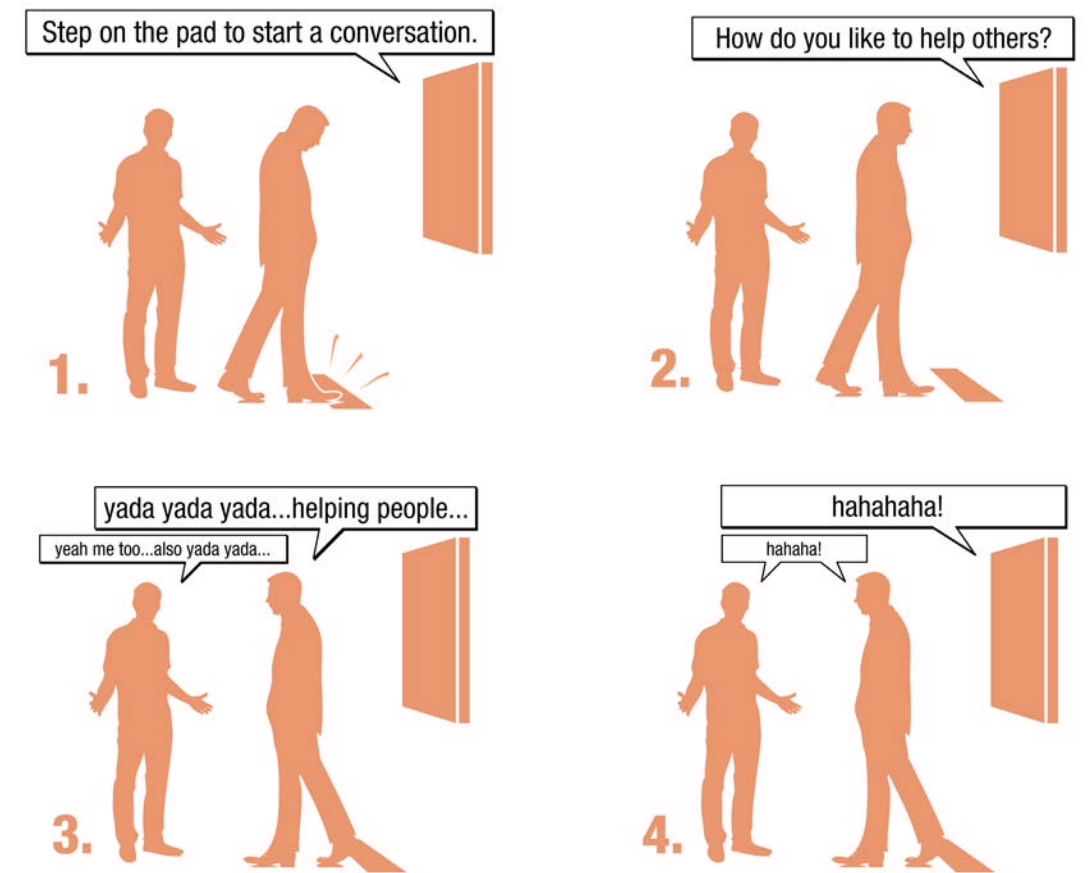
An ideal depiction of how users would interact with the Laugh Booth. Hearing laughter and applause after sharing something personal can be empower users to share more.

CASE STUDY: BLOB SQUAD

THE PROJECT

Blob Squad is a character creation toy, consisting of a cast resin body and a malleable clay head.

Players adaptively shape the clay into whatever form they want, and attach it to the body to create a new head for the figurine. After creating a new identity, players write a short blurb elaborating their character's origin story, likes and dislikes, hobbies, favorite food, and a space to draw their character's head.

THE CONCEPT

Designer toys are sometimes classified as "affordable sculpture," in that the consumer is paying for the emotional and artistic statement, rather than the entertainment value of a traditional toy. The artists and designers express themselves through making these figurines: and we are attracted to buy into their aesthetic message. This emotional connection to our objects justifies its importance, rather than a practical value.

I am a huge fan of vinyl toys, and what gets me excited about art toys is their character and individuality. Neither good nor bad, like a typical action figure, these figurines exhibited an attitude that was reflective of how I viewed myself: quirky, unique, and a little misunderstood. Similar to me: they stand around quietly, trying to look cool. They don't make our lives easier, but they do make them more interesting.

However, the novelty fades away and I start to look for newer and cooler figurines to add to my collection. These figures are static, they never change expressions, and maybe sometimes you can move their arms. As a creative consumer of art and media, I always had an itch for drawing and making my own fun. I began to think: how can I include myself in this movement? Are there opportunities for me to express myself through toys?
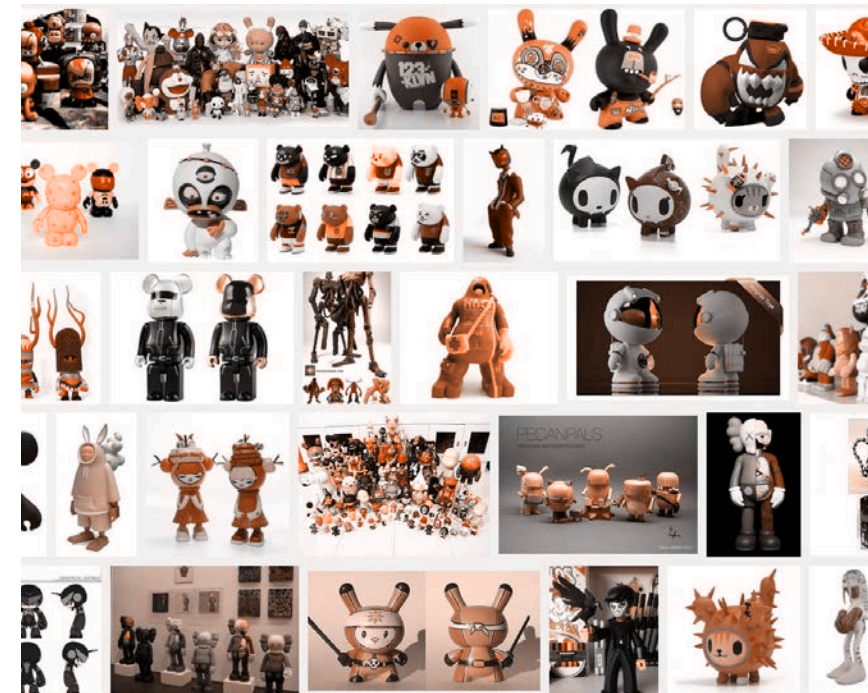
Designer toys became a medium for artists to design and sell "affordable sculpture" to everyday folk in limited runs. Even though one figurine maintains a single expression, a collection can display a spectrum of attitudes.

I decided to design an art toy figurine that was fixed to one expression or character, but opened itself up to infinite identities and back stories. I decided to stick with only a moldable head because it is the fastest way to create an identity. Players may grow frustrated and tired of sculpting a standing body every time, so I removed that option from the toy, focusing on just the head. The nondescript body language allows for open interpretation of what the stance is saying: it can be smug, shy, relaxed, or impatient. The open ended body echoes the personality in the character's face.

Gator (left) actually likes waiting tables because of the leftover french fries.

Maggie (right) was the original Gerber Baby's stunt double turned understudy.

Norman (left) takes his driver's test every year and no one can convince him otherwise.

FINDINGS

I tested the Blob Squad with middle schoolers in an art class setting. In a group of four or five students, I gave each one a figurine ad told them they have 3 minutes to make any character they wanted. After the time was up, I gave each student an index card and asked them to write down bits of information to give their character more personality. We presented each character to the group, giving time to ask questions.

In later rounds of testing, I brought the characters together and asked the group to collectively build a story around their creations. I became the mediator for creating the network of stories, asking questions like "How do these guys know each other?", "Why don't they like about the other?", "How do they resolve these issues in order to stay friends?"

I found that whatever stories the students told, parts of their personal history and viewpoints leeched into their character. Some characters were very much based off their creator, as seen in their liking of pizza, and dislike of school. Other stories were fantastical and wacky: secret agent cats, scarred faces, and eyes that only saw the color orange. It did not matter if the stories and sculpts met a standard of quality, what mattered was that the creators were given a chance to easily explore and express their creative thinking. Blob squad helped form the basis of my thesis explorations in DMI, and I see it as a project with a lot of potential in developing different play personalities, depending on how you play with it. Some students liked to focus on the clay sculpting aspect (kinesthetic/active play), while others flourished when it came to writing back stories (imaginative play).

