EVOKING IMAGINATION

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"Imagination is more important than knowledge. For knowledge is limited to all we now know and understand, while imagination embraces the entire world, and all there ever will be to know and understand."

- Albert Einstein

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EXECUTIVE SUMMARY

The aim of this thesis is to say what evokes imagination. Especially focused on objects of design. A conceptual structure in the form of a framework for imagination is introduced in the first chapter. Alongside the relation of imagination to interaction design, and the role of imagination how people see new structures in the world around us. It was found that user interaction design is diminishing misinterpretations in design (Redström, 2008). That design is designing us back (Willis, 2006). Meaning that the understanding of what elements in the user-object interaction evoke imagination can eventually lead to providing a useful starting point of imagination as a possible tool. And new knowledge for the design practice of interaction design.

The second chapter explored the literature on imagination. Imagination needed to be separated from other mental acts. Imagination is different, because it doesn't commit itself to the truth. The motivation to use imagination is extrinsic, compared to the intrinsic motivation of creativity. The role of imagination in the perception of object is one of synthesis. Imagination mediating between our sensibility and understanding. Providing the synthesis of intuitions into representations or concepts. Furthermore is the role of affordances discussed and found to provide perceivable of information for the perception of object, the intuitions for the syntheses by imagination. The phenomenological outlines for imagination are given following Bendor (2018), (1)Indeterminacy, (2)Possibilities, (3)Residuality and Folkmann (2013), (4)Negativity, (5)Unrealization, and (6) Transfiguration.

Design theories, ambiguity, open-endedness, and speculative design are explored and analyzed in how they already evoke imagination. Ambiguity focussed on the multiple interpretations of objects, open-ended focussed on creating possibilities rather than functionality and speculative design with providing alternative scenarios. All three design theories researched the realm of interpretation of object. But none has acknowledged the role of imagination, in the interpretation of things.

Chapter 3 focussed on the relation between the framework and how products are influential on the variables. The element of familiarity is given the role to what extent the subject needs to make use of their imagination. (De-)scripted, the script, following the definition of scripts from Madeleine Akrich (1992) is the relation or instructions between object and the immediate surrounding 'inscribed' by the designer. It is concluded that the script is providing space for new meaning creation. The object is open for multiple understandings, and the pre-consisting understanding of 'open' products is more easily detached. Eventually in Chapter 3 the element of context is added

to the framework. Context is considered to be influential how the instructions can be recoginized, coherent to the object. And incoherent to the object, how the use of imagination is looking for new possibilities.

In chapter 4 the design experiment is described, conducted and analyzed. In the design experiment participants are presented several objects that variate in their familiarity and script 'inscribed'. The participants are asked to explain what they see in front of them. If the first initial exploration of the object was over, alongside the object two types of relational contexts are presented, coherent and incoherent to the script of the object. The participant is asked to explain how they would use the object in the scenario. The explanation of relation between object and surrounding is analyzed, seeing how the interpretation of the instructions and affordances is dependent of the context. Furthermore the ability of the subject to explore multiple possibilities is important to not limit the search for possibilities. The design experiment showed that familiarity is the pre-existing knowledge and the subject subsequently is challenged if the object is unknown to make use of their imagination, by making the purpose of the object known. Furthermore familiarity is limiting the participant to ascribe new meaning if there is already meaning present. It is a personal competence to what extend someone can re-purpose an object. The experiment showed that some people are not able to do this. The script of an object is providing the space to re-purpose and thus explore the possibilities of use of an object. This exploration is preformed by imagination.

The last chapter provides a discussion on this thesis. Where is concluded that an unknown character present in design is evoking imagination. The unknown character triggers exploration in the search for understanding. The second conclusion is that the open interpretation of objects is evoking imagination. Providing space for possibilities, this space is mediated by the designer. The designer does has an important role in how the meaning of object is created linking it to the use of imagination. Indirectly the designer is influencing evoking imagination. To engage in the user in acts of imagination further research need to be conducted to research how the extrinsic motivation of the user is triggered. Provoking the subject to engage with the design and trigger the exploration of possible use, thus evoking the act of imagining. Imagination provides the search of new meaning and new possibilities. The role of providing more than one possible use, also needs further research to be able to say how to channel it to particular aims. To conclude it is possible to evoke imagination by design, by providing strange objects, resulting in the search for an understanding. And by providing open interpretations of use, leaving the meaning creation to the subject rather than the designer.

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1. IMAGINATION

Understanding the world around you and giving value to what you see, is an act of imagination. Saying this, positions imagination central to human activities. Everyday activities such as dreaming, sports, and cooking. In this thesis the role of imagination is researched in relation to interaction design, it is written to accomplish the master Design for Interaction at the Delft University of Technology. This chapter will provide information on the topic and the structure of the thesis. The relevance is substantiated by a short argument, where is argued that we suffer a lack of imagination in how we perceive and build the world around us.

1.1 INTRODUCTION TO THE PROJECT.

Imagination is the human faculty understood as the capacity of a subject to produce images, ideas and sensations detached from a perceived reality. An important differentiation here is the origin of the images, ideas, or sensations, not originating in the world but being created in the mind. Imagination is thus an internal process taking place in the mind of a subject. Imagination is so intertwined into our everyday life that there is no need to question its presence. In the following chapter the role of imagination is explained according Kant's theory of Perception, how it mediates between our sensibility and understanding. That through imagination we create meaning in the world around us, thus imagination being a central part of our understanding of the world.

Making a small leap to design, and Design for Interaction in particular, there is an interplay between the subject, designer and object. The interplay is likewise imagination where the subject is interpreting and perceiving the object created by the designer, leaving the physical interaction aside and merely focussing on the mental activity. A designer comes up with an object, with a wide variety of possible reasons, and places this in the 'real' world to be used by others. The design process put extremely simplified here, but in this process several moments occur where imagination plays a role in how the subject perceives the object. With this thesis, those moments are investigated.

Overall this thesis will look into the possible role of imagination in perception of users in design and interaction design. It will look into the role an object can play in the perception done by the subject. Is the object pure functional, like a cup to drink water from, or can it a be a form of transfiguration of meaning through use. The term transfiguration is following the definition of Folkmann (2013), "Design can be said to create figurations, shapes of experience. These figurations can be remodeled and reworked in order to create configuration and reconfigurations of experience. When design tries to frame experience different, push it further, this process may transcend the

figuration that is then brought on the other side of itself and thus becoming a transfiguration. (The Aesthetics of Imagination in Design, p.190-191)

This thesis is divided into 5 chapters. In the first chapter I introduce imagination and situate it within the context of interaction design. Furthermore, the first chapter will go into the significance of imagination, the relation to interaction design, the aim & objective of this thesis. Chapter 1 ends with the framework that is used to research imagination. In chapter 2 I will draw on literature to position imagination, and how it takes place in the perception of objects. The second chapter will sketch a phenomenological structure on the experience of imagination. In chapter 3 the framework is substantiated. The framework is populated with explanatory products, that ultimately lead to the understanding of imagination in relation between user and object and to the hypotheses for the design experiment.

To validate the findings from the literature research and the framework, chapter 4 is serves to communicate the design experiment conducted. Lastly, chapter 5 is used to explain and discuss the findings from the design experiments. What knowledge is generated by carrying out the experiment? I will discuss the limitations of the project, necessary choices made and conclude with recommendations and points of improvement.

1.2 CRISIS OF IMAGINATION.

Everyday we make use of our imagination, but to what extend do we 'wrongly'[1] direct our imagination? Is it a matter of personal values and beliefs? Is it the lack of divergent thinking facilitated by imagination? There is slowly developing a society where we suffer from a crisis of imagination. Meaning that we are facing several big challenges but don't know how to tackle them. Bendor (2018) indicates that sustainable ideas and the implementation are neglected, because people suffer from myopia. This myopia, short-sightedness, or lack of imagination is the reason that people can't see these ideas coming into actuality. Amitav Ghosh (2016) calls out the 'crisis of imagination' regarding climate change. Ghosh claims that today's culture finds it hard to deal with the understanding of climate change. Questioning why different modes of cultural activity do not address climate change, "—for let us no mistake: the climate crisis is also a crisis of culture, and thus of imagination." Slavoj Zizek (2017) adds the following: "One big problem, I think, is bio-genetics, so called post-humanism. There is a real prospect of controlling people in new, unimaginable ways." Furthermore Zizek addresses the *social trust* system[2], capitalism, hereby showing overlap with the argumentation of Ghosh, that of capitalism being intimately linked to culture.

1 THE CHOICE FOR 'WRONGLY' HERE IS MADE ON SUBJECTIVE OPINION. IN MY OPINION THE USE OF IMAGINATION, AS POSITIONED IN THE TEXT, CAN BE DONE WITH A BETTER MORAL CONSIDERATION.

2 THE SOCIAL TRUST SYSTEM IS A GOVERNANCE MODERATING ITS CITIZENS. CITIZENS WILL BE MODERATED THROUGH A CENTRAL COMPUTING SYSTEM. THIS SYSTEM IDENTIFIES YOUR ACTIVITIES AND ESTIMATES EACH PERSON WITH A CERTAIN GRADE OF YOUR "SOCIAL TRUST".

> "It seems to be easier for us today to imagine the thoroughgoing deterioration of the earth and of nature than the breakdown of late capitalism; perhaps that is due to some weakness in our imaginations."
> - Fredric Jameson (The Seeds of Time, 1994; p. xii)

All these challenges, rather than referring to them as problems, are missing the imaginary element of what the implications of such developments can be. We can't imagine which direction it will go or how it will develop. Having argued the crisis of imagination on a macro level concerning how we shape the world. Directly linked to interaction design we can argue as well that there is a form of diminishing imagination.

1.3 IMAGINATION & DFI.

The distinction has to be made here between the imagination of the designer to be creative, and the imagination of the user to perceive objects. Where creativity is more than mere imagination, according Alex F. Osborn (1953; p.117), "It is imagination inseparably coupled with both intent and effort. - Where imagination simply requires that we have some context from which to envision an idea, creativity requires that we have knowledge of the idea, motivation and freedom to explore and tinker, intelligence to see what makes the convergence of any set of ideas possible, and then the energy to see the process through." This thesis will focus on how imagination is evoked by design, and not researching the user's creativity. What actually evolves in interaction design is that we limit the use of imagination, as Redström (2006) puts it:

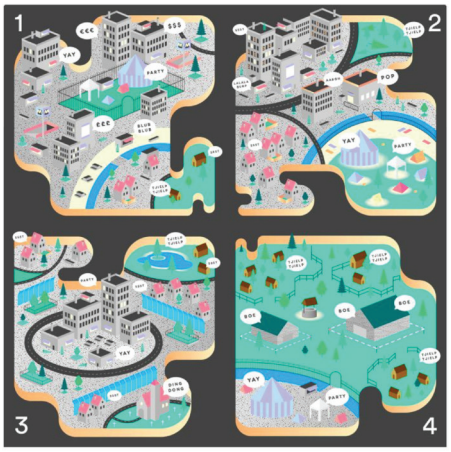
> "As the possibilities for alternative interpretations are systematically reduced as a result of the designer's attempt to optimize the design with respect to fit, the room for finding our own solutions, possibly coming up with interpretations that are more interesting than the original intent, is reduced to a minimum." - Johan Redström (2006; p.135)

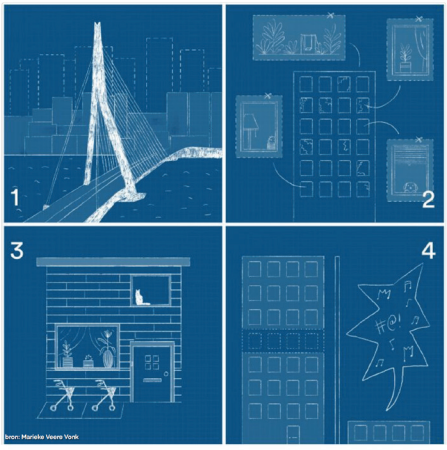
Redström argues the movement towards the user is problematic. Optimizing interpretations of use, thus eliminating possible misinterpretations is in fact reducing the use of imagination. So 'this crisis of imagination' is not only present in developments regarding society, but 'the crisis' is also present in the approach of user-centered design. In this light we have to rethink our preconceptions of both the role of, the user and designer.

Contrary to the argument above there are design fields that make an attempt at the use of imagination, a field such as Speculative Design. Where Dunne & Raby (2013) tend not to create only things but also ideas. Speculative Design as design theory among Open-endedness and Ambiguity will be discussed later on in this thesis (Chapter 2.7).

Lastly, we can add the understanding of design as practice of Willis (2006) what she calls Ontological Design: “we design, that is to say, we deliberate, plan and scheme in ways which refigure our actions and makings — in turn we are designed by our designing and by that which we have designed.“ It is that what we imagine in design, our world, acts back on us and designs us. Seen the ‘crisis of imagination’, we do need to embrace imagination in understanding and approaching our lifeworld. Imagination is an important element in how we shape the world around us.

To conclude, an example to approach the ‘crisis of imagination’ differently is given by Dutch online magazine Vers Beton, in the wake of the Dutch municipal elections of beginning 2018 they developed a voting advice application that uses pictures instead of words[3]. After looking in depth into the programs of the political organizations, they came up with 7 questions that represent the visions that the political parties have on Rotterdam. Vers Beton clearly states that it is a pilot and not a leading advice, they do argue though that the use of images triggers a different way of thinking. Where the subject imagines their political view and projects this on the pictures presented.





↑ fig.1 & fig.2 - two examples of the pictures created by Vers Beton in the realm of Dutch municipal elections of 2018.

Left: How does your ideal Rotterdam festival policy looks like?

Right: How should Rotterdam develop in terms of a residential city?

1.4 AIM & OBJECTIVE

The central aim of this thesis is to investigate how a person perceives objects (of design) and what role the imagination plays. To what extend, semiotic qualities, material qualities trigger imagination in the appropriation and/or the understanding of objects.

3 https://versbeton.nl/2018/03/waar-is-de-verbeelding-rotterdamse-politiek-onderschat-de-kracht-van-beeld/

The argument made in chapter 1.2, is that there is value in imagination, but to research what the value of imagination is falls outside the scope of the project. The scope of this thesis is how imagination is evoked through design. Imagination though, can be a transformative power, Folkmann (2013) argues that imagination can serve as a transformative power on our ways of using and engaging with design. Create new perspectives and responses to the cultural, societal, and environmental challenges of the future. But presupposed to this idea, we need to understand how imagination is evoked through design. We know imagination is important but we know very little about how to evoke and channel it towards particular aims. Therefore, the following research question is explored in this thesis.

RESEARCH QUESTION:

How is design evoking imagination?

SUB-QUESTIONS:

What is the role of imagination in the perception of objects?

What elements are influencing the evocation of imagination?

1.5 INTRODUCTION FRAMEWORK.

In order to research how design is evoking imagination an initial framework is set up. This framework is build up out of the variables, familiarity & strange, and, scripted & de-scripted. To be believed is that these factors play a role in evoking imagination. The framework serves as a conceptual base for the understanding of evoking imagination and analyzing the literature accordingly. The variables will be explained briefly and will be described in greater depth later in the thesis.

FAMILIAR:

When recognizing something, things are familiar and there is no need to imagine what it is and what it is for. A coffee cup is something we have seen before, putting cultural and societal references aside. We don't have to think how to use the coffee cup because it is part of our objective knowledge. Therefore, familiar is chosen to explain interpretations with little to no use of imagination.

STRANGE:

Chosen opposite to familiar, is strange. Strange objects will be difficult to be understood or not recognized at all. Being unusual or weird in this context is assumed to evoke imagination. When an object is not clear, the subject has to make it clear by using their imagination what the object is for, although the suspension of disbelief is crucial (Dunne & Raby, 2001; p.63). The conceptual model people create of strange objects are embedded in the subject's memory, prior experience and knowledge. This holistic image creation, from being strange, is to be considered to evoke imagination.

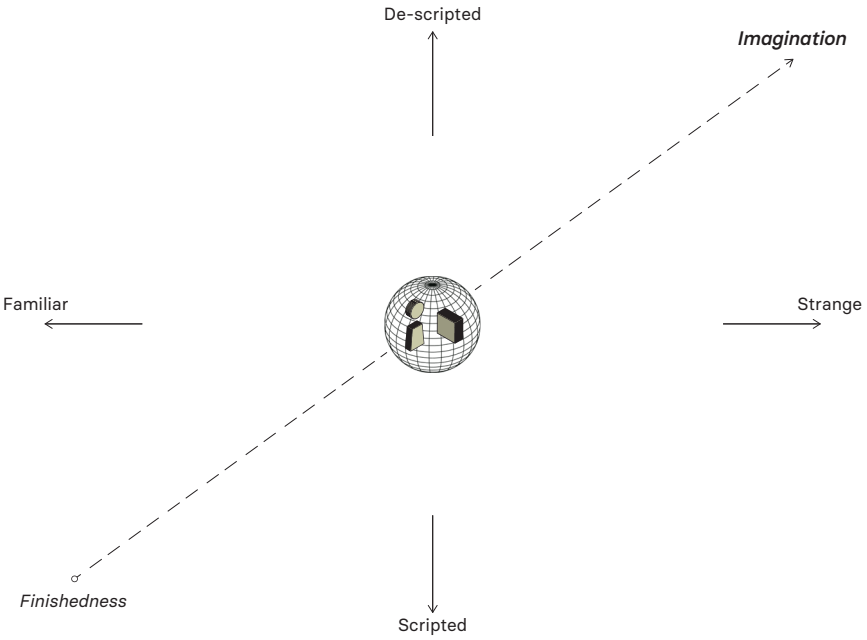
SCRIPTED:

The explanation of the term script(ed) is “Designers thus define actors with specific tastes, competences, motives, aspirations, political prejudices, and the rest, and they assume that morality, technology, science, and economy will evolve in particular ways.”, as given by M. Akrich (1992; p.207). This prediction of use means that designers inscribe instructions in products is subsequently not leaving interpretations open for imagination.

