A HOLISTIC APPROACH
TO DESIGNING FOR
SPECIFIC
AESTHETIC
EXPERIENCES
IN DIGITAL GAMES

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Abstract

This thesis aims to point out characteristics of game aesthetics, and accounts for one possible approach to design for a specific aesthetic experience. The theoretical framework that has been treated includes game design, interaction design, industrial design and aesthetics. Aesthetics have been understood from a classical perspective, where some properties are treated as being inherent of a game as an artifact, and others as sensual, perceptive and cognitive concepts that make out parts of the aesthetic experience of playing a game. The research has been conducted through theoretical studies as well as research through design, where the design process as well as the end artifact itself have made out research tools. It suggests a design process focused on the end material, and emphasizes hi-fi sketching. The process accounted for in this thesis has been focused on the multi-mediated end result, by framing the design or possibility space with themes, experiential goals and a parallelly constructed theoretical base of game aesthetics. The design approach has also been based on ideas of letting objects and concepts within the real world inspire game behaviour by association, within the frame of a chosen theme. Based on game qualities like simplification and coherence, my approach aims at designing aesthetically holistic games. Other aesthetic qualities that are treated in relation to the design process include representation, embodiment, presence, immersion, flow, fun, pliability and pace. The approach is argued to have strengths in the sense that it does not conform to pre-established genres, is more player oriented, can create coherent experiences and aid innovation. The backdraws are that it is not effective and does not guarantee that the outcome is neither pleasurable nor playable.
1. Introduction

- The dense atmosphere and the play of light in the background scenery that grabs you with its divine beauty as you explore the world of Limbo.

- The sense of being in total control by perfectly timing pushes and combinations of buttons, while your character dances across the screen in the fighting coreographies of Tekken 6.

- Holding on to Yordas hand, while exploring the vast and unforgiving spaces of ICO, with the fear of losing her constantly nagging your mind.

These are all ways in which the aesthetic experience of a game can be expressed through words. But to truly understand the poetry of games, one has to take part in the experience.

Digital games have the spellbinding power to strongly engage us in sensual, perceptive and emotionally compelling experiences. Yet, within the game design discourse, you are time and time again faced with perspectives where games are narrowed down to formal rule systems (Murray, 2005), and rarely come across works that treat game aesthetics (Niedenthal, 2008). A common misconception is that focusing on game aesthetics revolves around polygon counts, the resolution of textures or cinematic conventions like cut-scenes (Jenkins, 2004). But my view of game aesthetics has little to do with traditional, linear storytelling or strictly visual aesthetics. I believe that game aesthetics needs to address the whole game experience, focusing on the sum as well as the parts of what makes game experiences unique.

In this thesis, a prototype has been used to conduct research in two ways; It has been evaluated through players, and iterated based on the feedback from players, my own reflections as well as the theoretical framework. In turn, the prototype has also been contributing to the theory as the process of designing it has lead to new insights and conclusions on the topic of game aesthetics.
2. Research question
The first question that needs to be addressed is what the aesthetic experience means in the game context. To understand this I have been looking at classical definitions of aesthetics, user experience design within interaction design, game design research that addresses game aesthetics and provided a brief overview of the various definitions of games.

The second and most emphasized question, that heavily relies on the first question, concerns how one can design for a specific aesthetic game experience. This question will be addressed with regards to the answer of the first question, research through the development of a prototype and brief insights into diverging examples of development processes in the game industry.

The two research questions will be closely entangled, and exploring the second question will contribute to answering the first question as much as the first brings value to the second. I have also strived to keep theory and practice parallelle throughout my process in order to arrive at a discussion and conclusion that reflects both of these parts in my thesis equally. Designing for specific user experience is common practice within the field of interaction design, and I wish to expand this practice and investigate whether it might be applicable to the game design context as well. I will initiate my research by looking into definitions of aesthetics and what makes out the aesthetic experience in games. Further, I will describe my design process followed by a discussion of the theoretical framework in relation to my design process.

3. Motivation
Within the game design discourse, the practical design process has mainly been concerned with viewing games as formal rule systems (Murray, 2005), while research focusing on aesthetics or experiential qualities has been lacking (Niedenthal, 2008). For me personally, the perceptual and sensory experience of playing games makes out one of the most important aspects as to why I play games. This is also my strongest motivation for attempting to form an understanding of and to bring forward the discussion of game aesthetics.

I think that there needs to be an openness to alternative approaches to thinking about and designing games. Diversity would benefit the game design field, leading to better game designers and better
games (Salen and Zimmerman, 2003). Löwgren and Stolterman (2005) also describe how the construction of design theory plays an important role in challenging and revising established ideas and ways to go about the design process. They also describe how this kind of revision of preconceived ideas concerning how to think and create within a design discipline can aid innovation. Developing the game design discourse to form a shared language not only aids the discourse, but also game designers in their practical work as well as the audience in their critique of games (Salen and Zimmerman, 2003).

With my research I want to suggest an alternative design approach that focuses less on games as rule systems, and more as designed artifact with the potential to provide compelling aesthetic experiences. I do not solely wish to address games as entertainment artifacts in a global business context, but also as cultural artifacts that can bring meaningful experiences to our personal lives and society at large.

4. What are aesthetics?
In order to understand game aesthetics or what makes out the aesthetic experience in games, we briefly need to look at some classical definitions and how aesthetics are treated in related fields.

According to the online etymology dictionary, aesthetics derive from the greek words aisthetikos and aisthanesthai, which in turn stands for "sensitive" or "perceptive", and "to feel" or "to perceive by the senses or the mind". - online etymology dictionary

Moshagen and Thielsch (2010) mention how most modern philosophical analyses of visual aesthetics revolve around both the subjective and the objective view, whereas the aesthetic experience becomes the result of both the aesthetic qualities of an object and the preferences of its perceiver. This is also something Parson (2002) brings up, and he describes the objective characteristics that make out part of an aesthetic experience as deriving from the object or artifact in itself. Color, form or balance are all properties that can be said to interact to make up the overall qualities of an object (Parson, 2002).

The aesthetic experience also involves the viewers cognitive processes, includes mental states such as “a sense of heightened awareness” and can also allow for a temporary release or break from ones everyday mundane preoccupations. In the aesthetic experience, the perceiver of
an artifact can be emotionally affected by feelings such as sadness and anger, yet still be in control and keep a contemplative distance, or what Parson(2002) defines as “emotional detachment”. The perceptive state that also characterizes the aesthetic experience is that of exploration and intense focus. But what makes out an aesthetic experience depends to a great extent on the person encountering the object or artifact. Parson(2002) mentions how any object or artifact such as a machine, landscape, chairs and cloud formations can make out an esthetic experience, but emphasizes that works of art, that have been specifically designed for such an experience, are more likely to induce it;

“Works of art are more likely to promote aesthetic experience in the highest degree, that is, to sustain the most intense, complex, insightful and unified experiences.” - Parson (2002, p.27)

This also suggests that an aesthetic experience can somehow be crafted, created and designed. But how does one design for sensation and perception? In the field of interaction design, people have been trying to design for experiences since the birth of the discipline.

5. Interaction design and the user experience

“Using an interactive product may not be comparable to watching a movie in a cinema or visiting a theme park. Thus, designers may settle for establishing the context for an emotion rather than the emotion itself...Or do we rather ‘design for an experience’, that is, to take experiential aspects into account while designing, without being able to guarantee a particular experience.” - Hassenzahl and Tractinsky (2006, p.94)

The concept of designing for the end user experience, that in the field of interaction design revolves around material, tangible and emotional qualities, can also be a useful approach within game design (Niedenthal, 2008). Interaction design centers around the user experience, and the practise incorporates various methods, techniques and frameworks that can be utilized for this purpose (Preece et.al, 2007). The range of practical knowledge within the field differs among researchers, and many designers within the discipline have created their own perspective on as well as preferences concerning design principles or methods. Interaction design also draws from several previously established disciplines, where graphic design, artist-design, industrial design, psychology, human factors, HCI (Human Computer Interaction) and computer science are some of them. At the center of interaction design rests what is referred to as “the user experience”, which involves understanding and designing how a product behaves and is used by people (Preece et.al, 2007).
Among many other disciplines within information technology, HCI is one of the disciplines from which Interaction design has grown out of, and within HCI there has been a shift from focusing on design goals like efficiency, to more experiential and emotional qualities that can be related to aesthetics (Moshagen and Thielsch, 2010). The User experience field, or UX, constitutes a part of both HCI and Interaction design. A UX designer takes a human or user perspective on technical systems, and focuses on the experiential qualities of the end product. Preventing negative experiences has traditionally been an important focus in the field of HCI, and UX takes this further by also focusing on designing for positive user experiences. Instead of focusing on the avoidance of emotions like frustration or dissatisfaction, UX thus has its focus on designing for the user to experience feelings like “joy”, “fun” or “pride”. A focus on the human experience rather than material, in the creation of interactive products, is an important perspective to take if one is to affect people emotionally. Hassenzahl and Tractinsky (2006) raise questions concerning designing for particular emotional outcomes, and discuss whether it is at all possible to design for and predict such outcomes (Hassenzahl and Tractinsky, 2006).

Preece et.al. (2007) stress the fact that designing a specific sensual experience is not possible, but creating the preferences and design parts that can result in such an experience is what the interaction designer does. Thus, interaction design in practice centers around designing for a specific user experience. To state a concrete example, Preece et.al. (2007) describe how a cell phone can be designed to evoke satisfying sensations by giving the artifact smooth, silky or other specific properties, whereas a phone with heavy, large and rough properties can provide a negative experience that is unpleasant to the user. Designing the parts of the object that make out the objective aesthetics can this way be related to Parsons (2002) classical idea of aesthetics. The aesthetic experience is the subjective sum of the objective parts perceived or sensed by a user (Parson, 2002). Thus the objective aesthetics of a mobile phone is inherent to e.g. its material properties, whereas the aesthetic experience derives from these parts perceived and interacted with by a user.

How the user feels about a product or artifact, the pleasure and satisfaction of using it, from the perception of the whole to the experience of the parts or details, are important aspects to consider when designing for users. Preece et.al. (2007) mention functionality, aesthetics, “look and feel” as well as sensual and emotional appeal
as key values that shapes the user experience. Even though the field of interaction design does not offer step-by-step procedures that guarantees a good quality user experience, it points to research and methods that provides a framework of good examples that have been considered succesful on this topic. Designing for user experience goals is one common method within the field, and Preece et.al.(2007) mention experiential goals like; engaging, stimulating, provocative, surprising, annoying, frustrating, visually pleasing,cognitively stimulating, challenging, enhancing among many others as examples of negative and positive goals of how a system or artifact can be designed to make the user feel in relation to it.

Games are also designed digital artifacts that provide experiences to their players, and should therefore be possible to design with an experiential focus. But before we try to apply interaction design thinking in game design or sort out what game aesthetics are, we need to form a more general understanding of games.

6. Understanding games
Games are complex systems of interaction, but above all they are providers of rich, immersive and emotionally engaging experiences. Despite the experiential qualities and aesthetic possibilities that games have, there is little discussed on game aesthetics(Niedenthal, 2008). Niedenthal(2008) points out that aesthetics, which are commonly part of the definition and description of games, get little space in both game design and research. In many design processes, aesthetics are merely viewed as the visual layer that holds and covers the game system(Niedenthal, 2008). Games can hold high definition 3D graphics rendered in real time and audio to deliver impressive artwork, but these elements solely are not enough to make out a game nor account for the full aesthetic experience of a game.

A digital game is interactive. The player is a given element that interacts with a game, but a game in itself also inhibit interactions inbetween parts of it’s own system. Seen as a system, the behavioural properties of the small parts and their relation to each other, is the foundation of the whole that makes up a game. The properties of the parts are emergent by nature, and can over time form complex behaviours that are hard to predict or might even end up behaving in unexpected ways(Salen and Zimmerman, 2003).
Since games hold a lot of components, finding a definition that incorporates all aspects of a game is hard. Before I go into defining what the aesthetic experience in a game comprises, I will briefly go through how a couple of acknowledged theorists in the field understand games. I believe it is crucial to form an understanding of what is considered to constitute a game and how games are defined within the discourse in order to explore game aesthetics based on a solid theoretical ground.

6.1. Definitions in the field
The classical definition of games treats them as formal rule systems that have quantifiable outcomes (Juul, 2005). Callois (1961) defines four major categories that games can be split into; mimicry, agon, alea and ilinx. Games that are characterized by mimicry revolve around roleplaying and games such as chess or football that centers around skill are classified as agon. Alea inhibits games of chance such as Bingo or roulette and Ilinx games evokes bodily sensation such as Vertigo, similar to riding a carousel.

Playing a game is an unproductive, voluntary action that is not connected to material interest (Callois, 1961). Even though gameplay is not "serious" in the sense that it is not directly connected to the real world outside the game, it can still be intensely engaging (Callois, 1961). Games differ from play in the sense that they hold designed obstacles or challenges (Salen and Zimmerman, 2003). The player is equipped with different abilities to overcome or beat the challenges that the games present to him or her (Koster, 2005). Salen and Zimmerman (2003) view gameplay as a series of choices, that are being answered with a reaction or outcome within the game. In the trials of a game, failure often has a cost, and this can be manifested in the game or simply just internally experienced by the player (Koster, 2005).