Blob Squad Lineup (from left to right):
Tim Can, Fried Potato Head, Hot Dog Head, Timmy.
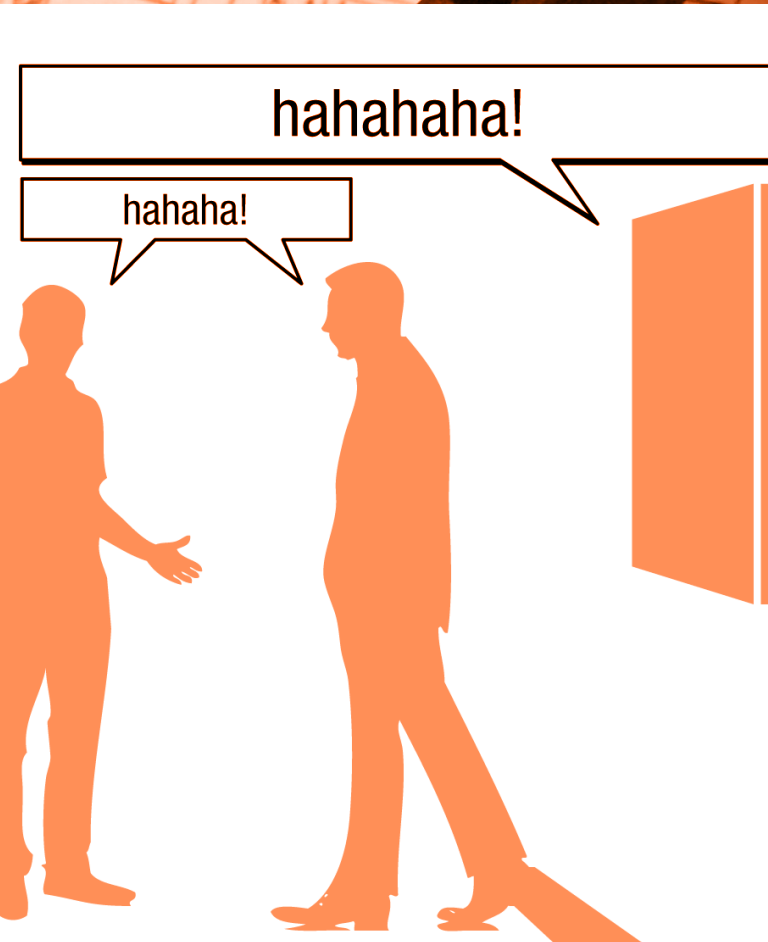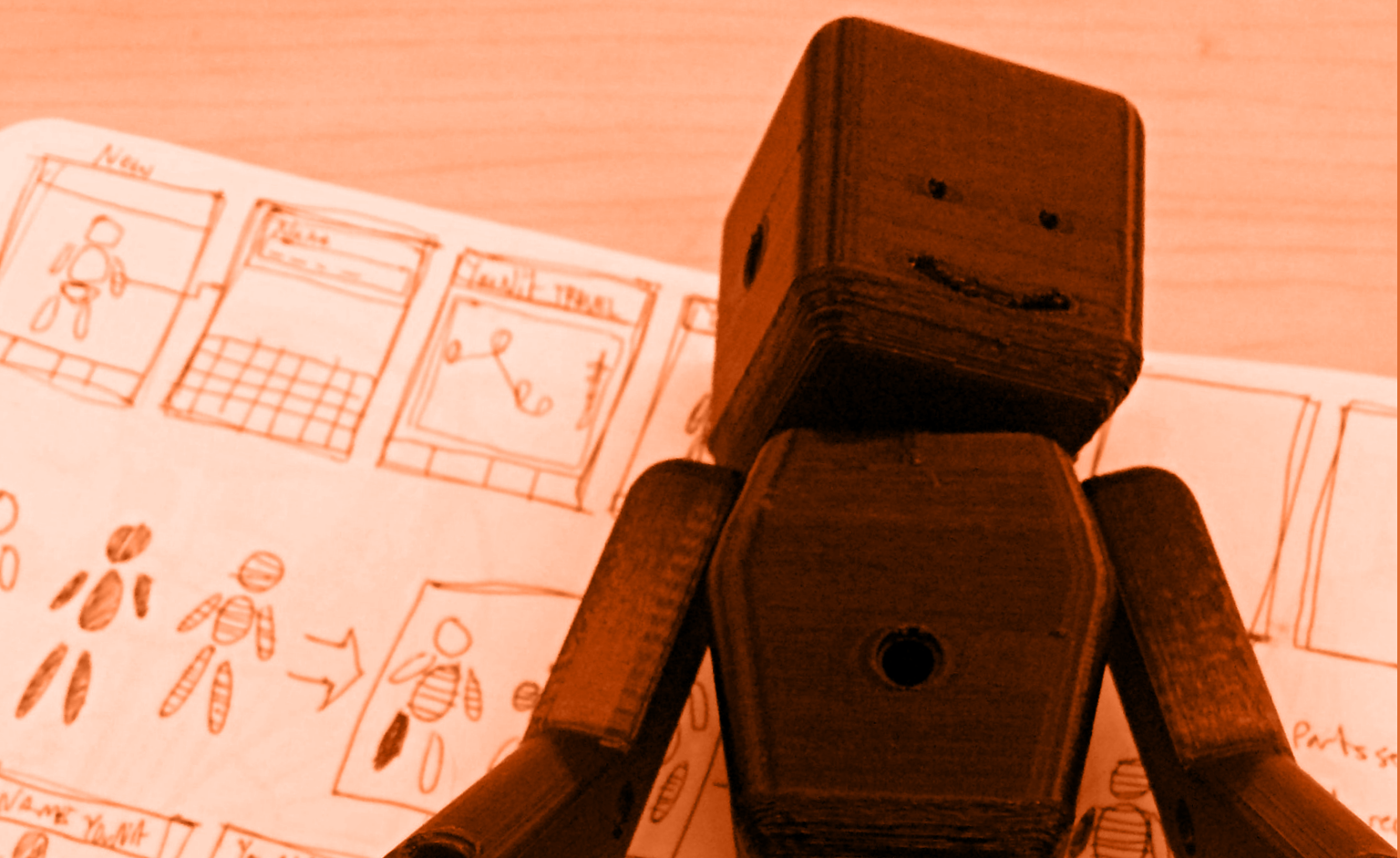
"*Play is a balance between discovering and constructing our own identities, while interacting with others doing the same.*"

CONCLU-SION

THESIS DIRECTION

During my time at the Dynamic Media Institute I have focused on designing and researching playful interactions that encourage people to expressively share and think creatively.

I believe that play is central in the creative process, and engaging with the world in a playful way allows people to make meaningful and lasting connections. Drawing from my experience in improv comedy and my interests in toy design, I designed, tested, and analyzed ten projects that investigate the connections between the systems we play with and the creative results we can produce through playing within the system. Here are some things I have learned in the past two years…

CREATIVE ENVIRONMENT

Throughout this thesis process, I worked to clarify for myself what it means to be creative, to try and crack the code to unlock my creative potential. It turns out that creativity is as much a combination of external factors as it is an intrinsic skill that we can cultivate. A creative environment can vary depending on the situation, from the materials we have to play with, to the time we are given on a project, to whether there is any project at all.

It feels good to know that I can be creative without trying, but pursuing and making the ideas real takes dedicated work.

There is no shortcut to hack a creative brain, all it needs is perseverance, and an environment conducive to creative thinking. People don't like to mess up, and so if we make it harder to fail and easier to start over, people are more willing to make decisions and take creative risks. The objects and experiences I have designed attempt to lower the barrier to entry into a creative environment, by providing materials and systems that players can use to develop their own creative ideas.

Owning running shoes does not make you healthier, but they are designed to make running a more comfortable experience. In the same vein, my projects are designed to make creative thinking more accessible and the making process more enjoyable, but players need to use them regularly in order to build their creativity.

THREE TRAITS OF AN EFFECTIVE CREATIVE

However, creativity as a skill can be exercised in all environments, regardless of their limiting factors. I see creativity as the ability to make something new given the things we already have. Even though my whole thesis dealt with designing for creativity, developing a creative thinking mindset starts with a change from within. Through my experience in comedy and design, I have noticed common skills that have helped shape fulfilling creative endeavors. Design and comedy are beautiful disciplines that strive to combine unlike topics into an intuitive and elegant delivery. Finding this delivery takes a lot of tinkering, experimenting, and testing, often performed through the act of play.