DE-SCRIPTED:

De-scripted is in contrast to scripted, a level for openness of interpretations is needed here. Akrich (1992; p.209) describes de-scripted as “It is the inventory and analysis of the mechanisms that allow the relation between a form and a meaning constituted by and constitutive of the technical object to come into being.” Leaving interpretations open and create space for the subject to imagine.

To conclude the framework (fig.3) for now, it is to believed that in the quadrant familiar & scripted the imagination is almost not evoked. Imagination will be most possibly be evoked in the top-right quadrant of strange & de-scripted.



↑ fig.3 - Initial framework.

2. LITERATURE RESEARCH

The notion of imagination is flexible and has a variety of uses. One way to explain imagination is the false believe of something, meaning I imagined the mug to be blue, but instead it was grey. Another use of imagination is closely linked to creativity, meaning to be 'creative' someone is 'imaginative'. A third use can be someone asking you to imagine. These three examples do show that imagination can be used differently in different situations. In this chapter the position of imagination is discussed according the scope of this thesis. It will provide the positioning of imagination in relation to perception, meaning making, and several design theories.

2.1 IMAGINATION AS MENTAL STATE.

The goal of the literature research is to set imagination apart from other mental activities. And place imagination in relation to the perception and interpretation of objects. It will discuss the general definition of imagination, the capacity to form a mental image not present to the senses, being insufficient when explaining imagination in relation to interaction design.

2.1.1 DIFFERENT TYPES OF MENTAL ACTIVITIES.

Remembering, believing and fantasizing are mental activities that also have the capacity to form mental images not present to the senses. Similar to imagination. The former mentioned mental activities and imagination do show overlap but there are distinctions between the mental states. If I'm telling a friend what I had for breakfast yesterday and I tell him, I had coffee from a blue mug. I'm doing the act of remembering. By stating I had coffee from a blue mug, I commit this thought to the truth, "as existing in my personal past that present itself in the present" (Casey 1976). Whereas if I'm saying I imagined the cup to be blue I'm not committing this thought to the truth or posit it as existing in any sense (Casey, 1976; Gaut, 2003). Imagining is fictional or make-believe (Gendler, 2011).

> "To imagine something is to form a particular sort of mental representation of that thing. Imagining is typically distinguished from mental states such as perceiving, remembering and believing in that imagining S does not require (that the subject consider) S to be or have been the case, whereas the contrasting states do." - Tamar Gendler (2011)

Fantasizing on the other hand can be understood, as a subject to be thinking of something he or she believes to be real, but which is not real. Similar to the third of twelve conceptions of

imagination, as described by Stevensen (2003). The latter case is tricky since it is fairly similar to imagining a possibility of use. The difference here is the input for the thought. When imagining something there is input of empirical evidence (see Chapter 2.4). The input for fantisizing is formed internally by the subject (not related to perceptual experiences per se).

Creativity too has it's relation to imagination, and creative thinking is making use of imagination, not by the aim, but by the result of something. Creativity is to have an intrinsic end, where imagination has an extrinsic end (Gaut, 2003). The goal of the research is not to test the creativity of a person, but in the interpretation of objects there is use of creative imagination in order to look for purpose of an object. The difference between creativity and creative imagination is made by the expected outcome. Creativity its aim is to create new knowledge (committed to the truth), creative imagination is seen as the ability to think through different possibilities (not committed to the truth).

The difference between imagination and other mental states is thus that imagination is not bound to the truth and can posit past experiences into the future. Having different input and an extrinsic end.

2.1.2 THREE TYPES OF IMAGE MAKING.

Imagination is forming mental images not present to the senses, Matherne (2015) distinguish between three different views of images, those being the (1)imaginary -, (2) snapshot -, and the (3) phenomenological view.

(1) Imaginary view, which we could label the 'imaginary view', an image is a picture-like representation of something that is not present and perhaps has never been present.

(2) 'Snapshot view', images are treated like mental snapshots, i.e., as representations that capture a single spatio-temporal instance. When I, for example, look at the sun just as it dips below the horizon, we might think that I (much like my camera) form a representation of it that captures this precise moment.

(3) 'Phenomenological view', images can be regarded as complex, holistic representations that represent something from multiple spatio-temporal perspectives, e.g., an image of a house that represents not only the front-side that is directly given to me, but its back-side as well.

Matherne in her work focussed on the role of imagination in our perception, by giving a systematic analysis of Kant's Theory of Perception. When a subject is imagining the possible uses an object, the subject needs to conjure a phenomenological view of the object in imagination. In order to imagine the object and its use, a holistic representation of the object is needed, a single spatio-

temporal instance will not suffice. When the object is brought into mind, we need to imagine the quality of material, the size (in relation to the surroundings) the weight.

2.2 MEANING MAKING BY IMAGINATION.

A part of human nature is that we constantly want to understand, what it is that we see and experience, we give meaning to the world and it things around us. The way we make our lifeworld understandable is partially performed by our imagination. Kant acknowledged the faculty of imagination to be the faculty that mediates between our sensibility and understanding. By following this belief, the role of imagination in meaning making can be acknowledged and given a prominent role in the way we see the world around us. The use of imagination allows us to give meaning or belief to things beyond our knowledge. Kenya Hara (2015) says first, "intrinsically, knowledge is merely the entrance to thought", making a link back to types of thinking and secondly " 'to know things' is where the imagination starts, not the goal". The faculty of imagination is actually allowing us to look beyond mundane uses and situations in everyday life.

2.2.1 IMAGINATION IN PERCEPTION.

This chapter is diving into the philosophy of Kant, through the analysis of Matherne (2015), in order to explain and explore the role of imagination in perception. This is considered important for the understanding of the 'cognitive structures' of imagination and the role of imagination in perception. Imagination is considered the mediator between the mental capacities of sensibility and understanding.

SENSIBILITY

Sensibility, "the capacity (receptivity) to acquire representations through the way in which we are affected by objects is called sensibility" (Kant, A19/B33, cited by Matherne, 2015:p.743), is what we are able to sense around us, within sensibility there are intuitions. An intuition is used to refer to any sensible representation, a singular representation that is immediately related to an object. An empirical intuition is a representation that "is related to the object through sensation". Intuitions allow the subject to skip steps in making something instinctively understandable.

UNDERSTANDING

On the other hand we have understanding. Understanding is the spontaneous capacity by means of which we are able to think about the object that is given through intuition. Within the perception and understanding, there are concepts formed. Concepts or conceptual representations can be seen as the possibilities through which we actively think about the objects provided to us by intuition. "Concepts are therefore grounded on the spontaneity of thinking, as sensible intuitions are grounded on the receptivity of impressions" (Kant, A68/B93, as cited in Matherne, 2015).

Imagination is assigned a role in perception, by mediating into understanding. Perception requires more than just being sensible, to go from intuition to concepts. Imagination engages in acts of synthesis in which it 'puts together' intuitive representations and 'produces images' on the basis of the synthesis. Kant explains the imagination as a "faculty of the synthesis of this manifold in us" and engage in the synthesis "in order to bring the manifold of intuition into an image" (Kant as cited in Matherne, 2015. p.754).

Matherne understands the manifold in this context, to be a manifold of objective representations that reflect the various parts of the object. In an example of a coffee mug, the manifold intuition of the mug include the representations of various aspects, e.g., the size, the ear (if present, arguably a mug), a chip broken of at the bottom, different glazing on the inside of the cup. "A manifold is not something that only reflects a single spatio-temporal instance, but rather can reflect multiple spatio-temporal instances" (Matherne, 2015, p.755), creating a holistic image in to the phenomenological view of an image.

Eventually this manifold is represented as 'one representation'. The object' representations as a whole is consisting of various representations of an object within the manifold of intuition, coming back to the mug and having the different intuitions such as the shiny glazing, a chip broken, the size, all these representations appearing in the manifold are eventually brought together by the synthesis and made into a holistic representation of the cup. Kant does identify these holistic representations as images. According Kant's view, perception requires images over and above intuitions in the narrow sense (Matherne, 2015). This 'phenomenological image' or concept created by means of synthesis is what is used for cognizing an object by means of this representation. Meaning that imagination is thus important how we create an understanding (believes & hypothesis) of what is present around us.

2.2.2 CONCEPTUAL MODEL.

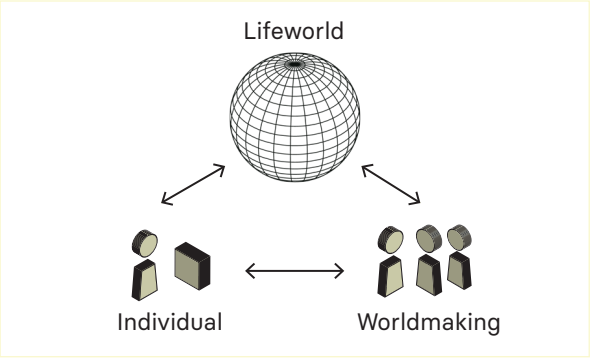
Kant argues that we approach experience with a conceptual model in place. That the conceptual model gives structure to our experience. What I understand by this is that the things we perceive and the 'concepts' created are related to other 'concepts' we have. The unity of the synthesis through original apperception.

When I have an hollow object that is closed at the bottom. The conceptual model of the object is placed within a conceptual framework of multiple 'similar' objects. In this way the subject can recognize or is able to associate the object as something from which they can drink a liquid. The synthesis of recognition is what enables the subject to see a receptacle as a drinking tool.

2.2.3 IMAGINATION ON PRODUCT & WORLD LEVEL.

Our individual imagination and the collective imaginary are intertwined. There is a purported role for imagination in the way we incorporate new ideas into long-standing cultural and societal ideas. The interaction and the perception of objects can link into propositional imagination, like belief, eventually leading in to new ideas and change of behavior. “The relationship between imagination and belief is not direct but mediated — and complex”. Creation of new ideas in design, further explained in 2.7.3 (Speculative Design), is interesting when we look at the relation between individual imagination and the collective imaginary. New experiences of imagination can alter the figuration of existing meaning. The interplay is also present since designed objects design us back (Willis, 2006) and on the level of this ontology of design we design objects that are permeated by imaginary meaning (Folkmann, 2010).

By evoking imagination through design there is the possible influence on our worldview. All the different ideas we possess they wander in the mind, which eventually can lead to new unforeseen creation of meaning. Where they emerge over time, saying that some objects or experiences have indirect effects over time, creating a ideas in the form of propositional imagination or belief.



→ fig.4 - simplified overview of the relation between the individual imagination, collective imaginary and the worldview.

It comes down to something that goes beyond the scope of the thesis but nonetheless regarded important, is that imagination can fuel the shift of the collective moral understanding. Where I believe eating meat is bad for the environment, some people will have a different moral understanding and belief otherwise. This ties into the ‘crisis of imagination’ mentioned in the introduction of the thesis. Imagination, and the lack of it, is intertwined with collective moral understanding and the reshaping responsibilities that come along with it. It is necessary to challenge both the individual and collective imagination, in order to evoke change in the collective moral understanding (leaving the discussion open, on what the correct moral understanding is).

2.3 IMAGINATION & INTERPRETATION.

The difference between interpretation and imagination is small. When receiving the question what the difference was, I couldn't differentiate them at first. Therefore a short explanation between the two is given. By taking both the definitions of interpretation and imagination we encounter the difference already.

Interpretation: the action of explaining the meaning of something.
Imagination: the faculty or action of forming new ideas, or images or concepts of external objects not present to the senses.

> "Imagination allows meaning to be understood, the world to be expressible and action to be feasible"
> - M. Foessel [4]

The difference between interpretation and imagination, is that imagination is the faculty able to take part in meaning creation. Interpretation is the action of explaining meaning. Imagination is interpretive in nature, and thus both acts are closely related and continuous. The interpretation or self-understanding of what is present to the senses is made possible through the images or concepts preserved in memory and imagination and which are offered to interpretation.

2.4 INPUT FOR IMAGINATION.

Imagination serves as a synthesis between our sensibility and understanding. In order for the imagination to function as the faculty to form an apperception, there are empirical intuitions (representations) needed. Intuitions can be seen as information, information where our imagination can work with. This 'databank of intuitions' is formed from our pre-existing experiences, and is what we call, memory. Using your imagination is using memory what the subject did experienced beforehand, thus is individual.

> "By imagining we ascertain nothing that we did not know beforehand in some respect. What we take to be in the imagined object or event is only what we already, explicitly or implicitly know about it."
> - Casey E.S. (2000; p.7)

If lets say a mug is unknown to the subject, the subject has never seen one, there is no memory present of a mug. Without this knowledge it is rather unlikely for the subject to be able to imagine a mug, and be able to say with certainty that it is indeed a mug. We use our knowledge and prior experiences in order to imagine. Similar to building blocks are intuitions and representation to imagination, without them there is no material present to build upon. Coming back to a comment of Kenya Hara, that 'intrinsically, knowledge is merely the entrance to thought.' Relates to the fact,

4 taken from http://www.publicseminar.org/2018/01/imagination-and-interpretation/. As cited in [12] Paul Ricoeur ou les puissances de l' imaginaire» in Paul Ricoeur: Anthologie, (Paris: Seuil,, 2007).

that knowledge is where the imagination starts.

2.5 AFFORDANCES & IMAGINATION.

The world around us is filled with with material things or objects that afford something. The perceivable bits of stimulus information of the material around us, otherwise known as affordances, are the actionable properties between the world and the actor (Gibson, 1986). The term affordance is first defined by Gibson, derived from the verb to afford, as the actions possible by a specific agent in a specific environment.

When looking at the affordances of a rock, it affords us to break open nuts, scare away or even kill animals for survival. The stone can also be taken indoors and used differently, namely as a paperweight or a bookstand. Contrary we also know that if we step on the rock (if big enough), it affords us to trip over, meaning that we can read affordances in both ways, positive and negative. "The medium, substances, surfaces, objects, and other animals have affordances for a given animal. They offer benefit or injury, life or death. This is why they need to be perceived." What Gibson is saying is that affordances are always there, for us to be perceived. Norman (1999) who has looked into affordances in relation to design, echoed this by saying "they exist naturally: they do not have to be visible, known, or desirable." With this in mind affordances show the relations between the world and the actor.

The relations between world and actor, the stimulus information tell us what we can do with the actionable properties, transferring it to our understanding. This is where imagination comes in and can be linked to affordances, as a way of understanding how an object can be used from what you see and infer from looking at it.

> "Detached object must be comparable in size to the animal in consideration if they are to afford behavior. But those that are comparable afford an astonishing variety of behaviors, especially to animals with hands. Objects can be manufactured and manipulated. " - James J. Gibson (1986; p.133)

Imagination makes use of affordances, we perceive affordances (intuitions) and after, imagining the use of the object affordances. This is certainly the case if something is new or not used before. In design we link affordances to functions, were a door handle can afford to be either grabbed or pushed, it also indirectly tells us which way the door opens, a door that needs grabbing often links to a conceptual model that the door needs to be opened towards you. The conceptual model according Norman, is how you think or expect something to work. The conceptual model according Norman, is slightly different to the conceptual model explained earlier. The conceptual model of Norman is about the (intuitive) use of object, and the conceptual model explained earlier is about the how we

place objects in a fitting (reverential) conceptual framework.

Good design, good as in being user-friendly or intuitively understandable, is a thing were the user has an effective conceptual model[5]. The designer creates a system product image, including shape/form/signifiers/affordances. Which, subsequently, the user needs to interpreted. This can be seen similar to the script the designer creates for an object to be used, this will be further explained in chapter 3.

> "The affordance, being invariant, is there always to be perceived." - James J. Gibson (1986; p.139)

Eventually affordances, are just there to be perceived. But in design these affordances can be altered and included in the design to create effective conceptual models for the user to perceive. In relation to imagination, if something is unknown we use the signifiers and affordances in order to make things understandable. Either by placing them in the reference to other objects (conceptual model), for instance with the stone used as paperweight, it affords to hold down papers (being heavier). Affordances can be used as information input, intuitions for the suppositions conjured in imagination for understanding the use of the object.

2.6 PHENOMENOLOGICAL OUTLINE IMAGINATION.

The following text gives the outlines of imagination following the phenomenological outlines of Bendor (2018) and Folkmann (2013). First both outlines will be explained and after they will be compared and see to what extend they are similar. Bendor divides the outlines into (1) indeterminacy, (2) possibility and (3) residuality. Folkmann divides the outlines into (4) negativity, (5) unrealization and (6) transfiguration. Folkmann though in his conceptual framework of imagination focusses more on imagination in relation to design.

> "What is sought in the implementation of such a method is an accurate description of a given phenomenon as it presents itself one's own experience, not an explanation of its genesis through reference to antecedent causal factors. The phenomenologist's basic attitude is: no matter how something came to be in the first place, what is of crucial concern is the detailed description of the phenomenon as it now appears." - Edward .S. Casey (2000, p.9)

(1) INDETERMINACY.