Juul (2005) divides games into rules and fiction, and has earlier stated that rules are a necessity of a game whereas fiction is not. But in his book Half-real, Juul (2005) moves away from this stance and revalues it slightly. He still makes a clear distinction between rules and what he defines as fiction in games, claiming that they both compliment each other but states that they are not symmetrical. By his definition of fiction, Juul (2005) makes clear that it is not to be confused with storytelling. According to him, the fictional world constitutes the graphics, sound, text, advertising and is affected by the rule system in a game. The fiction can also help the player to understand the rules of the game, and thus add meaning to the rules (Juul, 2005).
6.2. An old divide within the field

It is important to take into account the long-lived debate between narratologists and ludologists that has been dominating the field, in order to grasp how games are understood from different perspectives today. To briefly summarize this passed debate, narratologists have viewed games mainly as storytelling media (Murray, 2005), whereas ludologists have focused on games as formal rule systems (Juul, 2005). This is not only relevant to the understanding of where game discourse presently is situated, but it can also give us a hint as to why game aesthetics have not been addressed to such a great extent up till now.

Jesper Juul (2005) comes from a classical ludologic perspective. He positions his theory of what games are in relation to the classical model where games are considered to be rule-based formal systems that delivers quantifiable outcomes. The possible outcomes of a game has different values to the player, and in a game the player tries to influence the outcome. Juul (2005) states that this model addresses the crossmedial properties of games since it can be applied to all games, digital or analogue. Jesper Juul (2005) describes how cut-scenes and similar narrative elements disrupt the gameplay or play time. Seeing play time and fictional time represented as parallel lines, he views the play timeline as being interrupted by cut-scenes, while the fictional timeline often remains continuous throughout the game. This view is classically ludologic, and seems to stem from the time when ludology and narratology were debated as two diverging views in game design theory. Henry Jenkins (2004) views fictive elements in games differently, and argues for a discarding of these types of classical linear thoughts when it comes to game narratives. According to him, stories emerge as the player explores the game space, and is kept coherent by the designed goals and conflicts. Even though many games do not hold a narrative, Jenkins (2004) states that the game space always has narrative possibilities.

In her “the last word on ludology v narratology in Game Studies”, Janet Murray (2005) problematizes the extreme formalism in game studies, where the rules of the game are at focus whereas representational and dramatic elements are almost ruled out as irrelevant. New perspectives on games that treat games as cultural expressions, and puts them in relation to paintings, film, digital art and storytelling are seen as a threat to a part of the field that is strictly owned by those viewing and exploring games as abstract rule systems. Murray (2005) even goes as far as to state that ludology serves as an ideology as well as methodology, and proposes that the ideological part of
ludology should be called game essentialism. She describes how this game essentialism constitutes a great problem in the possibilities of knowledge construction in the area, since formalists are working against new perspectives that can serve the discipline as a whole. When the perspective is constrained to games as formal rule systems, the experiential qualities, the performative elements, topics like immersion, narrative and semiotics are left unaddressed and labeled as incidental or irrelevant. (Murray, 2005)

6.3. Behaviour and representation
Salen and Zimmerman (2003) make a distinction between rules and play, similar to how Juul (2005) treats rules and fiction. They also mention the second order design problem, and states that play or experience can never be designed, but is always indirectly controlled by the rules. Juul (2005) also emphasizes that the fictional representation or visualization of game objects always works as manifestations of the rules, and argues that the shape of the pieces in a game of chess does not affect the game rules.

Salen and Zimmerman (2003) shed light on different ways of looking at games as systems. They e.g. mention that a system can be viewed as ‘an organized set of interrelated ideas or principles’ or ‘A condition of harmonious, orderly interaction’. They further bring up Stephen W. Littlejohns book “Theories of human communication” and his definition of a system. According to him, a system is made up of objects or parts and attributes with different properties. A system is also characterized by how objects relate to or react to each other, as well as it always has a context or environment.

In the context of digital games, Nitsche (2008) describes how players seldom need to come in contact with the rules, but that they instead encounter the mediated plane that is a result of code and rules. The game space and it’s objects connects the player to the rules through meaningful visual and audiotative manifestations (Nitsche, 2008). Nitsche (2008) refers to the mediated result of the code and rules in a digital game as it’s presentation. The presentation is the layer where the player constructs meaning of and interacts with the game. This calls for the need for fields like semiotics in game design, since it regards how users understand or interperate symbols and objects (Salen and Zimmerman, 2003). As systems of meaningful interaction, the game context is made up from the forms of the space, it’s objects, narratives and behaviours (Salen and Zimmerman, 2003). One of the strengths of
spatial stories is that they can be built on symbols and meaning that associates to other existing narratives. When the story is embedded in artifacts and symbols, the space can become a scene wherein actions related to the narrative are allowed to be played out(Jenkins, 2004). Games are transmedial artifacts, and Björk and Holopainen(2005) incorporate both rules and themes in their definition of game aesthetics.

Fictional worlds are incomplete, and has to be completed by the imagintation of the player(Juul, 2005). The player fills out the fictional gap based on his or her previous experience of the real world in combination with the theme or genre that is represented in the game. Juuls(2005) idea of fictional worlds can be related to Jenkins(2004) idea of evocative spaces. The most classic form of evocative space is the amusement park. Jenkins(2004) mentions Disneyland as an example of a physical world or scene that has been built up to evoke the memories and fantasies that the audience associates with a particular story or genre.

Don Carson(2000), who has designed several amusement parks as well as computer games, lives by three simple principles when he designs to immerse any visitor to one of his worlds, be it virtual or real; Let the visitor/player go somewhere he/she could never go, be someone he/she could never be and let the visitor/player do things he/she could never do. Carson(2000) describes how amusement park design and virtual world creation share an intimate connection. The themes that are created in amusement parks are intertwined in the environment, and works as a kind of spatial storytelling that progresses as the visitor walks through them. With the help of texture, lighting and color, the amusement park designer is able to infuse the audience with emotional experiences related to different themes(Don Carson, 2000). These types of evocative spaces also signify game spaces. Jenkins(2004) mentions how American McGee’s Alice, that builds upon Lewis Carrolls Alice in Wonderland, changes the story by redesigning the narrative spaces. In American McGee’s version and the new Alice: Madness Returns Alice has to find her way through a dark and twisted wonderland, and the first version in particular tells the story of a mentally ill Alice solely through spatial setting.

“If games tell stories, they do so by organizing spatial features. If games stage combat, then players learn to scan their environments for competitive advantages. Game designers create immersive worlds with embedded rules and relationships among objects that enable dynamic experiences.”
- Henry Jenkins(2004, p.)
Juul (2005) describes how the real world is important in order for the player to understand and imagine the fictional world of a game. He relates to fictional worlds in their property of being simulations, and refers to how entering a car in e.g. Grand Theft Auto: Vice City (2002) builds on the real life experience of opening a car door and getting seated. Similar to Juul's (2005) ideas of simulation, Parson (2002) defines an artifact as having meaning if it can be related to other ideas, events or contexts. He also notes that this meaning, since it relates to other ideas, can be communicated easily.

The form of the space can also make out the rules of a game (Salen and Zimmerman, 2003). In Blizzards game Starcraft 2: Wings of Liberty (2010), the terrains or maps have different properties that effect the gameplay directly. On some maps, the bases you spawn at are situated on heightened parts of the terrain, and hinders many of your character classes to travel by foot. Adapting your strategy to the game space is necessary in order to have any chance defeating your opponent. Other game objects are also used to balance the game, such as piles of rocks blocking paths from bases, so that none of the players can perform a so-called "rush" or "cheese" and attack another player too early. Jesper Juul (2005) also brings up an example of how players use maps in Counter Strike, and points out what possible strategies the different positions on the map offers. In these cases, the space can also be said to make out parts of the rules since they change the gameplay conditions dramatically. Salen and Zimmerman (2003) also mention examples of when the game space can make out the rules. They bring up the game Thief as an example, where the player has to hide in the shadows in order to avoid being detected by enemies.

7. Game aesthetics
"A game designer doesn't create technology. A game designer creates an experience." - Salen and Zimmerman (2003, p.87)

Games have been researched from anthropological, philosophical and sociological perspectives, but aesthetics has only yet been treated to little extent (Juul, 2005). Björk and Holopainen (2005) acknowledge that the definition of the aesthetic experience inhibits traits that can also be found in gaming contexts. They further elaborate that the reason why game aesthetics have been addressed to such a small extent might be due to the fact that specific areas that make out aesthetic qualities of a game, such as narrative and graphics have been addressed
separately (Björk and Holopainen, 2005). Game aesthetics have, in game reviews and similar consumer analyses, mostly revolved around resolution of textures, polygon counts and the level of realism the graphics can represent (Jenkins, 2004). Before we embrace the question of how one can design for a specific aesthetic game experience, we need to create an understanding of what game aesthetics are. This chapter will be an effort to sum up the characteristics that can be said to constitute game aesthetics and the aesthetic experience of playing a game.

Salen and Zimmerman (2003) describe how games can create complex experiences evoking feelings like desire, pleasure, anxiety, and wonder in the player. Niedenthal (2008) makes an interesting comparison between how playing a game can be related to the experience of listening to a good song, drinking a glass of wine, etc. (Niedenthal, 2008) Similarly to this poetic description, Eric Zimmerman (2003) resembles the experience of playing a game with the magical feeling of finally solving a tough problem, kissing someone for the first time or indulging in conversation over dinner with close friends. Gameplay is generally judged based on emotional impact, and players often recall or focus on sequences of games that are visually or emotionally grand (Jenkins, 2005).

“[...]the big skies that can suddenly open before you when you ride your snow board in SSX, the huge shots in a hockey game when the puck goes much further than it could possibly do in real life, the pleasure of sending your car soaring off a cliff or smashing through pedestrians in Grand Theft Auto 3.”
- Jenkins (2005, p. 10)

He further elaborates that games enable us to experience these kinds of moments over and over, from different perspectives and sometimes in social contexts. The memorable moments of a game emerge as all elements coherently play together to form an experience. Jenkins (2005) emphasizes that such experiences are not merely based on temporary visual spectacles or “eye candy”, but when you feel in control, when the game environment feels responsive and when you simply “want to move”.

7.2. Aesthetic qualities of games as artifacts
What I hesitantly will refer to as objective aesthetic qualities in this section, are based on the classical view on aesthetics that Parson (2002) mentions. It refers to more measurable factors that we can agree upon as facts about games as artifacts. This section will be followed
up by the treatment of more experiential qualities that can be said to result from the interaction with, and subjective perception of, games. My categorization of objective and subjective parts are not to be emphasized as pure distinctions, but rather as an attempt to bring an understanding to how they can work together as a whole in the end.

**Simplicity** can be said to be a core concept that constitute a diverse range of expressions in game aesthetics. Games are based on math, and in mathematics the aesthetic elegance of a rule or equation is very much based on how simple it can get. As little as possible representing as much or as complex behaviours as possible can be said to be part of the beauty of mathematics (Montano, 2010). The idea of simplicity as something beautiful and functional can also be found in visual communications, where simple representations help us to cognitively sort out and understand symbols effectively (Zettl, 2008). The more you can communicate from a simple form, the more elegant it is considered to be (Preece et al., 2007).

Related to the elegance of simplified equations, Jesper Juul (2005) views simple rules that become complex over time or during interaction as being more interesting when it comes to games. Juul (2005) states that most computer games are either progressive or emergent, depending on the way in which it challenges the player. Emergent games consist of simple rules that combined and over time results in a complex gameplay, while progressive games presents the player with challenges in a more linear manner. He points to how games with a progressive structure can be kept under strict control by the designer, and that games with those traits often involve cinematic and more distinct story elements. Juul’s (2005) view on emergent games stems from his view of games as formal rule systems, and can thus be related to the concept of elegance in a simplified mathematic equation. Juul (2005) emphazises that there is also high and low level, as well as wanted and unwanted emergence. One example of unwanted emergence is when something that has not been predicted by the designer allows the player to e.g. cheat in a game. Generally, emergent games often offer replayability, while progressive games have goals and routes that are predetermined in detail and thus often less interesting to experience again due to repetition. Juul (2005) also mentions that progression games often have walkthroughs, whereas it is harder to describe one way of playing chess that always leads to victory. Björk and Holopainen (2005) also emphasize that simple rules are easily grasped and makes a game accessible to the player, while these characteristics doesn’t necessarily mean that a game is easy to play (Björk and Holopainen, 2005).
In games there is also a notion of simplification that can be related to how the concept is perceived and applied in visual communications. Games do not simulate reality, and when they do incorporate elements that represents an object or behaviour from the real world, this is often an extremely simplified simulation or representation. Raph Koster (2005) describes games as semiotic patterns that by their iconic simplification is easily comprehended by our brains. Our brains biologically simplifies reality all the time, in order for us to cope with the messiness of it, and therefore the simplified realities games represent suits our perception perfectly. The already filtered information that games offer enables our brains to grasp them more efficiently, and this is part of what makes them pleasurable (Koster, 2005). The difference between entering a car in GTA as opposed to in real life, Juul (2005) emphasizes, is that in real life there are many different ways of accessing a car, whereas there is only one way to do this in GTA. The activity is simplified in the game, but Juul (2005) further states that entering a car in real life is not a very stimulating activity, and thus we do not suffer from this simplification. This kind of simplification or “stylization” is common in games, and Juul (2005) further elaborates that games do not try to simulate fully detailed real world behaviour but rather stylized and simplified “concepts” of this behaviour. Related to Kosters (2005) and Juuls (2005) thoughts on simplification, Moshagen and Thielisch (2010) describe that the more fluently the viewer can understand or relate to an object or artefact, the more aesthetically rewarding the experience becomes.