This idea was inspired by Boston comedian Baron Vaughn on his podcast 'Deep Shit'

An effective creative is willing to learn.

Without a natural sense of curiosity, we would not evolve as a culture or species. Exercising our curiosity fuels creative exploration. A successful designer requires a lot of research to support their design decisions, and a successful comedian needs to be observant and open minded to find the humor that relates to the audience. Being open to new ideas jump starts the creative process, especially when it is combined with the things we already know. When we are curious, everything becomes an opportunity for exploration and play.
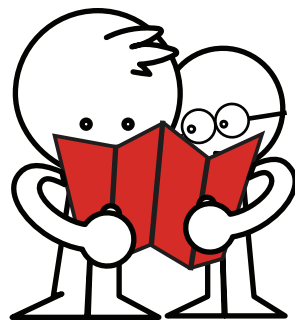
An effective creative is willing to work.

In the creative field, work is carried out through researching, iterating, and refining our product until it satisfies an objective. Experimentation and testing can be defined as play; in that the creative imagines new possibilities within the existing system, and pushes the boundaries of their design. Work becomes play when we fully embrace the system and lose ourselves in the activity we partake in. Play allows us to take ridiculous things seriously, which is an important attribute for those whose function is to create things that do not yet exist. When we play, we are allowing ourselves to fully commit to the game, and we often find ourselves in unexpected situations after being carried away by our imagination. This aspect of play is a double-edged sword when it comes to executing projects in a timely manner.

Setting constraints for our work helps to focus our creative efforts, by reducing the risk of distraction and increasing our mastery over the system we implement. Play prospers within the right balance of rules, and we enjoy submitting to these rules if it gives all the players a fair chance at fun. Breaking the rules, or simply working without guidelines can lead to a shallow or disappointing experience. I have had projects where I applied hardly any structure and flimsy creative direction; the final result consisted of disparate concepts that weakened the composition as a whole. An improv scene falls apart when the players do not support the overall direction of the scene, or when players' intentions are not communicated clearly. Creating realistic goals for ourselves enables us to quantify our efforts, and we are then able to compare new work to what we have already achieved.

An effective creative is willing to share.

Ideas always sound better inside our heads, but in order to evolve, they must be realized and tested in the world. Sharing ideas with others accelerates the creative process because we are introduced to new perspectives that inform and refine our creations. On the receiving end of ideas, we need to be critical yet supportive of the creator's endeavor, in order to elevate their design and propel them to improve. Comedians constantly refine their practice to be as clear and funny as possible, which is achievable only by sharing their work with an audience. Sometimes the potential merits of an idea are not recognized until an outside perspective points it out. In a scene, improvisers work together
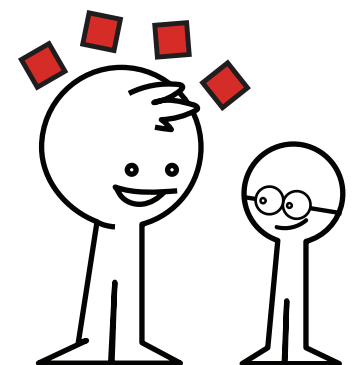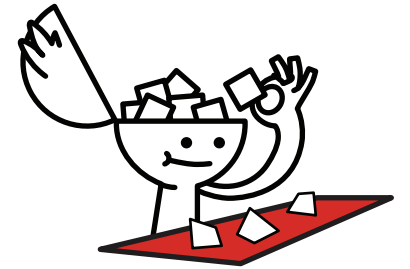
to share ideas with the audience, and if someone blunders, the team rushes in to justify that action as if it were intentional. Naturally, playing with others teaches us how to socialize and empathize with our fellow playmates. A network of observing others, sharing ideas, and encouraging creation over time builds trust and empathy, essential characteristics of a creative community. An effective creative team is one where all members freely share and freely trust each other.

THOUGHTS ON PLAY

Good play design facilitates the novelty/mastery continuum. We engage with a play system for its novelty, and through repetition we master a certain activity. After the novelty wears off, the player is allowed to test what they mastered in new situations to produce more novelty, and the mastery of a new system commences. The novelty/mastery continuum is how we naturally learn, observed in activities such as throwing a frisbee, stacking blocks, or testing out a strategy in chess. Play is a balance between finding something new and appreciating the familiar, which allows us to adapt the things we already know to things we just discovered.
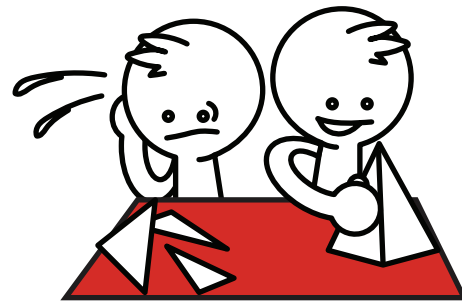

Play is a cycle, play is the process.

When we start to think about the benefits of play, it is easy to typecast play as the newest trend in increasing productivity in the classroom and workplace. However, play is more than a tool for entertainment and self-indulgence. I am arguing for a critical consumption of interactive media, that players should have more say in what they choose to make or do with the things they consume. We engage in playful behaviors because they are fun, but through consuming and experiencing the fun, we should be aware of the reasons why we engage in the consumption. Periods of play and creation are naturally followed by periods of rest and reflection. But lately, I find that rest and reflection

are being replaced by feelings of restlessness and distraction, spurred by interactions that celebrate amusement over appreciation. Ideally, playing with anything should bring a newfound appreciation for it. But in reality, we treat play as a way to save ourselves from an awkward silence, or melancholy boredom.

The creative potential in play comes from our desire to see everything as a building block when we play. Play is the great equalizer, playing with ideas, objects, or people suspends their preconceptions. Once these things are separated from their respective contexts, they can be viewed as a collection of equally important features, with their own potential for unlocking new realities. A brick becomes a doorstop, a couch is transformed into a cushion fort, a stock image turns into an internet meme. When everything is treated as an equally important module for experimentation, we can more easily conceptualize new forms that challenge convention. Play celebrates all aspects of an object or system, not just the functional parts.
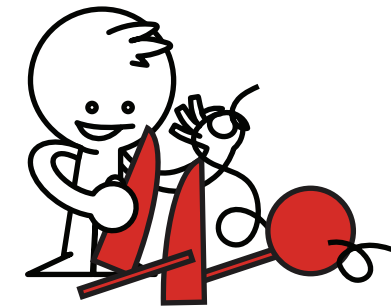
As players, we are able to separate ourselves from the context of everyday life, and sacrifice our judgment in order to become a part of the play activity. Play is selfless, we give ourselves up to play and we enjoy doing it. Being selfish or ironic hinders our ability to be playful, because we value our image or status over the shared experience of participating in something bigger. In order to play with others and fully engage with the world, we need to contribute our time, energy, and ego. Team sports and improv groups are made up of individuals committing themselves to playing modular roles in order to accomplish a larger collective goal.

THOUGHTS ON PROJECTS

Every project has a bit of each section embedded with it, showing that these categories are not really divisions, but in actuality they are different frames to approach the nebulous concept of play. As much as the Doodle Maker utilized unexpectedness to generate creative ideas, there was a creative system implemented to allow for these random shapes to work together. What players drew on top of the shapes was entirely up to their personal expression. Each section of this book puts a spotlight on specific aspects of play that I felt spurred creative thinking: Unexpected Fun, Creative Systems, and Building Ourselves.

Out of the ten concepts in this thesis, four were digital experiences, four had physical and digital components, and two were analog products. Designing for physical and digital interactions comes with its own set of challenges and opportunities. Physical objects are always 'on,' they provide immediate feedback and appeal to our sense of touch, sight, sound, and smell. It was easier for players to share and observe physical toys, and because they existed in three dimensions, they formed a connection with their surroundings, transforming the space into a playful arena. Projects like Blob Squad and Modulus brought players together to interact and share pieces, and encouraged using the room as another variable in changing the ecology of play.

Digital toys like Doodle Maker and TwitterBot use computation to randomize and accelerate idea generation. Virtual connectedness takes advantage of the web to instantly distribute information to the public, and the digital byproducts of these interactions are readily available to share online. Because the play components are contained within a screen, the play activity tends to disconnect from its surroundings, enveloping only the players involved. Tylo converts an analog puzzle into a digital experience that is more personal and portable than the original. Digital toys are not as dependent on context because it is easier to reset, relocate, and revisit experiences than their physical counterparts.