When we imagine there is always a level of vagueness related to the image. It features indeterminacy. This indeterminacy or vagueness makes what we imagine fuzzy. This vagueness present in the imagination creating a lack of sharply focused detail, "means what we imagine is essentially open in character" (Casey cited by Bendor, 2018). Our memory, where our experiences

5 Information retrieved from the online course on Affordances by Don Norman: https://www.interaction-design.org/courses/affordances-designing-intuitive-user-interfaces

are stored does deliver our prior experiences. By recollecting memories of experiences, there is the argument that these memories are fuzzy. Meaning that the memories of experiences are not always complete or vivid, but rather partly known.

> "for indeterminacy and pure possibility open up imaginative experience from within; and they do so precisely from within the limits established by the same experience's self-containedness and self-evidence." - Edward .S. Casey (2000;p.36)

(2) POSSIBILITY.

The indeterminacy of imagination invites us to fill in the gaps that are created by it. The gaps, either events, objects, or settings trigger our imagination and are essentially open. Bendor mentions, the only limits are our capacity to draw new associations between perceptive, mnemic (memory), and imaginative object and our willingness to let the imagination imagine, deferring any judgement by reality. Drawing new associations, is seeing new possibility. When imagination gives form to what is unknown, it is the faculty that sees and produces the possibilities.

(3) RESIDUALITY.

Although imagination takes place internally, there is always a certain relation to reality. "Its objects may not be 'real' in the strict sense of having an observable existence (or being available for empirical intersubjective confirmation), but neither are they unreal in the sense of lacking existence or lacking the ability to influence reality." (Bendor, 2018). This relation to reality comes from other faculties like: past sensations, experiences, memories, and feelings. Imagination never works completely on its own, it will always be closely associated with other mental faculties. Similar to Husserl saying imaginary objects retain "noematic nucleus", pre-existing experience and knowledge. Not only does the imagination include residual elements, its very existence relies on a measure of residuality: "The imagination is always rooted in available present and future worlds, taking its raw material, so to speak, from existing perceptions, experiences and memories. But it also reaches into the future, allowing us to project, extrapolate, surmise and speculate about things that may not exist materially, and events that have yet to take place" (Vervoort et al., 2015, p. 66. As cited by Bendor).

(4) NEGATIVITY.

When we imagine we take the sensual base and via a process of internalization we place it in the imaginary. This internalization is where the imagination is effective in consciousness and through the act of negation (the contradiction or denial of something) produces imaginary meaning. According Folkmann, the production of the imaginary through negation serves as a basic condition of our capacity for abstraction and conceptualization.

> "Negation is a concept of thought, not perception. ...What I am saying is that when we use negation to generate an alternative to what we perceive, we necessarily employ imagination, because we have to represent what is merely possible." - McGinn, C. (2004) p.140-141

(5) UNREALIZATION.

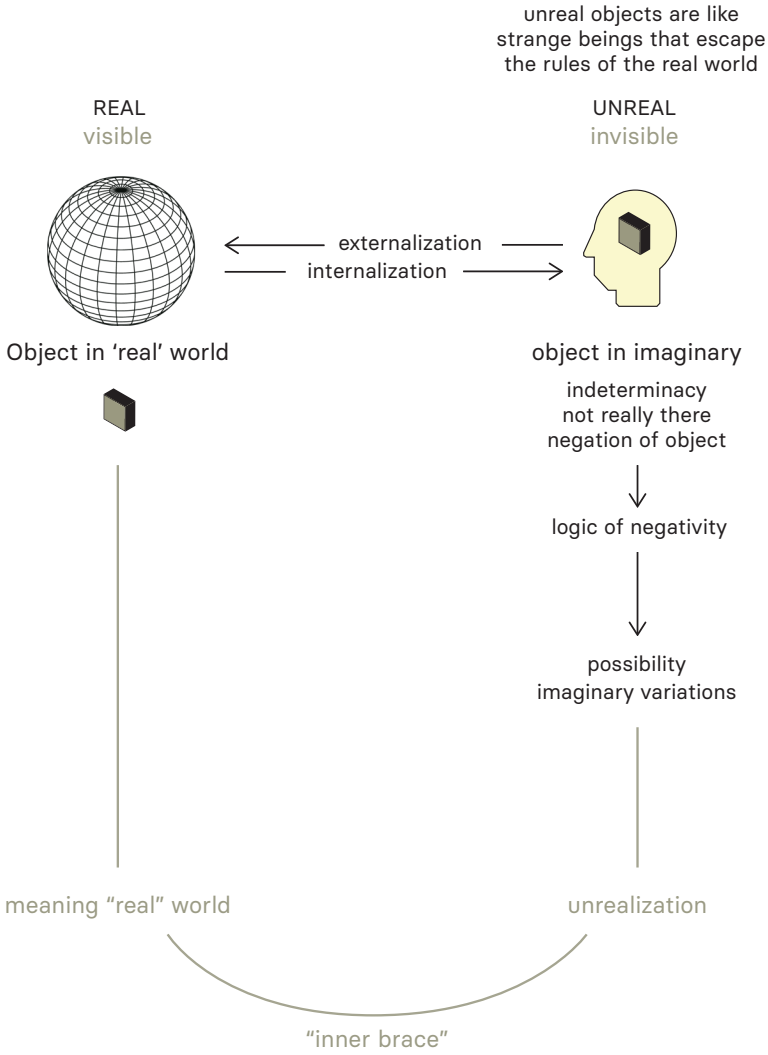
Unrealization simply put is the process to describe the detachment of the imaginary meaning. The imaginary meaning is detached from the 'real' world and is now free to create new meaning in the 'unreal' (imaginary) world. It challenges in a sense what meaning is. The act of unrealization unfolds between the given and actual being at stake at the border of the possible and imaginary. "Through the act of unrealization, new dimensions of meaning are explored, and the imaginary gains in importance as a vehicle and principle of meaning. This facilitates the production of symbolic meaning in design." (Folkmann, 2013). The meaning creation facilitated by unrealization happens in the space between the real and the unreal, the imaginary.

(6) TRANSFIGURATION.

This term is already mentioned in the introduction of the thesis. Trying to frame the experience different, in a way push the experience out further. This process can transcend the figuration. These figurations can be remodeled and reworked in order to create configuration and reconfigurations of experience. In a way transfiguration means that objects can have a transfigurative effect that pushes our experience further into new unknown territories, pushing our understanding further not bound to reality and being able to see new possibilities.

CONCLUSIONS:

The experience of imagination is explained according Bendor and Folkmann (fig.5). The experience of imagination is described as being vague and fuzzy, an act of negating the known. Both opening up space for new possiblities and new meaning. The object from the 'real' world is internalized and made part of the 'unreal' or invisble. the object in the imaginary is residual where it has a close relation to the other mental activities. In the 'unreal' world objects and their meaning can be unrealized and given new meaning. Making it possible to see things differently.



↑ fig.5 - Overview phenomenological outlines of imagination.

2.7 DESIGN THEORIES AS INSPIRATION.

This chapter will introduce three design experiments and for what reason they are discussed.

2.7.1 AMBIGUITY.

Ambiguity, makes ambiguous reading of objects. Meaning that what we see is vague to a certain extend and this vagueness evokes imagination. The relation to what is familiar to us is altered and helpful to look into what evokes our imagination. Gaver, Beaver and Benford (2003) describe ambiguity as the relationship in the interpretative and evaluative stance of the individual. Previous said that imagination sits between our sensibility and understanding. Is it possible to see the interpretative and evaluative stance similar to sensibility and understanding?

The definition of ambiguity is being open to more than one interpretation. This means that there are multiple possibilities of interpretation and therefore the products is open for ascribing meaning. Ambiguity differs from product characteristics, where products inherently are not ambiguous, ambiguity sits in the interpretative relationship between user and product. Thus ambiguity can facilitate meaning and plays a role in how people experience products. On a emotional level and on an aesthetic level.

Gaver (2003) talks about three sort of ambiguity. Ambiguity of information, context and relationship. Ambiguity of information is focused on how the information is presented, where the smile of Leonardo DaVinci's Mona Lisa is described "With insufficient information to go on, the viewer has to bring that smile into focus in their mind". The insufficient information will not directly mean that there is not enough information but that the information given is not directly recognizable or familiar and therefore suffers from a level of vagueness, what can be seen similar to indeterminacy. Indeterminacy takes place internally this information is presented externally.

Secondly there is ambiguity of context, which is maybe most interesting if we put ambiguity in the light of imagination. Gaver states that the context itself can create the ambiguity. Where the context makes the interpretation of product or experience ambiguous. The context creates a strange tension where the product itself can be quite normal, as with Elsa von Freytag-Loringhoven's Fountain (1917) (fig.6) (previously believed to be Marcel Duchamp). The relation the viewer projects on the object here is ambiguous and is not clear, the creation of the relation is imagination.

← fig.6 - 'Readymade' Fountain by E. von Freytag-Loringhoven

Ambiguity of relationship comes from the viewers one relationship with the object. The Prayer Device designed by Gaver & Martin (fig.7), transmits your prayers into the sky to whomever or whatever is listening. The object in itself is not sincerely ambiguous, the relation one project on it becomes open for possibilities and thus becomes ambiguous. The purpose and use of the Prayer Device is left open and the person speculates about their relationship with the device, which can be of intellectual, aesthetic, emotional or moral nature. Creating the relationship is again taking place in your imagination.

← fig.7 - Prayer Device, Gaver & Martin

Gaver explains ambiguity of relationship as evoking a projection, "Ambiguity of relationship, finally, evokes a projection of our subjective experiences and attitudes onto new situations." (Gaver, 2003;p.237). The evoked projection is happening in the imaginary where our subjective experiences and attitudes residuality, which is relatable to residuality. This projection onto new situations is similar to the use of imagination described before. Later on Gaver mentions the following, "Ambiguity frees users to react to designs with skepticism or belief, appropriating systems into their own lives through their interpretations." (Gaver, 2003;p.240). Saying that ambiguity frees users to react, is similar to imagination and the freedom it contains.

The example of Naoto Fukasawa and the MUJI CD player (fig.8), there is a ambiguity in play that involves all three sorts of ambiguity, lesser present of the three is the ambiguity of information presented. The information presented is partially new and therefore open. The relationship we make with the product is one of a ventilator, seen the information presented to us, reminds us of the on/off switch of a ventilator. This results that the relation we make with the device is ambiguous and not one of a cd player. Having the relation to a ventilator creates ambiguity of context, the object is not where we expect it to be. Making the product ambiguous.

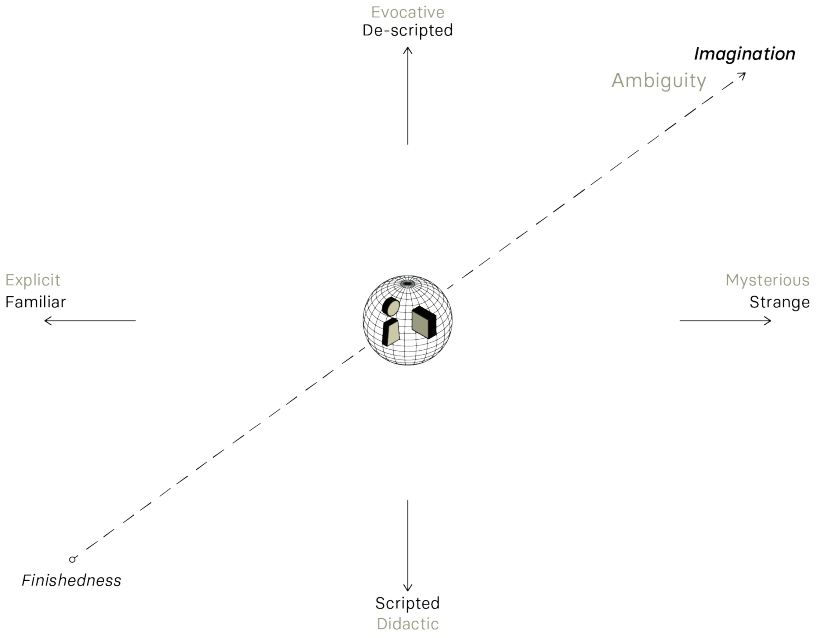
← fig.8 - MUJI CD player, Naoto Fukasawa

Coming back to the framework and how imagination and ambiguity relate, Gaver points out that ambiguity makes objects "evocative rather than didactic, and mysterious rather than explicit. Yet it is not simply their ambiguities that distinguish our examples, but the net effect of these ambiguities. They are similar insofar as their use of ambiguity makes them evocative rather than didactic, and mysterious rather than explicit." - Gaver. By comparing this description to the framework we can state that being open in essence and thus evocative is similar to being de-scripted. Mysterious is like strange, they almost bear the same meaning. Placing the description in relation to the framework, it shows that ambiguity takes place in the same quadrant where imagination is situated (fig.9).

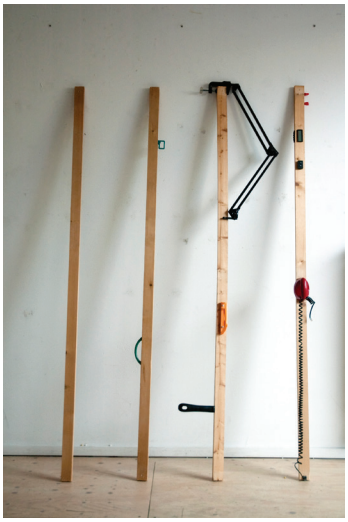
2.7.2. OPEN-ENDEDNESS.

A second theory of design, of interest to imagination, is open-endedness. Being open is said to be essential to imagination since it relates to how we can see possible interactions, thus what the use of imagination characterizes. To describe what open use is, or summarizes, the work of Zakkas (2011) is used. Zakkas in his master thesis researches different 'modes of use'. Zakkas argues that the interpretation of use is embedded in the object itself. Zakkas follows Latour (1992) that objets contains scripts (see also Chapter 3), these 'scripts of use' as Zakkas calls them, are 'written' on a semantic layer between perception and interpretation (Akrich, 1992).

↓ fig.9 - Design theory Ambiguity added in framework.



The layer between perception and interpretation, is imagination. The perception of things, our sensibility, and our interpretation of it, our understanding. According Akrich (1992) objects itself are envisioned and scripted towards a certain scenario. Zakkas states that objects present themselves with action ready qualities, these qualities being interpret by its user, similar to affordances of an object. He continues that when the object does not meet the user's present need, the user will construct new modes of use through improvisation. When doing so the user in essence de-signifies the purpose and its material and project a new unintended use on the material. In a way being resourceful with the object at hand.



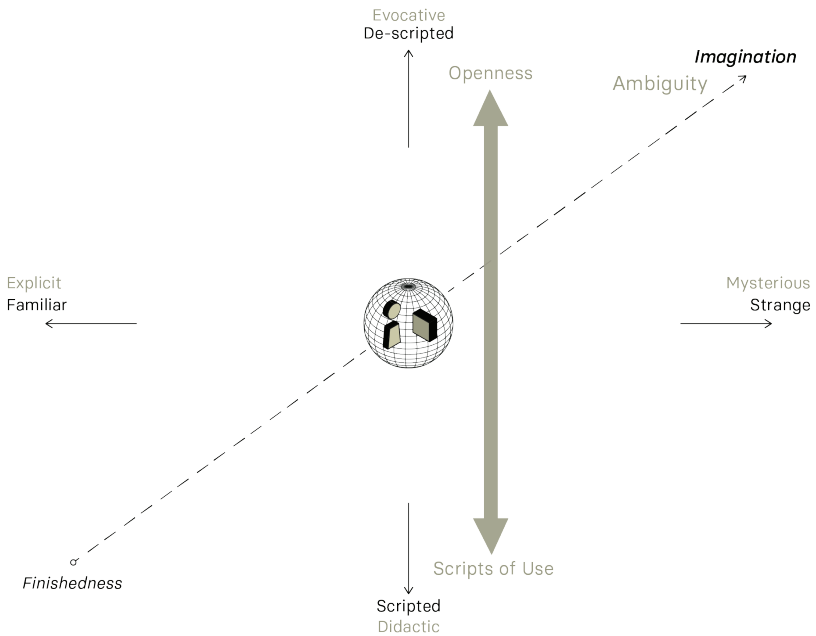
→ fig.10 - Sticks designed by Alex Zakkas which leave the intention of use open.

De-signification = is necessary in order to detach from an object its conventional utility and see it as 'raw-material in form'; something that can be re-signified as something new, and re-utilized for a new purpose (the desired and unfulfilled needs of the user).
Specialist object = raw material in form (the qualities of the product that the user interprets how they will use the object, similar to affordances and semantics) + purpose (utility)
Raw material = potential object (the envisioned object the user construct to fulfill their needs and desires).
- Zakkas - Modes of Use. p.15.