Juul (2005) also brings up the term coherence in relation to fictional worlds, and describes how incoherent fiction leaves the player to make sense of a game solely based on the rules. To state an example, in Super Monkey Ball there is nothing in the fictional world that explains why the monkey is trapped in a gigantic, transparent sphere. The monkey in the ball is fictionally incoherent, but if we turn to the rules for an explanation we find that we need the ball in order to play the game as it is intended to be played. Thus, the player turns to the rules to make sense of a game when the fictional world is incoherent. Another example of incoherence in fictional worlds are environmental boundaries or “invisible walls” that are not supported by the fiction. Hunicke, et.al. (2004) describe systematic coherence in game design as being reached when code, game object behaviours, user experience and all the different parts of a game are successfully representing a whole.
In the book "Aesthetic computing" Fishwick(2006) mentions how aesthetics can be seen as representation that is the result of the formal structures computed. What is represented, or the end result of what has been computed, is the artifact that is meant to be used or interacted with and is also the aesthetic material. As Fishwick(2006) describes aesthetic computing, designing for the aesthetic experience in the digital material can involve both art and design. Fishwick(2006) also mentions how aesthetic computing can end in both usable and nonusable artifacts, but he also makes clear that this depends on how you define usability. Fishwick(2006) elaborates about the term usability, and states that it can hold a lot of meanings, and that solely affecting the user’s emotions can also be understood as usability.

7.3. Aesthetic qualities of games as experiences

"To play a game is to experience the game; to see, touch, hear, smell, and taste the game; to move the body during play, to feel emotions about the unfolding outcome, to communicate with other players, to alter normal patterns of thinking." - Salen and Zimmerman (2003, p.)

The experiential qualities of games are hard to grip, and experiences vary from person to person. But subjective qualities that derive from interaction inbetween players and games or users and digital systems have been addressed by established theorists before. This section will be an effort to sum up and form an understanding of the cognitive, sensory and perceptive states that can be said to make out the aesthetic experience of games.

Salen and Zimmerman(2003) refer to an experience as being inherent of the ‘apprehension of an object, thought, or emotion through the senses of the mind’. It also refers to active participation and can be seen as an event that one ‘lives through’. An experience thus requires participation from a human being. Salen and Zimmerman(2003) describe the experience of playing a game as being fuzzy and hard to grip, in contrast to the orderly mathematical underlying rules of a game. But it is in this ‘sensory blur’ of the experience that the play inherent from the rule system occurs. The experience of playing a game can involve kinesthetic body movement, embodiement, complex emotional patterns and affect the overall mental state of the player.

"Looking at games as experiential systems means looking at them as participation, as observation, as a mental state, as bodily sensation, as emotion, as something lived." - Salen and Zimmerman(2003, p.)
Salen and Zimmerman (2003) center their theories in what they refer to as meaningful play, and state that meaningful gameplay emerges from the interaction between the player and the game. They describe common experiential traits that can be applied to play; as characterized by being strongly absorbing but not serious or productive. Kirkpatrick (2009) takes the notion of the play experience a little further than Salen and Zimmerman (2003), and states that the aesthetics of games is play. He characterizes good gameplay as being similar to dancing, and also relates the aesthetics of games as being characterized by a sense of embodiment.

Paton, et.al (2006) connects presence to the ability to act from a body in the virtual world. The virtual space becomes accessible to the player through action. In contrast to immersion, which they connect more to visual and audiovisual effects, presence relates to the sensual (Paton, et.al, 2006) experience of “being there” (Biocca, 1997). Paton, et.al (2006) states from their study of virtual environments that presence is affected by interactivity, feedback and meaningful presentation within the virtual space. Spatial and dramatic meaning are other key factors that affect the users or players experience of presence (Paton, et.al, 2006).

Gameplay can also be characterized by immersion, and Jenkins (2005) states that games can immerse us without surrounding us in mediated sound and images. Playing a game in first person perspective can bring the same sense of immersion as an old third person 2D platform game. He elaborates that this is partly due to the fact that games are interactive (Jenkins, 2005). The first-hand experience of games is rarely studied (Juul, 2005), but Brown and Cairns (2004) have performed a qualitative interview study with gamers concerning the complex topic of immersion. In contrast to Paton, et.al.(2006), Brown and Cairns (2004) found presence to make out an important part of immersion. Brown and Cairns (2004) describes immersion as being the highest level of engagement in a game, and based on their interview study they formed three levels of involvement; engagement, engrossment and total immersion. Engagement is the lowest level of involvement, and Brown and Cairns (2004) relates this to the basic principle of the player wanting to, deciding to and being able to play the game. The physical controls of the game play an important role on this level, since they allow the player to access the game space. But the theme or fictive elements of the game was also something that, according to their study, seemed relevant to player engagement. Some gamers for instance stated that they were not into sports games. Engrossment concerns emotional engagement in the game, and the interviewed gamers related this to the quality of
the visuals, the tasks they had to perform as well as narrative. Gamers related the level of craftsmanship to the effort that had been put in the game, and valued this as an important quality. The strongest level of involvement, total immersion, is characterized by a detachment from the real world, which Brown and Cairns (2004) also relate to presence. From their interview material, they pointed out empathy and atmosphere as two key factors concerning immersion and presence. Brown and Cairns (2004) concluded from their study that empathy related to identification with the main character, while atmosphere seemed to be made up by a combination of graphics, plot and sounds.

The concept of flow is widely used in game design theory, and builds upon a certain cognitive state that the player reaches when the challenges are balanced in relation to the abilities of overcoming them (Koster, 2005). To explain it in a very concrete sense, flow is the state that the player reaches when a game is not frustrating because it is too challenging and when it is not easy to the point where it gets boring. What characterizes the state of flow is intense focus on the task at hand, an altered sense of time and partial loss of self-awareness. All these aspects in turn bring a sense of enjoyment and fulfillment to the player (Koster, 2005). Koster (2005) tries to fit the emotional spectra of playing games into the word fun. He talks about games as learning devices, and refers to our internal reward systems that trigger as we understand, learn and master something. According to him, games that do not allow the player to learn become boring.

Löwgren (2009) explains something pliable as being responsive or when the material answers the input in a certain way that supports exploration of the digital material. In addition to pliability, Löwgren (2009) mentions rhythm as being an aesthetic of interaction. Rhythm or pace is also a concept established within the game design discourse, where e.g. high paced parts of a game can be complemented with cut-scenes or less intense passages that allows the player a temporary tension release (Juul, 2005).
8. Reflections on game aesthetics
The goal of my theoretical work has been to form knowledge to base my design process on. As a base for understanding what game aesthetics are and how one can design for a specific aesthetic experience, I have aimed to provide an overview of how games are understood.

Juul (2005) states that there is a clear distinction between rules and what he chooses to define as fiction. He brings up chess as an example, and states that the shape of the pieces does not affect the rules of the game in any way. But what Juul (2005) fails to consider is that the shape of the pieces actually does influence the rules. Shaping the figures of chess into round sphere’s would most certainly bring a radical change to the game. The form of the pieces would thus not only change the rules slightly, but would turn the otherwise strategic game of chess into the opposite; namely, a game of chance. Further, if you were to put holes in the game board, it would turn into the popular Swedish game "Labyrinth".

When it comes to rules and representation, as stated by example above, I think that practical game design might as well focus on the representational aspect. Just like Juul (2005) describes the fictional world as being shaped by the rules, I think that this relationship might also work well in reverse. I think that the game space can constitute the rules, like Salen and Zimmerman (2003) also point out, and that game objects, concepts, symbols and our associations to them can inspire game behaviours and rules in the design process. This would also probably serve as a solid foundation for the creation of coherence between the rules and the fiction that Juul (2005) describes. Game spaces and objects manifesting as rules and behaviours in such a manner can convey meaning to the player by association. I think this could not only work well as a way of enabling the player to give meaning to the objects, but thinking of game objects based on their representations can help to hold up a theme or narrative throughout the game that in turn can provide a holistic and coherent game experience.

Just like Juul (2005) states that the real world is important as a reference when the player encounters representations, simulations and simplifications of it in a game, I think that it can also serve the designer in her or his exploration of ideas. To elaborate further about simplification, I think that capturing the essence of an objects properties or behaviour can work as much as a starting point in a design process as setting out to create a game based on rules and classical mechanics. If the game space, it’s objects and behaviours are related to other ideas,
events or contexts, like Parson(2002) mentions as giving meaning to them, I also think that they can make the game coherent and meaningful to the player.

If you start to think about games in spatial terms, like Jenkins(2004) argues game designers should, you realize that many rules can be explained by accounting for the spatial features of a game. Thinking in spatial terms of Tetris, for example, can give you a solid idea of how the game works. You can’t move blocks in depth, since Tetris only consists of two dimensions. And you can’t put one block outside of the area where you are building if it doesn’t fit, because the space where you move your diversely shaped pieces is constricted. A behaviour similar to gravitation continually forces the pieces down. In platform games, like Mario Bros 3, spatial constrictions forces you to jump over gaps in the ground, and the space sometimes offers you possibilities to jump up on high places, or climb up on plants into the sky. The main goal of the game is to run horizontally towards the right until you reach the end of the game space or level, without getting killed.

One important part of my work has been to create an understanding of game aesthetics. The experience of playing a game shares a lot of, if not all, characteristics with how Parson(2002) and Moshagen and Thielsch(2010) describe the aesthetic experience. From states signified by a heightened sense of awareness, complex emotional responses and intense focus, to being overall perceptively, cognitively and sensually engaging. As Moshagen and Thielsch(2010) mention, aesthetics can be said to consist of both an objective and a subjective part, where the objective characteristics are inherent from the artifact itself whereas the subjective part is a result of how it is perceived. I have been aiming to provide an overview of some concepts that characterizes game aesthetics, and divided them into two parts. The first part has treated objective qualities, that are inherent of the game as an artifact. The second part treats subjective qualities, that concerns the sensual, perceptive and cognitive states that characterizes the aesthetic experience of a game. The concepts that I have chosen to treat as inherent to the artifact or objective have been; simplicity, coherence and representation. In relation to classical aesthetics(Parson, 2002), I view these as being parts inherent of the artifact since they can be measured, agreed upon and designed in a more practical and concrete sense. The subjective qualities that I have treated, signifying the experience of playing a game, are presence, immersion, fun, flow, pliability.
As mentioned before, simplicity concerning rules in the form of emergence, is a characteristic of game aesthetics that Juul (2005) refers to as being elegant. I agree that it can be elegant from the designer perspective, similar to how an algorithm or simplified mathematic function can be beautiful to the mathematician. But I argue that this aesthetic concept only becomes relevant to the player via the play experience if it makes the rules easy to grasp by the player (Björk and Holopainen, 2005). As Nitsche (2008) describes, players experience the mediated plane that is the result of the code and the rules, and thus seldom come in direct contact with the rules of a digital game. The mathematical or rule based simplicity thus only makes out a relevant factor in the aesthetics of a game when they affect the player directly. Simplicity in the form of objects and symbols representing behaviours can be said to play a larger role in game aesthetics. As Parson (2002) describes, meaning is constructed when an object or artifact can be related to other ideas, events or contexts. If this meaning can be more effectively communicated by simplification, this can aid the players understanding of the game. Connected to this idea of simplicity is also Kosters (2005) idea of how games simplify behaviour and how this suits our cognitive processes, since our minds tend to constantly simplify reality in order to grasp it. Objects and symbols that already have intrinsic meaning to the player can be a key to create what Juul (2005) calls coherent gameplay, and the complex properties and behaviours of real life objects can work as inspiration in the creation of rules and mechanics.

Anything can make out an aesthetic experience, depending on the subject perceiving. But, as Parson (2002) describes, I believe that art and artifacts that are intentionally designed to provoke such an experience are more likely to do so. Just like Preece et.al. (2007) describe how an artifact like a mobile phone can be designed to evoke certain sensations, I think that this experiential focus can also be applied to games. I think that a focus on experiential and emotional qualities like “joy”, “pride”, “provocative”, “cognitively stimulating”, “frustrating”, etc, like Preece et.al. (2007) mention as examples of interaction design goals, can also be at the center of a game design process. Kosters (2005) theory of fun relates to my work in the sense that it addresses the experiential dimension of gameplay. But in order to work in a practical design context, I believe that “fun” needs to be split into a more diverse spectra of emotional qualities. As Salen and Zimmerman (2003) describe, a person playing a game can experience desire, pleasure, anxiety, wonder and other complex emotions. If one is to shape this end player experience I argue that defining specific experiential goals, similiar to
what is done within the field of interaction design, might be an effective approach within game design. This might aid the game designer to craft the parts into a whole that in the end can provoke the desired responses that make out the experiential goals. As Preece et al. (2007) mention, there are no step-by-step guides that guarantee a specific user experience in the end, but the framework of previous design work and research is what works as a framework of knowledge in the practise of interaction design.

