A Thesis About Play

An exploration of play’s influence on people in meetings.

Bridget Hawryluk
(how-er-luck)
Herron School of Art and Design
Visual Communications MFA

Lee Vander Kooi (committee chair)

Pamela Napier (committee member)

Helen Sanematsu (committee member)
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ABSTRACT

In the hopes to move forward quickly, companies and organizations select the first idea that sounds "good" and move to implementation. Instead, companies and organizations should try to beat their competition with quality ideas that will lead them to innovation. To get quality ideas, groups need to be open to the generation of a large quantity of ideas as well as ideas that are wild and unrealistic, this is divergent thinking. When the group has a lot of ideas and unrealistic ideas they can later bring them back to reality. The transformation from wild to reality is where innovation lives, and the best way to get there is to have a lot of ideas that can be transformed.

This document focuses on how context appropriate objects enable transformative play, which leads to divergent thinking. A group’s goal should be divergent thinking. When people are divergently thinking, they are thinking in a child-like way, and are not using logic or reason. The time for logic, reason, and adult-like thinking comes later during convergent thinking. Both thinking styles are needed for innovation to occur, however, this thesis is focusing on the divergent side. Because divergent thinking is child-like in nature, it can be encouraged by incorporating play in the group setting. This can be done by introducing objects to play with, thus reminding group members that they should think in child-like ways.

A human-centered, design research approach was used while working with Indianapolis businesses and organizations to study the effect context appropriate objects have on idea generating groups. The companies’ and organizations’ current strategy of generating ideas was investigated and objects were introduced into meetings to study changes that occur. Analysis of the data was performed to discover which objects had the greatest positive influence on the groups’ ideation strategy and what characteristics of the contexts influenced appropriateness of objects.

With knowledge from the contexts, other context appropriate objects can be determined for new contexts. Knowing the characteristics of objects to introduce into group settings will lay the groundwork of incorporating play into contexts to encourage divergent thinking, which leads to innovation.
PROBLEM STATEMENT

Thesis Question
How might context appropriate objects enable transformative play to encourage divergent thinking in group settings?

Sub Questions
1. What are the characteristics of a context which influences appropriateness of objects?
2. How might the characteristics of contexts and objects be integrated to show influence from the context onto the objects?
3. How might groups select context appropriate objects to encourage divergent thinking?
4. How might selected context appropriate objects be evaluated to determine effectiveness?

Relevant Definitions

‘context appropriate’ specific to the context in which the object is being used based on criteria discovered and determined from this thesis’ research: (1) the amount of space in which the group is working, (2) the meeting structure, (3) the organization’s structure, and (4) the characteristics of the group members.

‘transformative play’ free movement that shapes the more rigid structure; when trust is gained within the group, play that changes through repetition as variables of situations change in a permissive environment.

‘divergent thinking’ put things together in different ways, generate alternates, break and restructure patterns to find new ideas.

‘group settings’ settings with two or more individuals working toward a common goal in a business or organization and in need of generating ideas to solve problems or address opportunities.
INTRODUCTION

Research focus

Imagine a work setting looking for solutions to a particular problem. The leader elicits the group for their ideas to solve the problem. A scenario like this might play out:

After being called into a meeting, a group files into the conference room where they have gathered many times before. They have experienced many meetings that have been dry, dull, and depressing as their boss lectures them about problems in their company, new policies, and strategic techniques to meet their yearly goals. The room, which is large enough for everyone to move around comfortably, is equipped with a long conference table, several chairs and a noncommittal taupe wall treatment. An inspirational poster with color-coordinated skydivers showing a display of “Teamwork” graces the wall.

The boss comes into the meeting and says, “Okay folks! Let’s be creative about this and get things done!” Everyone looks tentatively around the room wondering who will be the first to make a suggestion to solve the problem at hand. The group members know from experience that this can be their time to shine or sink. If the boss likes their solution they are golden. If, on the other hand, the boss does not like the solution, they will be judged and ridiculed for the rest of the meeting and it could put their job into jeopardy. This pressure has made the group hesitant to share ideas at all, let alone ideas that could lead the company to innovative solutions.

This scenario highlights several things that can happen in a typical meeting. Often there is pressure from the boss, as well as from the group, to perform well because failure is not an option and is a waste of time. The group is only interested in “good” or “right” answers. This shutdown of creativity is not conducive to the generation of ideas that lead to innovation.

Companies and organizations need to innovate or get left behind. Two examples of companies that failed to innovate and therefore struggle to survive in today’s world of innovation are Kodak and the United States Postal Service. Both had strong business concepts and were leaders in their industry as they grew and developed in their areas of expertise. However, they failed to take the strides needed to incorporate the impact of advances in technologies. Their failure to innovate has contributed to their downfall. Now both are struggling to stay afloat.1,2

It is a common myth that innovation comes from “creative” people. This is not the belief of this researcher, nor the philosophy of the school in which she is learning and training. It is this researcher’s belief that there is creativity in everyone and almost a formulaic approach to gain access to that creativity. This creativity can be tapped which can lead to innovation. As Charles Eames said according to Ralph Caplan, design critic, “Yeah, there’s a secret [to success]. First you have an idea, then you discard the idea. Then you have fifty other ideas and then you discard them. And then you do several models, and they don’t work and you throw them out. And the secret is work, and work, and work, and work, and work.”3 This quote demonstrates how Eames used divergent thinking.

There are two types of thinking styles: divergent and convergent.4 These styles are depicted in figure one. When divergently thinking, one does not judge the options or ideas based on budget, time, physics, or even common sense. The name of the game while diverging is quantity, not quality. This thinking style should be child-like in nature and when using it people should not use logic. These outlandish ideas open our mind to a large quantity of ideas providing kernels of wildness that can become reality in innovative solutions.

In contrast, convergent thinking is the time for judgment and logical choices. This thinking style should be adult-like and aim for quality based on appropriate criteria for the task at hand. Realities such as budgets and timelines, to name a
few, must be considered. For success in convergent thinking, the group should set themselves up for success by providing a multitude of ideas to be judged. When these thinking styles work together, innovative solutions can result. This happens because the group comes up with many ideas before selecting one and the chances of one or a combination of the ideas that the group diverged on are better when there are unrestrained ideas and a large number of ideas from which to choose. However, when groups try to converge as they are diverging, and visa versa, very little progress is made. This typically happens as the group comes up with one idea, thinks about the success rate for that and implements it without exploring any other options. The entire group needs to have the same understanding and vocabulary regarding these thinking styles. This requires them to have an understanding of how the thinking styles can be utilized to help their group. The group also needs to know which thinking style they are engaging in at any given time. This can be as simple as asking, "Are we diverging? or converging?" Or starting at the beginning of each gathering with a statement like, "First let's diverge about this, then use judgment and converge."

To encourage divergent thinking this researcher hypothesizes that objects can be introduced into group settings enabling the group members to have the same mindset needed for divergent thinking; childlike, no logic, and no judgment. Incorporating play into group settings encourages group members to engage in this mindset, a vital characteristic of divergent thinking. This thesis explores which objects are appropriate and successful for specific contexts in enabling play, and divergent thinking, in the group setting. It also explores what makes the objects appropriate.

Why Organizations Need to be Innovative

Businesses and organizations strive to be innovative in their endeavors so they can survive and thrive in a declining economy. As previously mentioned, Kodak and the United States Postal Service are two examples of large, seemingly stable companies that have recently suffered due to lack of innovation.1,2

One way businesses and organizations can increase innovative is to ensure they explore a great number of unrestrained ideas during the generative phases of their problem solving or opportunity addressing process. The more ideas people come up with, the more likely it is that some of those ideas will be innovative. This is divergent thinking.

Innovative ideas can exist at varying levels within the company or organization. From strategic planning for the organizations’ future to the execution of day-to-day tasks, innovation should be a part of the organizations’ culture. Divergent thinking at even the smallest level keeps the company in the mindset of innovation leading them to success.

Why Divergent Thinking Matters

Divergent thinking matters because ideas matter. Companies that want to do a great job and succeed in their field know that they need to be innovative and come up with new ideas. They also know that innovation starts with hard work and many ideas. The more ideas the better and the more unrestrained the ideas the better. Divergent thinking is actively deferring judgment to allow any and all ideas for a particular problem or opportunity. ‘The time for judgment...
comes during convergent thinking. Both thinking styles need to work together to succeed. During the course of a problem solving process, the group cycles between divergent and convergent thinking styles. This thesis focuses just on the divergent phases of that problem solving process. This also means that play is not always appropriate. Play is appropriate during the divergent phases, but should be set aside during convergent thinking because play enables a child-like, no logic mindset which is not appropriate for convergent thinking. According to Kolko, “Our ability to be playful -- even if only temporary -- is critical to developing new ideas, allowing them to live long enough to engage this mindset which is not appropriate for convergent thinking.” Figure two shows the research focus of this thesis and where play is appropriate.

How Play Helps Groups Innovate

One way to encourage divergent thinking is for the group to play while they are ideating. According to Edward DeBono6, Jon Kolko7, and Tim Brown8, playing within a group will help that group think divergently and work better as a team because trust within the group is also enhanced when playing as a group. When the group has trust, they feel more comfortable engaging in play as well as feel comfortable sharing their wild and unrealistic ideas that can ultimately lead to innovation.