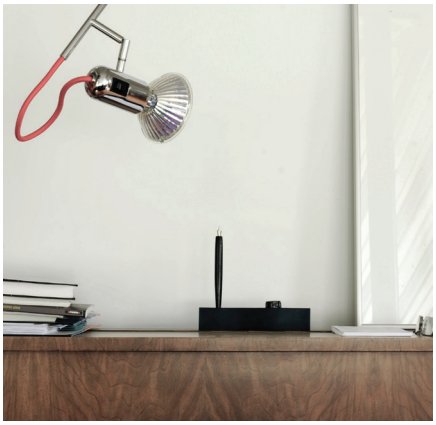
The above mentioned list are elements required according Zakkas to create new open use in products. It can be seen as a way of breaking down the intended use of a product and projecting new use on them. Are there desired unfulfilled needs of the user, if so... the products needs to be stripped to is raw materials and re-interpreted into the new imagined use.

De-signification according to Zakkas is 'removing' conventional meaning and seeing an object as raw material. The raw material object enters a state of potential object. This state should already unlock a wide range of possibilities for inventing new uses. Further on Zakkas state that "by removing the meaning of an object (unrealization) you are simultaneously shifting (temporarily unlearning) the skills that made the object useful in the the original state". In essence de-signifying is similar to affordances (Gibson, 1986), only with de-signifying you purposely try to create new utilizations.

↓ fig.11 - Design theory Open-endedness added in framework..



A great example of an open product and in line with how Zakkas argues to create open products, is the work of Marlies Kolodziey Hidden Values (2015). In her work of Hidden Values (fig.12) , Kolodziey designed 5 objects which she “re-invented” the way how engage with objects that surround ourselves. She argues that value is hidden in how we relate to object and combine it. The objects are without a specific function, thus open, to leave space for the imagination. Koloziey states it was more about designing possibilities rather than functionalities.



↑ fig.12 - 1/5 & 2/5 of Hidden Values, Marlies Kolodziey. →

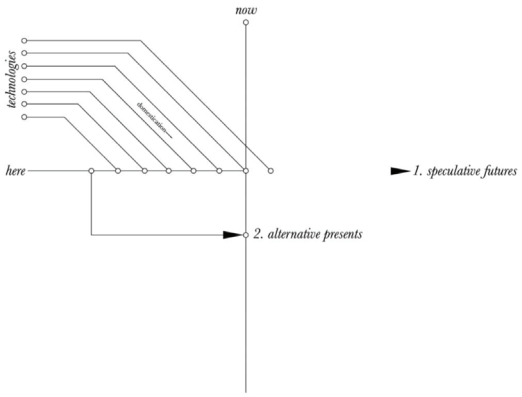
2.7.3. SPECULATIVE DESIGN.

A third design theory that connects generally with imagination is speculative design. Speculative design is a tool to not only create things but also ideas (Dunne & Rabby 2013). “But to do this, we need more pluralism in design, not of style but of ideology and values.” In the introduction of this thesis the argument is made that we encounter a ‘crisis of imagination’. This ‘crisis of imagination’ has to do how we see possible futures, ideology and values, and speculative design is about transcending the viewer new ideas. Creating new ideas with the user is almost alike to transfiguration which is part of Folkmann’s phenomenological explanation of imagination. Design, and in this case speculative design, tries to frame our experience different. The way we interpret the design has a trans-figurative effect on how we see and engage with the world, and thus is part of the development of new ideas.

Speculative design open to several interpretations according Auger (2013). This is similar to the definition of ambiguity, being open to more than one interpretation. The difference is in the definition of speculative. Speculative design speculates about possible futures (fig.13) is ambiguity more embedded in the now and the ‘direct’ interaction of product and user. Speculative design is more a way to show a narrative, and thus ‘indirect’ open to open interpretation.

> “They usually take the form of scenarios, often starting with a what-if question, and are intended to open up spaces of debate and discussion; therefore, they are by necessity provocative, intentionally simplified, and fictional. Their fictional nature requires viewers to suspend their disbelief and allow their imaginations to wander, to momentarily forget how things are now, and wonder about how things could be.” - Dunne & Raby (2013;p.3).

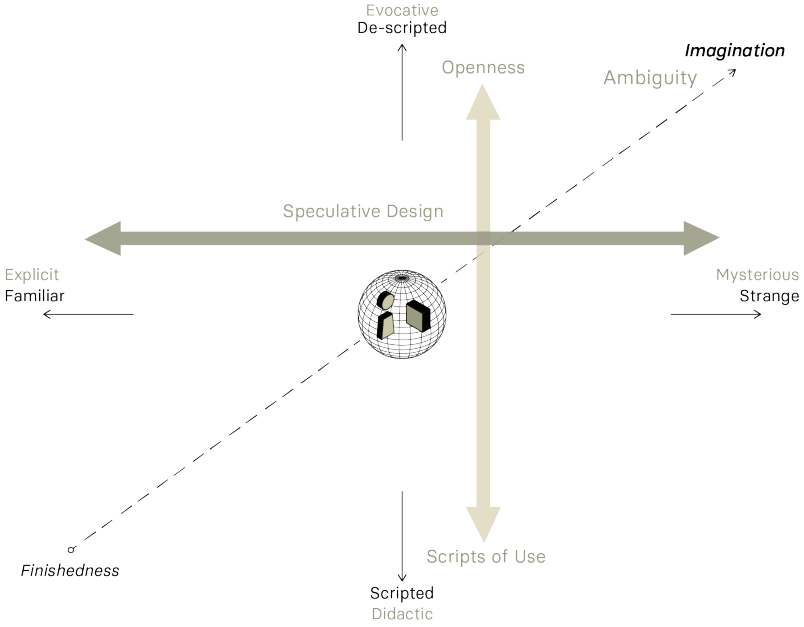
Auger (2013) mentions that to create the speculation one has to play with a desirable discomfort. As Auger states that Freud calls this the uncanny. Being familiar and at the same time foreign to the viewer/user. Although speculative design has more to do with presenting alternatives futures it does make use of the ideas presented regarding the outlines of imagination. The logic of negativity will play a role to make the ‘uncanny’ understandable. Possibilities are presented to the viewer instead of creating the possibility oneself. The imagination is the faculty active in the creation of meaning and the understanding of the possibilities presented. Closer to ambiguity is the idea of presenting a speculated alternative, where the information/context and relation are left in the unknown spectrum. Since the relation is not fully present (yet), the viewer has to construct the relation theirselves and this connects to the added value of using ambiguity.



↑ fig.13 - Alternative presents and speculative futures, Auger (2013)

An example of speculative design that present possible futures is the Flypaper Robotic Clock, part of Carnivorous Domestic Entertainment Robots (2009) by Auger and Loizeau (fig.14). The robot uses a loop of flypaper rotated by a small motor from which flies and other insects are scraped into a microbial fuel cell. They explore the space how autonomous robots can be seen as contemporary domestic furniture rather than appliances. To evoke a debate around the implications of using microbial fuel cells to power domestic robots. They present a possible future and push the understanding we have of robots in the domestic space. Showing a possibility gives us new information to proposition a belief and rethink how we see this type of electronics implemented in our everyday lives. We interpret the 'present' appliance and translate it into the future, by the means of imagination.

↓fig.14 - Carnivorous Domestic Entertainment Robots, Auger & Loizeau.



↑ fig.15 - Speculative Design added to the framework.

2.7.4. CONCLUSIONS

The three design theories all present the object of design to be either open for or challenging interpretation. The interpretation is in the form how we read the instructions or how known or unknown something is to the subject. Ambiguity plays with multiple interpretations and thus leaves space for the creation of meaning. Open-endedness facilitates in the multiple relations we can make with the surrounding. Speculative design is providing a possibility and in that extend is pushing the boundaries of the figurations in place. Providing information for the discussion of the speculated given. Within these design theories the subject is asked to use imagination, either for meaning creation or for transfiguration of the experience. Using imagination to detach the object from the 'real' world and explore possibilities.

2.8 APPEARANCE OF IMAGINATION IN PRODUCT INTERPRETATION.

Imagination comes before the act of interpretation. Imagination creates meaning that will be explained through interpretation. Sensing an object creates intuitions from which we create a representation of an object, similar to the interpretation. Our representations of the object is the synthesizing of the manifold of images into a concept. The concept is eventually taking up by our understanding.

In our interpretation of products we either recognize things or are unfamiliar with the object. If recognized we can use this in our conceptual model (affordances), if the recognition cannot be completely formed there is a form of wander to make what is unknown, known. Present in the 'real' and 'unreal' dyad of our thought. From the representations presented, we try to synthesize the representations into a concept for understand. This (imaginative) understanding can be a 'best guess' but is eventually the understanding (believe) we ascribe to what we see. The appearance of imagination comes into play when we need to make sense out of something unknown. It is assumed that if something is known, the meaning creation already has taken place and there is no need to do it over again.

2.9 CONCLUSIONS

The conclusion is that imagination plays a role in making sense out of what we see around us and it can create new meaning and understanding. Through the comparison to other mental states is found that imagination is close related to other mental acts, but has some unique characteristics. These characteristics are that imagination is not committed to the truth, is residual in working closely with other mental acts, as for instance memory, and having an extrinsic end. Imagination can be understood as a mediator between what we sense around us and our understanding. It is believed that imagination is not needed when what we perceive is known and their is no intrinsic motivation present. A 'reason' is needed in order to imagine, not that we don't imagine without a 'reason' but, when we sense an object which is (partly) unknown or the meaning is (partly) unknown or challenged the extrinsic motivation becomes present. Imagination will synthesize the representations and pass it on to our understanding.

Placing it in the light of interaction design trough the design theories taken as inspiration, we can conclude that imagination is not recognized as a possible tool for designers to work with. All three design theories work with how interpretation is read from products, imagination in itself is not deliberately involved in the theory. Redström (2008) points out that possible interpretations are systematically reduced by designers to optimize design. The argument that there is need for more imagination, because of the 'crisis of imagination', thus conclude that there is a need for including and understanding imagination in the realm of interaction design. It is valuable to know how to open up space for interpretations, and in this space there is an important role for imagination. Being the faculty that creates meaning and provides in possibilities. The relation between object and user and the constitution of object use is explored in the next chapter.

3. FRAMEWORK

In the first chapter the framework and the variables of the framework are introduced. The previous and second chapter discussed part of the literature related to imagination. Imagination being different from other mental activities, and how imagination is used in design theory. This chapter will further research the framework, and introduce a third variable in the form of context. Each of the variables will be discussed in relation to imagination, and examples will be given in order to populate the framework and create a better understanding how objects or objects of design evoke imagination. Simultaneously it will explain the interplay between object and user, from the perspective of the framework. The findings in this chapter are build on the previous chapter and will eventually lead into the hypotheses of the design experiment.

3.1 FAMILIAR & STRANGE

When I wake up in the morning I start with brushing my teeth, I pick up my toothbrush and remember intuitively how to apply the toothpaste on the brush and brush my teeth. This act is familiar, and so are the toothbrush and paste as objects, to me. Where I intuitively remember, there is no need to recollect the act of brushing my teeth, this scenario of use is known and part of my knowledge how to preform this act. This is called retentiveness, "once they (interactions) are thoroughly learned, we need not recollect explicitly how we first learned them." Retentiveness makes the assimilation of cognitive, perceptual, and motor skills possible (Casey, 1976). The act of remembering or recollecting applies to almost everything around us. The scenarios and objects of design a subject remembers, are thus familiar and there are objects that are unknown to the subject, thus in this context are considered strange. Of course the world is not black and white, a world with only familiar and strange things. The interpretation of the world around us is a bit more complex. Not all objects of design are completely familiar to us, when I first saw a broom it looked like an enlarged toothbrush. The object is in that case simultaneously familiar and strange. Therefore, I do my best to understand the meaning the broom, I associate a cleaning purpose of the toothbrush to the brush of the broom. Since it is larger then the toothbrush, I appropriate the broom for something else than cleaning my teeth. By relating pre-existing knowledge to, in this case, a strange broom, I try to make the world around me understandable. This is believed to be done by imagination synthesizing between sensibility and understanding, familiarity is limiting the imagination and strangeness (unknownness) is evoking imagination.

3.1.1 FAMILIARITY

Brushing my teeth is now familiar to me, there was a moment in time that this was unfamiliar, new, or strange to me. There was no prior experience of me brushing my teeth, I had to experience by doing to make brushing teeth part of my memory. Casey (1976) describes familiarity as a delimiting trait of memory, "i.e., the fact that what we remember is always something with which we are already acquainted to some degree." To say that we remember something, is to be "at least minimally familiar" with it. This remembering is an act of the subject's own memory.

An example to explain familiarity in the framework is a fork (fig.16), a handle with two or more tines on one side. When saying that familiarity is something that the subject needs to have experienced in their own past and thus being part of their knowledge, a fork is than an object that is understood and part of the retentive memory of the subject. The subject truly has knowledge of the meaning of the fork. Similar to the toothbrush, the fork is something learned through experiencing. Learned as a toddler how to properly eat with a fork in the right situation.

← fig.16 - a fork, considered a familiar object.

Familiarity is linked to our memory and thus our presupposed knowledge. The definition of knowledge[6] can be described as, 'the condition of knowing something with familiarity gained through experience or association.' So familiarity is gained through experience, and when part of this experience something becomes familiar. In the field of interaction design, often is tried that the designed object is fitting within the conceptual model of the user. Another important thing to mention related to familiarity are cultural and societal references. A simple example of cultural references is that within the western culture, there are many different ways of drinking coffee (fig.17). in France it is common to drink coffee with two hands from a large cup, in Italy they generally drink espresso holding the small handle of a small cup, and in Turkey they drink unfiltered coffee with the coffee ground still present in the cup. The same beverage is consumed with different cultural references (in the way how they interact) attached to it.

6 WWW: HTTPS://WWW.MERRIAM-WEBSTER.COM/DICTIONARY/KNOWLEDGE

↑ fig.17 - different types of drinking coffee. Left: French. Middle: Italian. Right: Turkish.

3.1.2 STRANGE

Strange can be defined as something which is not recognized intuitively. Something not directly understood. Strange is considered to evoke imagination because it triggers a certain type of thinking. When something is strange it can to the shape shape or material, or even the usage. As explained in the example of the broom, when the object is new we try to level it into a field of understanding. We transfer known elements, representations if we talk about images, onto the unknown elements.

→ fig. 18 - head massager, a strange object.

An example of strange is the head massager. Seeing this object does not directly relate to the fact that you can massage your head with the object. There are different reasons why this is the case, the shape of the object is weird in the sense that it is relates closer to a kitchen utensil than an object to message your head. Secondly, we don't have a lot of referential objects (head massagers) to associate with. It can even be that this is the only object that is known as a head massager and can be placed in

this product category. Of course there are multiple products that categorize as a head massager, but few are known to us. It is rather specific. When we can't give meaning to an object, we tend to assign meaning. A search for possibilities, a negation of what it can be (if not this, than that).

3.1.3 RELATION TO IMAGINATION

In the context of this thesis, familiarity is the factor that determines to what extend the imagination has to do work. This maybe sounds a little simple, but if we consider everything that is part of our knowledge to be learned from a textbook or by doing.

There is need for a something known in the equation otherwise, the whole interaction is too strange and will be disregarded. That the things we have pre-experienced are considered known, thus part of one's understanding. Then the things we do not have seen or experienced, are open for potential uses or interpretations, thus possibilities.

3.1.4 DESIGN THEORIES FAMILIAR-STRANGE.

In the design theories, Ambiguity, Open-endedness and Speculative Design they do play with the things we deem familiar or strange. Ambiguity does play with the understand we have of things, by making things ambiguous we have to question what we know and subsequently the conceptual models in play. Open-endedness has more to do with the instructions of objects and those being multi-interpretable, it shows minor overlap with familiarity in the sense that is has more to do with how we read perceivable bits of stimulus information. Eventually Speculative Design is the most preoccupied with the variable of familiar-strange. Speculative design makes use of strange interactions, by questioning what we know and expending our

↓ fig.19 - Oh Void 2 by Ron Arad.

3.1.5 EXAMPLES

RON ARAD - OH VOID

Oh Void, a chair designed by Ron Arad (fig.19). The name, Oh Void, is chosen because the object is filling the material empty space. The reason for this object to be strange is that it doesn't match the product category we have of chairs. The shape is different and strange, the material look of the objects appears to be solid and very heavy changing into a perceived sculptural object. Arad did explore the possibilities and use of a new material, namely Corian. This new exploration and implementation is what Folkmann appoints to have an transfigurative effect. Where the new material and form, push further our (other designers) experience of what is possible, and therefore opens the room of possibilities. Simplified it does gives us, theoretical knowledge of what is possible in the realm of material-use and implementation.

PHILIPPE STARCK - JUICY SALIF

Although most people, certainly the ones that do something related to design, know or have seen the Juicy Salif designed by Philippe Starck (fig.20). The reason why this is considered strange has to do with the unusual relation you attach to the product and the relation you have between object and context. The Juicy Salif is also seen as a conversation starter because of this strange association with its context (Lloyd, P., & Snelders, D., 2003). You probably do not have guessed it, it is used to squeeze lemons, it is a lemon squeezer. The association with the object is totally different since the material and shape do not come close to the conceptual model we have of the 'traditional' lemon squeezer.