Concepts like presence, immersion, fun, flow, etc, are all more or less subjective qualities inherent from the experience of a game. These perceptive, cognitive and emotional qualities all have in common that they are hard to measure, but more importantly; that they have to be evaluated through interaction with a game. To create a deeper understanding of game aesthetics and how one can design for a specific aesthetic game experience, I have conducted research through design. But before we go into my design process we need to create an understanding of how design processes are practiced and reflected upon within the industry and game design discipline today.

9. Game design in theory and practice

“Design is the process by which a designer creates a context to be encountered by a participant, from which meaning emerges.” - Salen and Zimmerman (2003, p.41)

Salen and Zimmerman (2003) describe games as possibility spaces that players interact with and explore, whereas the goal of the design process is to define this space. They describe their sense that games as a medium seems to have almost unlimited possibilities, in relation to their frustration over what kinds of games they see on the commercial market.

Traditionally within the industry, the game designer is responsible for writing a game design document that covers all parts of the game currently in production. Laramée (2002) describes how a game design document is created as a means of communicating the game concept to the different parts of the development team. The game design document needs to clearly communicate the different parts as well as the whole in a game concept effectively in order to work as foundation for planning and executing programming, modeling, distribution, etc. in the respective teams that make out the total game development team or corporation. Laramée (2002) describes that there are three different stages in which a game design document serves different purposes. The
first step in the conventional design process is to create a document description that accounts for what genre the game will belong to, how it differs from other games on the market, the target audience, a time schedule, etc. This tradition of writing a “treatment” has been adopted from show business conventions in Hollywood and Broadway. What follows next is the “design phase”, wherein changes in the game is done through writing and is therefore very time efficient. During the “prototyping phase”, changes in the design document results in time spent on redevelopment and is thus less cost-effective. During the last part of the process, the “development phase”, changes are expensive and are only made if major design problems occur (Laramée, 2002).

Jenkins (2004) argues for a more spatial game design when he mentions how the long documents that game designers write often end up describing spatial and environmental qualities rather than character motivation and goals. Fullerton et al. (2008) note that the methods used in the game industry are limiting, and that new game concepts are often implemented without testing or prototyping, since many new games are simply variations of old game mechanics. This also stems from the fact that it is an industry with a lot of capital at stake in every game design process. Not only the quality and lack of innovation of the games released suffer from this, but also new potential players (Fullerton et al, 2008).

But there are alternative processes that have been implemented successfully in the commercial game business. In an interview for GamaSutra in February 2012, art director Arnt Jensen from the Copenhagen based independent studio Playdead, explained how their process of making the game Limbo (2010) focused on working around different kinds of “themes”. He also revealed that they did not use design documents, the traditional game design tool, but that they prototyped around those themes. Arnt further states that conveying a certain feeling was the most important goal he had when they created Limbo;

“I don’t know if it’s that important if it’s specific storytelling. I don’t care about that. It’s important to have those special feelings. It was supposed to feel this loneliness so that in the end, when you meet the little sister, it seems like you haven’t seen people for so long, the impact will be so much bigger”
- Arnt Jensen, GamaSutra 2012

Arnt Jensen had already defined the graphics before the actual studio was formed, and the process had been initiated. But rather than constrict the gameplay design, they experienced the artistic approach as
having a positive impact on the overall game design process.

"I think that's one of our forces. Like we had everything integrated, the sound, the graphics, and the gameplay, everything of those affect each other. Back to the original question, it's not that I think we have emphasis in some of them, but it's all like having them fit together in a single piece." - Arnt Jensen, GamaSutra 2012

Thomas Grip and his development team from the independent game company Frictional games centers their design processes on creating tension and aim to affect players emotionally by focusing on visual and auditative elements. In his guest lecture at K3, Malmö he mentioned how they avoided traditional survival horror game conventions like punishment and throwing massive amounts of monsters on the player, and instead focused on creating tension and atmosphere. By removing the punishment of dying from being exposed to the dark for too long and making the player encounter monsters less frequently, Thomas Grip describes how this actually made their game experiences more fearful. Thomas related this directly to film, and pointed out that horror movies always play on this kind of tension or expectation of encountering a monster, and how these types of movies stop being scary as soon as the monster is revealed to you. This way, Tomas thought, the player didn’t have to get "stuck in a mechanic" when encountering and having to battle a monster.

"Then it's not a monster anymore, then it's just a piece of programming that you have to understand." - Thomas Grip, Guest lecture, K3, Malmö, 2012.

Tomas also emphasized not to base a game on one mechanic, but to instead start with "high level" design and work down. According to him, you always sacrifice game aesthetics if you focus on mechanics.

Within the game design discourse, when Hunicke et.al.(2004) talk about aesthetics, they address the emotional responses that the designer aims to provoke the player to experience while he or she interacts with the game. According to them the player perspective is often signified by the aesthetics of a game, which in turn is born out of dynamics and mechanics. With their MDA(Mechanics, Dynamics, Aesthetics) framework, their goal is to incorporate game design, development, criticism as well as technical research within a unified theoretical frame. According to them, any of the three perspectives in the MDA framework can be taken in a game design process. Hunicke, et.al.(2004) encourage player-centered game design, and the focus on experience rather than the implementation of features. Fullerton et.al.(2008) also argue for a
player centered design approach, and state that this is important if one aims to create games wherein all the dramatic, formal and dynamic elements are balanced to promote emotionally engaging experiences.

Salen and Zimmerman (2003) point to the iterative design process as being crucial in practical game design. Iterative design is necessary since games in their properties of being emergent interactive systems are hard to predict, as is player interaction with a game. Throughout the process, the game designer becomes a player, as the play activity becomes an act of design (Salen and Zimmerman, 2003). Donald Schön (1992) describes the design process as being characterized by the designer creating, while giving meaning to the design through observing at the same time. This way, the designer can suddenly detect or discover something through experimentation. Donald Schön (1992) describes designing as being a process of “seeing-drawing-seeing” and reflection as being part of the process. He describes the designer as having a knowledge that is of both sensory and bodily character. This way, the designer is much more complex than the computer, which lacks such delicate sensory inputs.

10. Design process research approach
My design process has been focused on exploring how one can design for a specific aesthetic experience. I have incorporated methods from interaction design, got inspired from other game design processes as well as grounded my process on theories covered in previous sections. Throughout the process I have been exploring and sketching through lo-fi prototyping, hi-fi prototyping, paper sketching, moodboards and evaluated as well as iterated my design through playtesting. Since methodology or design approach is part of what I have been aiming to explore with my thesis, I will go deeper into my approach and how it has changed over time in my process description. The design process and theoretical framework will then be discussed as part of my knowledge contribution. My approach has been to design for a specific end user experience, or what I would call a specific aesthetic game experience.

11. Design Process
This section will describe my design process, and my practical exploration of the two research questions. Followed by this section there will be a discussion that incorporates both the practical and theoretical work.
11.1. Initiation
Initially, I began to experiment with various physical materials as a means to explore and spark ideas for game behaviours. I was interested in exploring the concept of sparking ideas based on association to materials and their properties. Making Lo-Fi prototypes is a common way to evaluate ideas in the field of interaction design, and lo-fi prototyping is most useful in the initial phases of a design project (Preece et.al, 2007). Some examples of lo-fi prototypes that are widely used in interaction design processes are sketches, storyboards or scenarios, mockups, etc (Preece et.al, 2007). What Lo-Fi prototypes all have in common is that they are all cheap to develop, they can evaluate diverse design concepts, function as communication devices and be used as Proof-of-concept. Inspired by paper prototyping and mockup creation, I explored form, color and texture by sketching physically. Löwgren (2012) points out, how the primary goal of sketching is to explore ‘a world of possible ideas’, rather than to take a step towards closing the exploratory process in order to finalize a product or artifact. Sketching ideas make them into physical artifacts that the designer can develop by reflecting and iterating (Löwgren, 2012).

11.2. Experiment: The game design game
Exploring materials as a method in game design was my initial experiment in the design process. As I was experimenting with what I called “the game design game” in collaboration with another person, I wanted the materials used to spark ideas by association.

In the field of industrial design, which has also inspired interaction design methodology, the design process is inspired by materials (Ashby and Johnson, 2010). Materials have different qualities and behaviours. Ashby and Johnson (2010) divides materials properties into different categories. The aesthetic attributes are experienced through our senses; sight, touch, taste, smell, sound. Form, color and texture are examples of attributes that materials can have (Ashby and Johnson, 2010). In the context of game design; texture, form, color and sound are all attributes that games try to mimic or simulate. In level design there is for instance extensive research on how to apply light, form, color and sound to affect the mood the player, lead the way through a terrain and indicate what parts of the environment are important in different ways (Niedenthal, 2008). Materials also enable us to associate to a particular time, place, event, person or cultural meaning (Ashby and Johnson, 2010). Ashby and Johnson (2010) mentions how e.g. Gold brings association to wealth or
the color black associates to death in many cultures. Perceived attributes are signified by experiential qualities, that makes us decide whether a material is modern, humorous or shabby, while emotional attributes relates to how a material makes you feel, e.g. happy, threatened, angry etc (Ashby and Johnson, 2010). Combining different materials, the diverse qualities of materials can help spark new ideas, in both concrete and abstract ways.

In my design game, I wanted to incorporate materials with different properties, to playfully come up with and explore game ideas in a spatial manner. I set up the experiment in my home, and invited the three participants into my home separately. I decided to try it out with people I knew, since I saw it as a small experiment that I initially wanted to evaluate fast to see if I could find something worth taking further with it. I also wanted the participants to trust me, since I thought that the experiment might be preassuring for a participant that saw me as a total stranger.

The rules were simple; one person functioned as the game while the other was the player. The materials used were non-representational in the way that they all consisted of “building block materials” that can be used or combined with other materials to create artefacts. The materials consisted of paper, plastic of varying transparency, yarn, steel wire, fabrics with different patterns. The duration of the experiment sessions was about thirty to forty minutes, and the ending of the experiment seemed to come naturally as participants seemed to become creatively exhausted after this time. Between every new game idea tested, short breaks occurred naturally, as the roles were switched and the new game designer prepared for creating and leading the next game. The game design game was inspired by Jenkins (2004) view on game designers as spatial sculptors, and I wanted to explore how materials and their properties could inspire game behaviours and rules by association.

Fig.1. The “game design game” experiment.
All sessions were recorded on video, and analyzed afterwards. The games that emerged from performing the experiment differed widely, and I have picked out a couple of them below to provide an idea of how the experiment worked.

11.2.1. Game example one
This game had a distinct narrative. It built on the player being a hero that had to overrun spatial obstacles in order to get to the final boss enemy in the end. After conquering the enemy, the player was also rewarded with a visual spectacle where different materials were waved in the air to the players content.

**Interesting choices with the material in this game:** One of the interesting uses of material in this game was transparent plastic used to symbolize the wind blowing. It indicated to the player when a platform that blew from one point to another was about to change direction, and made it easier for the player to estimate when to jump. The enemy boss that the player encountered at the end of this game was made of entangled yarn, that could easily transform into different forms and sizes. This was used to symbolize how the antagonist grew stronger and changed tactics depending on the damage taken.

11.2.2. Game example two
In another game, a glass jar was covered with dense black fabric to hide the contents of the jar. The hidden jar was then filled with valuable artefacts, and the objective was for the player to “fish up” the contents with the help of a long, and wobbly steel wire. The end of the steel wire was formed into a hook, to enable the player to grab the treasures hidden in the covered jar. Materials collected could be traded to upgrade to more stable fishing wire, and when the material in the jar was too hard to fish up, the player had the option to cheat by uncovering the jar.

**Interesting choices with the material in this game:** Steel wire turned was transformed into hooks. The fact that the material was hard, but still flexible made it an ideal part of a “fishing hook”. The two types of steel wire used had different thicknesses, which affected how wobbly and hard to control they were. This also served as parts of an upgrade system in this game.
11.2.3. Game example three
One of the games created was a 2D game placed flat on the table. Platforms were created out of cut paper, and collectable building materials were placed out on different locations. The objective of the player was to reach different places in the level by building towers and bridges to move between platforms.

Interesting choices with the material in this game: Paper is easily ripped in pieces, and served well to accommodate the game space with a lot of material to build from in a short time.

11.2.4. Game example four
Another game was made with a large piece of dark fabric that the game creator transformed according to the moves and behaviour of the player. When the player jumped three times, the hill he was standing on was lowered with the ground, while another part was growing. The game space changed in this manner, and allowed the player to take new pathways depending on his previous behaviour.

Interesting choices with the material in this game: The flexibility of the fabric was the base for this game. It functioned well to hide it’s supporting objects consisting of hands and other objects, and so provided a coherent terrain that could change it’s shape while still being clearly communicated. Clay was also used as an artefact carried around by the player. As the player advanced through the game, the artefact was able to change and fit new purposes. Clay can be ripped into pieces, and still transform into a unity afterwards. The material is also easy to shape into different forms, and functioned well as an artefact that transformed throughout the game.