David Kelley, founder of IDEO, knew that friendship is a shortcut to play. Play gives us trust and with trust people feel comfortable with each other and able to take creative risk, which is critical for designers to be innovative. The friendships and trust in the group has to be built to be successful. Trust is not present spontaneously but must be gained, and one way to gain that trust is through play. As groups play together, they gain trust with one another. When people play or when situations become playful and a game, people feel relaxed, they are more familiar with their surroundings, and they become comfortable with other people. Adults that engage in play will have more creative solutions leading to innovation. This allows them do their jobs better and feel better as they do their jobs.

According to Kolko, “Our ability to be playful -- even if only temporary -- is critical to developing new ideas, allowing them to live long enough to engage this pattern switching, and to cultivate even more ideas.” Kolko also states that play is more than an environmental preparation of placing toys in the work area, but a cultural mindset that needs to be cultivated. The objects’ presence gives group members permission to play. This permission establishes the cultural mindset to play, which is more important than the object itself.

Transformative play is an essential element of this study because it relates to the point Kolko demonstrates regarding play being a cultural mindset. Transformative play indicates that play happens more than once and in different ways. Repetition of play indicates permission for the play to occur, both from an authority (management) and from the peers in a group context. Permission from peers and management invites trust within the group making the group members feel comfortable to engage in play and contribute to generating ideas, thus creating a playful mindset. Figure three shows the relationships of the aspects of transformative play.

The idea of play leading to innovation is not new. Products have been developed to help people embrace this idea such as Lego®’s SeriousPlay™. Several books have been written about the topic ranging from a book about the history of play titled Play by Dr. Stuart Brown where he links play with enhanced creative ability to business books such as Permission: A Guide to Generating More Ideas Being More of Yourself and Having More Fun at Work by Pamela Meyer and Brandy Agerbeck which walks the reader through the process of giving permission to his/herself to play and generate many ideas. And there is a class offered at Stanford’s d.school titled From Play to Innovation. Along with these examples, leading design firm IDEO has recognized the importance of play in encouraging innovation and has incorporated it into the companies culture.

Why use Objects to Enable Play?

This thesis focuses on objects, and the exploration of what characteristics are needed for these objects to be useful for transformative play to encourages divergent thinking. As Tim Brown states in his TEDTalk, objects can act as reminders on two levels: (1) they remind people to engage in play and (2) they remind people of playing with the objects in their past. Engaging in play and encouraging people to engage in play can be accomplished with the presents of objects to act as reminders. Objects remind people to play and also remind them that they are “allowed” to play, thus indicating a permissive environment. Acting as a reminder of how people have played with objects in the past, influence the way people play with the objects in the present. They remember a technique for playing with the object or a way of combining objects with their partner and playing together. This influence shows repetition and changes the way in which play is being engaged, thus showing transformation.
What is Play and How is it Defined?

For this thesis, play is defined as free movement within a more rigid structure. Play has the potential for developing into transformative play, or movement that eventually shapes the more rigid structure. This means that the system of play has changed to become something new. Play has the potential to change when it occurs more than once, because the circumstances in which play is taking place cannot be exactly the same twice. The environment might change, the people playing might change, and because of changing circumstances, people play in different ways. Through repetition, the system of play is transformed.

Games and play are closely related, often forming a circular path of one feeding into the other while the other contains the one. The distinction becomes clear when different levels of formality of play are articulated. These levels have been established by Katie Salen and Eric Zimmerman, coauthors of the book Rules of Play: Game Design Fundamentals, and they are: game play, ludic activities, and being playful.

The level of play with the most structure is game play which is the formalized interaction that occurs when players follow the rules of a game and experience its system through play. Some examples of games are: hide and seek, chess, pong, pinochle, and halo. Games vary in complexity but all games have this definition in common.

Ludic activities are less structured and includes a larger breadth of behaviors. Ludic activities are play activities that include not only games, but all of the non-game behaviors we also think of as “playing.” Game play is set within ludic activities along with the “non-game behaviors” such as: playing with a frisbee, playing on a playground, a cat playing with yarn, and playing with legos or silly putty. These activities do not have set rules or a start and finish but they are playful activities.

The last level encompasses the largest amount of behaviors as it includes ludic activities which in turn includes game play. This level is called being playful. Being playful refers not only to typical play activities, but also to the idea of being in a playful state of mind, where a spirit of play is injected into some other action. The examples in this area include: joking around, being sarcastic, and coming up with nicknames. These behaviors occur when the person being playful has the reference of ludic activities and game play in their mind which influences their behavior.

While all of these levels of play have the potential to be transformative in nature, this thesis is focused on the level of ludic activities excluding game play. Ludic activities are at the appropriate scope and scale for this thesis because they are something the researcher can introduce into contexts without being so specific and formalized as a game and not so broad as to ask the participants to incorporate play into their ordinary actions. Ludic activities also focus around an object that acts as a reminder to play in that area. Figure 5 depicts the levels of play described above.

For play to thrive in group settings, two main components of the context are required: (1) an existing cultural mindset and (2) trust. “Being playful and having a playful environment isn’t about what toys are available but is more about creating a cultural mindset that allows the freedom to explore, break the rules and reject the “way things are done.” During a TEDtalk, Tim Brown, CEO of IDEO describes a similar set of components needed in contexts for play to thrive. Brown’s components are: (1) trust and (2) a permissive environment where the group members know they are “allowed” to play. Brown’s third component for the context is objects. The objects act as reminders to the members to engage in a play during their work.
Methods

The framework which influences the researcher’s decisions about what design research methods to use comes from Jane Fulton Suri’s article “The Experience Evolution: Developments in Design Practice.” In the article Fulton Suri describes types of methods that she organizes into categories showing varying levels of immersion the context that the designer can become engaged. Those levels are: (1) trying things yourself, (2) asking for participation, (3) looking at people in context, and (4) learning from previously gathered data. While the researcher often plays with objects during her individual research work, this information is not used for the research as it does not fit within the limitations of this thesis pertaining to “group settings.” The researcher did engage methods that fits into the categories: asking for participation and looking at people in context. The information the researcher gains through “learning from previously gathered data” helps frame the research focus which is stated in section three, Problem Statement.

In and Out of Focus

This thesis is not resulting in the production of a field guide that aids groups in selecting context appropriate objects. The research being conducted frames the content of a selection process and how it can function to assist groups in selecting context appropriate objects to help their group be more innovative. The result of this thesis is a starting point for further research.

This thesis is focused on the interpersonal behaviors in group settings and how objects can help groups be innovative. Research surrounding individuals using objects are not explored in this thesis.

Play has a strong presence in youth education to help teach them skills in varying subjects. However, this thesis is not focused on youth participants using objects to further their education. It focuses on adults who are working together toward common goals in businesses and organizations.

This thesis is not centered around making or producing objects. The objects that are used are pre-developed and can be bought in stores. The objects studied are not just toys. While toys are some of the objects used in this thesis and can be used in group settings to help people generate ideas, they do not have to be toys. Objects without the preexisting culture of play can also be used to play with in group settings to lead to innovation, however, the level of preexisting culture of play is not studied in this research.
Action-Based Research

For this project the researcher takes part in action-based research to take a hands-on approach to investigate the effect of introducing objects in group settings. During action-based research, theory is the foundation but work to investigate proposals and fill the gap in theoretical work is done in the field. This researcher’s work is conducted within Indianapolis businesses and organizations. They are: Attic Design Collective, Big Car, Irvington Development Organization (IDO), and State Farm Insurance office of Dan Blackley.

While working with these organizations and businesses, the researcher took a human-centered design approach. This approach recognizes that people are the experts of their experiences and puts them as the focus of the research. A human-centered approach to action-based research allows the researcher to get feedback and gain insights from the people in the context that will use the outcome of the research. People know best if something is helping or hindering their groups’ productivity and innovation. This approach recognizes and sees it as an asset to research.

Partners in Research

The focus of the research centered around groups generating ideas for their company/organization. Because idea generation occurs only during certain parts of a project, the researcher needs to work with several contexts to have a greater chance of working with groups while they are generating ideas. This also gives the
researcher the opportunity to see different approaches for idea generation, work with different types of organizational structures, sizes of groups, meeting spaces, meeting structures, and different types of people within groups. The following describes interested and accessible contexts in which the researcher is working.

Attic Design Collective is a design firm in downtown Indianapolis. “We do a little of everything, but we always start with a lot of thinking. Our work is grounded in our ability to figure out how to get your message to the right people in the right way.”

Attic Design is made up of co-founders, who both have background in design.

Big Car is a nonprofit organization that works on culturally enhancing Indianapolis. “Big Car sparks creative ideas and completes cultural projects and events that make Indianapolis a better place. Our mission is to bring art to people and people to art.” The group that the researcher is working with at Big Car is made up of a group of eight artists, designers, and musicians who run the programs and coordinate with Big Car’s volunteers.