↓ fig.20 - Juicy Salif by Philippe Starck

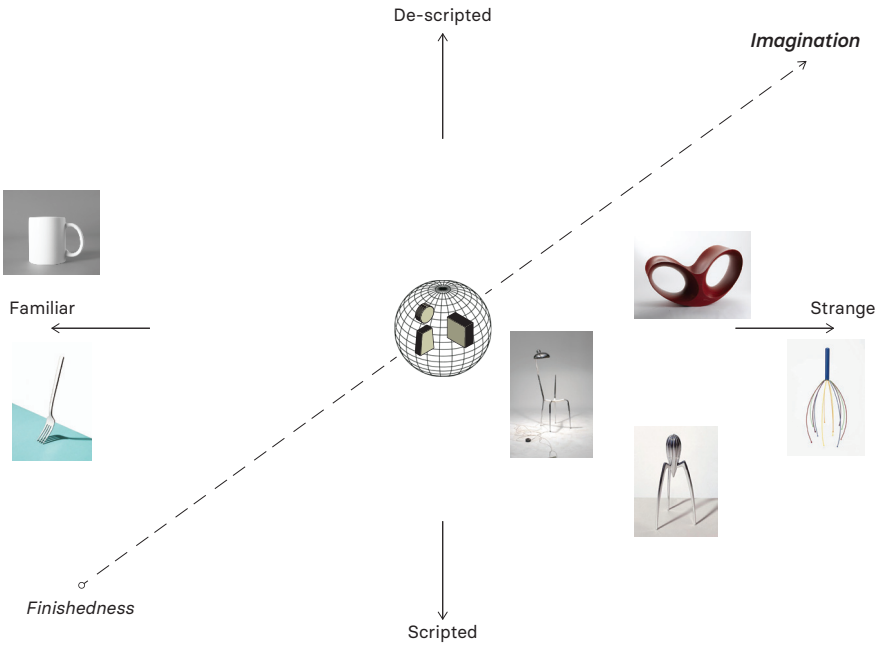
MARTINO GAMPER - BARE LIGHT

The Bare Light of Martino Gamper is one that looks like a chair but is a lamp (fig.21). This so called 'readymade' was part of 100 chairs in 100 days presented in 2007 (Junte, 2013). The conventional and practical elements of the chair are disregarded, like functionality, safety and sustainability. As a designer he plays with the idea of what a chair should be. And by doing that Gamper is also questioning our understanding of the object known or recognizable as a chair. Gamper made chairs that are maybe unusable, Gamper is also questioning the conception of meaning we assign to a chair, pushing the boundaries between, mundane everyday objects and design.

← fig.21 - Bare Light by Martino Gamper

3.1.6 CONCLUSIONS FAMILIARITY

When we look at things, try to perceive them, familiarity is an element in how the object presents itself without further explanation. This presenting is linked to what we know. If something is familiar, in the scope of the thesis, it is understood to be something the subject has experienced before and is part of one's own knowledge. Something being familiar and thus part of the subject memory is not evoking imagination, simply because the object or situation is already understood. There is no synthesis necessary. Contrary to familiar, something being strange is believed to evoke imagination simply because we try to make what we see understandable. What was not fully understood previously. And as discusses in the previous chapter, it is believed that the forming of concepts and the understanding of things is mediated by imagination.



↑ fig.22 - Framework populated with familiarity examples.

3.2 (DE-)SCRIPTED

"A large part of the work of innovators is that of "inscribing" this vision of (or prediction about) the world in the technical content of the new object. I will call the end product of this work a "script" or a "scenario." The technical realization of the innovator's beliefs about the relationships between an object and its surrounding actors is thus an attempt to predetermine the settings that users are asked to imagine for a particular piece of technology and the pre-scriptions (notices, contracts, advice, etc.) that accompany it." - Madeleine Akrich (1992;p.208)

As a variable scripted is different compared to familiarity in the way that familiarity is something experienced over time, being part of your memory collected by the subject himself. Scripted, the 'script of use' is what the designer has inscribed into the use of and object. The difference being that in the scripted variable, it is about the input from the designer on the use. Since we can say that almost everything we use, is made with the help of humans in the proces. It is the interplay of what the designer believes to be needed between the object and surrounding actors.

3.2.1 SCRIPTED

When I come home, I turn on the light. This light happens to be hanging in the center of the living room. Let it be the case that my reading chair is positioned in the corner. If it is after 11 pm I'm not able to have the proper lighting in the corner of the room to continue with the book. What happens here is that I'm indirectly limited by the light when reading my book. Therefore, as an explanatory object for scripted, the lightbulb (fig.23) is chosen. Is it not the lightbulb, on its own that is defining certain things. What I want to point out is that certain choices made by the designer are of influence on me as a user how to interact and handle certain situations. The lightbulb can only be installed in a therefore designed socket, in this case it is fix to the ceiling. This is scenario of use, is what is called a 'script'. "Designers thus define actors with specific tastes, competences, motives, aspirations, political prejudices, and the rest, and they assume that morality, technology, science, and economy will evolve in particular ways." Akrich (1992; p.207). When designing an object of use a designer also sets the space in which the actor is supposed to act on top of that the designer is also defining the competences, motives and aspirations, as stated in the definition of scripted by Akrich.

← fig.23 - A lightbuld, considered scripted

Why a script is important in relation to imagination is the following, the script defines the use of the object. By defining the use of the object in a specific way and in a specific scenario is directly limiting the amount of the user's imagination in the scenario, because the designer decided otherwise. Instructions that are included with the object are what guides the interpretation of the user. When instructions are specific to one type of use or the affordances of the object do not afford much, there is not a lot for the subject to hold on to in terms of using their imagination.

Redström (2006) argues, that the user is becoming the subject of design and that as designer we limit the space to find out the possibilities of use by designing specific interpretations for use. These interpretations, can subsequently linked to the affordances Norman is mentioning. 'Good' design is believed to be intuitive in use, designing intuitive interpretations is resulting in the limited effort needed for understanding something. This is supported by the affordances and signifiers we implement in objects of use. Creating this 'perfect' conceptual model.

By going back, to the familiar-strange examples, the fork and head massager and we take look at, what Zakkas (2011) describes the 'script of interaction'.

Script of use: fork.
Holding the body between finger and thumb.
Placing the tines pointed towards, to be 'punctured', object.
Placing the object in material (of purpose).
Lifting thing towards your mouth.
Placing thing in mouth.
Using teeth to force thing of the pointy end of the fork.

Script of use: head massager.
Holding the body between finger and thumb. Placing the pointy end towards object to be 'massaged'.
Place object over head of subject.
Move object-body up. Move object-body down. (repeat multiple times) Move object away of the subject's head.

It becomes clear that both scripts of the objects are not much different from one another, still they are placed opposite in the variable of familiarity. The fork has an epistemological character as explained.

3.2.2 DE-SCRIPTED

When we talk about de-scripted, the instructions of the product are open in use. They do not define their way of use on the user. It has to be noted that each object comes with its limitations. No object is open for every use. This is probably why designers exist. Ultimately a highly de-scripted product or 'tool' is a piece of rope (fig.24). The object is close to a raw material which is allowing a more open interaction according Zakkas (2011). Raw material means, one material in their 'raw' form. A stone, although not deliberately designed, can be seen as a raw material. It does affords a multitude of possible interactions, also explained by Gibson (1986; chapter 8).

> ""Objects of knowledge" with an "unfolding ontology", design objects can be seen as "processes and projections rather than definitive things" (Knorr-Cetina 2001; p.181-182). This openness may imbue them with a potential for defining, creating, or actualizing meaning. My point is that this openness can be founded on the level of imaginary meaning..." - Mads Nygaard Folkmann (2001;p.87)

← fig.24 - Piece of rope, seen as a descripted object.

Going back to the piece of rope, the difference to the lightbulb is that the rope affords so much more things than the lightbulb. A rope has mobility (supported by the actor), although certain light sources do have the same ability as well. It affords to keeping things together. With a variety of appropriations in different situations. When needed to dry fabrics, the subject can tighten a line of rope between two fixed objects. Subsequently hanging the fabrics to dry. It can prevent your rear bender on the bike from falling down. There are numerous ways to use the rope in different situations, depending on the strength of the rope it allows many varieties of use. It is open in use and interpretations.

An object can be de-scripted, but it is still to the subject to use their (creative) imagination to come up with possible uses. This proces is described by Brandes (2006) as non-intentional-design (NID). Brandes explains non-intentional-design as the exploration of use of everyday design. For example using a key to open a letter.

> "There are two parameters that are constantly mentioned in connection with an object's character: form and function. While function represents an object's "rationality", as it were, and justifies its existence, an object's form embodies its function." - Uta Brandes (2006;p.55)

NID is about the relation of actor and object, but not from the designers perspective, but from a perspective of subject and object (function & form). "The form of an object represents the possibilities of its appearance in actual situations; its form is the sum of its potential appearances in situations" (Brandes, 2006). NID is dependent on the subject, if the object is able to 'de-script' the meaning or purpose of an object. It is a personal competence to re-purpose the use of an object, not everyone is capable of doing so. Brandes, also described 4 characteristics that play a role in the association of the role of the re-purposed object in the context of NID. These characteristics are 1) form, 2) material, 3) value, and 4) availability. When a subject wants to drink water, but there is not receptacle at hand in the form of a glass or mug, the 'scripted' objects. The subject looks for the

availability of an object, that isn't too valuable, a material strong enough to hold water and of a form similar to a receptacle, a shape that affords to hold water.

3.2.3 RELATION TO IMAGINATION

As designer we play an important role in the use of imagination by the subject. The influence of the designer is present because we live in a world where almost everything is designed, or to quote Paul Rand. "Everything is design. Everything!" Akrich (1976) discussed the "inscribing" of the "script" done by designers, meaning the designer is speculating to their best guess how the object will be used. This script is subsequently interpreted by the user. And since most products are scripted in a way that they don't leave a lot of space for misinterpretations, the user, the subject is bound to 'limited' interpretations inscribed by the designer.

The script of the object is to what extend the subject can assign their meaning to the object. The designer assigning the intended meaning onto the object. De-scripted this meaning making is left more open. The designer, intentionally leaves the possibilities of use open, by inscribing limited functionality. Leaving the interpretations and/or instructions open the subject has more space to assign meaning to the object of use.

3.2.4 EXAMPLES FOR (DE-)SCRIPTED

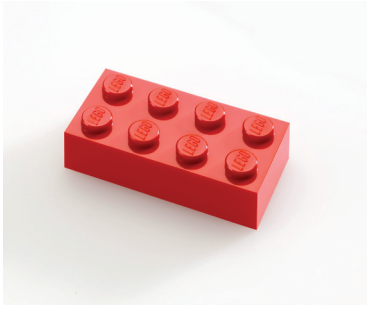
HIDDEN VALUES - MARLIES KOLODZIEY

In her work of Hidden Values (fig.12&25), Kolodziey designed 5 objects which she "re-invented" the way how engage with objects that surround ourselves. She argues that value is hidden in how we relate to object and combine it. The objects are without a specific function, thus de-scripted and open, to leave space for the imagination to engage with. Koledziey states it was more about designing possibilities rather than functionalities. Taking away the functionalities, is in fact designing de-scripted objects. Koledziey in fact broaden the space where we can re-purpose the functionality of the object.

↓ fig.25 - 3/5 by Marlies Kolodziey as part of Hidden Values

LEGO

Another object that is interesting to look at is LEGO (fig.26). LEGO are in fact different shaped blocks or shapes that configurate which each other in a specific way. There is a limited amount of instructions present when playing with LEGO. The instructions that come with LEGO are in most cases predefined by LEGO themselves. Having different product-lines, ranging from only selling the 'old-skool' LEGO-blocks to specified themed, for instance Star Wars, LEGO. The wonderful thing with LEGO is that it has an element of being unfinished. The configurations of LEGO are endless and the way you want to see meaning in what you make is up to the subject. Since everything can be something with a little use of imagination (fig.27).



← fig.26 - Singular LEGO block

← fig.27 - Simple shapes presenting much more.

STRAP - DROOG DESIGN

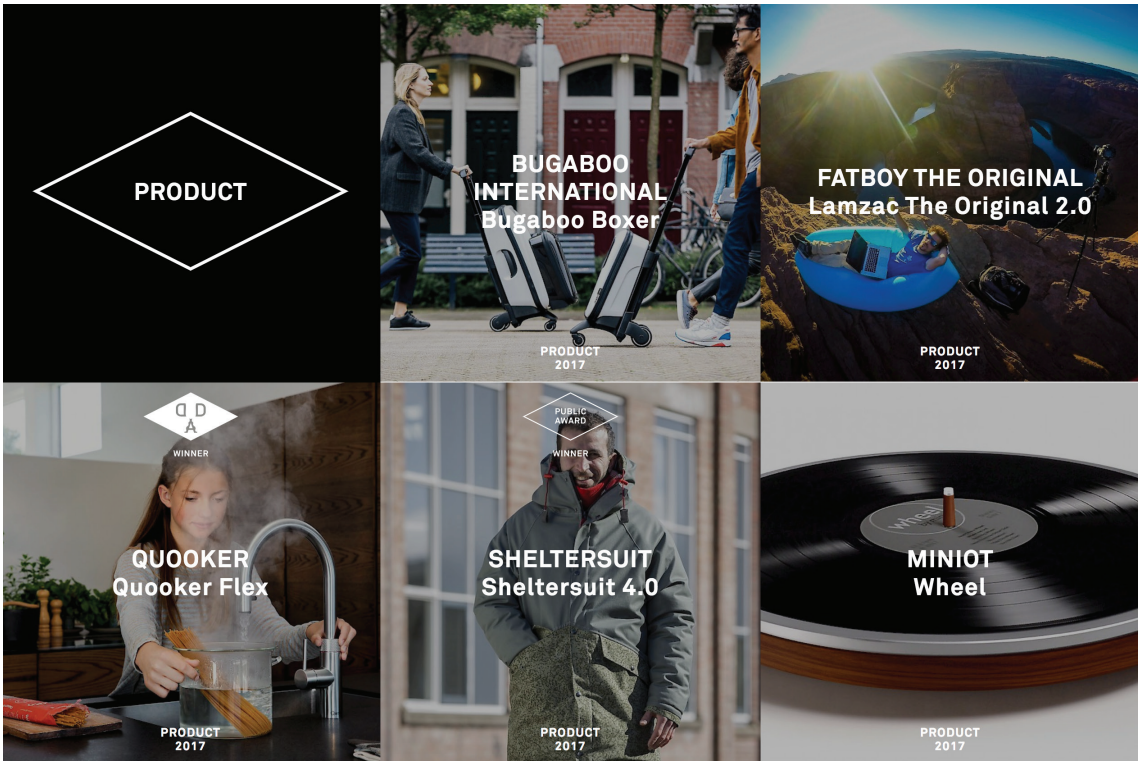
Strap by Droog Design (fig.28) is exploring the associate proces we have with product. The association made is Dutch, Strap is similar to the 'snelbinders' (fasteners) we place on a rear bike rack. What is interesting about the design of Strap, is the fact that it affords rather than that it has a specific function. Again can be said that this object of design is facilitating in possibilities rather than in functionality. They simultaneously and deliberately play with the instructions and familiarity of an object. Using the familiarity and association we have with a certain object, and transform the meaning and use of the object.

↑ fig.28 - Strap by Droog Design.

DOPPER - MERIJN EVERAARTS

Dopper (fig.29) is designed to change the perspective of users on the usage of plastic bottles (single-use plastics). Dopper is designed to give a different meaning to the water bottle by creating not only the object but also a statement. By having a dopper, you agree and show that you are 'aware' of the environment around you. Having the Dopper to make a statement, is different than just having a bottle. This aside, the design of the dopper is also rather ambiguous. The shiny white plastic top is not directly perceivable as a small cup that is detachable from the main part. Here the material does not relate well to the conceptual model we have with this material. Furthermore, the white cap prevent us from sensing the internal threat this combined with the ambiguous signifier of the plastic is resulting in a hidden feature. There is need either a supposition needed that the cap can twist or by seeing someone else do it, it becomes part of the subjects empirical knowledge.

↓ fig.29 - Dopper by Merijn Everaarts.



↑ fig.30 - Dutch Design Awards in the category Product

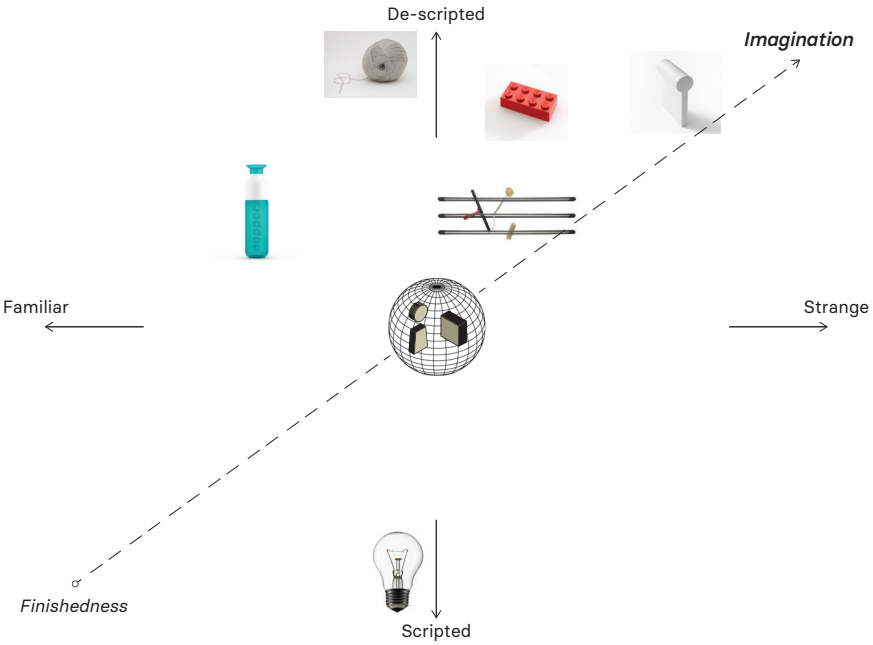
DDW AWARDS CATEGORY PRODUCT:

Another example to give to the variable of (de-)scripted are the Dutch Design Awards 2017 in the category of products (fig.30). All are innovate daring new products according the description on the website. If we place it in the light of imagination needed from the user, they are all familiar and scripted to specific need. There is no 'new' innovation taking place but rather alterations on already existing products. This strengthens the argument that industrial product design and the interaction designed around it does not leave much open for imagination on the user's side. It is rather the opposite being unimaginative, and rather very intuitive (thus arguably good design). Exception there for the Fatboy 'Lamzac the Original 2.0', Fatboy found a creative way to have a comfortable seat small enough to take during travels.