When designing an integrated experience, I wanted to take the depth of physical play and blend it with the wide breadth of digital interaction. The Random Inventor Game and YouNits merge the rich tangibility of the handmade with the complex variability of the digital program. The RIG app keeps a history of our drawn ideas while offering opportunities to design new products. YouNits take the action figure and the doll, and turns them into tools for representing our complex identities

and relationships. The Motion Paint project translates our physical motions into beautiful patterns, challenging us to move differently. Players are brought together by a shared physical space, and the digital play allows them to experience their world in different ways.

LOOKING FORWARD

I hope that these projects establish the foundation of my exploration into designing creative tools. Although each product can stand alone as a commercial toy, I envision them to be just as useful in an office or classroom as they are in a domestic setting. The role of toys is not limited to children at home, they can be modified to exercise creativity and gather diverse perspectives in various settings. Especially in a digital age, the creative environment is mobile: we can create new possibilities within the devices we carry everywhere. I see my products as proto-prototypes: platforms for developing new ideas and systems, an auxiliary brain to organize and randomize the bits of information we input. Play is a necessary element in creative work, it allows unrelated things to bump elbows, and turns mistakes into opportunities. We need play to stay both flexible and sharp, and digital toys help us understand our own abilities to affect change in a digital landscape. My projects are all about how we can make it easier for others to make something. Just as we use a hammer, screwdriver, wrench to build or fix our surroundings, we need digital literacy and interactive tools to navigate the digital world.

I look forward to practicing more improv comedy as a way to keep my mind elastic, and to help me not take life so seriously. As a designer, I will continue to use play as an integral part of my creative process, and to develop new frameworks that question how we think. As new technology opens up new worlds to explore, I aim to find new ways for others to express themselves by making new things, to reveal our evolving humanity through play and creativity.
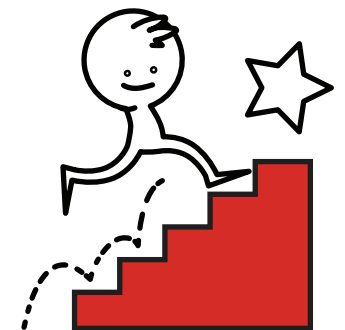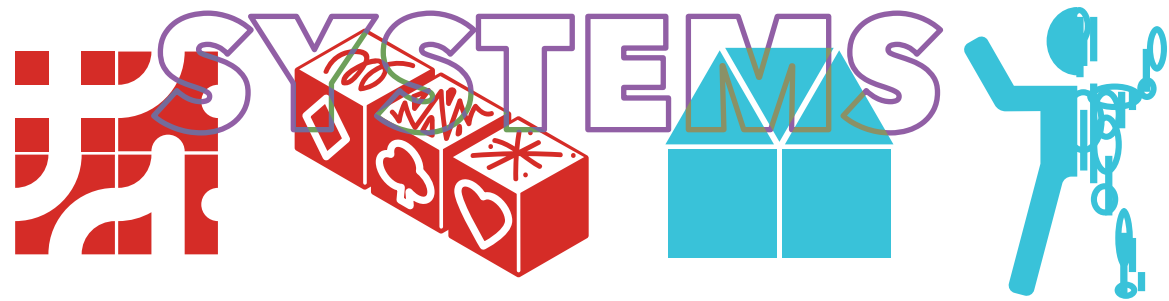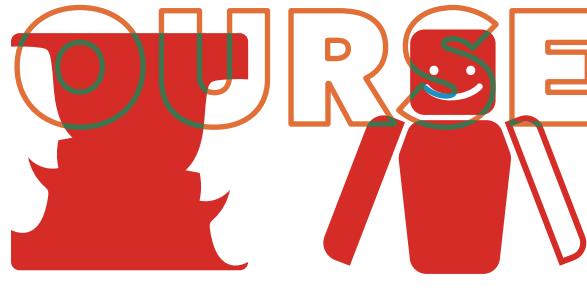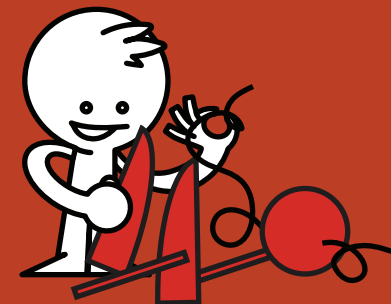
UNEX-PECTED FUN
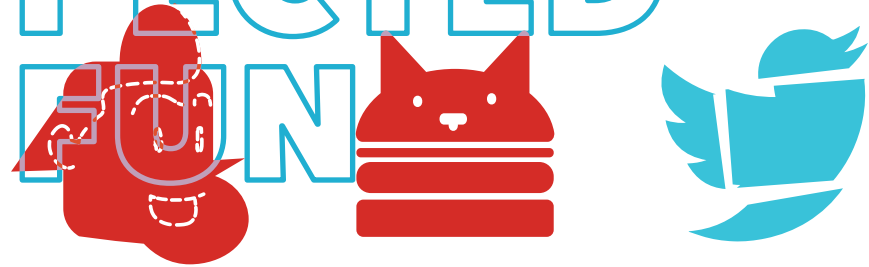
CREATIVE SYSTEMS

BUILDING OURSELVES

"Design and comedy are beautiful disciplines that strive to combine unlike topics into an intuitive and elegant delivery."

Appendix-
Digital Analogs

This paper details the transition of construction toys from their analog forms to expanding into the digital dimension. I felt that the subject matter is relevant to my thesis writing: construction toys of the times reflected how we valued creativity in our children, and the different materials these toys were made out of afforded different systems of construction. Structure, play, creativity, and the designer consumer relationship all evolved in tandem with new manufacturing and dynamic media innovation. The research I conducted for this paper helped me clarify the relationship between toys, creativity, and play in a historical context.

EMPOW-ERING THE SPACE OF PLAY:

CONSTRUCTION TOYS FROM ANALOG TO DIGITAL FORM

INTRODUCTION

Anthropologist Brian Sutton Smith says this about play: "[Play] schematizes life, it alludes to life, it does not imitate it in any very strict sense."

(Fanning, Mir, 2014). Creativity has been a highly prized trait in individuals, indicative of insightfulness, originality, and inventiveness. Children are recognized to be exceptionally and naturally creative; creating and adapting in their play activities are signs of a productive personality. Educators, parents, and children themselves have seen the potential in play as a learning experience, and have used this activity to develop more effective learning environments (Ogata, 2013). Parents wanted their children to believe they were capable of growing up to be an engineer, designer, or creative thinker. As a result, they bought their children toys that playfully developed skills required to be a well-equipped individual. Toys are not a direct translation of reality, yet we can see society's evolving attitudes about learning and creativity through the different types of construction toys through the past 180 years (Lauwaert, 2009).

The purpose of this paper is to track the history of construction toys from analog to digital form, and to map out the underlying philosophies of creativity and learning that reflect these objects. Construction toys enable users to exercise their creativity and develop a deeper understanding of their physical world, through playful acts of assembly, disassembly, and experimentation.

Each new technology provides new ways to build and create. Construction toys are tools that channel and amplify our curiosity and creativity; they give users the power to affect the space they occupy, be it physical or digital.

Construction toys have always brought about a sense of empowerment and agency over the space in which they inhabited. The shift from problem solving to creative thinking signaled a change in educational attitudes, especially in America and Europe during the years of the Cold War (Ogata, 2013). Embedding a creative thinking mindset as opposed to a rigid problem solving state of mind reflects the Free World's ideas of individuality being a core tenet of Democracy. This

mindset recently reemerged when Richard Florida classified the "Creative Class" as a socioeconomic group that requires filtering large amounts of diverse information in order to complete their jobs (Ogata, 2013).

What Is a Construction Toy?

In its initial commercialization in the early 1900's, construction toys were defined in a more narrow sense, comprising of wooden, metal, and or plastic units replicating architectural and mechanical elements so as to recreate those structures on a smaller scale (Lauwaert, 2009). This emphasis on a more literal view of construction limited these toy sets to scaled down versions of buildings and vehicles, rarely venturing into an imaginary realm.

Top: Mouse Trap uses construction as part of the play, but is considered a game because of the rules attached.