Irvington Development Organization (IDO) is a nonprofit organization in the neighborhood of Irvington, on the east side of Indianapolis. “IDO shall promote the unique attributes of historic Irvington in an effort to attract positive development and create a balance of businesses in the area, with a focus on maintaining a vital main street corridor and a thriving neighborhood. Additionally, IDO shall work to ensure that revitalization efforts are compatible with the character of the Irvington community and enhance the quality of life for Irvington and Indianapolis residents.” The researcher is working primarily with the board of this nonprofit organization which is made up of 18 businesspeople, club leaders, and residents of Irvington.

State Farm Insurance office of Dan Blackley is located on the far east side of Indianapolis. “State Farm®’s mission is to help people manage the risks of everyday life, recover from the unexpected, and realize their dreams.” Three staff members meet with the researcher during staff meetings on Casual Fridays.

Dr. Min Basadur describes a high level conceptual model of the design process as: formulate problem, formulate solution, and implement solution. He goes on to describe it in more detail as a process to be utilized by business people in his book The Power of Innovation. The eight steps that he includes are: (1) find problems, (2) fact find, (3) problem definition, (4) find ideas, (5) evaluate and select, (6) plan, (7) sell and gain acceptance, and (8) act. Steps 1-3 fall into the first phase called “formulate problem” which is mentioned above. "formulate solution" contains steps 4-5, which leaves steps 6-8 in the final phase of “implement solution.”

The researcher follows a variation of the process described above called CASPI. Instead of the eight steps Dr. Basadur describes, there are five phases. Those phases are: Collection, Analysis, Synthesis, Prototyping, and Implementation. This framework comes from Vinjay Kumar cited in Hugh Dubberly’s website in an article titled, “The Analysis-Synthesis Bridge Model.” In the collaborative article by Dubberly, Evenson, and Robinson, they describe several different designers’ models used when moving through the design process, specifically the transition from analyzing information to synthesizing new possibilities. Kumar’s model of the innovation process represented in the article describes the CASPI process.

Kumar’s model shows a matrix of real to abstract and know to make. The path taken through the four quadrants made by the matrix is: (1) know the real (research or collection), (2) know the abstract (analysis), (3) make the abstract (synthesis), and (4) make the real (prototyping and delivery/implementation). These four quadrants make up the path of the innovation process. This is the process the researcher engages in for her project to explore her research focus. Through the innovation process, the researcher went through iterations of the phases. When the researcher discovers more information is needed before fully engaging with the next phase, she does iterations of the original phase. This happens during the movement from collection to analysis, and again from analysis to synthesis. While the researcher wants to move on to the next phase she
realizes that more is needed and goes back to quickly collect or analyze that information. This type of collection and analysis is focused meaning the researcher knows what actions she needs to take to complete each phase and move through the iterations.

During each phase the researcher is engaging in divergent and convergent thinking styles. This has a different meaning in each phase. The divergent part of collection includes obtaining as much information about the contexts and objects as possible. The convergent part of collection includes organizing the raw data to make sense of it in later phases. However, the divergent part of analysis is unpacking the data into single pieces and finding patterns with those pieces and the convergent part of analysis was creating separate frameworks for objects and contexts.

The following is a detailed look at what the researcher’s path and learning outcomes for each phases of CASPI.

**Collection**

**How Collection Occurs / Process**

Collection occurs with all contexts in which the researcher is working. Two areas of information is the focus during the collection phase. Those two areas are: context information and object information. Context information includes: the space in which groups work, meeting structure, and organization structure. The researcher investigates this information to see and understand the current situation and to see what factors of the context have the potential for influence over appropriateness of objects. Object information includes: introducing objects into contexts, noting attributes of objects, and obtaining feedback from contexts regarding how the objects help or hinder the groups work, what they like and do not like about the objects, and how the objects are used in the group setting.

Collection starts with *ethnographic methods* of observation and documentation. The ethnographic approach allows the researcher to understand how the participants work together and to see the activities in which they are engaging. The researcher observes meetings with all four of the contexts. Initial groupings of information the researcher find are: how the groups conduct meetings, how they generate ideas, group behaviors, tools that the groups use, and the space in which the groups work. Documentation of observations made include: photographs, audio recordings, time-lapse video, and notes taken by hand.
Cultural probes enables the researcher to gain the participants knowledge about the groups’ process, interactions, and hierarchy within the group. Culture probes that the researcher uses include: (1) worksheets and (2) journals for individuals to fill out. The probes contain questions and visualization prompts regarding how the group comes up with ideas, how many ideas they generate, how “out of the box” those ideas are, and feedback about the objects introduced into the group’s culture.

The researcher interviews participants in their context to gain knowledge from the participant’s viewpoint. During the interviews, the researcher asks questions that are open ended to gain as much information from the participants as possible. The open-ended questions enable participants to engage with each other and build off of each other’s answers.

The final design research method the researcher uses is introducing objects into the contexts. To determine what to introduce, the researcher starts by asking the opinion of the participants in the context. This approach is taken because of limited time with each context and respects the fact that the people in the contexts are using the objects. Without gathering the participants input, the researcher could have tried a trial-and-error method to determine the category of objects to introduce. When the objects are introduced to the contexts a few things happen. (1) The researcher explains the role of the objects, (2) she asks the participants to manipulate the objects while they are thinking and generating ideas. Some of the objects are group objects and some of them are individual. Group objects tend to be building supplies that the group works on together. Individual objects are available for each person to manipulate on their own. While the individual objects could be combined to work together between multiple participants, this is not what the researcher observes. Feedback questions about the objects are in the cultural probes and is addressed during the interviews to gain the participants perspective.

The researcher is introducing objects in three of the four contexts in which she is working. The fourth context, IDO, will be used to test prototypes further in the research project. Information is gathered by cultural probes, interviews, and observation to gain an understanding of the contextual information at IDO, which is profitable during prototyping.

Data the researcher collects using the above methods are organized based on the context from which they were collected. This organization helps the researcher remember details about the meetings in which data was collected as well as organizes the data to allow patterns which emerge later within each context.
Collection Findings

Context information and object information are the focus areas during the collection phase.

Data gathered for context information includes: information from all four contexts regarding the space in which they are working, what elements are around the people such as music, tools, chairs, table sizes. Also included was personal behaviors of who and how people were leading the meeting, how the organization is structure, the types of issues the groups were discussing, any techniques the groups were using to document their ideas or work, and the attire being worn at the meetings.

Data gathered for the object information includes: information from three of the contexts which the researcher introduced objects. Information regarding how the group members used the objects, initial reactions to the objects, how the personal behaviors changed while they were using the objects both on an individual level and group level, the number of ideas generated, and how out-of-the-box were the ideas generated.

Why Collected Data is Important

Collecting data from a large breadth allows the researcher to gain knowledge both about the contexts in which her participants are working and about the objects that she introduces into the contexts. This large breadth of information leads to greater understanding of the concrete “what is” as explained in the analysis-synthesis bridge model. Gathering a large breadth of information is important because this data sets the foundation of all future insights and solutions. Without proper exploration and investigation of the current situation, innovative insights will not have a strong leg of reason on which to stand.

Analysis

How Analysis Occurs

With data collected, the researcher engages in analysis by unpacking data, pattern finding, and creating separate frameworks for the context and the objects. Unpacking data makes up the divergent part of this phase, while pattern finding and creating frameworks serves as the convergent part of this phase.

The researcher unpacks the data to see each piece of information and the impact the pieces of data have on each other. The act of unpacking data has three steps: (1) describe what you see, (2) interpret what that means, and (3) identify opportunities or insights. This method comes from the designer, Jon Kolko, in his book *Exposing the Magic of Design*. The researcher starts by describing everything in each piece of raw data. Each piece of raw data can consist of several facts that the researcher needs to unpack to gain a full understanding of the subject of the raw data. Asking the simple question “What do I see?” the researcher describes all pieces of the collected data. The researcher makes note of each description on separate, movable tools such as post-its. Moveable data makes it easier to join similar data into groupings in the next method of pattern finding.

After describing the data, the researcher interprets the meaning of each description. Just as the researcher asked a question to prompt her to describe, the researcher uses the prompt, “What does it mean?” to interpret the described data. By asking the meaning of the data collected the researcher moves out of the concrete examples and into the abstract as the researcher is making an educated guess based on her time in the context, the feedback from the participants in the context, and her own experiences. Analysis is in the “current situation” category or “what is,” not yet moving into the “future” concepts or suggestions, such as “what could be.” The researcher makes note of each interpretation on separate, movable tools as well.

The last stage of the unpacking process is identifying, and noting on separate, movable tools, opportunities that the researcher finds. These are often hunches.
that the researcher needs to get out of her system and do not normally amount to anything really substantial. However, because this is part of the divergent part of the phase, the researcher writes down anything that might be an opportunity, because one of those post-it notes might be exactly where the research needs to go and the researcher potentially might not have seen it if she had not written it down.

Pattern finding is a way of organizing the newly unpacked data to see connections made throughout data and to see strength of connections. There are different systems of pattern finding such as geographically, chronologically, or similarity of content. The system the researcher uses in this research is similarity of content. Within this system, connections are visible by grouping unpacked data with similar content.

Creating frameworks builds a structure to show how the key groupings are related and the aspects of each of the groupings. The researcher creates two separate frameworks during this phase. One for contextual information and one for object information.