In terms of creativity from the designers, the imaginative part is something different. Most of the products bring different ideas/products together to create new possibilities/products. Quooker took inspiration from a flexible hose often used in dishwashing environments in restaurants, giving the Quooker flex new affordances and more options for appropriation for the user. Bugaboo took the idea of their strollers and implemented that idea to luggage carrying. Both took existing products and merged it with their own products.

3.2.5 DESIGN THEORIES

Ambiguity plays with the interpretation of objects and their use. The purpose of this is to provide a different type of interaction, rather than a functional one. In the case of (de-)scripted there has been a rather focus on the functionality of things and their instructions. The purpose of Ambiguity is not sincerely in the domain of 'pure' functionality, moreover in the field of how we ascribe meaning onto objects and situation. The experience itself. Open-endedness is the one design theory discussed, that relates most to the variable (de-)scripted. Open-endedness is concerned how the subject reads the functionality of the object or how they re-purpose the meaning of the object. In open-endedness the form & functionality are important, where the form is closely related to affordances. If an object is suitable for appropriation because of the affordances, the object can possibly be seen as an object which is de-scripted and thus open. Speculative Design is more comparable to scripted-design. The purpose of speculative design as Dunne & Raby (2013) explain, is to consider a -what if- scenario to open debate and discussion, and eventually create new ideas through design. In order to do so they present scenarios with the script already present to be reviewed against what we already know. To transcend the figuration of the known experience by providing possible futures or scenarios. Speculative Design to a different extend has to do with how the instructions are designed, since it speculates about the same interactions it leans more to scripted, there is a different (maybe imaginary) view needed from the designer and less from the subject, because the subject is more spectator than user in the experience.



↑ fig.31 - Framework population with the (de-)scripted examples.

3.2.6 CONCLUSIONS (DE-)SCRIPTED

Familiarity has to do with pre-experienced interactions and encounters we had with objects. The intersubjective knowledge of subjects and/or the intuitive use of an form or material (affordances), are used by designer to determine the best suitable 'inscription' of 'script' for the object. Scripted means that the designer determines instructions (perceivable bits of information) with limited to singular instruction(s). By limiting the interpretations, the subject is limited in ascribing different meanings onto product, and therefore is limited in the use of imagination. Designers are removing irrelevant interpretations, resulting in removing the space for imagination. Where de-scripted is leaving the interpretations more open, and thus providing in possibilities. Abstraction in object allows the meaning to be steered by interpretation, where the meaning creation is done by imagination.

3.3 CONTEXT AND THEIR RELATIONS

In the creation of meaning of objects, the context is an important factor. The context is part of the script inscribed in the object. The script is predetermining the setting in which the object supposedly is placed. The difference is made between coherent context, that of the script and incoherent context, not related to the 'inscribed' script.

> "Generally all design objects are artifacts that share the act of making sense (Hagan 2007, cited by Folkmann) and are inscribed in and circumscribed by context and cultural meaning, whether they interfere with or reflect the larger context of society or, on a smaller scale, define themselves in relation to their immediate surroundings or reflect meaning that is intrinsic to design, other design objects or design principles. In this respect, all design objects, whether defined with material closure as static objects or as objects of interaction, may be seen as unfinished. They are always parts of a larger networks involving other objects that together play a role in constituting "and embedding environment for the self" while also defining open and unfolding knowledge processes (Knorr-Cetina, 1997,24)
> - M.N. Folkmann (2013, p.86)

3.3.1 COHERENT CONTEXT.

The coherent context for my toothbrush is set by, the sink, the toothpaste, a towel. Everywhere where those objects are the intrinsic relation is present and it is intuitively understood that I can brush my teeth. The coherent context factors can be present in the bathroom, the kitchen, the toilet at the sport gym. If we do the same for the mug, every coherent context is one where I can insert a drinkable non-harming liquid in the mug. The supermarket, the park if I brought a my own beverage, same for the beach, a garden with a water-tap. What can be learned from simply stating these two examples is that coherent context means that in is coherent to the act that is presumed to be doing with the object.

↓fig.32 - Umbrella Stand by Kenya Hara. 'Without Thought.'

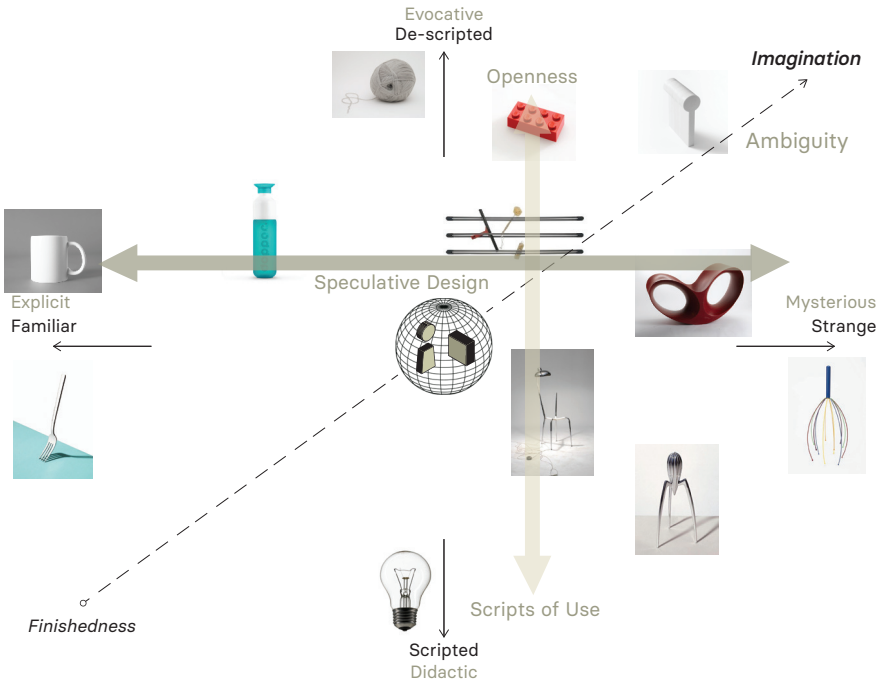
Naoto Fukasawa / Phaidon Press

Kenya Hara came up with design 'without thought', explaining it as a subconscious behavior that we already take part in. The umbrella stand is nothing more than a small gutter where you can place your umbrella. This behavior is already present because we automatically place our umbrella between tiles to prevent it from sliding away, it is an affordance which is always there to be perceived. Kenya Hara is designing these affordances and calling it without thought. Exposing the relations we subconsciously make, by designing objects which we didn't knew we needed up until the fact that Hara brought it to our attention.

3.3.2 INCOHERENT CONTEXT.

Incoherent context is when the intended relations of the 'script' are not present. An incoherent context is asking the subject to make unsuspected relations. If I need to be resourceful in a situation, there are new relations created and an object is appropriate to best knowledge into the new scenario. Ambiguity already talked about context, ambiguity of context. The ready-made of von Freytag-Loringhoven (fig.6) is placed in a contradiction and provoking context, causing the meaning to be questioned. This is done with the purpose to evoke different emotions within the spectator. For the scope of this thesis it is especially interesting to look into the relations supporting use, instead of creating internal conflict in making relation between object meaning and surrounding.

↓ fig.32 - Complete framework, design theories and examples variables.



Familiarity: Product type	Context: Relational Factor	(De-)scripted: Instructions	Use of imagination
Familiar (Known)	Coherent	Retentiveness Casey (1986)	Pre-experienced, known interaction
	Incoherent	De-signification Zakkas (2011)	Re-utilize for new purpose According affordances
Unfamiliar (Relatable/ associative)	Coherent	Intuitive Conceptual Model Norman (1999)	Good design is intuitive conceptual model
	Incoherent	Non-Intentional Design Brandes (2008)	Re-pursose object and appropriate
Unfamiliar (Unrelatable/new)	Coherent	Openness of instructions for possibilities	Possibilities can be imagined
	Incoherent	Complete open object-user relation	Imagination can run freely

↑ fig.33 - Overview conclusions Chapter 3, bracketing for design experiment.

3.4 CONCLUSIONS CHAPTER 3

The goal of this chapter was to research the relation between object and user with regards to imagination. Familiarity and the recognition of objects and their use is a personal competence. Where the pre-existing knowledge is dependable on the past experiences of the subject. Familiarity is therefore divided into three groups or types. (1) Familiar, being able to make use of the retentive power of memory. Conjuring the memory intuitively. (2) Unfamiliar, if the object is not familiar and the use retentive, we have an object partly known and unknown. The unknown elements of the object or experience will be filled in by what we know, preformed by imagination. (3) Unfamiliar, and completely new. The object is not experienced before or isn't prototypical, it can't be placed in a certain product category.

The assumed variable to come after familiarity is context. Context comes before the instructions, the reason for this is that the relations between object and user are influenced by the context. In the interpretation there are two contexts chosen, (1) the coherent and (2) the incoherent context. The object's 'script' will be difficult to be interpreted correctly by the subject as long as the script is unknown to the subject. In the case of an (partial) unknown script, the coherent context

is needed in order to be able to come up with the right understanding of that object. Contrary, we have the incoherent script. Since all design objects are designed with a script in place, the purpose of the object can be disregarded when the object is located incoherent to the intended use. The re-purposing and de-signification of the object is needed to come up with new utilizations.

The last factor is (de-)scripted. (De-)scripted is codependent on the context and object. Therefore it is not considered a variable in the experiment. The script comes in relation to the surrounding and are 'inscribed' in the object. The word inscribing does signify this script is not open for alterations. The influence of (de-)scripted comes from the combination of the three factors. The unfamiliar and 'new' object is chosen in accordance to the literature on what would be an open object. The associative objects are 'scripted' as assumed every designed functional object is. The object chosen for this type of familiarity are considered to have affordances that can be-repurposed.

Eventually this leads to 6 different scenarios possible for the evoking of imagination (fig.33). These six different scenarios will be tested and analyzed by means of the design experiment. The design experiment will be discussed in the next chapter.

4. DESIGN EXPERIMENT

This chapter explains how the design experiment is constructed and which decisions are made in order to come up with data that eventually will lead to answering the research question. First the goal of the design experiment is explained according the findings of the previous chapters. Furthermore the experiment in itself is explained, the products and the accompanying scenarios. Why those are considered to fit within the findings of the research done. Finally the chapter will be concluded with the findings of the design experiment and the themes recognized from the design experiment.

4.1 GOAL

The goal of the design experiment is to investigate the role of imagination in how someone perceives and interpret objects and their relations to the surroundings. In the previous chapters the variables of the framework are explored and from the research the hypotheses for the experiment are concluded. The variables, being familiarity, (de-)scripted and context.

HYPOTHESES.

Familiarity: when something is familiar there is no need to constitute new relations. The meaning of the object is present with the subject internally, it is believed that the already present meaning is blocking the participant in creating new meaning or re-purposing the object. Thus familiarity, the influence of existing knowledge present, makes the use of imagination unneeded and the already existing understanding is preventing the creation of new meaning.

(De-)scripted: the 'script' present in the object is determining the relation the subject makes between object and surrounding. The instructions 'inscribed' by the designer is setting boundaries for relations between object and surrounding. In this sense the designer is responsible for the act, preformed by the subject, of connecting sensual impressions to concepts of understanding on a concrete level. Thus (de-)scripted is responsible to what extend the relations are determined by the designer, the openness in relation between object and surrounding is assumed to evoke imagination to create new meaning done by the subject.

Context: is responsible for the relations presented to the subject by the surrounding. The context, sensuous bits of information presented either in coherence or incoherence with the object, is assumed to lead the subject in their synthesis of images into understanding. When the object is situated in a coherent context, the 'intended' relations will be discovered more easily, where in an incoherent context the relations are 'unknown' and open for possibilities. Thus, context is of influence how imagination is able to create understanding by providing 'correct' relations between object and context, if there is a need for constituting new relations between object and context.

These variables are believed to be responsible for the interpretation of an object. When the subject is presented an object and is asked to make it understandable, these variables are assumed to play a role in how the understanding is created and their influence on imagination in presenting the understanding.

4.2 BRACKETING EXPERIMENT

The design experiment has its limitations and in order to come up with good and usable results, the factors that will influence the experiment's outcome need to be controlled. To do so, there are decisions made regarding the participant group, how the material is presented and the engagement with the participants. Furthermore the preconceptions of the participants are taken into consideration resulting fitting probes and scenarios for the experiment. First the interrelated relation between variables is discussed.

To effectively test all three variables in the experiment, the idea was to gradually adapt each one independently in the experiment. But soon after the influence of changing one variable, was found to be influencing other variables. Lets say we take a mug and we want to gradually move the mug (assumed to be familiar) from familiar to strange. How can we do this? It is impossible without changing the physical appearances of the mug. And by changing the appearances of the mug, you automatically also change the perceptual information that is used to read the 'script' of that mug. An object is seen as a fixed given in the framework, being familiar to a particular extent and having a 'script'. The appearance of the object in itself will not be adapted gradually. To variate familiarity in objects, there are 3 types of familiarity chosen, namely familiar (known), unfamiliar but having a certain purpose (unknown, with associative features), and unfamiliar (new, ambiguous) with an open 'script' (see also 3.4). For each of the three types, an object is chosen. The objects are introduced in chapter 4.3. The choice is made to use rather simple object compared to complex. The complexity will be confined to an object that has no electronics and has a rather specific use and multiple signifiers are possibly present.

In the hypotheses of the experiment the 'script' is seen similar to the relations of the object with its immediate surroundings, and the context being partially responsible for delivering information to construct the relation. Meaning that both (de-)scripted & context together are responsible for the relation between object and surrounding are interpret. The decision therefore is made not to change the variable of (de-)scripted in the experiment like with familiarity and context, but to incorporate the (de-)scripted variable in the probes themselves. This still allows how instructions or affordances are interpret from the object in relation to the context. Eventually it will be able to say how the 'script' is of influence on the use of imagination, because the 'script' is taken into consideration in choosing suitable objects for experimentation.

The objects are chosen by the designer in accordance to the assumed pre-existing knowledge of the participants. Where there are 3 types of objects for familiarity chosen, the middle type, unknown with associative features, is provided with a 'back-up' object. The chance that someone knows the object, thus is familiar instead of unfamiliar with the object, is taken out of the equation here and is tackled by providing a second object in this type of familiarity. The participants furthermore are presented with an example run introducing the functioning of the experiment. Once the real experiment begins they know how the experiment is conducted. The questions by the interviewer do have an open character and limit steering participants into biased answers.

Since the objects in the experiment will not be placed and used in the real coherent & incoherent context, the context will be presented by means of printed images. In the context pictures there are people present, but not on the foreground. They are present to indicate the object being an object of use, but are not deliberately showing the use of the object. The way these images are presented to the participant is kept similar throughout the course of the experiment. The conditions of each test are similar and the presentation of the context to the participants will not cause deviations in the outcome. To prevent flawed conclusions the testing sequence of the experiment is chosen randomly. Where there will be 3 types of objects, according familiarity, with each two contexts. In total there are 48 combinations possible, of which 12 are chosen at random.

Eventually the participants used in the experiment are students from the faculty of Industrial Engineering, TU Delft. The assumption is made, that by taking students with a similar educational background it will result in a coherent outcome. The cultural background is open for discussion, it is not taking into consideration perse. It was assumed that the students in Delft have similar social and cultural references. National related references are not taking into consideration. Although they are present. This is tried to bracket out by picking scenario's that are recognizable and universal, not specific to a certain culture.

By controlling certain factors, the outcome of the test is considered to be more reliable and provide coherent answers for the analysis of the design experiment itself.

4.3 DESIGN EXPERIMENT

The design experiment consist of in total 5 objects of which one is used as an explanatory object and therefore will not be discussed further. The three object types, a familiar object. An unfamiliar object which has instructions involved (un)known to the participants, the assumption is made that the object can be associated in the coherent context. Lastly, there is an unfamiliar object which is assumed to be new and strange to the participants of the experiment. The objects used in the experiment will be explained why they fit within the conditions of familiarity and (de-)scripted and the coherent and incoherent context will be shown.