Below: A model is made of different parts, but the product is not taken apart after completion.

Broadly speaking, a construction toy consists of smaller modules that can be assembled into a larger system, where the act of play is in constructing, exploring and deconstructing. This has been the foundation of what defines a construction toy, and the objects that will be discussed in this paper are in line with this basic principle. There is a strong emphasis on the process of creation and open exploration, and playing with a finished product is only a part of the play cycle. The idea of the user being self sufficient, even in constructing their own entertainment is self evident in this movement.

Firstly, a construction toy is not a game. Games come with a predetermined set of rules associated with the play, where there is usually a definitive end resulting in a 'win' or 'loss.' The gameplay is defined by the rules, which was made by the creator of the game. A toy on the other hand, stands as an open-ended product, with the play interaction being defined by the user. The user can establish his or her own rules with their toy to make a game, but it is important to note that these rules do not completely define the play. A construction toy contains its own rules of connecting to other modules, but invites users to assemble those rules into their own arrangements. A core element of construction toys is giving the user the ability to use the toys to conduct their own experiments and aid discovery.

Secondly, a construction toy is not a toy model. While a model is similar to a construction toy, in that it comes with pieces to be assembled into a larger object, it comes with a limited outcome of creation. Model pieces serve one or few functions, leading to an end product that functions with limited results. Once the model is built, it stays built. However, construction modules are created with multiple points

of connection, and it is encouraged to reuse the pieces and create something beyond the instruction manual.

Thirdly, a construction toy is not a puzzle. Although these also come with smaller pieces needing to be put together or taken apart, the goal and challenge of puzzles is in finding the correct way to arrange or deconstruct the pieces. Puzzle pieces are made to fit into specific and limited arrangements, purposely made to challenge the user in decoding the construction. Construction toy modules are intuitive in their connections, and should connect with most other pieces in the same friendly way. Construction toys are intended to facilitate many different iterations using the same pieces, and the play act is in rearranging elements.

Parlor Puzzles are made to fit in a certain way, and the intention is for players to construct and deconstruct the pieces in order to 'solve' the puzzle.

Constructivist Theory

Constructivism emerged in the late 19th to 20th century, and held that "the child explores and adopts to the environment by coping with everyday challenges" (Hoorn, 2015). Constructivism is a theory of child development that states the child is an active force in teaching themselves about their world, effectively capable of influencing both nature and nurture. According to Jean Piaget, children learn about the world through "assimilation and accommodation". Assimilation occurs when the child incorporates new information into their mental models of the world. Accommodation is when the child changes their mental models in light of new information. In the act of play, both processes are used in a fluid cycle, which develops a healthy and active mind.
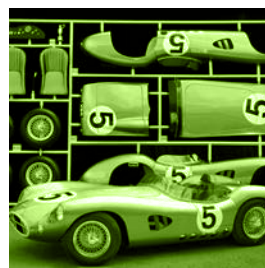
Lev Vygostky was another constructivist thinker who came up with the idea of a Zone of Proximal Development, or ZPD. He wrote "children performed beyond their usual level of functioning when engaged in the social and cognitive collaborations through with this zone" (Hoorn, 2015). The ZPD is essentially an area of heightened learning and shared reality, co-constructed by the players and sustained by established rules. Vygotsky argues that the best learning experiences are achieved in the ZPD, where the play environment strikes a unique balance between challenging yet engaging (Hoorn, 2015). Assimilation, Accommodation, and ZPD's are observed through all phases of construction toy play, although with varying levels of utility.

We create ZPD's when we perform improv, calling it a Group Mind.

A BRIEF HISTORY OF CONSTRUCTION TOYS

Rigid Connections

From 1830 to before World War II, construction toys are still in their infancy, and their creators had a narrow view of the purpose for a construction toy. An adherence to a learning curriculum and a more literal translation of construction gives the title for this period: Rigid Connections. For example, in the British toy trailers magazine games and toys from July 1914 we find the article Construction Toys of Merit stating:

"WE LIVE IN THE AGE OF CONSTRUCTION TOYS.... ONE THING STANDS OUT FROM THE GREAT BOON AND THAT IS THAT THE AVERAGE BOY OF TODAY IS A TOY WHICH IS NOT ONLY A TOY, BUT ONE WHICH HAS AN EDUCATIONAL VALUE ATTACHED TO IT." (LAUWAERT, 2009).

This shows the emphasis placed on advancing educational learning, rather than developing creativity.

Friedrich Froebel was credited with starting kindergarten in the late 1830's, integrating toys into his curriculum to systematically expose young children to different aspects of the physical world. He referred to his toys as "gifts." The first gifts comprised of simple wooden cubes, spheres and cylinders, so that they can learn how they look and feel. As the children grew older, they are given more complex gifts to show more complicated and abstract processes. Eight small cubes can be stacked together to make a larger cube, a basic illustration of smaller pieces combining to form a large whole. Froebel believed that children should form their own questions about the world and encouraged them to explore through playing with his toys (Fanning, Mir, 2014).

Maria Montessori was an Italian educator in the 1920's, who also devised a progressive curriculum based on object-learning and full immersion for a richer learning environment. She believed that the best way to learn is to actively engage in activities, using multiple

Wooden Blocks were an important part of Froebel's teachings.

senses to gain a fuller understanding of concepts. Adult supervision was in a guiding role, rather than a teaching role, as in Froebel's system. She developed her own set of building blocks for the classroom (Fanning, Mir, 2014).

On the commercial end of construction toys, building sets such as Meccano, Erector, Tinkertoys and Lincoln Logs became widely popular in Europe and America starting in the beginning of the 20th century.However, "most construction toys center [at this time] on urban design: building houses, bridges and other architectural constructions" (Lauwaert, 2009). The more complex Erector and Meccano sets contained motors and gear trains to make moving parts for cranes and automobiles. All of these sets rarely ventured outside the bounds of the mechanical and civil engineering idea bin, with the exception of a sci-fi robot or rocket ship.

While the Froebel gifts and Montessori toys encouraged children to use their imaginations and explore abstract concepts, the commercial building toys were seen more as teaching tools for engineering and not entirely billed as "creative toys," as seen in the next section.

The slogan "Engineering for Boys" did not age well.

Play should be inclusive, and toys should be accessible all genders and backgrounds.

Plastic Creativity

In both Europe and North America larger efforts to restore domestic tranquility informed the widespread study of 'good toys.' The idea of a "good toy" is one that leaves a positive impression on the player, improving a useful trait or skill such as creativity or dexterity. Designers and psychologists alike believed abstraction and simplicity in children's things encouraged the child's imaginative powers, qualities similar to the simple wooden blocks of the past period (Fanning, Mir, 2014). After World War II, many of the factories that were used to create munitions and other accessories of war converted to making domestic and consumer goods with new material innovations, mainly plastic. Because plastic does not need to be harvested or sanded like wood, and comes at a fraction of the weight and cost of metal, it became an ideal material for making toys. The ease in which different shapes could be made with plastic brought about another toy revolution, bringing innovative ways to connect pieces, past merely stacking wooden blocks or meticulously fastening metal struts with nuts and bolts.

The creators of toys such as LEGO and the Eames Toy employed colorful plastic and embraced the idea of creativity to bring construction toys into its golden age. The popularity of construction toys was such that it transcended the bounds of the classroom curriculum, and the importance of developing creativity in children became widely accepted in American and European markets. Ole Christiansen originally developed the plastic LEGO brick in 1949, which was relegated to making houses (Robertson, Breen, 2013). Once LEGO developed the iconic automatic binding brick that held pieces together more securely than before (figure 2), a whole new variety of ways to attach the bricks led to an explosion of different forms that could not have been built before. In 1955, LEGO introduced their "System of Play" which encouraged users to mix their sets and create new ideas that went beyond the box illustrations (Lauwaert, 2009).