11.3. Reflections on the experiment
I expected that if the experiment would work, it might be a good way to remove the constrictions of prototyping in a classical game engine or board game manner. I expected the materials to inspire the design in an abstract manner, and that the materials would be utilized in an explorative way and for the sake of their different properties. Some materials are transparent, some have friction, a steel thread is hard, yet thin and and flexible. Paper is fragile, while clay can be ripped in pieces and assembled again. The properties of the materials seemed to influence how the games turned out, and what design decisions were made. The use of some materials were also sometimes stretched, and
led to interesting findings that would have been hard to develop in a purely cognitive manner. Designing and controlling a whole game turned out to be rather difficult, since the player needed to know what to do next in the game. Because of this, many design decisions were made fast and based on conventions. But some decisions that seemed to grow out of the dialogue between player, “game” and material resulted in very interesting design results. The fact that the player was able to directly ask “the game” about certain things pushed the designer into making new design decisions;

“Can I walk here?” - Lisa

"Is seems hard to balance on that." - Mattias

"Will I die if I go outside this platform?" - Anders

I was surprised that the experiment worked as well as it did. Most of the games turned out pretty coherent and with their own interesting design choices. The drawback was the short time we had for reflection, since you didn’t feel comfortable leaving the player waiting for your next design decision. That way some of the game elements slipped into game conventions that were safe and effective for both the player and the game master to comprehend and build upon. The player was the driving force that pushed the game designer forward, and asked interesting questions or came with suggestions that helped the designer to think through ideas and make new design decisions;

"What do I do now?" - Anders

"Maybe I can use this thing to unlock something?" - Mattias

The materials used seemed to be “colored” by their previous use in close-by sessions, and were often avoided in the session after. Over time, the materials might have to be switched out to avoid repeating old design decisions. Many design decisions made in this explorative manner seemed hard to come up with purely cognitively. Ideas that are difficult to communicate verbally can be discussed and explored through materials if the participant is comfortable enough with the method. As Fullerton et.al(2008) argue that the most important skill for a game designer is communicating ideas, I suggest that this could serve as a complement to other forms of communication within a game design team. As opposed to writing game documents that are sent out individually, this can serve as a platform where everyone can take part and ask counter questions with the help of the material at
hand. As Preece et.al(2007) describes Lo-Fi prototypes, this method for inspiration is also cheap, fast and can help communicate ideas. The materials seem to support a kind of game design through spatial sculpting, that Henry Jenkins(2004) argues for. Many design decisions made concerned the actual game space, and the one playing often had space related questions about what would happen if he/she moved to a specific point or if reaching certain places would be possible. Throughout the experiment, different properties of the various materials used were utilized by forming different ideas and to make the gameplay interesting. Clay was transformed into different objects with varying form and functionality, as the player advanced through the game. The game terrain made of fabric, controlled by the hands of the game creator became a game space that transformed according to the moves and behaviour of the player. Materials properties, like transparency, friction or bouncyness could be used to make creative leaps when used as metaphors. The stimulus of materials like these might help the game designer to explore beyond the constrictions of a specific game engine, and come up with new ideas that challenges the old genres or conventions.

Since the process was pushed forward by the player, the games didn’t seem to "get stuck", but were constantly fed with new inputs. This was one of the strengths of the experiment. I was also surprised by how collaborative this method ended up to be, since both the player and the current game designer seemed to always design the game together. It would be interesting to explore how the collaborative element could be further developed. Since I only tried it out with people I knew quite well, it was hard to tell whether it could work for who more or less are strangers or have a more formal relationship to each other. The benefits with this inspirational method was that it was cheap, fast and could be used to collaboratively brainstorm and communicate game ideas. The backdraws found in this particular experiment and context indicated that it might be limiting if the participant acting as the game creator gets stressed by the player that pushes the game forward. In some cases this led to safe design decisions that seemed to repeat patterns from established game genres. The difficulty for one person to simulate all the complex behaviours that a game can constitute also pointed to the obvious limitations of this design game.
11.4. Hi-Fi sketching
As I was faced with the limitations of the physical material, I felt the need to dig right into the intended end material, and head into the digital realm. Game design theory today is largely based on theories that were constructed before the digital material even existed, and the definition of games often strives to incorporate all games, independent of material and mediation. What is important to point out is that the digital material differs from the physical in such a way that it offers a unique flexibility. It can answer the players actions with instant feedback, hold and manipulate an extensive amount of information or data, in the form of sound, images, video, text, etc, and hide information that is not necessary for the player to get involved in(Salen and Zimmerman, 2003). Löwgren and Stolterman(2005) go as far as to say that the digital material has no inherent properties, which again points to it’s flexibility. The physical material, on the other hand, is bound to the physical rules of real world, and can not hold fiction narrative or hide the rule system to the same extent as the digital material(Salen and Zimmerman, 2003).

Lo-fi sketching and prototyping serves well when it comes to conventional design processes. But if one is to really explore possibilities and experiment with digital design, hi-fi prototyping can sometimes be a necessity(Löwgren, 2012). Löwgren(2012) points out how the designer can sketch as a means of manifesting ideas into the real world. Ideas then become artifacts that can support reflection and which new design directions can rest upon(Löwgren, 2012).

11.5. Digital prototyping
I have chosen to freeze and magnify some parts of the prototype in the design process in order to communicate the different turns the development has taken. To me, the concepts that are presented separately are all just frozen moments or new iterations in a continuous process. They are presented chronologically, as they were developed, and are described with emphasis on the design decisions that led me further into my final concept.

As in all iterative design processes, many ideas were discarded along the way. As soon as I made changes in my design work, except for fine-tuning and detail oriented work, I took a break from the “doing” in order to overview and take time to reflect upon the change. In the context of game design, this reflecting most of the time involves playing the prototype. My reflections typically concerned if the new implementation brought something new to the current game concept.
or if it strengthened the current aesthetic in any way. I also tried to understand how new add-ons and changes could lead the rest of the design work further, and in what direction I was going with a particular change. To aid my reflection, and since I didn’t have any design team, I also showed minor changes to people around my work place, so that I could understand the new whole with fresh eyes instantly. This way, many small design directions throughout the process have, beyond the formal playtest, been evaluated by people I have found to be close by at the time of implementation. I have magnified parts of my design process in order to communicate more in detail how themes, experiential goals and aesthetics have aided me through my practical work. This has also been done in an effort to concretize my idea about how to design for a specific aesthetic experience. The design decicions that are described have not always been grounded on or “validated” by users, but merely describe an early, explorative design process where sketching and prototyping in the spirit of Donals Schõns(1987) “doing-reflecting-doing” has been applied.

As described by Donald Schön(1992), I have been commited to a “design conversation” with the material, which in my case has been digital within the constraints of a game engine. Salen and Zimmerman(2003) describes how the designer becomes the player and design through playing, and related to their and Donald Schõns(1987) idea of doing-reflecting-doing, my design process has been characterized by a kind of “playing-iterating-playing”.

11.6.Experiential goals
Initially, I defined three experiential goals to base my work upon; “control”, “pleasure of moving” and “feeling small and vulnerable”. These goals could have been based on user data of some kind, but I chose to pick experiential goals in order to explore whether I could design games based on them at all. At the point when they were decided upon I did not know whether they would end up being significant or not. The “pleasure in moving” goal was based on Kirkpatricks(2009) notion of play, and how satisfying gameplay can be a kinesthetically pleasurabale experience similiar to the embodied act of dancing. Pace and pliability also play a large role in making the game environment responsive to player action and pleasurable to move in. “Control” was related to Paton et. als(2006) theories of presence as being strengthened by making the game space accessible to the player. Feeling in control can thus be said to enhance the players sense of “being there”.(Paton, et.al, 2006). Presence is in turn, according to
Brown and Cairns (2004), intimately connected to the players level of engagement and the experiential aesthetic immersion. The “Feeling small and vulnerable” goal was an aim to establish a relationship between the player and the game character to evoke empathy. This, since empathy strongly affects the players experience of both presence and immersion (Brown and Cairns, 2004).

11.7. Themes
Throughout the design process, I worked around themes that were sometimes only conceptual and vaguely articulated, yet at other times manifested in the form of moodboards and more detailed atmospheric concepts. Moodboards are simply collages of color, form and texture that are used as tools for ‘exploring the emotional landscape’ (Saffer, 2010, p.108) of a designed artifact. As Löwgren and Stolterman (2005) mention, the digital material has little or no inherent properties, and my aim was to create themes that could aid me to associate to material properties as reference points in my design process. This approach also ended up sharing a lot of similarities with my initial lo-fi experiment where physical materials and their properties were used to spark ideas for game behaviours. I used the themes as tools for framing the possible representational and behavioural elements I could use within the prototype. This way, I hoped that the themes could work both as inspiration as well as a frame to keep the overall fictive elements within the theme coherent in relation to each other. I thought that this could also work to support specific atmospheres, which Brown and Cairns (2004) also mention to be important for the level of immersion the player experiences.

11.8. Prototype
The prototype sketching was done in the game engine Unity3, since it is a free and powerful game engine well suited for rapid prototyping. The free version does not include specific types of rendering, such as real-time cast shadows, some post rendering effects and some shaders. In general, everything that is not available in the free version concerns visuals. These limitations have resulted in a lot of work arounds, since my development process has revolved around visuals in the form of themes.
11.9. Concepts
As mentioned, the four concepts described below were part in one continuous iterative process. I have chosen to emphasize different moments along the road to better communicate my design process. The process has revolved around hi-fi sketching and been based on themes, experiential goals and the previously defined theoretical framework of game aesthetics.

11.9.1. First concept sketch

Fig. 2. Screenshot of the first concept sketch.

My first concept was created around the theme “darkness and light”. I visualized this theme directly in the game engine, and created a 2.5D game prototype to give the player a good overview of the game space with the goal to aid movement and control. I wanted the player to feel in control to the point where the movement almost felt like, as Kirkpatrick (2009) signifies one of the joys of playing games, dancing across the game space.

I made the whole game space dark, and added one lightsource to the player only. In this stage I started testing my rough prototype, to get an idea of the experience of exploring a dark game world with only one limited light source. Many design decicions were made by association, like light representing life in it’s property of being “the source of life”. Light also has the ability to burn out over time, in the form of fire, so I thought that implementing a timer that visually represented health light fade away would work as a coherent metaphor. To provide the player with a goal, I added different light sources that the character had to
collect in order to expand his/her own light radius and sight range. As I played it through several times to get a feel for how it was to move in the environment, I tried to balance jumping speed, gravity and distance between platforms to make moving around flexible and stimulating. But as I played the prototype, I noticed how having a limited range that light up and make your surroundings visible makes you act cautious and hesitant. I felt more motivated to sneak than to throw myself out to explore the game space. As I noticed that this was in conflict with my “pleasure of moving” goal, I decided to take a new design direction.

11.9.2. Second concept sketch
Since my previous prototype worked against one of my experiential goals, I decided to open up the design space by changing direction.

Fig.3. The theme for the second concept sketch.

My first theme exploration mainly revolved around the concept of shadow theatre and the sense of having a back-lit visual look as well as paper texture. I tried to implement this look and feel by initially sketching using different filters in Photoshop to later try and implement the theme in the game engine using various textures and shaders.
In the end I got quite close to what I had been aiming for in my moodboard, and could continue my process using the theme as a tool. From one iteration to another, the prototype had almost taken an opposite direction compared to the previous example. The light was no longer represented by the character, and so the whole visual theme had become inverted. The paper texture I had applied made me think about ink, so I started to experiment with black, blurry particle effects, to see what ideas they could spark. Since I at this point had provided an overview of the game space that was not limited by a light radius, I also started to implement a lot of elements that the game character could interact with to aid my “pleasure of moving” goal.

Initially I made a wall that the character could jump against, as this was something I related with control and pleasant rapid movement. As I played through different scenarios that could involve the classic “wall jump” feature, I started to realize that the movement the character made, and the way it felt to jump against the wall was actually a movement that I experienced to be more close to hovering or floating. I then reconsidered the wall as game object and representation, and started to think about what could be more visually symmetrical to this movement. I then created a sort of steam of black ink or smoke that slowly moved upwards, modified the game objects behaviour slightly, and tested the redesign immediately. As I played the prototype after this implementation and moved in the black steam, this representation seemed more coherent visually with what I was doing. I also fine-tuned the different variables to bring the action and the object visually
representing it closer to each other. In this sense, I tried to keep what Juul(2005) refers to as the fictional world coherent by designing game objects and their behaviours to match each other.

In this prototype I also made classical game objects like platforms that fall if you stand on them for too long, and platforms that could be controlled similar to elevators as you stood on them. On the platforms that fell as you jumped on them I also added the sound of glockenspiel in different tones to enhance pliability in the form of direct feedback(Löwgren, 2009). At this point I was thinking a lot in terms of pace and rhythm that Löwgren(2009) mentions as parts of interaction aesthetics, as I aimed for enhancing two of my experiential goals; "pleasure of moving" and "control". One aim that I had at this point was to, similar to what Kirkpatrick(2009) describes as an important aesthetic quality, design the movement in and interaction with the game space to almost feel like dancing.