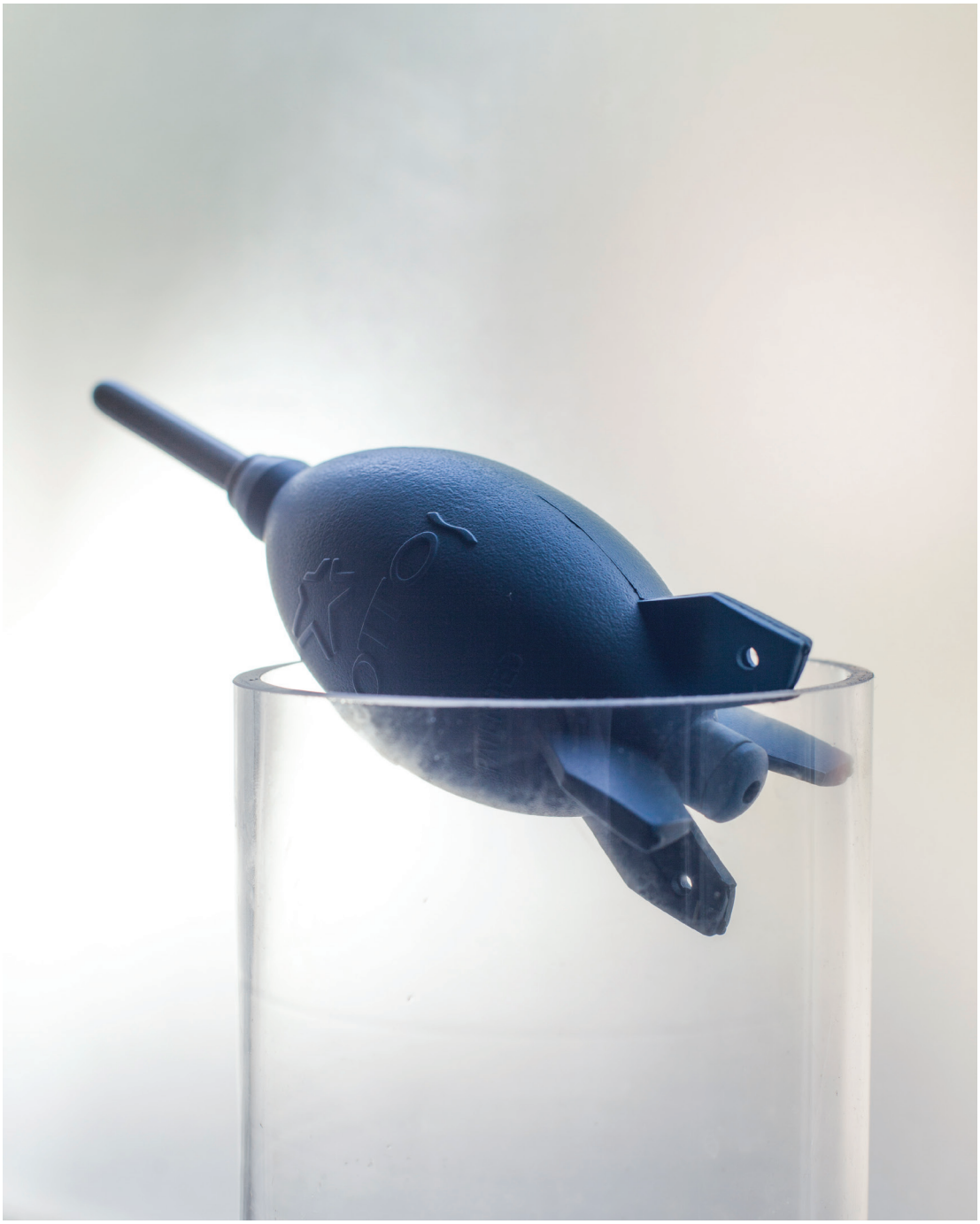
↑ fig.34 - Familiar product, the mug

MUG

The mug is a universal recognized object, it is known among most people. Therefore the mug is considered to serve as a good example for familiarity. It doesn't need explanation its purpose, the mug is known to be a receptacle that is used to drink water. Furthermore people use it to contain material or other object different to a drinkable liquid.

The context coherent to the mug is the kitchen. The kitchen is the place where coffee is prepared or beverages are stored in the refrigerator. The incoherent context to the mug is the market place. The market place is chosen because it does not relate directly to drinking. Whereas the context of the park, or at your grandparents house, is still very closely related to the act of drinking. In order to break away from the act of drinking and allow the participants to construct new relations, the market is chosen.

→ fig.41 - Top coherent context & bottom incoherent context of the mug.



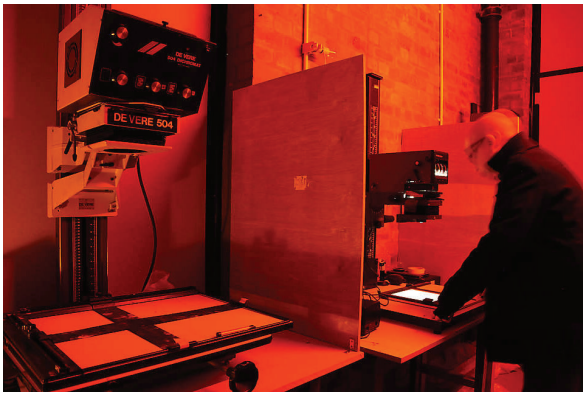
↑ fig.36 - Unfamiliar product, the air dust blower.

AIR DUST BLOWER

For unfamiliar there are three objects chosen of which two are real objects for a specific purpose, where the third one is considered unfamiliar and (de-)scripted. The first object in unfamiliar is an air dust blower. The purpose of the air dust blower, as the name would suspect is to blow air. This object is used in the context of photography and the development of pictures. Where negatives are developed and scanned, and need to be free from dust. By pressing the object it deflates and trough the thin tube the air is blown out. The thin opening generates a strong air flow and is strong enough to blow away dust. Another purpose of the object is to clean lenses of cameras.

The coherent context of the air dust blower will be presented as the darkroom where pictures are developed. In the picture itself are two machines situated that are used to enlarge pictures, thus a space where pictures are scanned and development. The light in the picture is red, which will relate to the fact that there is no daylight present in the room, strengthening the fact that it is a room for the development or handling of negatives or pictures.

The incoherent context for the air dust blower is a public community garden. Where the relation between object and surrounding compared to the technical background of photography is somewhat opposite. The repurposes possible in the garden can be linked to quite precise uses of the device. It offers different kinds of relations in comparison to the darkroom, which will challenge people to use their imagination in order to come up with different uses.



→ fig.37 - Top coherent context & bottom incoherent context of the air dust blower.

↑ fig.38 - Unfamiliar product, the paint bucket opener.

PAINT BUCKET OPENER

The second object is to serve as a substitute object in case the air dust blower is familiar to someone. Eventually this object will help to further develop an understanding for the use of imagination in the perception of objects. It will not be disregarded if the air dust blower is not recognized and thus interpreted as unfamiliar. The third object is a paint bucket opener. It is suitable to open big plastic paint buckets as well as steel paint cans. On both outsides there is a small upstanding edge, which you can put underneath the brim of the lid of the paint can. The 'hook' is used to open plastic buckets.

The coherent context is a room where they undertake renovations. There is someone painting and there are multiple tools and different stuff laying around. Since the man in the picture is painting, the relation between painting and the bucket is assumed to be picked up.

For the incoherent context there are two people busy when working on making a piece of clothes. There is not a specific reason why this context is chosen as incoherent, apart from the fact that it does not relate to painting. The object is small and easy handled, in this context that could come in handy but that is left open to the participants.

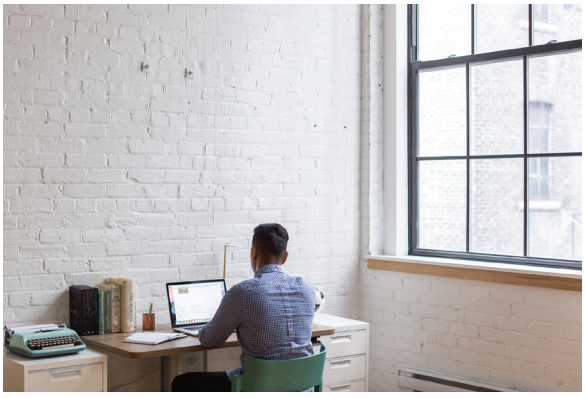
→ fig.39 - Top coherent context & bottom incoherent context of the paint bucket opener.

↑ fig.40 - Unfamiliar and open product, inspired by Marlies Kolodziey.

2/5 (BLOCK) BY MARLIES KOLODZIEY

For the last type of object, to be open in character and doesn't obstruct the creation of new meaning, a totally new and strange object is picked. During the research the objects of Hidden Values of Marlies Kolodziey were found to be real good examples of object unknown to us and open in character and providing possibilities. For these particular reasons, the decision is made to take one of her objects and replicate it with some minor adjustments. The object that is pick out of the 5 is described by Kolodziey, to relate to the unknown and "is seducing the hand to reach out and touch". The object is made by simple laser-cutting the same shape multiple times, glueing them together. It is a 'raw-material' making it a potential object (Zakkas, 2011). The reason why this object is copied, is because it eventually will not change the outcome of the design experiment if the object was designed by me or by someone else. To leave my presumptions and view on what an object with an open character is out of the picture, the object of Kolodziey is chosen.

Since this object is open in character and has not a specific purpose inscribed, there is no real coherent or incoherent context. To make the division between the two, the example of Kolodziey is studied and there is concluded that in the context of the home office the object is convenient. As stated the context is neither coherent or incoherent if the object is really inhibiting an open character, but the one context is still more convenient than another. For the incoherent context, a cooking situation is taken. Where a parent and a child are participating in the act of cooking something. Both contexts are assumed to provide enough possibilities for the use of the object.



→ fig.41 - Top coherent context & bottom incoherent context of 2/5.

4.4 SETUP

The test is rather simple in its execution, since the participants are asked to explain what they see in front of them and how they think it will be used in a certain situation. The explanation of what they see and think is asked to do by speaking aloud. The explanations are recorded via audio to be analyzed later on. The role of the interviewer in the experiment is to make sure that the participants do produce useful data and aren't drifting away from the initial questions asked. The material needed for the design experiment are 5 objects, of which one will serve as an example. A recording device, and a notebook to keep notes during the experiment. The example will have only one context to be shown, since it is only there to familiarize the participants with the procedure of the experiment. The setup of the test is also elaborated in Appendix A.

One test is about 15 minutes in its totality. In total there are 12 participants. The participants is seated at the table and a small introduction will be given, that they will be shown 5 objects, 4 object as data for the test and 1 as example. After the introduction, the example is first shown to the participants. Supported with the question, "what do you think this is?" The question is kept open in order to leave the interpretation to the participants and try to leave them unbiased. After the participants has explained the object and their use, they are asked to pick it up if they didn't do so already. They are given some time to answer according new interpretations or insights and explain those. If they don't add anything anymore, the context will be shown. When they have seen the context, the question is asked "how they would use the object in this situation?" After explaining, the context is swapped with the second context and asked to, again answer the question, "how would you use it in this situation?" In the end this process is repeated until all objects have been treated.

4.5 ANALYZING IMAGINATION

The design experiment is analyzed by transcribing the 12 test conducted. Through the transcription of the test, the 'cognitive structures' can be analyzed to a certain extend. The transcript will provide information on the process of externalization after the internalization already has taken place (for the transcripts see Appendix B).

the information if the participants perceived the objects as was assumed, either familiar or unfamiliar. Subsequently can be analyzed what the effect of the context is on the the meaning creation of the objects. If the participants were able to easily de-signify and re-purpose the utilization of the objects.

Folkmann (2010) is used as inspiration for the analyzes of the transcripts. Folkmann identified three settings that are effective in the designers process of "turning inner imaginings into products". The design process is looking for something not yet known, the same is happening to the participants

when they encounter an scenario unknown and an object they can't intuitively understand. The settings are identified as (1)known-unknown, (2) whole vs. detail and (3) focussing-defocussing. These dichotomies will help, because it gives input to direct the analyzes. Known and unknown are mentioned throughout the thesis and recognized as the space where imagination operates. How the known is projected onto the unknown. Whole vs. detail is the top-down or down-top approach to discover the understanding. And focussing defocussing, according Folkmann, is the relation between problem statement and solutions. Where people want to make things understandable the questions, how would you use it in this situation is similar to a problem statement, and the solutions is the answer created through understanding. Mediated by imagination is to be believed. Furthermore the outlines of imagination is a good guideline in how imagination is experienced. Negation and possibilities, explaining a search for possibilities are signs that for example can be recognized and related to imagination. Giving background information is the indication of residuality in the thinking process when imagining. Lastly, and the most straight forward thing to do, is to count the amount of participants familiar or unfamiliar with an objects presented. The unique uses of each object can be counted and compared. To see if pre-existing knowledge and the 'script' are limiting the use of imagination.

4.6 DESIGN EXPERIMENT OUTCOME

The goal of the design experiment was to find out the use of imagination in the perception of objects in situations. Each object will be discussed how they are understood by the participants. Eventually the hypotheses stated in chapter 4.1 are analyzed. This chapter will only focus on the data from the transcripts, and leave the discussion open for the next chapter.

Mug - Coherent / 14 Uses (3 Unique)
Mug - Incoherent / 20 Uses (6 Unique)

MUG:

From the 12 participants all 12 were familiar with the mug. In their explanation they were all sure without any hesitation that this was a mug. The relation with the coherent context is also known for all participants. "Just fill it with water & drink from it" - P1. This quote is illustrative for the answers given. Only participant 10 has given more than the generic answer of just a mug to drink from in the coherent context. Namely:

> "Sometimes if you need to store some sachets of sugar or whatever. Sometimes [inaudible] a cup you put that into it. You can use it to hold, you know cutlery sometimes as well." - P10

The affordance of the mug, being a receptacle able to hold things and fluids, is used to troughout, also in the incoherent context of the market. Some participants were questioning the utility of taking a mug to the market at forehand. Denying themselves already from using their imagination. In the incoherent context the mug is given 20 uses by the 12 participants of which their are 6 unique utilizations. Of those uses, all of them are have a comparable applications. All the 6 utilizations rely on the same affordance of the mug, that of holding something because being a receptacle. Watering plants, carrying small and using it as a planter pot were mostly mentioned.

Air dust blower - Coherent / 13 Uses (6 Unique)
Air dust blower - Incoherent / 15 Uses (7 Unique)

AIR DUST BLOWER

None of the participants recognized the specific purpose of the object. During the explanation of the object before going into the scenario's, most participants assigned the application to filling balloons or even inflatable beds up with air. A second group thought it could contain liquids because there was a hole on the bottom of the object. This hole is there allow the device to be filled with air again. Without the right understanding, it was noticed that there were suppositions created regarding the understanding of the object before going into the scenarios.

In the coherent context, the situation was not really well understood. This resulted in 13 uses of which 6 unique ones. 3 of which were related to containing oil or cleaning liquid. And 8, of which 6 cleaning the surface, related to blowing air. In the description of the scenario some participants ended up with explaining a scenario related to the development of pictures. Where still a lot of participants did not understand the relation between context and object, that of cleaning negatives in a darkroom to develop photographs. Is developing of analog pictures too specific or is this interaction becoming obsolete in this digital age?

In the incoherent context there were 15 uses assigned to the object of which 7 unique ones. 10 out of the 15 are related to putting either a liquid or plant nutrition in there. The affordance that was recognized in the object was the possibility to precisely apply water or nutrition to a specific plant, in need of extra care or not. Some participants thought of this application due to prior experiences. Harming or taking care of plants. Furthermore someone gave it the purpose of inflating a mattress, another dubbed it a throwing device and one participant gave it the purpose pollinating other plants by spreadings spores.

Paint Bucket Opener - Coherent / 18 Uses (8 Unique)
Paint Bucket Opener - Incoherent / 13 Uses (7 Unique)

PAINT BUCKET OPENER

Again none of the participants recognized the intended use of the object. There was certainly a contextual factor of recognizing the bucket opener as a beer opener. Since everything is a beer opener for students. The hook was appropriated to be an opener of some sort. The triangular opening was recognized but couldn't be made understandable.

In the coherent context 18 uses were conjured by the 12 participant, having 8 unique uses. Most of the uses are assigned to scratch something of the wall. Paint residue or masking tape. Using the hook to reach corners or go around doorposts. Only four participants eventually recognized the intended use of the paint bucket opener. Although they did not directly made the relation, by scanning the context to perceive it accordingly they arrived at the act of opening paint bucket. Where two participants mentioned that they just recently had painted a space, having a more vivid recollection of the act of painting and what is used in such context.

Block - Coherent / 25 Uses (10 Unique)
Block - Incoherent / 18 Uses (7 Unique)

2/5 (BLOCK)

To make it more convenient the object 2/5 is called block. This strange object with open relations to the surroundings was not understood by anyone, as expected. Some people in the explanation of what it was they saw in front of them they already assigned it with the utilization of being a paper weight or doorstop, because of volume of the object.

In the therefore coherent context, the context what would result in a more convenient object-surrounding relation resulted in 25 uses with 10 unique purposes. With the bookstand and paper weight mentioned the most, the most interesting application of the object is the following:

> "Hmm. [pause] as paper weight maybe, or [pause] to, hehe, something used to help you rehabilitate from drinking coffee. That it is present but it doesn't allow you to actually drink coffee." - P6

The block being a form of mediator in a placebo effect drinking to much coffee, which is an super interesting application of which possibly almost nobody would have thought about. In the incoherent context the participants thought of 18 uses of which 7 unique, most related again to the cookbook present in the picture. The other utilities are related to baking cookies, to roll dough or even to hammer hammer the dough or other food. One participant in this scenario tried to understand the block by questioning if there were more hidden features to it.