The above methods use both sets of information, context and object. Outcomes from the methods are being kept separate to better understand and focus of both sets of information.

As stated above, the researcher keeps both sets of information separate at this point. For that reason the following description will first explain the process taken for the contextual information then explain the object information. While the information stays separate, in reality, the researcher works on both separately but simultaneously.

Contextual information

The researcher started pattern finding for contextual information by placing the unpacked data into Fulton Suri’s framework of “formal and behavioural qualities [which] influence people’s experience in complex ways as they are interpreted through various filters of personal, social, and cultural meaning.”

This framework is made up of services, products, media, and environments (figure 17). The researcher organizes data in this framework to start with an existing framework before she makes her own.

The researcher documents the patterns by taking a photograph, then starts all over using groupings that she started to identify while pattern finding with Fulton Suri’s framework. The new groupings the researcher develops include: (1) methods, (2) process skill, (3) meeting details, and (4) personal behaviors. Documentation of the new groupings is conducted by taking a photograph and making notes. The researcher then continues pattern finding into new groupings using content obvious cues such as: space of meeting, issues, tools available, time of meeting, food available, and artifacts created.

Analysis Process

As stated above, the researcher keeps both sets of information separate at this point. For that reason the following description will first explain the process taken for the contextual information then explain the object information.

The researcher started pattern finding for contextual information by placing the unpacked data into Fulton Suri’s framework of “formal and behavioural qualities [which] influence people’s experience in complex ways as they are interpreted through various filters of personal, social, and cultural meaning.”

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Using the patterns found, the researcher groups the new categories which results in larger groupings with content obvious groupings making up subgroups. The larger groupings include: (1) people, (2) place, and (3) issue. Using the larger groups as a framework which makes up the context, the researcher identifies aspects of each group in the framework. Meeting structure, organization structure, and characteristics of people make up the people aspects. Space and tools available make up the place aspects. In-house verses public and duration of issue makes up the issues aspects.

The researcher converges the groupings down further as she identifies which groupings and aspects of those groups have influence on appropriateness of objects the context uses. The final groupings are: (1) people with aspects of meeting structure, organization structure, and characteristics of people. And (2) place with the aspect of how much space is available for the groups using objects.

Object information
The researcher uses the same process for unpacking data as stated above in the contextual information section. The difference is what is being unpacked. Feedback from cultural probes, interviews, and observations of people playing with the objects makes up the raw data for this section.

Pattern finding in this section focuses on how well the object helped or hindered the participants playing with them, as well as identifying attributes of the objects the participants are using. When both helping/hindering patterns and object attributes pair up, the researcher is able to identify larger patterns of what attributes help groups and what attributes hinder groups.

During this process the researcher also identifies which object attributes are most effective in each of the contexts. She does this by identifying the attributes of objects introduced into contexts and analyzing feedback from the participants about the objects as well as behaviors observed by the researcher. The researcher uses criteria based on the preferred outcome of the research to evaluate effectiveness. Objects enabling transformative play to encourage divergent thinking is the preferred outcome of the research. Therefore, the researcher uses elements of transformative play and divergent thinking to see if the objects are effective. Elements of transformative play include: (1) repetition of play, (2) trust within the group, and (3) a permissive environment. Elements of divergent thinking include: (1) an abundance of ideas and (2) wild and unrealistic ideas.

The attributes of objects are: simple to complex, dull to colorful, 2D to 3D, mutable to rigid, undeveloped to developed, and small in size to large in size. The researcher uses this information to create the framework for objects.
Analysis Findings

The findings from analysis are the creation of frameworks for contextual information and for object information.

The contextual framework is made up of place and people. The researcher uses concrete examples from her research to describe each subgroup of place and people (figure 20).

Within the framework of place, the group that holds influence over appropriateness of objects is space. Space is referring to the amount of space the group is in while they are generating ideas. Examples of space include: (1) large and open space, (2) medium, comfy, cozy space, and (3) small and tight space.

Within the framework of people, the groups that hold influence over appropriateness of objects are meeting structure, organizational structure, and characteristics of people. Meeting structure is referring to the way a meeting is set up, roles of participants, and consistency of structure throughout the meeting. Examples of meeting structure include: (1) small group with equal leadership/responsibility roles, (2) leader with sub leader and discussion among everyone, and (3) leader of meeting, then everyone talks in seemingly haphazard way.

Organization structure is referring to the way an organization is structured, or the hierarchy of the organization. Examples of organization structures include: (1) leader and group answers to a board of directors, leader leads subgroups like committees, (2) leader and entire group answers to larger umbrella organization, and (3) small organization in which both, or all, members are co-owners of the organization.

Characteristics of people refers to traits that people in the group possess. Using divergent thinking styles and convergent thinking styles to categorize the examples creates a framework for this subgroup. Examples of characteristics of people include: (1) mainly divergent traits such as creative, fun, child-like, gets sidetracked easily, (2) mainly convergent traits such as logical, systematic thinker, sees the big picture, realistic, and (3) equal parts divergent and convergent traits among the group.

The object framework is made up by attributes of object which include: simple to complex, dull to colorful, 2D to 3D, mutable to rigid, undeveloped to developed, and small in size to large in size (figure 21).

Simple to complex refers to the amount of concentration the person playing with the object needs to give that object. A simple object does not take a lot of concentration to fiddle with, there is nothing to “figure out” with this object. On the other hand, a complex object has a puzzle element to “figure out” which takes some concentration.

Dull to colorful refers to the amount and type of color on the object. Dull objects are neutral in color and only one color. Colorful objects have many, bright, bold colors.

2D-3D refers to the amount of breadth and depth the object has or could have. 2D objects have or appear to have length and breadth, but no depth. 3D objects can have both breadth and depth, meaning how far off a flat surface the object raises.

Mutable to rigid refers to how much the object changes as people play. Mutable objects have the potential to change a great deal and have many options available for change to take place. Rigid objects do not change form as people play.

![Figure 20: Analysis Findings for Context](image)
Contextual elements found to have influence over appropriateness of object.

![Figure 21: Analysis Findings for Object](image)
Aspects of objects that can be plotted along continua to compare several objects at a time.
Undeveloped to developed refers to how much people are "making" with the object and the permanency of the creations. Undeveloped objects lend to people making, building, or creating. Developed objects do not lend to any making. The object just exists.

Small in size to large in size refers to the amount of physical space the object takes up. Small objects are around the size of a one inch cube, such as a dice. Large objects are around the size of a three foot cube, such as a large beach ball.

Above descriptions define the words at extreme ends of the continuum the researcher uses to plot objects introduced into context.

Why Findings are Important

The findings from analysis answers the first subquestion: What are the characteristics of a context which influences appropriateness of objects? Through the analysis process, the researcher is able to create framework of characteristics of a context that answers this question.

The researcher is creating frameworks to understand the current situation at an abstract level. By creating her own abstract frameworks, she has a fuller understanding of what information is needed from the context that has influence over the appropriateness of objects.

The findings also show how the objects introduced into the contexts are encouraging people to play and think divergently. Feedback from the participants show this encouragement: "It was great (using the objects). It helped me focus and think creatively. " "Keeping my hands busy helps me focus and allowed (the group) to come up with more ideas than we normally come up with."

Synthesis

How Synthesis Occurs / Process

After a clear picture of the current situation is understood through analysis, the researcher creates an abstract understanding of what the future “could be” by synthesizing new models. The synthesis occurs by comparing characteristics of contexts, such as space, characteristics of people, meeting structure, and organizational structure, with the determined context's appropriate object. The result of this comparison determines which contextual characteristics influence which characteristics of objects. The researcher also creates an explanation of why context characteristics are influential over object characteristics and calculates object characteristics for different combinations of contextual selections.

Comparing characteristics of contexts with the context's appropriate object, the researcher observes which objects three of the four contexts found most effective. She also sees the characteristics of those objects side by side with the characteristics of the context in which the objects were being used. This takes the researcher into her next method: determining which contextual characteristics influence which characteristics of objects.

Determining which contextual characteristics influence which characteristics of objects occurs as the researcher compares the three contexts’ contextual information with the objects’ characteristics for each of the contexts in which the researcher introduced objects. As she compares the three sets of information, she looks for and identifies patterns within characteristic groupings of the context and the directional move on the continua for objects. The researcher tests identified patterns with all context/object data sets to determine if the pattern is valid throughout all samplings. As patterns are validated, it is determined that the specific context characteristic has influence over the specific object characteristic found in each pattern. This process continues until all object characteristics are paired with a contextual characteristic grouping.

After determining which of the context characteristics influence the objects’
characteristics, the researcher creates an explanation of why context character-
istics are influential over object characteristics. This explanation includes which
object continuum is being influenced by which context characteristic grouping,
as well as, what the specific needs of each characteristic in that context grouping is
in regards to the matched object characteristics. Patterns that occur over all of the
contexts worked with are included in the explanation as well as how the objects
should be used in the group setting.

Lastly, the researcher calculates object characteristics for different combinations
of contextual characteristics. The researcher consults a math expert for technical
help in this area. Fueled with the information of context characteristic selec-
tions for three of the contexts in which the researcher worked and the objects’
characteristics for the appropriate objects in each of those context, the researcher
and consultant determines a formula which calculates new object characteristics
for different combinations of contextual characteristic selections. The new object
characteristics are shown as new plots on each continuum for
object characteristics.