The theme of this concept brought the silhouettes and shapes of the surrounding game objects forward and made them visually prominent. This made me associate to sculptures, and the concept of creating and bulding within the game space. I then started to experiment with various ways of picking up objects and throwing them onto other surfaces to build your own way through the game space. I implemented primitives in the form of cubes that the character could pick up and stack in order to reach further up in the game space. Initially the cubes had simulated physics characteristics, which made the towers of stacked cubes fall if you were not careful when you jumped on them to reach other places in the game space.

After some development of this concept I felt the need to take a new design direction in order to continue my exploration. As the rate of new ideas for implementation decreased, I decided to open up my design space again and try other ideas.
11.8.3. Third concept sketch

As I opened up the design space for exploration once again, I went back to the initial concept of darkness and light. But this time I decided to try it out in full 3D and to emphasize my experiential goals. Since my goals were “pleasure of moving”, “feeling small and vulnerable” and “control” I decided to try and stretch these aspects to the fullest. I increased the speed of movement, steering control, let go of moving limitations in the z-plane and put the camera close to the “ground” of the game space in order to enhance the experience of moving fast. As I tried this out I realized that it had a lot in common with racing games, but to try and not get limited by the genre I still tried to keep it open beyond the conventions. The darkness, first person perspective and virtual 3D made it hard to grasp distances, so I decided to provide the player with an overview of the current area by implementing the feature that allowed the player to jump extremely high. This did effectively work to provide the player with an overview of the game space, but it also held some surprising experiential effects. At the point in the air when your character’s body stopped going upwards but had not yet started to fall down by gravity, you got a wonderful pause in movement that contrasted nicely to the otherwise intense movement and control on the ground. As I realized this by playing, I wanted to enhance that contrast of being on ground, where you collected light blobs and moved fast, to the feeling of being weightless, detached and observing the placement of the lights from far away in the air. To reinforce the contrast between being on ground and up in the air, I also added different sounds to the respective states. I enhanced the impression of
moving fast while on ground by adding fast paced music. As the player would jump up into the air, the music would fade into an atmospheric, hollow wind sound. As I played through the prototype, I felt a joy in the movement and control over the steering and thought that the movement on ground got even more intense in contrast to the more contemplative jumping up in the air.

Being high above ground, listening to the howling wind, made me feel detached from the fast paced reality on the ground. It felt somewhat contemplative and intimate, and this made me realize that I was getting closer to my third initial experiential goal; “feeling small and vulnerable”. As I found this effect intriguing, I felt the need to go back and implement it in one of my older theme concepts.

**11.8.4.Final concept sketch**

![Screenshot of final concept.](image)

After my experiment with the “racing game”, I went back to my second concept sketch, that held the theme of shadow theatre. As Löwgren and Stolterman (2005) describes it, ideas or concepts might seem clear at some point, but when something unexpected is discovered it can bring the concept back to a more abstract level. The design space can then be said to be open again, but it is yet enriched by what was recently encountered (Löwgren and Stolterman, 2005).

**Note:** Video footage of this concept can be found at: http://marie.biip.cc/?p=242
I decided to try out the effect of zooming in and zooming out to enable the player to get a close-up view on the character as well as an overview of the game space that I had found interesting in my racing game prototype. I worked with sound in a similar way as with the concept before, and used a more detailed sound while you were zoomed in, and the sound of a hollow, howling wind in the zoomed out mode. The player could still see and control the main character the same way in zoomed out mode, and I was hoping that this contrast would enhance the goal of “feeling small and vulnerable”. I also designed this with the experiential goal of “control” in mind, since the zooming provided somewhat of a god-like perspective on the game space and character that the player could switch inbetween at any time[Fig.7].

What had followed me through all the iterations and prototypes was the concept of light vs dark. I had based my first hi-fi prototype on this concept, and it followed me throughout my different stages of exploration. At first this concept revolved around the activity of gathering light, in order to expand the field of view when advancing in the game space. Later it became part of a shadow theatre theme, where light and dark was extremely contrasting and where I worked light effects into the game space for atmospheric purposes.

When I started experimenting with the camera, I wanted to convey a feeling of loneliness and vulnerability. The character is extremely small on the screen while the the game is zoomed out, and a lot of elements have been added to strengthen this sensation. But at the very beginning I simply started out by having a simple zoom in and zoom out function,
where the atmosphere would change solely by sound. An empty and hollow wind sound was then playing as the player was zoomed out, and as you zoomed in the character of the sound would change.

At this point I had an idea of creating some kind of puzzle that you could overview while the camera was zoomed out, and that the zoomed in mode would provide more traditional platform gameplay. I then wanted to aim for creating some kind of strategic gameplay or puzzle to the zoomed out mode, and traditional platform gameplay in the zoomed in mode that also provided a more intimate relationship to the character.

Fig.8. Paper sketches of puzzle concepts.
As Löwgren (2012) mentions, lo-fi prototyping can aid idiomatic design, and since I was not in for inventing a whole new type of puzzle I started to sketch as many puzzle ideas as I could think of. Many were spatially oriented, and concerned dividing the space into different parts so that the player had to puzzle them together to form and unlock new paths [Fig. 8]. The final idea that came out of paper brainstorming that concerned rotating and moving the game space or pieces of a level. This seemed like an idea that could hold some smaller puzzles, and something that felt closely connected to feeling in control.

![Fig. 9. Paper prototyped puzzle that was implemented.](image)

I decided to try this out in digital material right away, since I wanted to understand how the interaction felt but also because I wasn’t even sure if I could implement such a behaviour to run smoothly at all.

![Fig. 10. The puzzle implemented in the Unity3 game engine.](image)
As I got the idea working successfully in my prototype, I started to explore different shapes and forms [Fig.10] to try and understand how I could combine and use the different parts of the game space in interesting ways. As I played around, I was mostly concerned with whether this gave me a feeling of control when I moved the game space parts. I also wanted to make sure that I could actually move my character on the platforms at the same time as I manipulated them. Exploring this idea solely on paper or in theory would not have been possible. In a traditional game design process, my next step would probably have been to create a puzzle in the crude and simple environment that I had created, but I instead started to think about the visual and the spatial forms. In order to spark new ideas within this core concept, I decided to make a new visual theme that could guide me forward.

![Fig.11. Theme for final concept.](image)

This time the theme was colorful and held a lot of organic shapes, landscape features and spatial information [Fig.11]. I brought this theme into my game engine in small portions at first, by modeling and texturing in 3D Studio Max. Initially, I was interested in whether I could lightmap textures and easily switch them out so that the game space seemed to get dark. My idea was that, similar to the first concept, the player was to collect “light blobs”, and in this concept I wanted to see how it could be integrated into the game space. As I experimented
with how to represent the “light blobs” and portray light, I suddenly got surprised by how the particle effects would interact with the foreground texture layers and their shaders. It was as if the light seemed to “bleed out” on the screen, similar to the light effect in an overexposed photography [Fig.12]. I instantly got fond of this effect, since it provoked a very physical sensation as you looked at it, and worked to emphasize it even more.

![Fig.12. The state of the prototype as I “found” the light effect.](image)

What could be said to be the core mechanic in this concept was born this way. As I developed the light effect further, I got it to spatially incorporate the whole interface. I also noticed how it was not only “visually rewarding” to look at, but also bright to the extent that it was physically exhausting to be exposed to for a longer time. I then started to think about what light could mean in relation to the character, and based on the overarching “darkness and light” concept, I thought that the character might logically be scared of light. I had made the character into a black round shape, and thought that it would be more coherent if it avoided light, rather than collected it as had been the goal in the previous concepts. My idea instead developed into that the character was to utilize the game space to hide from light. Technically, I then started to explore how I could trace the character in the game space from another point in the game space. As this was successfully implemented, I started to go deeper into the details of my development process. To keep my idea and theme coherent, I constructed a narrative or plot that could work as a reference point for my design process.

**Core idea and narrative**

The game world contained light sources that your goal, as a one-eyed little demon, was to destroy. Your objective was thus to bring darkness upon the “multiverse”. To survive, you had to avoid the intense light rays from the big light sources that were circling the worlds. By rotating and moving the planets, you avoided the light by blocking the rays with the light beams, and at the same time you were able to throw dark
blobs that blocked the big light blobs from refilling the smaller light sources. As you played, you controlled both the rotation and movement of the planets at the same time as you moved around with your character. This made the game quite a motoric challenge.

Giving the player the ability to zoom in and out between perspectives was oriented towards the experiential goal of “feeling small and vulnerable”. I hoped that the intimate perspective of the character in close-up would bring meaning to the “godlike” perspective[Fig.13]. But more importantly, I wanted the “godlike” and more distant perspective to make the player feel small in a grandious world[Fig.14].

Fig.13. The zoomed in mode of the prototype.

Fig.14. The zoomed out mode in the prototype.
The game space was designed so that the player could take cover and hide from the light rays. Since the light sources orbited around the game space, the player had to move around and find new places to hide from the light.

I thus wanted the spatial structure to be varied and organic, so that the player had to make quick judgements concerning which direction to turn the game worlds in, as well as where to move the character. In my prototype the game space[Fig.15] ended up constituting the rules to a great extent, since you had to hide and build the game space to avoid light and block light rays from refilling the light sources you wanted to destroy. You also had to rotate and move the parts of the game space in order to take advantage of it in different ways.

Fig.15.Modeling the game space in 3D Studio Max.
The Controls
Initially I used the keyboard and mouse as inputs, but as I wanted the player to be able to move at the same time as s/he manipulated the environment I decided to rethink the physical interaction with the game. The game’s input had become too complex for keyboard and mouse interaction, so I decided to look for a controller that had been designed to master complex input. I had made unconventional interaction designs with games earlier, but thought that in this case my prototype had too much input needed in order for a totally new interaction to work well. There is always learning involved in novel interaction, and to not make this burden twice as big I decided to go for a classical game controller that resembled the one designed for PS2 and PS3. The buttons on the Logitech Dual Action Controller[Fig.16] are ergonomically placed close to each other and fit for two hands using them.

Fig.16.Input controller.
"Game lighting is not just about supporting verisimilitude in game environments; simulated illumination can have an effect on player emotion, and create a fertile environment for the development of more complex game pleasures." - Simon Niedenthal (2008, p.104)

Light plays an important role in the final concept prototype, and the effect that was implemented in the end was the result of explorative experimentation within the possibility space framed by the minor and overarching theme. The fact that screens actually emit light makes out for an intense sensual and perceptive experience as the interface in an organic manner goes from being dark to bright. The effect got even more intense as it affected the surrounding objects by making the paper texture layer emerge and become visually prominent.
As I started to think about ways to portrait the health or life of the character, I knew I did not want to display it as a conventional progress bar. I started thinking about the interface, and considered making use of the whole screen. But since it was already taken up by the light effect I decided to take another direction. I knew that I was also interested in creating a bond between the player and the character, and that I wanted to give the player a good reason for zooming in. From my small, informal playtests I performed with people that happened to be around during the process, I learned that most testers played the prototype without zooming in at all. This was due to the fact that the zoomed out mode provided a necessary overview of the game space. I decided to try visualizing the characters health or life in the zoomed in mode, and started to think about ways to represent it. At this point I had already created one eye for the character, and animated the eyelids to give it more life. The character also looked in the direction it was moving.

![Fig.19.Depictions of the character health increasing.](image)

I started thinking about ways in which I could associate light and health with the character in the zoomed in mode, and realized that I could base this visualization on how eyes actually respond to light in real life. I decided to remake the whole eye and animate the pupils so that they responded to the amount of light they were exposed to, and this way represent the life of the character without introducing obtrusive GUI elements. At the same time this association was a way to keep the rules coherent to each other as well as the rules coherent in relation to the representation or fiction that Juul(2005) describes. As mentioned before, I also wanted to create a bond between the player and the character. As a result I also added the behaviour that the zoomed in mode made the character regain life faster. But in order for this to happen, the player had to stop moving the character so that it faced the player. To strengthen the bond between player and character, but also to provide feedback I added a sighing sound of relief from the character as the life was regained.
Sound
In a development with focus on aesthetics, sound is of main importance. Sound can provide richer feedback, enhance atmospheres and evoke emotional responses (Sonnenschein, 2001) that are all crucial parts of the overall aesthetic game experience. The sound design within the scope of this concept, has e.g. been focused on providing feedback to improve experiential qualities like pliability (Löwgren, 2012). I have also tried to reinforce the contrast between the zoom perspectives to strengthen my goal of “feeling small and vulnerable” with the help of sound, and finally music. As mentioned before, Brown and Cairns (2004) point out atmosphere as one of the key factors that affects a player’s sense of immersion and overall level of engagement, and sound can be said to play a significant role in establishing this (Sonnenschein, 2001).

Sound has the ability to influence our perception of space and can induce sensation of volume, texture and other material properties (Sonnenschein, 2001). For the zoomed out mode, I initially chose to use a hollow sound, that I had tried out in my “racing game” concept, and that reminded me of “empty space” and vast distances. Close up, I chose a more textured sound from an old record player needle. I wanted this to associate detail and intimacy.

Later on in the process, I reinforced the contrast between the modes by composing music instead. The zoomed out mode was then characterized by minimalistic glockenspiel sound accompanied by the hollow wind sound implemented earlier, and switching to the zoomed in mode would fade in many different layers that together intensified the pace. In the zoomed in mode there were no environmental sounds, and my goal was that this mode would immerse the player in the music and bring a heightened sense of movement and intimacy with the character.