Charles and Ray Eames were industrial designers and architects that purposely designed construction toys to not resemble everyday objects, instead placing the focus more on the process of creating, as seen through their aptly named "Toy" and "House of Cards" and "Do-Nothing Machine." By removing the need for these products to resemble real-life counterparts, these toys eliminated a "right" or "wrong" mindset when comes to building (Ogata, 2013). Because plastic was so light, larger structures could be built and handled by children with little assistance. Whereas the building toys of the past period repli-
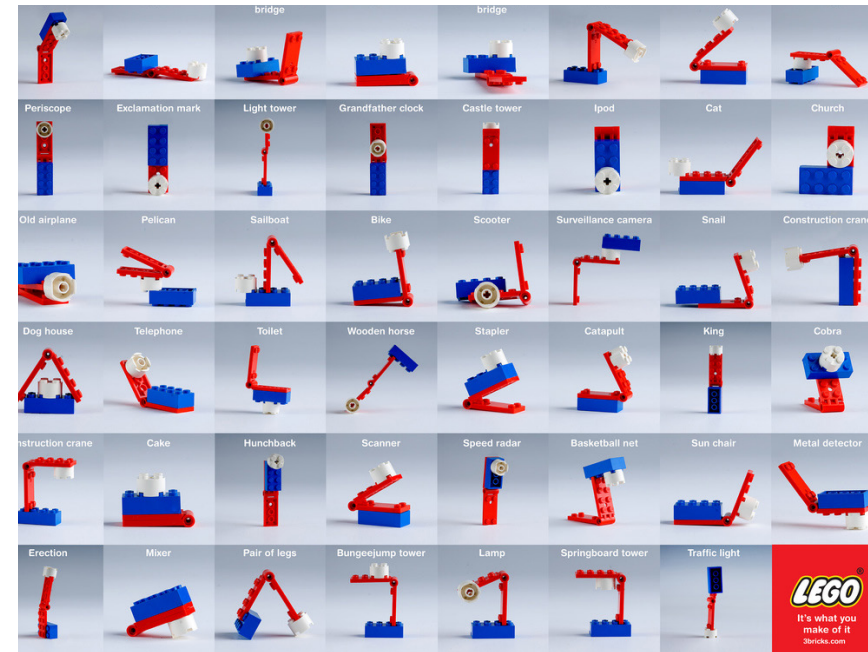
Using only three Lego pieces, you can create dozens of unique designs representing vastly different ideas. Thanks Plastic!

"Take your pleasure seriously"

Ray Eames constructs a tower using the aptly named Toy.

cated scaled down versions of buildings, the Eames Toy facilitated the building of structures larger than the user. This development brought the user into another level of immersion in construction play, instead of merely imagining themselves inside the environment of the toy. This level of immersive play becomes increasingly important in the digital era.

The construction process itself was the product of these toys. Brightly colored, easy to assemble, and beautiful in all configurations made the building process all the more accessible to children and parents alike. Instead of focusing on building to strengthen engineering skills, these construction toys emphasized experimentation and reiteration to develop creativity in a domestic setting. A guide to architectural toys in the magazine Progressive Architecture argued,

A focus on the process and experimentation is essential for developing a creative drive. Imagination was needed because play activities leaned more to Indoor settings.

"PROCESS BECOMES AS IMPORTANT AS A PRODUCT IN A CONSTRUC-TION TOY...THE LAST THING THAT CHILDREN NEEDS IS A TOY WITH UTTER REALISM" (FANNING, MIR, 2014).

It was the common belief that although not all children are built to grow up into engineers or scientists, they were capable of using creativity, whatever career path they choose (Ogata, 2013).

Digital Dimensions

Historians of childhood and children's toys have argued that the toy industry in the latter half of the 20th century gradually moved away from the class of creative playthings that appeal to parental notions of tradition and educational value.

By the year 1980, personal computers were a common household item. Analogue technologies were increasingly being digitized, and games and toys were no different. These new digital construction toys introduced a new dimension of assembly, namely using time and programmed actions as units of creation along with digitized shapes and blocks. One of the first digital construction toys was the Pinball Construction Set (1983), which allowed users to make and play with their own pinball table configuration. Using a simple drag and drop interface, players can arrange bumpers, flippers, and ramps, as well as assign sound effects to different parts to make a unique pinball game. Bill Budge, the creator of the Pinball Construction Set, also created video games where you can create your own dungeons to explore and quests to fulfill. Most of the play cycle happens in the construction phase of environment, and the playing of the actual game is seen more as testing and refining the user's creation. The idea of success in this toy is not winning the game the user created, but in constructing and learning from a new experience.
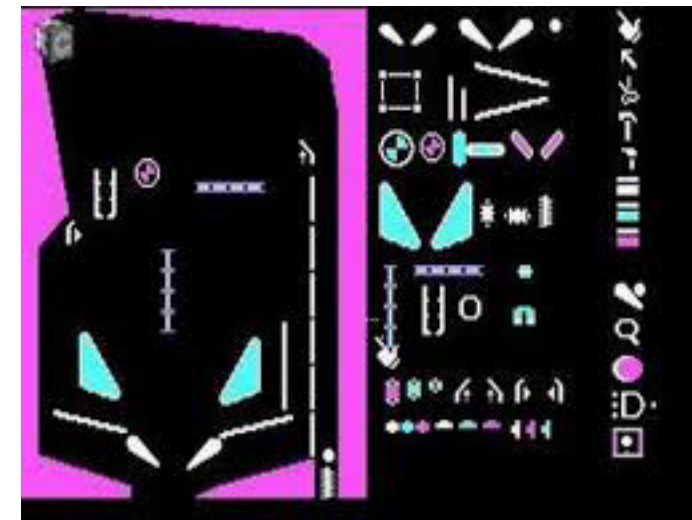
The Pinball Construction Set by Bill Budge (1983).

In 1989, Will Wright created the first SimCity, which he himself calls a digital toy rather than a video game. In this program, users build a computer simulated city, with roads, buildings, and terrain as the building blocks. While a lot of players try to build a city that is deemed successful in reality, in that it has low crime rates, a healthy populus, and sustained economy, the idea of a successful project is up to the creator (Lauwaert, 2009). Some may want to build a prosperous metropolis, while others find enjoyment in destroying one. All players are able to construct their creations in a way that fits their own creative style and facilitates creative experimentation. Will Wright cites using time as an important element in changing the way users see the world through playing with his programs. By giving users time as another element to control, they are able to experiment in ways that could not have been accomplished with purely physical construction toys (Wright, 2007).

Minecraft is an increasingly popular digital toy where users mine blocks of material to craft and create different tools and building structures in their vast unlimited environment. A large appeal to Minecraft is its Free Play mode, where users are free to build whatever they like with unlimited resources and unlimited space. A large appeal to Minecraft is the unlimited space in the virtual world, so there is no limit financially and physically to how big are these creations can be. Users pay a flat fee for unlimited virtual space, which is very unlike the normal toy market, where bigger toys cost more money and take up more space. Minecraft has multi user capabilities, which allows students to chat and build simultaneously, facilitate collaborative construction of knowledge. Such multi-user capabilities allowed teachers to build educational experiences that incorporate critical thinking, group problem solving, creativity and conflict resolution skills. Beyond the confines of the virtual world, social learning activity has evolved in response to the game itself - within the communities that have formed around it, the plethora of instructional websites and the sharing of build resources (Fanning, Mir, 2014).

The use of Minecraft as an educational tool brings to mind Vygotsky's zone of proximal development, where users are established in the shared space in a shared reality and abide by the same rules to cover the same challenges. A big difference though, is that in Minecraft the shared environment is not imaginary, but entirely virtual and up to the program and facilitator to develop that space. This established shared space does help with facilitating collaboration, exploration and standardizing the experiences that all players receive in the virtual world. (Fanning, Mir, 2014).
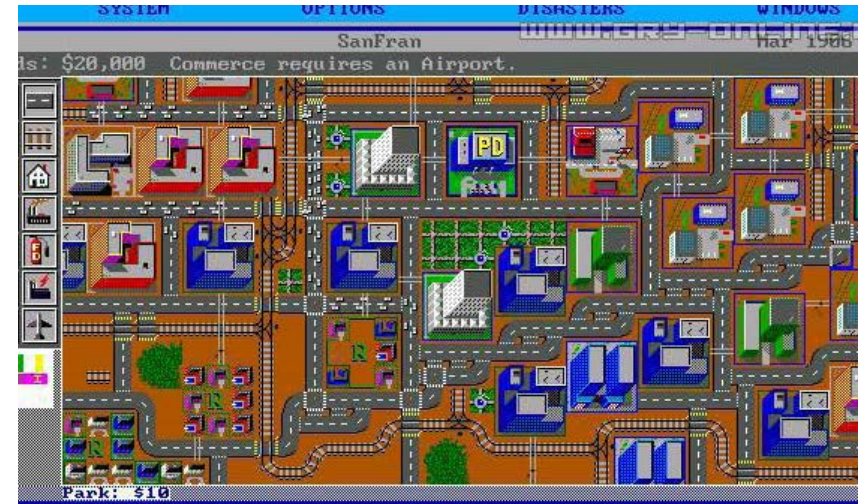
Sim City (1989) allows players to build a city, and watch how the program changes it over time.