Synthesis Findings

The findings from synthesis are the outcomes of the methods explained above.

The outcomes of influence are as follows: The object characteristic continua influ-
enced by the context characteristic grouping “space” are: (1) 2D-3D, (2) small-
large, and (3) dull-colorful. The object characteristic continuum influenced by the
context characteristic grouping “meeting structure” is undeveloped-developed.
The object characteristic continuum influenced by the context characteristic
grouping “organization structure” is simple-complex. And the object characteris-
tic continuum influenced by the context characteristic grouping “characteristics of
people” is mutable-rigid.

The explanations are as follows:
All contexts:
• All contexts benefit from objects that plot on the dull half of the dull-colorful
continuum because too many colors become distracting.
• All contexts benefit from objects that plot on the simple half of the simple-
complex continuum because objects that have aspects of them to “figure out”
take attention away from the tasks at hand.
Place: Space
- Large and Open: Large, open space allows objects to be larger in size and very three-dimensional. Larger space also allows the object(s) to be more colorful as it seems to be less of a distraction in large spaces.
- Medium, Comfy, Cozy: Medium space allows objects to be medium in size and moderately three-dimensional. Objects should have few colors or neutral tones.
- Small and Tight: Small, tight space needs objects to be small in size and slightly three-dimensional. Objects should have only one color that is neutral in tone as more colors in small spaces can be distracting.

People: Meeting Structure
- Small Group with Equal Leadership/Responsibility Roles: The more structured the meeting the more developed the object.
- Leader with Sub Leader and Discussion Among Everyone: Moderate amount of development in the object as the meeting is moderately structured. There is someone leading but it is also an open forum.
- Leader of Meeting, then Everyone Talks in Seemingly Haphazard Way: Unstructured meetings can benefit from undeveloped objects as they could then make things together.

People: Organization Structure
- Leader and Group Answers to a Board of Directors, Leader Leads Subgroups like Committees: The more hierarchical the organization the less simple the object can be. In these organizations the roles tend to be established.
- Leader and Entire Group Answers to Larger Umbrella Organization: Moderate amount of hierarchical levels indicates that the object can be moderately simple meaning that the object doesn’t have too much to “figure out.”
- Small Organization in which Both, or All, Members are Co-owners of the Organization: Smaller organization with a partnership means that each person is wearing multiple hats and less attention can be spent on objects being used, for this reason the objects need to be pretty simple.

People: Characteristics of People
- Mainly Divergent Traits: People with divergent characteristics benefit from objects that are mutable.
- Mainly Convergent Traits: People with convergent characteristics benefit from objects that are rigid.
- Equal Parts Divergent and Convergent Traits: Organizations that have an equal amount of divergent and convergent characteristics benefit from objects that are in the middle of the mutable-rigid continuum, a little bit for everyone!

Groups are advised on how to use the objects within their group setting for the objects to be effective. That advice is as follows:
- Undeveloped and three-dimensional objects lend groups to making things together, for this reason the object should contain enough pieces for everyone present to be a part of the building/constructing. Developed objects are more individual and there should be one object per person.
- When coming up with ideas as a group, participants should use their appropriate object by fiddling or manipulating it giving their hands something to do while they think. When participants have an object, they are able to focus on the task at hand and think divergently.

Why Findings are Important
The findings from synthesis answers the second subquestion: How might the characteristics of contexts and objects be integrated to show influence from the context onto the objects? Through the synthesis process, the researcher is able to determine influence from context characteristics onto object characteristics, why that influence occurs, and how it can translate to new contexts.

The researcher is creating models to show an abstract level of “what could be.” By creating an abstract model, she is able to clearly articulate the influence of contexts on objects and how this knowledge can be transferred to new contexts as group members are determining what characteristics objects should embody to be most effective in their group setting.

The synthesis process, including the outcomes of the methods, allows the research to transfer to contexts not worked with during the project. The transferability of the research allows the research to connect design thinking values of divergent thinking to other disciplines.
Prototyping

How Prototyping Occurs / Process

The researcher prototypes to determine the appropriate vehicle groups use to select context appropriate manipulable objects. The prototyping methods the researcher uses to determine the appropriate vehicle include: ideation, sketching, and a criteria grid.

During ideation, the researcher uses her divergent thinking and deferral of judgment skills to generate a list of possible vehicle groups can use to select objects. The key ideas that the researcher moves forward with are: IVR (Interactive Voice Response), Spinning Wheel of Information, Map of Underground, and Field Guild. The researcher converges to these key ideas based off interest in the idea and potential the ideas possess.

To flesh out and gain a better understanding of the ideas, the researcher sketches what the ideas are and how they would work. By visualizing the ideas, the researcher identifies any trouble areas and what medium the solution could use to convey its message.

To converge to one idea concept, the researcher employs a criteria grid to compare the four key ideas. The criteria that she uses are: (1) people have to want to use it, (2) researcher has to be able to prototype it, (3) it embodies the spirit of play, (4) implementable by somebody, someday, and (5) fast process to get to outcome when using it. Using the criteria, the researcher converges to the field guide solution. The researcher fleshes out solution by applying concepts from “Choose Your Own Adventure” books to give the reader a method for selecting specific characteristics in each contextual grouping. The solution is determined: A “Choose Your Own Adventure”-esque Field Guide!

Figure 32: Prototyping Process

The researcher diverges on possible selection process vehicles, visualizes them, and uses a criteria grid to determine the most appropriate option.

Figure 33: Prototyping Outcomes

Sketches of outcome gives the researcher an understanding of how the field guide functions and the selection process for readers.

Prototyping Findings

The findings from prototyping are the descriptions of what goes into the “Choose Your Own Adventure”-esque Field Guide, how it functions, and why it is the appropriate vehicle for the selection process.

“Choose Your Own Adventure”-esque Field Guide is made up of three sections: (1) introduction, (2) adventure, and (3) conclusion. The introduction informs the readers why the book is beneficial to them by explaining why innovation is needed and how objects will lead the group to innovation. It goes on to inform the readers of the purpose of using objects and an explanation of divergent thinking. The introduction also has the important explanation that the field guide is not meant to be read from cover to cover, that the reader needs to answer the questions at the bottom of each page during the adventure to advance towards the selection of objects for their group setting.

The second section, adventure, is the longest as it contains all combinations of the characteristics from each contextual grouping as well as a summary page for each combination of contextual characteristics. In this section there are questions at the bottom of the pages asking which characteristic of a contextual grouping applies to their specific context. Each option directs the reader to different pages in the field guide. By turning the page, the reader is making that selection and moving on to answer the next question about the second, third, and fourth contextual grouping question.
After the reader has made their fourth selection, the field guide will direct them to a summary page which lays out each selection made, gives examples of what appropriate objects for their context would be, and explains why the examples work for the selections made. The field guide then directs the reader to a summary page that advises them on how to use the objects in their group setting.

The final section of the field guide contains the conclusion. The conclusion has evaluation prompts for the groups to answer after using the objects to evaluate if the objects are enabling transformative play to encourage divergent thinking which leads to innovation.

The “Choose Your Own Adventure”-esque Field Guide is the appropriate vehicle for the selection process because it met several requirements. It is playful in nature, it reminds the readers of reading of books like “Choose Your Own Adventure” when they were children putting them in a child-like frame of mind which is helpful while diverging. It is an object itself that guides people to select more objects. The field guide in this format follows a logical selection process needed for ease of use for the readers. And there is opportunity for expansion in the form of volumes or a series of field guides. The research in this thesis is the beginning of exploring this area. More research can be conducted to make the selection process for future contexts more accurate and applicable to more contexts.

Why Findings are Important

The findings from prototyping answers the third subquestion: How might groups select context appropriate manipulable objects to encourage divergent thinking? Through the prototyping process, the researcher is able to create a selection process for contexts to use when determining context appropriate objects.

The “Choose Your Own Adventure”-esque Field Guide brings the researcher to a concrete example of “what could be.” In creating the field guide, she is proposing a concrete solution that answers the third subquestion stated in the above paragraph.
Implementation

How Evaluation Occurs / Process

The researcher uses the implementation phase to evaluate three parts of the research in which she is engaging. These parts are: (1) Objects presented in contexts enable transformative play to encourage divergent thinking. (2) Format of object-selection process. (3) Selected objects using the selection process enable transformative play to encourage divergent thinking in testing context.

For the first evaluation part, objects presented in contexts enable transformative play to encourage divergent thinking, the researcher visits the context in which she had left objects: State Farm. The researcher had been working regularly with State Farm during the collection phase of research. After collection was complete, the researcher left objects with the context and allowed them to engage with objects without the researcher present. During evaluation, the researcher goes back to the context and asks them questions, in the form of an interview and worksheet, to see if aspects of transformative play and divergent thinking are present.

The format of object-selection process, part two of research for evaluation, takes place with Attic Design Collective. Attic Design Collective is a design firm and has experience with solution production and book production. The researcher pitches the idea of a “Choose Your Own Adventure”-esque Field Guide to the designers at Attic Design by showing them a visualization of the use of the book along with a Choose Your Own Adventure book. The designers at Attic Design give feedback on the format of the solution, as they see the format as a viable option for a wide variety of settings.