“music restores a link between mind and body [...] music can initiate us into a fantasy world [...] music plays an important factor in drawing us into the illusion-reality.” - David Sonnenschein (2001, p.105)

When I composed the music for the zoomed in mode, the metaphor I worked with through the process was the idea that the player would submerge into the inner mental and emotional state of the character, by being brought closer in distance as well as through the soundscape. Sonnenschein (2001) describes how music has empathetic qualities, and that the personality or inner emotional landscape of a character is often portrayed by music or ambient sound.
When I designed some parts I instantly knew how I wanted them to sound. Throwing “dark blobs” onto surfaces and having them instantly increase in size as they stuck onto parts of the game space seemed "natural" to add a sound feedback to. My first association to the visualization of the “dark blobs” sticking to surfaces and increasing in size was that they should be accompanied by a clean popping sound. Similar to the ones you can create by pressing out air from between your lips. I started recording and mixing this sound, and as it was added to the lightblobs it seemed to match the representation. The sound when two worlds collide as you move them was based upon a hollow but warm sound of two table tennis balls colliding. I wanted it to feel like two small things colliding, rather than some grandiose "earthquake related" sound, since the worlds are perceived almost like small toys when you interact with them in the zoomed out mode.

11.10. Making sense of the process

"To a designer, truth is not as crucial. In design, it is necessary to create an image of reality that makes a good foundation for design." - Löwgren and Stolterman(2005, p.31)

Löwgren and Stolterman(2005) emphasize that “to design is to create something new”, and that it is not centered around problem solving. A design process cannot be predicted, and Löwgren and Stolterman(2005) describe how one characteristic of design is that it involves chance and uncertain outcomes. The design process is often misinterperated as being similiar to a straight line, from idea to finished design. But due to the unpredictability of design work, the process is often very crooked and uneven. At some points the idea or concept is clear, but then something unexpected is discovered and the concept is brought back to a more abstract level yet enriched by what was recently encountered(Löwgren and Stolterman, 2005). Throughout my design process, I have left concepts behind and opened up the design space several times, in order to explore new themes based on the goals I had set from the start. Similar to how Löwgren and Stolterman(2005) describe the design process, the previous concepts have all contributed to the last and are thus as important as the final one.

One crucial finding for me was how well hi-fi prototyping suited for
sketching, and that I was able to actually discard many ideas even though I had put a lot of effort in realizing them. Löwgren(2012) emphasizes how sketching on paper, whiteboards or post-it notes only serves its purpose when you are working with idioms and conventions. He brings up wireframes as one example, and describes how they work perfectly for envisioning design ideas that are idiomatic, but how they are rendered useless when it comes to sketching novel or unconventional ideas. He also mentions how you can create detailed storyboards when you create a film, but points to how the common interaction design method of storyboarding different user scenarios is far less accurate due to the unpredictable nature of user behaviour.

Throughout my process I have utilized various different sketching techniques, whereas the first one involved experimenting with different materials to let their properties inspire game behaviours and constrict game spaces. But games are interaction systems complicated to such an extent that this sketching method proved to be too limited to account for my purpose. Since I also believe the aesthetic material of digital games to be the multimediated result of the rules or the compiled code, I decided to change material and go for hi-fi sketching.

Schön(1992) describes the design process as a reflective conversation between the material and the designer. As the designer makes a design move with the material, it “answers” or “talks back”. He describes how the design process in its explorative nature involves a lot of surprises that makes the designer reflect on the current state of the design. This is what he defines as a kind of “reflecting-in-action” or “reflecting-on-action”. Since the digital material, as Löwgren and Stolterman(2005) point out, lacks properties, I believe that this reflective conversation with the digital material can be initialized by establishing boundaries as food for thought. The whole idea of my initial “game design game” experiment was to use materials to constrict possibilities and to work with concepts to base ideas on. I initially hoped that this design game could state an example in how designers can use materials in the real world to manipulate and give properties to the digital material. Although I found the lo-fi prototyping to be limiting, I brought the core idea of giving the digital material properties with me into my hi-fi prototyping process. Instead of actual physical objects, I chose to work around themes and user goals as a way to constrict the design space and strive for coherence and a holistic end user experience. To evaluate any concept in a holistic approach, the core parts of the game experience had to be in place. As games in their very nature are hard to predict(Salen and Zimmerman, 2003), allowing for any part to
change can make the whole game change or become incoherent as a whole. This is also why making plans about designing for the aesthetic experience in the early experimental development phase is hard. Instead, I suggest that the designer, similarly to the painter, occasionally expands their focus and tries to grasp or understand the whole. Löwgren and Stolterman (2005) describe how reflection regarding the parts as well as the whole is of great importance throughout the design process.

Fig. 20. Visualization of my frame of thought throughout the process.

I have chosen to look at the process and game parts quite traditionally split in two parts; behaviour and representation. But I argue that the whole needs to be considered in order to design for a holistic aesthetic experience (Fig. 20). In my process I have chosen to treat rules as
behaviours since I think that rules, as a word inherent from mathematics per definition and by association relates to engineering more than design. In this sense, theory in relation to my design process, has not revolved around the construction of absolute truth. I have merely tried to lay out a foundation for design with my framing of the design space (Löwgren and Stolterman, 2005). Using the word behaviour has been a means to take focus from rules in my design process, and balance my two ideas of representation and behaviour. Striving for coherence and a holistic aesthetic experience, these words are also been more closely related to each other than Juuls (2005) concept of rules and fiction.

11.11. Playtest

“Being a superior game designer isn’t about controlling every aspect of the game design or dictating exactly how the game should function. It’s about building a potential experience, setting all the pieces in place so that everything’s ready to unfold when the players begin to participate.” - Fullerton et.al. (2008, p.3)

Embodiement, presence, immersion, flow, pliability, pace and last but not least play, are all qualities inherent of games as experiences. The aesthetic experience is born out of the relationship between a player and a game over time, and the playtest enables the designer to take part in the game experience with fresh eyes and a diverse range of subjective perspectives. It aids the designer to make decisions concerned with where to go next and what parts need to be iterated in the aim for a specific aesthetic game experience.

In my qualitative playtest I had five participants in the age span 24-30. The range of game experience differed between the participants, and two of them had a very limited experience of games. The playtests were performed in my own home, since I wanted the prototype to be tested in a “natural gaming environment”. This was an aim to get the participants immersed in the experience in a similar way as they would usually do. I hooked up my sound system, offered my sofa, dimmed the lights and put the game up on a flat screen tv for them [Fig.21]. Since some gamers e.g. turn off their sound in favour of their own music I decided that I wanted to have total control over the experience as a whole, so that the prototype could be evaluated as the holistic experience it was intended to be in the end. For my playtest I also wanted to have control over the platform, so that no bugs or lag interfered due to running the game on different systems. Adjusting and preparing the game controller also required my presence in the setup.
For my bachelor thesis, me and my partner had one playtest session online, where we encouraged people to play our prototype and to answer an online form afterwards. The playtest was performed this way in an effort to allow the players to experience the game according to their own play habits and in their own gaming environment. But in the end it proved to be hard to interpret many answers, and to overall understand what the players were referring to as they reflected upon something in the game. When someone complained or pointed out an issue it was hard to make out from their text answers whether the problem was due to a bug inherent of their own system or if it concerned something we had actually designed. Overall, we experienced the inability to observe players as they played to be very limiting. Our second playtest was performed at campus, in a controlled environment where we video recorded, observed and interviewed the participants afterwards. But the sterile environment of that playtest didn’t seem to bring anything but the illusion of an “objective” laboratory setting. With this background, I decided to aim for having the best of both worlds, observing the gamers while in a potentially familiar gaming context.

I told the participants to talk out loud as they played, if they felt comfortable doing so. As Fullerton et.al.(2008) recommend, I wrote down everything the play testers said during their sessions. After the
session I asked them to reflect upon and describe how they experienced the game overall. I chose open questions, and mostly aimed for getting them to talk about the first topic that came to mind. In my bachelor thesis, me and my partner had been using closed and very detailed questions. As we were reflecting on the interviews, we found that both of us were of the impression that many participants seemed to make up some answers to cover the fact that they hadn’t considered the issues we brought up at all.

My strategy was to observe how the players behaved in the game space and how they reacted to different situations during gameplay. Since the game had elements that did not follow any typical genre that the players could recollect and act upon, how they understood and gave meaning to game objects, the game space, interaction and the game behaviour was crucial to me. By observing their behaviour I could form an understanding of how the parts of my game worked in terms of e.g. coherence, simplification and narrative.

Fullerton et.al.(2008) state that the main focus of a playtest should be to try and experience the game through the player. They mention that observing what the player focuses on, how she moves, what makes her frustrated and how she reacts to this as examples of things that can give the designer an understanding of the play experience.

All playtest participants seemed to be afraid of the light objects that circled around the worlds, and this made them act with caution. Initially they also seemed to struggle a lot with the controls, since there were so many buttons to keep track of at the same time.

"Very hard. I have major problems coordinating under stress."- David

"Too many buttons for me, I'm getting stressed. I'm not used to this. It's nice that it is not timed, and that you still get this stressed. You have a lot of things to focus on, both moving and puzzling. Good for the brain." - Laura

Based on the concept of game flow(Koster, 2005), the prototype initially seemed to be hard to the point that it was frustrating. All participants expressed this in some way, either verbally or through failing the game over and over. It was not until they had died and replayed the prototype a couple of times that they really started to get into the controls. Lisa, for instance, who had even jumped to suicide a couple of times because she was frightened of the light could appreciate the game after a couple of replays.
"When you learn the controls it becomes more of a logical puzzle. You build your way to advance." - Lisa

As they learned the controls, they could also reflect upon the whole experience to a greater extent.

"You felt weak and vulnerable, but when I got control of the controls I felt powerful because I could manipulate and outsmart the game." - Kristin

One of my experiential goals was to make the player feel "small and vulnerable". The fact that Kristin almost literally pinpointed this in her reflection on the game experience afterwards made me feel like I was on the right track.

"Aaaaaah!" - Mattias

Mattias bursted out as he started to fall, and elegantly caught himself in the air by selecting and steering a world to land on. Afterwards he mentioned how this event made him freeze, and that he got butterflies in his stomach for a moment. He often laughed at himself for not mastering the puzzle, and seeing the humour in the situation as he one of his thrown “darkblobs” landed on an unintended part of the world. The fact that all players reacted strongly when they fell off any part of the world, and referred to the character falling as “I” points to the level of presence the players felt while engaged in the game. All participants thought that the controls were hard to learn, but felt rewarded as they spent some time to learn and take control of them.

"It is easier to get hooked when it is this hard. I guess it is pretty balanced, but slightly too hard." - Kristin

Laura thought that the game reminded her of the particles that everything is made up of, or that the game narrative took part at the beginning of time. She also talked about feeling like a helpless and vulnerable creature exposed to a lot of obstacles. Laura did not have much gaming experience, and stated that motoric gaming skills were not her specialty. She liked the fact that she could save herself even though she was falling, and as I observed her do this it seemed to really get to her in a sensual “vertigo” like state.

"It feels like the earth – a particle or a cell. It is a world at the beginning of the universe, or maybe you are the only one left in the world. It is about survival. It felt hopeless, but it was fun. Very beautiful light." - Lisa
Even though I am hesitant to the word constricting nature of the word fun within the game design discourse, I did find it valuable when one of my playtesters pointed out that she found the game experience fun.

"Very beautiful – and that makes you wanna play more. You understand that you are supposed to mess with the planets. It feels like you want to protect the character." - Kristin

The fact that Kristin mentioned that she understood what she was supposed to do in the game pointed to that the game was somewhat coherent. Similar to how the players in Brown and Cairns (2004) study had pointed out the level of craftsmanship as a valuable quality, Kristin, Mattias, Lars and Lisa appreciated the effort that had been put into the modeling, texturing and overall visuals. Brown and Cairns (2004) judge the level of craftsmanship as being significant when it comes to experiential qualities like immersion and involvement. This level of involvement can also be related to how Kristin associated this appreciation to the urge to play more. Brown and Cairns (2004) also found empathy to be closely connected to presence and immersion, which Kristin could be said to have expressed as she mentioned how she wanted to protect the character. Lisa also expressed empathy as she described her relationship to the character;

"The character becomes you, maybe because it is made up from a realistic body part. The character becomes an individual that you get sympathy for. Or maybe more like a friend, a living creature." - Lisa

"It is another universe, and the character lives there. The character probably wants to go home now. Maybe it is lost." - David

"I felt a bit lonely. Or as if the character was lonely. I wanted to take it out from the screen and pet it." - Lars

Even though little effort had been put into story and plot in a traditional narratively linear way, all the players had a created their own fictive and dramatic understandings based on the game space, sound, game goals and the main character. This is in line with Jenkins (2004) theories about games holding narrative in their own way, and Juuls (2005) theory of the fictional world of a game as always being completed by the players imagination.