Minecraft (2010) creates an open world where players can mine elements from the environment to build new tools, buildings, and food.
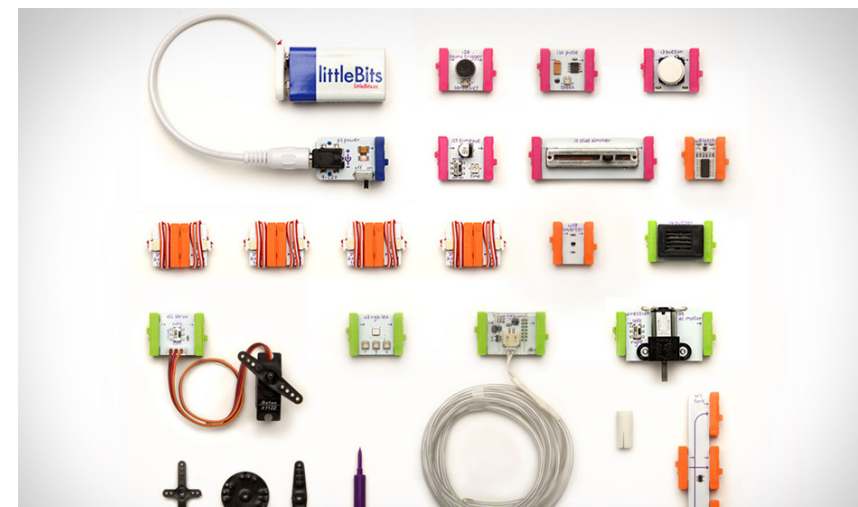
littleBits (2011) are modular electronics that make it easy for players to design their own circuits.

While digital toys like Pinball Construction Set, SimCity, Spore, and Minecraft exist solely in the digital realm, there are also construction toys that integrate physical and digital parts, such as LEGO Mindstorm and LittleBits. Mindstorm sets contain a 'smartbrick,' which is a 32 bit minicomputer and motor that computes information from a controller or sensor and performs actions based on certain feedback. The programming language reflects the concept of a physical LEGO brick, in that blocks of code can be attached to each other to build a more complex digital program, which is carried out by the Mindstorm robot (figure 6). LEGO Mindstorm attracted a strong following in older LEGO fans, most notably known as the AFOL, or Adult Fans Of LEGO. AFOLs became a tight knit community through their sharing of ideas and creations on LEGO web-based forums and chatrooms. These AFOLs were important in helping LEGO reset their priorities and principles in the late 1990's, by sharing with company directors what they loved about LEGO and what they expect to see LEGO do for them as loyal customers (Robertson, Breen, 2013). This is a prime example of how a strong relationship with the customer can decide a product's success. The internet is a powerful tool in maintaining that bond (Lauwaert, 2009).

As these toys shifted into the digital realm, the internet provided avenues for users to become more vocal in the product development process, as well as more social in the networks of play. The internet provided an incredible platform that fundamentally changed the relationship between makers and consumers of construction toys, bringing users into the same product development cycle as the creators. The importance of the power of many grew exponentially to the point where the periphery of consumers could not be ignored. Developers became increasingly aware of passionate and vocal fan groups online, sharing ideas, and creating their own modifications to the product. The increased socialization allowed for more opportunities for collaborations in both the physical and digital space (Lauwaert, 2009).

Open Source and Accessible Technology

The idea of open source is having an open dialogue where anyone can contribute to the development of a product, through appropriating source material and adapting it to unique interests. The original developers have to sacrifice autonomy over the project and have faith that passionate users can generate innovative developments to further

interest within the periphery of users (Lauwaert, 2013).

Extending beyond the realm of play and toys, open-source technology and strong networks of passionate users helped to bring about a new hobbyist revolution in the form of the Maker Movement. Within the Maker Movement, passionate crafters, engineers, and artists convene in a shared workshop, where they learn how to use tools, share ideas, offer feedback, and socialize with fellow makers. Many of the core principles of the Maker Movement are very similar to the values held by construction toy developers and constructivist thinkers, such as the importance of making, sharing what was made, learning through making, playing and discovering, and embracing change (Hatch, 2014). Creating a shared space where users were given the freedom and power to shape their immediate environment is a fundamental principle of both Makerspaces and construction toys. Although Makerspaces are guided by principles of play and socialization, they do not necessarily involve the use of toys in the creative process. Open exploration may be used in the creative process, but makers usually have specific projects they want to accomplish with the help of a Makerspace (Hatch, 2014). I would argue that a Makerspace is an evolved form of a construction play space, where the creativity and imagination developed in the latter contribute to more effective practices and projects in the former.

A maker space brings together a diverse group of people, tools, and projects. Accessibility, diversity, and passion make it a creative space.

CONCLUSION

Traditional product development models were disrupted and inverted by the use of the internet by product consumers. The users were no longer relegated to merely playing with the toys, but were elevated to the level of actual toy developer. The power of many minds building and sharing far outmuscled the minds of the creators, and the internet became a powerful tool in garnering user feedback and fostering an open source environment of user generated content in the play cycle as well as the product development cycle (Lauwaert, 2009). Many programs were offered richer experiences through open-source development and modifications. By having their feedback not only heard but also used in future releases validated the fans' time and energy spent on those programs. The idea of sharing and socializing through the web revolutionized the way players interacted with these toys. Not only were they player/consumers, but also designers/engineers in their own right (Lauwaert, 2009). Through the internet, every user has the platform to have their voice heard and their creations shared.

The way in which creators interacted with users also changed through the internet. Developers used data mining to gather large amounts of information about user sentiment and how the toy is actually being used. The periphery of users became increasingly important to developers as they were being increasingly vocal about their feelings on the products they used. What once took months and years to develop a new toy through research, development, testing and distribution now takes days and weeks for a digital program. Finding feedback is as simple as logging onto a forum, development and testing is accomplished through thousands of users contributing modifications and patches, and distribution is limited only by the strength of an internet connection (Robertson, Breen, 2013).

Even though play is generally thought of as a social activity, construction toys were known to isolate users in their own houses. Because the small pieces could get damaged and dirty outside, construction toys became primarily indoor toys.

"CONSTRUCTION TOYS ARE DESIGNED TO BE PLAYED WITH INDOORS AND WILL KEEP CHILDREN OCCUPIED FOR HOURS WHILE THEY WERE SAFELY INSIDE THE HUMAN HOME. AS SUCH, THESE TOYS REFLECT THE RELUCTANCE TO LET CHILDREN PLAY OUTSIDE UNSUPERVISED" (LAUWAERT, 2009).

When the outdoors were deemed too dangerous for children's play, indoor toys became a popular alternative to capture a child's attention. Children playing video games before the internet also suffered from this isolation. However, socialization had always been a core value of encouraging play in early childhood development. The socializing associated with digital construction toys as seen through Minecraft signals a resurgence positive collaboration in a digital space. Players are able to communicate and build simultaneously in a shared space, even if the players themselves are miles away.

Technology adds new layers of building when it comes to construction toys, by adding new dimensions to play with, as well as facilitating the imagination of complex concepts. Regardless of the technology, all construction toys are used as tools to exercise a user's creativity, facilitate in exploring their interests, and sharing their discoveries. Presently, there is a spectrum of physical and digital construction toys on the market, catering to a variety of interests, from engineering robots to designing abstract sculptures. This goes to show the general public still believes developing creativity is of utmost importance no matter what age the user is.

There are many ways digital and physical toys can coexist, and be used as tools to develop creative confidence in players of all ages.