The final evaluation part to test is the process of selecting objects for a specific context, introducing that object into the context, and testing to see if the object enables transformative play to encourage divergent thinking. As stated in the collection section of this document, the researcher collected context information about IDO but did not introduce objects into that context. This context is used to evaluate the entire process of (1) using context information to select appropriate objects, (2) introducing the selected objects into a group setting in the context, and (3) testing to see if aspects of transformative play and divergent thinking are present.

Evaluation Findings

Evaluation findings for the first evaluation show the continuation of play in State Farm’s context without the encouragement from the researcher and aspects of divergent thinking present in the context. All aspects of transformative play and divergent thinking are present in the context. Play has occurred more than once in the context, showing repetition of play. The environment is permissive, with all employees including the boss, playing with objects as they generate ideas. Trust is present within the group as nobody feels uncomfortable playing within the group. Trust is also shown in that everyone feels comfortable sharing wild or unrealistic ideas one of the aspects of divergent thinking. The other aspect of divergent thinking is a large quantity of ideas generated. According to the evaluation, this is also present. “[Objects at the meetings] have made meetings more fun and we seem to be able to come up with more ideas.” “We’ve come up with more ideas - both really good and really bad ideas.”

Findings from the second evaluation with Attic Design Collective show positive response for the “Choose Your Own Adventure”-esque Field Guide. Both designers understand the way the guide functions and follow the reasons why the solution is presented in such a manner. The designers express excitement about the applications of the guide in both spreading the value of divergent thinking and the marketability of the guide. The design firm states that they are interested in helping with production of the guide if funding becomes available to further research.

The third evaluation starts by using the contextual information and the selection process model to determine appropriate objects for IDO’s board meeting. The determined objects for this specific context are interlocking building blocks such as large scale Legos®. These objects are introduced into the context at the beginning of the meeting.

“[Objects at the meetings] have made meetings more fun and we seem to be able to come up with more ideas.” “We’ve come up with more ideas - both really good and really bad ideas.”
In this meeting the agenda did not include idea generation, but was purely an update meeting. However, as the group is talking about options of how to resolve a problem, they are generating more ideas than the researcher has seen in the past. In addition to more ideas than they normally come up with, some of the solutions are wild and unrealistic as they jokingly suggest solutions that are both out of the budget and physically impossible. Divergent thinking is established with these two observations.

Two aspects of transformative play are present at the meeting with the third aspect in the works. The environment is permissive as the interim executive director, president of the board, all of the board members, and guests at the meeting are accepting the presents of the objects. There is trust within the group to engage in playful activities. This is evident by how quickly group members collect building block pieces and start making creations.

Repetition of play is also proven after the meeting when the researcher and the executive director (ED) reflect about the meeting and the influence of the objects. The ED did not think people were going to play with the objects so quickly. She guessed they were going to be very tentative about the new object’s presents and perhaps slowly start to play. It shocks her how quickly people started collecting the pieces to make their creations and she sees the need for objects in meetings and board retreats where they will be coming up with many ideas for strategically planning the future for IDO.

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"It was a better board meeting than most."

"[The blocks] added creativity? I think it probably encouraged participation."

"I didn’t play with the blocks but watched others and was surprised by their creations. They displayed playfulness I would not have expected."

Why Findings are Important

Findings from evaluation answers the fourth subquestion: How might selected context appropriate objects be evaluated to determine effectiveness? The researcher answers this question by engaging with the contexts that are partners with her throughout this project.

Through evaluation, the researcher discovers that the selection process created results in context appropriate objects that help groups incorporate transformative play into their group setting leading them to divergent thinking and eventually innovation.

Figure 39: Implementation Phase
Implementation for this project is in the form of evaluating the selection process, the format of the selection process, and the incorporation of play to encourage divergent thinking.
CONCLUSION

Research Conclusions

Incorporating objects into group settings help groups engage in play, which makes groups think in childlike ways. This type of thinking lends itself to divergent thinking, which allows groups to generate many ideas including ideas that are unrealistic and outside the boundaries of “normal” or even “do-able.” Pushing these boundaries leads to innovation, which helps the groups’ company or organization survive and thrive.

The researcher discovers truth in Kolko’s statement, “The notion of being playful is to appreciate and encourage divergent thinking.” She sees that the object’s presence encourage group members to engage more during the meeting. Since some objects can be distracting, the importance of selecting context appropriate objects is apparent. The four areas that are influential over what the objects need to possess are: (1) the amount of space in which the group is working, (2) the meeting structure, (3) the organization’s structure, and (4) the characteristics of the group members.

Context appropriate objects allowed the group to engage in transformative play which lead them to think divergently. As groups, companies, and organizations incorporate transformative play by introducing context appropriate objects, divergent thinking and innovation will be within the grasps of everyone, instead of reserving this task for “creative” people. “Creative” people should rejoice in this transfer of responsibility to a shared responsibility and get excited about the possibility of incorporating a broader knowledge base thus broadening the pool of potential ideas.

Figure 40: Conclusion Findings
Visualization shows the process found during research. Starting with the groups’ want of innovation, through the selection process of context appropriate objects that will lead the group to innovation via divergent thinking and transformative play.
Future Implications
As with all research, this is just the beginning. The end of this thesis marks the beginning of future research opportunities for this focus. With the information found from this thesis, future research is framed more precisely and clearly.

Areas for further research include:
Continued research with more organizations to see what objects are most appropriate for new contextual characteristics. Since this researcher had limited time, she could only work with a few contexts to test for influential context characteristics and successful objects. Researching with more contexts will expand the data pool to incorporate more options which will make the selection process more accurate.

Add a new continuum to object characteristics: preexisting play culture to non-existing play culture. The objects tested in this thesis all had a preexisting culture of play which might have influenced how the group members were playing with the objects. Ideas generated with non-existing play culture objects might breach the bounds of “normal” ideas more because group members will have to think wildly to play with the object before they are asked to think wildly for ideas. Research needs to be conducted to better understand the impact of this variable.

Creation of context appropriate objects that evolve as they are being used to show evidence of transformative play and divergent thinking. Research needs to be done in this area to gain insight on the best way to develop an object that evolves. The evolution of object would show proof of transformative play and divergent thinking and act as the groups’ evaluation to see if the object is helping.

"Choose Your Own Adventure"-esque Field Guide design and production. With the information gained from the research conducted for this thesis as well as future research, the design and production of a field guide can transpire. The field guide solution creates opportunity for multiple volumes of field guides to be used by a wide breadth of organizations and companies. As research continues and more data is collected, the field guides can be updated and split into different series based on specific contextual selections. The impact of the field guides has the opportunity to reach different types of organizations and companies, creating a universal understanding and value of divergent thinking and play in group settings.

Final Conclusion
Let’s revisit the setting from the introduction. Again the company is coming together seeking solutions to another problem, this time with the knowledge gained from this thesis. The leader elicits the group for their ideas to solve the problem. A scenario like this might play out:

After being called into a meeting, a group files into the same conference room where their past experiences have been torturous. They remember the many meetings that were dry, dull, and depressing as their boss lectures them about problems in their company, new policies, and strategic techniques to meet their yearly goals. Now however, the boss starts the meeting in an entirely new manner. He gives everyone a chance to share their point-of-view, allowing everyone an opportunity to voice their concerns and ideas. This is something they had not felt comfortable doing in the past.

The room has basically the same furniture and arrangement as it did before. But now there is a Rubbermaid container with different objects available. The objects chosen for this meeting are large, interlocking, building blocks of varying colors. The blocks are laid out along the conference table so everyone can reach them and there are enough for everyone to build. The boss selected the objects after he worked his way through the selection process found in an Object Selecting Field Guide. The process of using the field guide was similar to "Choose Your Own Adventure" books that he loved to read when he was young. This put the boss in a playful mindset that filtered into the meeting he is about to start.

Figure 41: Objects as Reminders
Objects in the group setting reminds people to incorporate play into their work. When they play, the amount of ideas increased substantially.
The boss comes into the meeting and says, “Okay folks! Let’s talk about how we can encourage our clients to use our website. First let’s diverge. Remember, that means every idea is welcome. The more ideas we have to judge later the better off we’ll be!” Everyone starts collecting blocks and assembling them as they make suggestions regarding the problem at hand. The group members have learned that the boss’s new attitude of “every idea is welcome” is genuine. They start to suggest off-the-wall, completely unrealistic ideas that could have put their jobs in jeopardy in the past. Now however, the group laughs about those ideas as they take them even further coming up with some pretty outlandish ideas. They know that the opportunity to bring the ideas back to reality will be there and they welcome the prospect that they might be hitting on a solution as unique as their boss’s new attitude and something they would have never thought of before. The group is enjoying the process.

The overall mood in the conference room has gone from that of tension and anxiety to light-hearted and enjoyable, while still focused on the task. The objects in the room, the building blocks or something similar, remind the group members to play and think like a child while coming up with ideas. The objects also remind the group members that they are “allowed” to play and that permission transfers to the welcoming of any ideas for solving problems and approaching opportunities.