"I liked the fact that I could save myself from falling, with the help of the planets or worlds." - David
All of the participants managed to save themselves from a certain death by moving a part of the game space underneath their falling character. Everyone also pointed to this with appreciation, and seemed to experience almost being surprised by their own ability to in a quick maneuver save the situation. This was also something that surprised me, since I thought this scenario had been unique to me when I was playing the game prototype. I thought that the numerous playthroughs of my prototype had brought upon strange behaviours like these on me, and I even felt like I was cheating in my own game when I pulled the stunt of catching myself from falling. As I had experienced it in a direct manner I related it to “control”, which had been one of my initial experiential goals throughout the design process.

### 11.11.1 Playtest reflection
The players did seem to reach a cognitive state of heightened awareness that Parson(2002) describes as characterized by an aesthetic experience. Participants also seemed closely focused on the game, and could jump to suicide in panic as they simultaneously strongly expressed their panic and chock emotionally as their character fell to a certain death. Parsons(2002) description on how the aesthetic experience is characterized by exploration and strong mental focus were also characteristics that the playtesters expressed, but is also a state games in general can be said to provoke. After the playtest sessions it was overall interesting to note how everyone talked in terms of how they “felt” while reflecting over the game experience. You are seldom faced with reflections with such a rich spectra of emotions accounted for from someone who is asked to reflect upon other designed artifacts such as mobile phones, chairs, or even paintings.

Since it felt like I had become partially blind in relation to my prototype and where it was heading, the playtest sessions helped me understand, evaluate and see new possible design directions. Through the playtest, the aesthetic qualities of my prototype as well as my pre-defined experiential goals, could be explored and evaluated. The core issue that seemed to surface from the sessions was the difficulty and lack of control the players felt as they tested the game. This forced them to play the game over and over until they learned to master the motoric challenge, and access the game space for real. The controls in combination with how their movement was constricted in the game space were the two parts that seemed to bring upon this frustration. Since “control” and “pleasure in moving” were two of my main design goals throughout the twisting and turning process, I wanted to adress
these issues right away. The fact that every participant also mentioned saving themselves from falling in the last second as being thrilling and exciting was also very valuable for me. I wanted to explore how this sensation could be even more intensified and what other behaviours or interactions in the game could provoke similar experiences.

11.10.2. Iterations
Since a lot of players witnessed feeling frustrated with the constraints of and difficulty of the game, I decided to make some iterations that could also strengthen my goals; “control” and “pleasure in moving”. I brainstormed different concepts that I thought associated to freedom of movement such as swimming, but to go in line with my theme and keep the game coherent I decided to add the bonus of flying [Fig.22]. To associate this with a symbol that could fit into the theme of the game, I added clouds that passed by through the game space. Colliding with a cloud would thus give the player wings and the ability to move more freely for a limited period of time.

![Fig.22. The wing bonus.](image)

The clouds also offered the possibility for players to save themselves from falling to their deaths, since they could try and steer their character close to a cloud as they fell off a world, lending them another chance at beating the game. This was greatly inspired by the participants appreciation for being able to catch themselves in the air with a world as they fell. I also focused on movement and control by adding the ability to jump very high when jumping on top of some environmental “mushroom shaped” objects. To enhance the pliability qualities of the “mushrooms”, I animated them so that they reacted as the player toughed their surfaces, and threw the player up into the air.
12. Discussion

Part of this thesis has aimed to create an understanding of what can be said to constitute the aesthetics of digital games. Through the gathering of concepts used within the game design and interaction design discourse, I have laid a foundation for my design process and knowledge construction of game aesthetics.

Game aesthetics have been treated according to a classical model that Parson (2002) and Hassenzahl and Tractinsky (2006) have described as being characterized by objective and subjective parts. As part of the qualities that I view as being inherent of games as artifacts, I have treated concepts like simplicity, coherence and representation. The aesthetic game experience, which can be said to be characterized by embodiment, presence, immersion, flow, fun, pliability, pace, dramaturgy and play, is born out of the relationship between a player and a game over time. The aesthetic game experience is based on a game being, perceived by and interacted with, a subject; the player. Just like user tests plays a crucial role in evaluating the user experience within interaction design (Preece et al., 2007), playtests allow designers to tap into the aesthetic game experience through observation of and reflection upon the experience. This can in turn help the designer make decisions concerning where to go next and what parts need to be iterated in the aim for a specific play experience. But to create an understanding of the aesthetic experience of a game, the designer does not solely have to rely on playtests. I think it is important not to forget that play experiences, as Salen and Zimmerman (2003) points out, can not be observed but are only fully understood through interaction. Through the act of what Schön (1992) describes as “drawing-seeing-drawing”, the designer steps back to observe and reflect on the design throughout the process. Applying the terminology of Schön (1992), the act of game design could be described as a kind of “playing – iterating – playing”. This way, I think that playtests serves as complements, although very valuable ones, in evaluation of the aesthetic game experience. The playtest can bring different subjective perspectives of the designed artifact into the light and complement the overview necessary for the designer to grasp.

Like Nitsche (2008) and Fishwick (2006) describe, players are faced with the sum of the parts, the multimediated result of the formal system that in interaction makes out the aesthetic game experience. To understand the rules as players, we often need to scratch the surface and analyze the game to grasp them in an indirect manner. I argue that it is the end experience, by taking what Hunicke et al. (2004) refers to as the player
perspective, that the designer needs to focus on in order to design for a specific aesthetic game experience. As Thomas Grip mentioned in his guest lecture, I think that starting high-end and working your way down helps to keep focus on the end experience. In order to evaluate experiential qualities such as pliability, flow and presence, hi-fi prototyping might even be a necessity. I also argue that incorporating experiential goals, that are part of interaction design methodology, can aid a design process that focuses on the end user experience.

Kosters(2005) theory of fun is relevant to the topic since it touches upon the experience of playing a game, but for my practical work, it has been more fruitful to split the emotional and experiential possibilities of gameplay into a wider scope of facets. As Salen and Zimmerman(2003) mention, the experience of playing a game can involve emotions like desire, pleasure, anxiety, wonder, etc. Throughout my design process, I had three specified goals that I worked towards evoking in the players; “pleasure of movement”, “feeling small and vulnerable” and “control”. According to my analysis of the playtest results two goals seemed to have been “fully” achieved. But most of all, the playtest helped me to form an understanding of why they had been achieved and how I can enforce the ones who had not been achieved.

Throughout my design process I have also used visual themes as a means to spark ideas about game behaviours in a strive for coherence. As mentioned, Juul(2005) states that fiction adds meaning to the rules. I think that this thought is interesting to elaborate further. Just like Juul(2005) describes the fictional world as being shaped by the rules, I think that this relationship might also work well in reverse. I think that the game space can constitute the rules, like Salen and Zimmerman(2003) also point out, and that game objects, concepts, symbols and our associations to them can inspire game behaviours and rules in the design process. This would also probably serve as a solid foundation for coherence inbetween the rules and the fiction that Juul(2005) describes. Game spaces and objects manifesting as rules and behaviours can convey meaning to the player by association. I think this could not only work well as a way of enabling the player to give meaning to the objects, but thinking of game objects based on their representations can help to hold up a theme or narrative throughout the game that in turn can provide a holistically coherent game experience.

Similiar to Jenkins(2004), I believe that games have their own ways of conveying stories, and that the narrative can be part of the game space
in the form of a theme, atmosphere or what you actually do in the game. In my playtest, the participants seemed to have formed their own ideas of narrative, solely through the game space, game objects, sound and game goals. But as much as a game space can hold complex narratives (Jenkins, 2004), it also consists of boundaries that make up rules for action and interaction. My game rules have been defined by the shape of the game space in relation to how light behaves. I think that splitting rules and fiction is problematic, and my use of the terms representation and behaviour has been an approach to keep the two closer together or to at least denote their intimate relationship throughout the design process. You can create games solely relying on rules and dress the rules in fiction afterwards, but I think that this approach is problematic. If the representation or fiction is bended and skewed to fit the rule system, the end experience risks ending up lacking what Juul(2005) refers to as coherence.

I have used concepts like coherence and simplification, and started designing in what could be thought of as the opposite end by focusing on representation and the high-end result rather than rules. I have argued that this works as well as the other way around, based on Jenkins(2004) theories of spatial sculpting, and the fact that the game space and it’s objects do constitute rules in many games(Salen and Zimmerman, 2003). To incorporate this practically in my design process I have created themes, sometimes visually in the form of moodboards and at other times as keywords. The themes have both served as giving the digital material properties(Löwgren and Stolterman, 2005) and served as concepts to base my sketching on.

I think that what Salen and Zimmerman(2003) refer to as the “second-order design problem”, where rules are viewed as the only element that the designer can manipulate directly, does not constitute a problem to my approach. Game behaviour is hard to predict over time(Salen and Zimmerman, 2003), and game design is something that happens, in what Schön(1992) would call a "seeing-drawing-seeing” process. As Salen and Zimmerman(2003) describe, the designer throughout the process becomes a player, as the play activity becomes an act of design(Salen and Zimmerman, 2003). I do not think that there is a certain “order” in which this is done, but argue that the two activities are not separate but blurred together in a game design process. The fact that game behaviour is hard to predict can also be stated to make out more of a possibility than a problem. Sketching and design work overall always involves elements of surprise(Schön, 1992), that make the designer reflect on the current state of the design, and this type of
discovery can give way for new interesting design discoveries.

Hi-fi prototyping, as opposed to lo-fi prototyping, is a slow and time consuming form of sketching. And throwing out highly developed material throughout the process can be hard. But in the context of prototyping for a specific aesthetic experience, I argue that it is a necessity. Most of the aesthetic qualities that I have brought up in my thesis would be hard or even impossible to evaluate through lo-fi prototyping.

I am not suggesting this as an approach that should replace any other method, but I am merely trying to open up the game design discourse for alternatives. Similar to Salen and Zimmerman(2003) I believe in the importance of diversity when it comes to developing the game design discourse. The construction and re-design of design theory can help to push the boundaries of established methodologies(Löwgren and Stolterman, 2005), which in turn can influence what comes out of the design process.

Researchers within the game design field points to the lack of innovation in the game industry(Jenkins, 2004), (Salen and Zimmerman, 2003), (Fullerton et.al.2008 ). Even though I personally would state parts of the game industry are changing, I can agree that there is an extensive re-use of genres, rule systems and fictional themes within the industry.

The process that I have suggested does not hold any guarantees for a novel or pleasurable gameplay result. But I do think that the approach aids innovation, since it does not take off in a design space consisting of pre-established genres and classical rule systems. I suggest that the design approach presented here, with it’s focus on exploration, can work as an aim to go beyond existing genres and their respective conventions. By this I do not mean that genres do not serve a purpose, but rather that aiming at a particular genre before the design process is initiated will most likely narrow down the possible outcomes.

Lastly, I would like to reflect upon the definition, and why I have chosen to adress it as the aesthetic experience. To denote it’s close relationship with the experiential qualities of a game, and instead of just referring to it as a “game experience”, I argue the importance of defining it more specifically, and make clear what parts of a game it addresses. The aesthetic experience, with its definition involving sensual, perceptive and emotional characteristics, has a lot in common with the experience of playing a game. In the interaction design context, the
“userexperience” incorporates both functional and aesthetic qualities. Since part of the definition of games is that they are unproductive in their very nature, I suggest “aesthetic game experience” as a term because it denotes the purely experiential qualities.

13. Conclusions
In this thesis I have pointed to characteristics that I think of as relevant to game aesthetics, but that more importantly have helped me to ground my practical work. Within aesthetics I have touched upon concepts such as simplicity, coherence, representation, embodiment, presence, immersion, flow, pliability, pace and play. I suggest that these concepts of game aesthetics can be divided into objective parts inherent of the artifact, and subjective parts that characterizes the experiential qualities of playing a game. The subjective qualities inherent of the aesthetic game experience can be observed and evaluated through playtests, but also by the designer in the form of a “playing-iterating-playing” approach inspired by Schöns (1992) idea of design work as a kind of “drawing-seeing-drawing”.

I have also suggested an approach to design for a specific aesthetic experience in a game, that centers around hi-fi sketching, themes and specific experiential goals. My particular approach is not to be viewed as a safe solution or method, but should merely be viewed as an example of one possible approach to designing for a specific aesthetic experience.

Further, I have argued that coherence in between fiction and rules can be maintained by focusing on representations of simplified real world concepts, objects or symbols and their inherent behaviours or properties instead of rules, throughout the design process.

The suggested design approach has strengths in the sense that it doesn’t conform to pre-established genres, is more player oriented, can create coherent experiences and aid innovation. Due to it’s focus on exploration and experimentation, the approach is more suited for the initial part of the design process. Since it is not efficient and can not guarantee the outcome of an innovative or pleasurable game, it might be more suited for a research departments or similiar contexts within the commercial industry or academic discipline.
14. **Further research**

The research does not address the whole scope of game aesthetics. For further research it would be interesting to sum up and more in depth discuss all the different characteristics and concepts that can be said to make out game aesthetics. It would also be interesting to try the approach in some sort of participatory design process. This could mean to initiate the design process by forming experiential goals and themes that players who might not refer to themselves as "gamers" would like to explore.

It would also be interesting to follow this start-up approach throughout a complete development process to understand whether concepts that are born from this approach can develop into full games that last over time.
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