CONSTRUCTION TOYS: ANALOG to DIGITAL

[RIGID CONNECTIONS]   [PLASTIC CREATIVITY]   [DIGITAL DIMENSIONS]

1900-1910
Maria Montessori develops school based on constructing surroundings

1914
Charles Pajean creates Tinker Toys

1945
Frank and Theresa Caplan found Creative Playthings, Hollow Blocks with Martha New

1949
LEGO uses plastic brick design

1983
Bill Budge creates Pinball Construction Set

1985
LEGO Partners with MIT to make MindStorm

1830
Friedrich Froebel develops Kindergarten and related toys to curriculum

1945
After WWII, Plastic becomes the prevalent manufacturing material.

1958
Lincoln Logs, Milton Bradley, Playskool merge with Hasbro

2010
Markus Persson (Notch) releases Minecraft 1.0

1800   1900   1950   2000

1876
Child at Play, Thomas Eakins

1932
Ole Kirk Christiansen founds LEGO, makes wooden toys.

1977
Computers become commonplace in American households.

2005
Will Wright develops Spore

1907
Frank Hornby creates Meccano sets

1920
Caroline Pratt founds the Play School, Develops Unit Blocks

1948
Arthur Ca arrara develops Magnet M Master

1950
Charles and Ray Eames design the Toy, et al.

1989
Will Wright develops first SimCity

2011
Ayah Bdeir founds LittleBits

L. Rossoni // 2015

This timeline depicts important developments and notable figures in the history of construction toys. The three sections of this paper are shown as three divisions in the timeline.

DIGITAL ANALOGS BIBLIOGRAPHY

https://en.wikipedia.org/wiki/Game_creation_system

Garrelts, Nate, Colin Fanning, and Rebecca Mir. "Teaching Tools." Understanding Minecraft: Essays on Play, Community and Possibilities. 2014. 38-56. Print.

A collection of essays on Minecraft, ranging from its spectatorship on YouTube to its use in teaching college courses. A particular chapter titled "Teaching Tools" relates Minecraft to older construction toys from the past century, aligning the game more as an exploratory toy, than a goal oriented game.

Hatch, Mark. The Maker Movement Manifesto: Rules for Innovation in the New World of Crafters, Hackers, and Tinkerers. 2014. Print.

This book details the history of the modern Maker Movement, as well as discussing some key tenets of innovation and crafting in a hobbyist environment. It lends some insight to how elements of play and open ended prototyping leech into more adult communities, as the movement gains a larger following.

Hoorn, Judith Lieberman. Play at the Center of the Curriculum. 6th ed. New York: Merrill ;, 2015. Print.

A manual for teachers and educators, explaining different kinds of play, and how they should integrate these types into curricula to develop mentally, emotionally, and physically sound children. Important chapter about Vygotsky and Piaget's philosophies about Constructivism and play centered development.

Lauwaert, Maaike. The Place of Play Toys and Digital Cultures. Amsterdam: Amsterdam UP, 2009. Print.

Looks at the cultural and sociological influence of certain toys, from LEGO to video games. Notable excerpts on Will Wright, developer of the Sims, and the shift of user participation in LEGO sets.

Ogata, Amy Fumiko. Designing the Creative Child Playthings and Places in Midcentury America. Minneapolis: U of Minnesota, 2013. Print.

This book details the history of mid-century american toys, and the cultural influences that shaped the toy market. Focuses on the toy market aimed at developing creative children, and the evolution of the educational toy into a creative one.

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A short explanation of Vygotsky and Piaget's theory of Constructivism.

"Pinball Construction Set (Game)." Wikipedia. Wikimedia Foundation. Web. 17 Nov. 2015. <https://en.wikipedia.org/wiki/Pinball_Construction_Set>.

Wiki Article about one of the first popular construction set video games. Notable inventor Bill Budge.

Robertson, David C., and Bill Breen. Brick by Brick: How LEGO Rewrote the Rules of Innovation and Conquered the Global Toy Industry. 1st ed. 2013. Print.

History of LEGO and the inner working of its business plans, from inception to present day. Notes its core values and how they held up or changed according to the market.

Vale, Brenda, and Robert Vale. Architecture on the Carpet: The Curious Tale of Construction Toys and the Genesis of Modern Buildings. 2013. Print.

This book draws similarities between architecture and the construction toys that may have inspired and influenced the designs. Useful for making connections for how our childhood fascinations may shape our adult occupations.

"Spore, Birth of a Game." TED: Will Wright. 1 Mar. 2007. Web. 15 Dec. 2015. <https://www.ted.com/talks/will_wright_makes_toys_that_make_worlds?language=en>.

TED talk by Will Wright, where he discusses his game Spore and his reasons for designing digital construction toys.

MAKE IT OURSELF BIBLIOGRAPHY

Besser, Matt, Ian Roberts, Matt Walsh, Joe Wengert, and David Kantrowitz. The Upright Citizens Brigade Comedy Improvisation Manual. , 2013. Print.

This book is a roadmap to the Upright Citizen's Brigade style of comedy improv. It provides a good breakdown of how good comedy can be made on the fly with universally important skills such as listening, observing, being honest, being a team player. I explore certain improv exercises and theories in this book, using them for inspiration for projects. I am interested in how this book can help in making the creative/design process more efficient, enjoyable, and rewarding.

Glenn, Joshua, and Elizabeth F. Larsen. Unbored Games: Serious Fun for Everyone. , 2014. Print.

A fun collection of games that require little to no extra materials in order to have fun. Many games need objects that are already found around the house, and provide variations on the rules for extra challenges or for inclusivity. I am reading this book for inspiration on resourceful ways to engage groups of people to play. Games are divided into different categories, such as indoor, outdoor, mental, sports, etc.

Halpern, Charna, Del Close, and Kim Johnson. Truth in Comedy: The Manual of Improvisation. Colorado Springs, Colo: Meriwether Pub, 1994. Print.

This book is mostly based on the Harold, which is a classic format for performing longform (story-based) improv. The Harold specializes in using callbacks, and subverting patterns to make comedy without specifically making "jokes." I love how the 3-scene structure creates a more in-depth narrative that allows the players to explore and remix characters, relationships, and bricks (ideas). The terminology of "bricks," "scaffolding," and "structure" relate back to building and Construction-ist philosophies for learning and playing.

Csikszentmihalyi, Mihaly. Creativity: Flow and the Psychology of Discovery and Invention. New York: HarperCollinsPublishers, 1996. Print.

Creativity is an elusive subject; it is hard to measure and hard to reproduce. Mihaly Csikszentmihalyi interviewed more than ninety creative people about their creative process and how their thoughts on creativity. He details commonalities in how certain conditions and mindsets are conducive to producing creative discoveries. More than the people, their peers and the system in which they work have to be receptive to new thoughts.

Leski, Kyna, and John Maeda. The Storm of Creativity. , 2016. Print.

This book breaks down the parts of the creative process that all creative people navigate when they engage in critical thinking and making, from framing a problem to producing an innovative solution. It is interesting that part of creativity is leaving things up to chance, and allowing zoning out and distractions to influence new ideas. Traditional strategies for problem solving such as linear thinking and following preconceptions make way for unlearning and lateral thinking.

Bogost, Ian. Play Anything: The Pleasure of Limits, the Uses of Boredom, and the Secret of Games. , 2016. Print.

Game Designer Ian Bogost discusses how our culture thinks about fun, play, and games. He breaks down misconceptions about what fun is, and why having fun all the time is not necessarily a good thing. He stresses the importance of boredom, as a backdrop that fun and engagement naturally springs from. He argues that when we are constantly being entertained, boredom becomes a dead-end instead of an opportunity for making our own play.
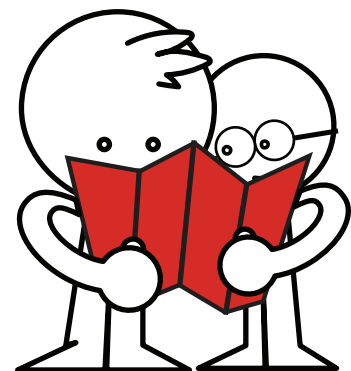
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Dr. Stuart Brown writes about the behavioral and psychological affects of play in biological and social development. He argues that play is necessary for developing social and cognitive skills humans and animals need to survive. Play is the brain's way of keeping itself flexible. Playing creates new neural pathways between different parts of the brain, making it more adaptable to new situations. He discusses various types of play, like rough and tumble play and role playing, along with different play personalities, from the jokester to the director.

Sicart, Miguel. Play Matters. , 2014. Print.

Miguel Sicart writes about how play is created in an ecosystem of people, objects, spaces, and technology. Sicart focuses on emerging technologies shifting the function of play in our lives. He writes that computers are primed for play, in that we appropriate the hardware and software for our own experimentation and expression. He makes a distinction between 'play' and 'playfulness;' the former is an act of engagement, the latter as an attitude attached to non-play activities.

THANK
YOU FOR
READING!