They have learned to trust each other, incorporate play into their idea-generating phase, and think divergently. This will lead them to innovation.


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Project Description: Intro
1. IDEO, "Human Centered Design," 4-9
2. Attic Design
3. Big Car
4. Irvington Development Organization
5. State Farm

Project Description: Analysis
2. Fulton Suri, "Experience Evolution," 40-41

Conclusion
Assessing the Work Environment for Creativity
by Teresa M. Amabile, Regina Conti, Heather Coon, Jeffrey Lazenby, and Michael Herron


These authors focus on the social influence and how it can affect both “the level and the frequency of creative behavior.” Creativity by teams and individuals is a starting point for innovation. The authors look at the “intra organizational foundations of innovation, the psychological “context of creativity”, and the work environment perceptions that can influence the creative work carried out in organizations.” The research utilizes the conceptual model “KEYS: Assessing the Climate for Creativity” to look at existing organizations for aspects of creativity. As this thesis is related to improving creativity for the sake of innovation, this literature is very relevant. One of the objects of this thesis is to create a framework in which to see existing aspects of transformative play in an organization, and these author’s involvement with KEYS will be helpful in that creation.

The Power of Innovation
by Min Basadur


Dr. Basadur dissects the creative problem solving process in this book to make it available to everyone, although he has tailored the book to business people in product design. He describes the process skills needed to work collaboratively and describes in detail how to move through the creative process in eight steps. The eight steps can be separated into three stages of the creative problem solving process. Those stages are: Problem Finding, Problem Solving, and Solution Implementation. Dr. Basadur provides pointers throughout the steps to aid groups working collaboratively.
Design is Fun: Promoting Play in Design Process
by Merve Bayram

Bayram, Merve. Design is Fun: Promoting Play in Design Process. University of Cincinnati, Design, Architecture, Art and Planning: Design, 2010. <http://etd.ohiolink.edu/view.cgi?acc_num=ucin1280779027>. Design is Fun is a thesis from the University of Cincinnati’s design program focusing on ways to introduce fun into the design process as a whole and the improvements play brings to the design solutions. The author defines what play is (using Lieberman’s definition along with others), goes through a chronology of play, and explores ways to bring play into the design process as well as reasons why play should be present. Design is Fun is directly related to this thesis as both have the end result of people playing more to help them in their process. The idea that “play fuels synergy” is also explored in both theses.

Artifacts as Tools in the Design Process
by Elizabeth Boling and Kennon M. Smith

Boling, Elizabeth, and Kennon M. Smith. “Artifacts as Tools in the Design Process.” Handbook of Research on Educational Communications and Technology. Ed. J. Michael Spector, Ed. M. David Merrill, Ed. Jeroen van Merrienboer and Ed. Marcy P. Driscoll. 3rd ed. New York: Taylor & Francis Group, LLC, 2008. 685-690. Web. 5 Dec. 2011. <http://www.aect.org/edtech/edition3/ER5849x_C051.fm.pdf>. The researchers define artifacts as designed objects or systems, including those created in the process of design and those resulting from the act of design. It speaks about the importance of using artifacts during the design process to help develop and solidify concepts and issues regarding the issue being approached through the design process. The authors call those artifacts process artifacts. Along with Bowen and Parry and Sanderson the artifacts in this case are directly related to the content of the design process as the artifacts are being built to represent parts of the issues or solutions. The use of artifacts in the design process as stated by these authors helped the researcher realize the artifacts she wants to work with in this thesis should not be directly related to the content of the problem space in which the participants are working.

Critical Artefact Methods: Using Provocative Conceptual Designs Within Participatory Human-Centered Design
by Simon J. Bowen

Bowen, Simon J. Critical Artefact Methods: Using Provocative Conceptual Designs Within Participatory Human-Centered Design. Oslo: Web. Nov. 2011. <www.nordes.org>. “Critical Artefact Methods” is a paper introducing a workshop during the 2009 Nordic Design Research Conference entitled Engaging Artefacts. The author describes the use of artifacts as the medium for critique is explored and the opportunity of using “critical artifacts” during the design process by playing with materials to create mock-ups and storyboards to get a deeper understanding of the issue being addressed through design. Along with Boling and Smith and Parry and Sanderson, the artifacts in this case are directly related to the content of the design process as the artifacts are being built to represent parts of the issues or solutions. The use of artifacts in the design process as stated by these authors helped the researcher realize the artifacts she wants to work with in this thesis should not be directly related to the content of the problem space in which the participants are working.

Play: How it Shapes the Brain, Opens the Imagination, and Invigorates the Soul
by Stuart Brown

Brown, Stuart L., and Christopher C. Vaughan. Play, How It Shapes The Brain, Opens The Imagination, And Invigorates The Soul. New York: Avery Pub Group, 2009. 5-13. Print. Dr. Stuart Brown, founder of the National Institute for Play, uses this book to describe the reasons for play and ways to make the reader’s life more playful. Brown states that we are “made to feel guilty for playing” but that play can benefit adults just as much as it benefits children. Play is a catalyst and can help increase productivity and improve the overall health of the person willing to let play into their daily lives. The author’s work is centered around “understanding the role of play and using it” which is also the intent for this thesis.

The powerful link between creativity and play
TED talk by Tim Brown

Brown, Tim, Perf. The powerful link between creativity and play: TED Ideas worth spreading, 2008. Web. 6 Oct 2011. <http://blog.ted.com/2008/11/06/the_powerful_link/>. During this presentation, Brown notes the link between creativity and play including why play is important and what elements need to be in place for play to occur. He talks about the foundation of IDEO, and how David Kelley started the company based on this value of friendship and play. Friendship is a shortcut to play which requires trust within group dynamics. This ultimately leads to better creative solutions as well as people feeling better as they do their jobs. Brown also describes different forms of play: exploratory, building, and role play. The concepts that Brown articulates are present in the foundation for this thesis.
Lateral Thinking, Creativity Step by Step
by Edward de Bono
Lateral Thinking explores the concepts of thinking in a new way. It compares lateral thinking to vertical thinking. Lateral thinking is defined as being “concerned with changing patterns”, and De Bono gives techniques to practice lateral thinking. “Lateral thinking is an attitude and method of using information.” The process of using lateral thinking includes the generation of new ideas, not using judgment but instead “movement” to use ideas as a stepping stone to new ideas. This concept involves the rearranging of information to form new insights and lead to new ideas.

Six Thinking Hats
by Edward de Bono
The author outlines a process for companies/organizations to see multiple perspectives of a problem/opportunity. By asking those in the meeting or group to put on various “hats,” it is asking those people to play the different roles portrayed by those hats. There are six different colored hats: yellow, white, red, black, blue, and green. Green hat thinking is associated with fertile growth, creativity, and new ideas. De Bono explains the role of lateral (divergent) thinking and humor alongside green hat thinking stating that using the six thinking hats as a role-playing exercise or even a game makes it possible to request certain types of thinking. The green hat is the hat of interest to this thesis.

Six Thinking Hats
by Hugh Dubberly, Shelley Evenson, and Rick Robinson
This article is a compilation of several designers’ approach to bridging the gap between analysis and synthesis. The basic Analysis-Synthesis Bridge Model is a matrix with horizontal labels: describe and interpret, and vertical labels: researching and prototyping. The article describes the importance of being diligent in this process as it leads to innovative solutions. The model used in this thesis to describe the phases the researcher goes through comes from this article. Vijay Kumar’s model is the depiction of CASPI: Collection, Analysis, Synthesis, Prototyping, and Implementation.

The Experience Evolution: Developments in Design Practice
by Jane Fulton Suri
This journal entry talks about the opportunities for designers to design more than objects, but experiences and systems as well. Fulton Suri describes the process design researchers can use to first gain an understanding of existing experiences on different levels of immersion. She identifies the levels of immersion in which the design can engage as: (low immersion) (1) learning from data, whether secondary sources or our own analysis, (2) looking at people in context, (3) asking people to participate, and (4) trying things ourselves. Exploration and explanation of design research methods that fit in the levels of immersion are also part of this journal entry. The information from this entry relates to this thesis because the researcher uses the framework described above to see if all four levels of immersion are being used and if all levels of immersion are appropriate.

Gamestorming: A Playbook for Innovators, Rulebreakers, and Changemakers
by Dave Gray, Sunni Brown, and James Macanufo
The authors of this book state that “serious games help organizations solve complex problems through collaborative play” and they spell out the reasons behind that and some techniques that can be implemented with the supplies around a typical work-place. Three main concepts of this thesis are discussed in this book: play, collaborative groups, and (because the student will be conducting research in work settings) play using appropriate tools for workplaces. The idea of kick starting the imagination and innovation through a separate activity and the use of artifacts are also mentioned in this book. The use of artifacts are used in a way that is very literally linked to the content, using artifacts to help keep track of information as well as make it a tangible thing in the environment.

Homo Ludens: A Study of the Play Element in Culture
by Johan Huizinga
Homo Ludens is a book in which the element of play is examined in different cultural contexts including: language, civilizing functions, law, war, knowing, and poetry. Huizinga calls out a relationship between play and poetry that is also evident in all forms of poetry and art such as music, dance, and “plastic arts” such
as arts and crafts. Homo Ludens focuses on the history behind play, relating it back to the Greek gods. As play is the key element of this thesis, Huizinga relates by giving a history from which the researcher can learn.

**Human Centered Design Toolkit**
by IDEO

IDEO. Human Centered Design Toolkit. 2nd, IDEO, 2012. 4-9. Print. This toolkit, from leading design firm IDEO, is a collaboration of many designers using a human centered design approach. This book describes the importance of being human centered and the reasoning behind using a toolkit. The researcher is able to utilize the methodologies and tools found in this toolkit. The researcher is also able to use this book to show skeptic people examples of this approach being used in the real world which gives validation to the researchers’ work.

**IDEO + Play**
from IDEO’s website


This excerpt from IDEO’s website shows the value the company has for play. Not only do they design play at IDEO they use play during their design process. IDEO’s founders and designers have found that play in an “organization can lead to a flood of innovation.” This methodology is at the heart of this thesis and IDEO is a concrete example of this topic and show’s the topic’s relevance.

**Design at Play: Immaterial Forms of Consumption**
by Adriana Ionascu


“Design at Play” is a paper from the 2009 Nordic Design Research Conference entitled Engaging Artifacts, in it the author comments on the use of play in the design process. It is stated that objects and the engagement with them reveal “details about the ways in which (people) relate to an already designed world.” The idea that objects and their uses are transformed based on what the user needs, and in that way the user is designing the objects and the uses of the objects around them. These altered objects can then be used for analysis on how to design other objects. The transformation of objects and the uses of them is directly related to transformative play and the need of the objects to be mutable.

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**The Art of Innovation**
by Tom Kelley


The Art of Innovation takes the reader through the successful innovation process used by IDEO, a design firm focused on human-centered design to help organizations innovate and grow. The author describes the stages of IDEO’s process as follows: (1) Understand, (2) Observe, (3) Visualize, (4) Evaluate and refine, and (5) Implement. Tim Brown, during his TEDtalk, echoes the ideas of Kelley as both sources are coming from IDEO. Another concept that is present in both the thesis work and in this source is the concept of divergent thinking, coming up with many ideas without placing judgment.

**Exposing the Magic of Design**
by Jon Kolko


Exposing the Magic of Design explains, in layman’s terms, how creative problem solving is approached and the techniques behind the process. Kolko specifies that a playful environment is needed “to appreciate and encourage divergent, abductive thinking” and is more than just toys in the environment but an established mindset that allows and fosters questioning “the way things are done”; rule breaking, and the generation of ideas. These concepts have become the key concepts of this thesis.

**Group Dynamics for Teams**
by Daniel Levi


There are two areas, or perspectives, of small groups working together represented and connected in this book. They include (1) group dynamics, how people work together in small groups and (2) the use of teams in the workplace. The goal of this literature is to examine the theory of group dynamics and apply that theory to the concrete world where people are working together in their workplaces. Through this application of theory, the way people work together is exposed and understood and can be improved. As the research for this thesis will be conducted in group settings the knowledge of group dynamics can also be applied.
Playfulness, Its Relationship to Imagination and Creativity
by J. Nina Lieberman


Playfulness is a research document that analyzes the relationship of play, imagination, and creativity. The term playfulness is defined as being made up of: spontaneity, manifested joy, and sense of humor. Lieberman examines the relationship between play and divergent thinking. The difference between "child's play and adult play" is also examined in this book. As this thesis is relating to adult play, Lieberman's research is relevant.

Tools for innovation
by Arthur B. Markman and Kristin L. Wood


A compilation of papers from multiple disciplines, *Tools for Innovation* has several papers regarding the use of objects or methods used to spark or intensify innovation. Sketches are noted as a tool for revising and conceptualizing ideas to make them more innovative. Other tools that are mentioned have been named design enablers (which includes collaborative sketching), which fall into two categories: demand driven and internally derived. The internally derived tools have the same role as the manipulable objects that are being explored through the research of this thesis.

From Workplace to Playspace: Innovating, Learning, and Changing Through Dynamic Engagement
by Pamela Meyer


*Permission* is a tool for "permission-givers, -takers, and -getters" to give suggestions of how to have more fun while working and how that fun can transpire into more innovative outcomes at work. The six principles of permission (create safe space, model it yourself, be you, play within the given, get over yourself, and don't take it too seriously) set up the mindset needed to have fun with the book and with play at work. These "permissions" are linked to this thesis by incorporating play as a technique to generating more innovative outcomes in group work.

Thinkertoys: a Handbook of Creative-Thinking Techniques (2nd Ed.)
by Michael Michalko


*Thinkertoys* is a tool to improve, jump-start, and enable creative thinking. There are several techniques that can be implemented in individual as well as group work. The idea of divergent thinking is valued in this book as well as the knowledge that each technique has an appropriate time to use it. That appropriate time is when the technique is linked to the content but might not necessarily related literally to the content. There are two different categories for the techniques which are: linear (manipulating information to generate more ideas) and intuitive (find ideas through intuition and imagination). Knowing the appropriateness of the tools and using an outside tool to generate more ideas are key concepts that are echoed in this thesis.

Naked Innovation: Uncovering a Shared Approach for Creating Value
by Zachary Jean Paradis and David McGaw


The authors strip away the hidden aspects of innovation so anyone can develop innovative solutions. It speaks to the importance of innovation and how innovation is not owned by any one discipline but shared across disciplines. The authors present ways to thinking about and be innovative. Innovation and creating more innovative solutions is the ultimate end goal of this thesis and *Naked Innovation* offers insight on the process of getting to that end goal.
Co-ordinating Joint Design Work: The Role of Communication and Artefacts
by Mark Parry and Duncan Sanderson


The authors articulate that the role of artifacts is to help the participants externalize and represent the “objectives, constraints, form, function, assembly, materials and so on” of the subject at hand. The author’s artifacts are directly related to the issues at hand and are created within the design process. The artifacts are an important part of the design process as they “are the foci of much of the social interaction, as contested symbols, objectifications of temporary agreements, and symbolic representations of potential productions.” Along with Bowen and Boling and Smith, the artifacts in this case are directly related to the content of the design process as the artifacts are being built to represent parts of the issues or solutions. The use of artifacts in the design process related to these authors helped the researcher determine the role of artifacts (objects) she wants to work with in this thesis.

The Innovation Killer: How what we know limits what we can imagine...and what smart companies are doing about it
by Cynthia Barton Rabe

Rabe, Cynthia Barton. The innovation killer: How what we know limits what we can imagine ...and what smart companies are doing about it. New York, NY: AMACOM, 2006. Print.

Defining innovation and telling how innovation is viewed in the business world, The Innovation Killer gives insight on how innovation could occur, how it helps organizations, the roles it takes to collaborate and when collaboration is appropriate. Zero-Gravity thinkers are introduced as an outside person or group of people that can question the “experts of content” in ways that make the experts redefine, restate, and see different angles/aspects of their opportunity. The end goal for this thesis is for innovation to occur in group settings and Rabe explores the same issues in her work.

Rules of Play: Game Design Fundamentals
by Katie Salen and Eric Zimmerman


The authors explore many different kinds of play within and surrounding games, all types of games, and the design of “meaningful play.” Within Rules of Play, the authors define play at different levels and in relationship to games. They give a general definition of play that can be used but does not include characteristics of the act of “being playful” itself. The book creates a theoretical framework which game designers can look towards to gain a deeper understanding of the innovations they have potential to create.

The Ambivalence of Engaging Technology: Artifacts as Products and Processes
by Cristiano Storni


“The Ambivalence of Engaging Technology” is a paper from the 2009 Nordic Design Research Conference entitled Engaging Artifacts. This paper comes from a technology background that is using design research to see what the relationship between artifacts and designers in larger socio-technical arrangements. It is suggested that a true definition of an artifact includes what the artifact is and does, as well as how it can be more or less engaging. This author also includes a continuum of innovation from traditional models to emerging new ones. The information available is relevant to this thesis because it speaks to the importance of innovation and different perspectives of the use of artifacts in a design process.

The Ambiguity of Play
by Brian Sutton-Smith


The Ambiguity of Play describes and defines play by breaking it up into different forms. Sutton-Smith also describes and defines ambiguity the same way. He states in this book that play activities range from private to public as well as describes the different rhetorics of play in terms of: animal progress, child play, fate, power, identity, imaginary, and self. Through these seven rhetorics, Sutton-Smith lays out the history, function, form, players, discipline, and scholars of play. This authors work gives historical evidence of the use of play which the researcher of this thesis can use when examining new forms of play.
Encouraging Spontaneity in Innovation
by Barry M. Vornbrock


Vornbrock’s research was presented at a conference for engineering and technology management, explores the relationships between spontaneity and innovation. The author references Lieberman for the definition of playfulness which includes spontaneity and also uses her definitions of different forms of spontaneity including: cognitive, social, and physical spontaneity. Vornbrock notes that spontaneity is more likely to happen in groups made up of diverse people. The diverse group brings to the table a broader base which leads to spontaneity. As spontaneity and play are being used by this author to encourage innovation, so the researcher of this thesis is also exploring play’s role in encouraging innovation.

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