Quote: “What if it was hollow on the inside like a sort scoop. Or if it were two parts like a herb thing or anything. For people with only one hand.” - P8.

This questioning of alteration can be understood as the object being ‘to open’ for interpretation and that the participants is also imagining possible functionalities and workings beyond the physical form.

THE HYPOTHESES

(1) Familiarity, the influence of existing knowledge present, makes the use of imagination unneeded and the already existing understanding is preventing the creation of new meaning.

Most interesting effect of familiarity was to see that if the understanding is there. The motivation to explore further is not present. Which is substantiated by the fact that only 1 participant came up with more uses in the coherent context of the mug besides drinking from it. Another effect of familiarity was analyzed in the creation of meaning in the second scenario. Where the understanding that pre-exist was obstructing the creation of new meaning. The understanding of the mug is present in such a way that the concept created is of retentive nature, and is causing the understanding to be taken for granted without considering or exploring other possibilities. The incoherent context for the mug did not evoke much more than the affordance of the mug to hold something. Which is almost as familiar to us as drinking from the mug. The same was seen on a more personal level with the other objects, where the utilization in one context was reassigned in the second context. No effort was undertaking to de-signify the utility and come up with a new one. Either the participants couldn’t do it, by lacking creative imagination or resourcefulness, or we really become lazy in using our imagination and appropriating new uses. The hypothesis for familiarity has proven to be partly true. Where familiarity is making the use of imagination and the exploration of possibilities unneeded, it is the conceptual understanding that is blocking the creation of new meaning. Conceptual understanding does not have to be correlated to familiarity because it can be created a few moments ago and is not retentive like familiarity.

(2) (De-)scripted is responsible to what extend the relations are determined by the designer, the openness in relation between object and surrounding is assumed to evoke imagination to create new meaning done by the subject.

The open object of the three, unfamiliar and new for the participants, is evoking the most uses within the participants. Also the most unique uses are thought of related to the de-scripted object. This indicates two things, the search for possibilities, because in the experiment those uses are not stated to be fixed but rather presented as possibilities of uses. Secondly the unknownness of the object, the lack of instructions ‘inscribed’ does create space for the creation of meaning by making new possibilities. The continuous act of trying to make things understandable and some participants

asking for explanation of the object does imply that the a de-scripted product, inscribed with open interactions, is providing a fluid space for understanding that can be easily be re-purposed in different uses and situations.

The effect of (de-)scripted on the other two factors is not so much present. The analysis on familiarity is found to be unfluencial, and the influence on the context is also not present. Where the influence of context on the script is present, the other way around is not or less apparent. The reason for this is that context and the form and material in the experiment are fixed elements. And those element being fixed leaves no space for the 'script' to be of influence on the other factors.

(3) Context is of influence how imagination is able to create understanding by making 'correct' relations between object and context, if there is a need for constituting new relations between object and context.

Context is believed to be influential on the imagination in providing space in which the participant can search for possible understandings. It creates boundaries for the search to understanding the object's relation to the surrounding. It is providing the relations. In the experiment the relations are limited to the picture, thus the influence of context is rather static.

Context is to be considered influential as explained here before on the instructions present in the object. Providing handles that the instructions can grab to make connections. In case of familiarity, the influence of context can take away or amplify doubt in what the object possibly can be if not understood. The right context can give the subject just a bit more confidence that the 'right' understanding is created.

5. DISCUSSION

the final chapter will provide an evaluation of the design experiment. Through the design experiment the research questions are addressed, and leading into the conclusions of the thesis. Next up the experiment and the limitations of the thesis, the knowledge created and the relation to design for interaction are discussed. This chapter is concluded with the recommendations.

5.1 DESIGN EXPERIMENT

The design experiment served the purpose to evaluate the framework. Following the hypotheses set for the design experiment, familiarity, the influence of existing knowledge present, is making imagination unneeded up till the boundaries of the subject's knowledge. Secondly the instructions, (de-)scripted, is providing space where the relations between object and surrounding are constituted. The instructions are 'inscribed' in the product. The third and last hypothesis is concerning context, influential on the relations made between the object, both in familiarity and instructions, and its immediate surroundings.

In the experiment familiar is found to be obstructing the use of imagination. When something is strange, something being unknown is evoking imagination in a limited manner. The 'strange' objects are evoking imagination in the exploration for the 'right' understanding. Thus not exploring the use necessarily, but exploring the different possible understandings. It is analyzed that the logic of negativity is playing a role in the understanding of the strange object, if not proposition 1, then possible proposition 2 and so on. Until the point that a proposition is found that is fitting with the propositional belief of the subject. To conclude, strange is evoking imagination, it has been noted that it evokes imagination to make the object understandable.

(De-)scripted is found to be most effective in evoking imagination. Where the possibilities explored were not bound to specific use but rather to the affordances of the object. Thus an open script is providing room for the creation of meaning. Not having a fixed or singular purpose inscribed is also decreasing the resistance to re-purposing the meaning of the object by the subject. The familiar object is easily de-scripted, by de-signification, but difficult to appropriate due to the known structures in place. The known structures in place are preventing further motivation to explore the space of possibilities, because the synthesis creates the understanding so easily. Thus the (de-)scripted variable is providing room for the subject to create understandings contrary to familiarity where the goal is too find a fitting understanding. Where open instructions allow the subject to create more than one fitting understanding.

Context is influential on the intuitive reading of the scripts of objects. And thus subsequently is playing a role in the natural shift of objects perceived strange and bringing them into familiar territory. In the experiment is seen that context is leading to the discovery of intended uses. Only the influence of context in the experiment is difficult to analyze seen the passive nature of pictures in comparison to real environment that show a more vivid world of relations.

5.2 INFLUENCE OF BRACKETING

In an effort to create reliable data and minimize unusable data the experiment is bracketed. The variables of context and scripted were combined because of the influential character of the variables on each other. This is found to limit the outcome because the space provided to make relations between object and surrounding were bound to a picture. What was interesting from using a passive picture was the active search and explanation of such done by the participants to find an understanding that was satisfactory.

The group of participants is chosen as students from the faculty of Industrial Design at the TU Delft is found to be effective for the outcome of the test. The similar backgrounds and social and cultural references are in place and eventually lead into a homogenous outcome of the test. Where the 'input' is kept similar, further research can look into different age groups and background and their engagement with imagination. To see if their is even a noticeable difference in the outcome.

The objects in the test are of influence on the outcome. The choice for simple, non technical objects of use. To be able to state this influence is not possible for now. But the objects are chosen to the best assumptions of the designer according the research conducted and the knowledge gained from the thesis. The type of objects and the relation to the context given are creating the space of possibilities, to say if this space ism similar to each other independent from the object is hard to say, and needs further testing.

Analyzing the data and recognizing the use imagination is biased to researcher. It is tricky for the recognition of imagination in general because it is a internal process if the mind and closely related to other mental states, and not deliberately presenting itself the explanation of the participants. The indirect nature of analyzing imagination this way is prone to misinterpretations from the researcher. It could be prevented from mistakes, by analyzing the data with experts of mind to create mutual consensus of what to be called imagination and what not.

5.3 ADDRESSING THE RESEARCH QUESTIONS.

To answer the research question, the first chapter is used to introduce the topic and set the scope of thesis. The second chapter is used to research imagination through literature. Chapter 3 is used to further create understanding of the framework and the role of familiarity and scripts,

in the perception of object done by the subject. Chapter 4 explained the design experiment and the outcome. All this information is resulting in an answering the research question. First the subquestions are addressed to eventually address the main research question.

WHAT IS THE ROLE OF IMAGINATION IN THE PERCEPTION OF OBJECTS?

The role of imagination in our perception is assumed to be the syntheses of sensibility into understanding. Situated between the 'real' visible world and the 'unreal' invisible world (residuality). Imagination is able to take what we know beyond the boundaries of reason and detach meaning and create new meaning internally(unrealization). This means for perception, that imagination is the human faculty that can push our understanding and experience and create new understanding (transfiguration) with the pre-existing knowledge we have.

Having knowledge is part of us humans, the things we have experienced in the past through sensibility. Interpretation and perception of things around us is done in order to make sense out of the world. The important role that is believed to be reserved for imagination, is making sense of what is around us if we don't have all the information or knowledge present to us. Something being unknown or new to us, is the space where imagination is acting and helping us to understand these phenomena and the objects that reside those.

To conclude the answer, in the case of objects. Imagination is the faculty that can present representations of what objects 'can be' or 'how they are used' without committing this thought to the truth. Creating new meaning of the object is the active search into new possibilities of use. This is done by imagination, because imagination is not bound to reason and doesn't need to commit to the truth. Thus the role of imagination in perception is when unknown objects present themselves to the subject, imagination is the faculty that is able to make sense out of the unknown. Situated between the 'real' and 'unreal', not bound to the truth, able to create new meaning and eventually leading to the new possibilities.

For further information on residuality, transfiguration and unrealization, see the phenomenological outlines of imagination in Chapter 2.6.

WHAT ELEMENTS ARE INFLUENCING THE EVOCATION OF IMAGINATION?

A division is made between object and subject to explain the question and the elements that influence the evocation of imagination. First the object will be discussed. The object is researched through the framework of familiarity and (de-)scripted and eventually tested by means of the design experiment. The design experiment tested the influence of the both elements on imagination. From the design experiment is concluded that the familiarity of objects is evoking imagination by wanting to make strange known and understandable. Meaning that if something is strange we try to make

this understandable by bringing it back to the familiar. Projecting known onto the unknown. The experiment showed that there was an active search of the participants to give a understand a strange object by finding a 'right' purpose, unlike with a familiar object where the understanding is present and stated, and no further exploration took place. Thus familiarity evokes imagination to find understanding for the purpose of objects.

(De-)scripted is understood as the instructions 'inscribed' in the object. The instructions are 'inscribed' by the designer and are called a 'script' (Akrich,1992). The variable of (de-)scripted is ranging from scripted, the designer enforcing you a certain and specific use in context, to de-scripted being open for multiple interpretations. The experiment showed that open instructions, de-scripted, provides space for new possibilities. Facilitated by the fact that these objects are re-purposed more effectively and the instructions being simple and thus do not result in obstructing conceptual models.

The subject is the person acting out the imagining, the use of imagination is residual in the sense that it draws from other mental acts such as knowledge and memory. The residuality of imagination is important because it is considered the input for the imagination, in order to imagine something you have to have pre-experienced information of that intuition from the past. The amount of knowledge and memory present in a person is considered to be influential to evoking imagination. Imagination revolves around the unknown, if the subject doesn't know much, there is more need for imagination. Contrary to someone who knows a considerable amount of information. A person that know lots, is not prone to evoking their imagination. In the search to new possibilities, having knowledge of things from different fields is considered useful in the creation of new connection.

Furthermore the attitude of the subject is important for the use of imagination. In the experiment is observed that some people are not able to de-signify the purpose of the object because the purpose is already present within the subject. The personal attitude of the subject is thus limiting to a certain extent the engagement with the act of imagination.

The last element of influence is considered the motivation. The element of motivation is not researched properly as the other elements but is nonetheless considered to be important, because this is the link to how designers can make use of imagination in product interaction. Imagination has an extrinsic motivation to act. In the design experiment for instance, the extrinsic motivation is provided by me. Asking the participants how they would use an object in a given scenario. Asking how the participants will use the object, is subconsciously asking them to imagine.

The elements from the object are familiarity, evoking imagination by trying to understand the purpose when talking about objects of design. By bringing known elements into the unknown. The script of an object, provides the space for possibilities. The space for possibilities allowing relations to be easily constructed and re-purposed. The elements that evoke imagination but are intrinsic to the subject are memory and pre-existing knowledge, personal attitude or competence and the extrinsic motivation for the subject.

HOW IS DESIGN EVOKING IMAGINATION?

Design is evoking imagination by providing unknown information to the subject. Being unknown, or partly unknown, objects challenge the subjects perception. In challenging the perception, imagination is the faculty that is important to create understanding of the unknownness around us. How design is evoking imagination is to look strange or having an open character of use. To question reality and open space for exploring possibilities. The open character is considered most effective to evoke imagination.

the first conclusion is that an unknown character in design is evoking imagination. The unknown character triggers exploration in the search for understanding. The second conclusion is that the open interpretation of objects is evoking imagination. Providing space for possibilities, this space is mediated by the designer, thus the designer of objects plays an important role to what extent design evokes imagination and creates meaning in a concrete manner. Lastly imagination is evoke by providing an extrinsic motivation to the user. Evoking the subject to engage with the design and trigger the exploration of possible use.

5.4 THE POSSIBLE USE OF IMAGINATION IN DESIGN FOR INTERACTION?

In the introduction of this thesis, the 'crisis of imagination' is mentioned. This thesis looked into how to evoke imagination, by understanding how we trigger imagination. Being able to countermove into a different direction, now present in UX Design, compared to limiting the misinterpretations argued by Redström (2008). To do something about the 'crisis of imagination'. Using imagination in inscribing objects of use with a space for possible interpretations. And explore the space to what end the use of imagination can be deployed.

The possibilities of making new relations through imagination is an interesting feature for the field of design for interaction. Questions emerge in interaction design how to change behavior, values, and beliefs, and make people more aware of the world around us and its need for change. Vervoort & Bendor (2015), argue for a plurality of worlds in world building. The plurality of worlds is similar to having multiple possibilities to choose and build from, facilitated by imagination. There is believed to be an important role for imagination in the creation of new unforeseen world views.

5.5 LIMITATIONS

This thesis is written with a general approach to imagination in the perception of objects. The goal to which aim the imagination is used, isn't thoroughly addressed. Which eventually can limit further research because the information provided by this thesis is too broad and not transferable into more specific fields of design practice.

Another limitation of this thesis is the fact that there is only one experiment conducted on which the results are based. Certain parts in the literature also can be researched more substantiated before transferring them into the design experiment. The design experiment thus has 1 set of combinations that are used to test the hypotheses of the variables to evoke imagination. Having only one experiment and one set can be argued to be unsubstantial. To give substance to the conclusions, the experiment in future research can be repeated with different sets of products. Using a different set of objects provides the opportunity to compare the objects with the conclusions of this thesis. Pointing out beforehand which elements will most likely be responsible for evoking imagination provides the possibility to concretely specify these elements.

5.6 RECOMMENDATIONS FOR FUTURE RESEARCH

This thesis set foot into the role of imagination in the interaction between object and subject, (and surrounding). Related to the framework, the first recommendation is that the familiarity is open for further research. What does familiarity mean when we purely look at the aesthetic qualities, linking to affordances, and playing with the ambiguity of familiarity. Exploring the engagement of the subject with objects by seeing how familiarity of the object facilitates in creating the extrinsic motivation needed to imagine. To what extend simple shapes and complex ones evoke imagination. The research showed that raw-material is more prone to open interpretation and that ambiguity in objects is facilitation multiple interpretations.

The second recommendations is doing research on a more methodological approach to design for the space of possibilities. In everyday design the goal is to find one possibility that matches with the design brief or objective. What the implications are of designing for the same design brief but coming up with objects that facilitate in the space of possibilities rather than a specific purpose. Changing our way in approaching the script we inscribe in products and see what the outcome of such objects can be? Speculative design does provides in the space of possibilities, but most of the times not by designing multiple possibilities but rather giving one scenario.

The last recommendation is to do further research into the engagement of users with objects that function to evoke imagination and to what aim imagination is needed. How to design the extrinsic motivation to explore and engage with these type of products. If objects have no purpose to us, it is difficult to for the user to engage. It is not part of our nature to pick up a random objects and use them for whatever purpose. How can designers incorporate functionality that provides in certain needs but are still leaving room for possibilities, and thus imagination.

BIBLIOGRAPHY

Auger J. (2014): Speculative Design - Crafting the Speculation. Digital Creativity, 24(1), pp. 11-35.

Akrich, M. (1992): The de-scription of technical objects. Bijker, W. and Law, J.: Shaping technology/ building society. MIT Press, Cambridge, MA, USA, Sleeswijk, pp. 205 – 224.

Alderson, S., Ball, R. & Barber, E. (2007) Phaidon Design Classics. Phaidon Press Ltd.

Bendor, R. (2018): Interactive Media for Sustainability.

Brandes, Stich, Wender (2008): Design by Use The Everyday Metamorphosis of Things.

Casey, E.S. (1976). Comparative phenomenology of mental activity: Memory, hallucination, and fantasy contrasted with imagination. Research in Phenomenology, 6, 1-25.

Casey, E. S. (2000). Imagining: A phenomenological study. Indiana University Press.

Dewey, J. (2005): Art of Experience. Penguin.

Dunne, A., & Raby, F. (2013). Speculative everything: Design, fiction and social dreaming. Cambridge, MT: MIT Press.

Dunne, A., & Raby, F. (2001). Design Noir: The secret life of electronic objects. Springer Science & Business Media.

Folkmann, M. N. (2010). Enabling Creativity. Imagination in Design Processes. In DS 66-2: Proceedings of the 1st International Conference on Design Creativity (ICDC 2010)

Folkmann, M. N. (2013). The Aesthetics of Imagination in Design. MIT Press.

Folkmann, M. N. (2014). Unknown Positions of Imagination in Design. Design Issues, 30(4), pp. 6-19.

Gaver, W. W., Beaver, J., & Benford, S. (2003). Ambiguity as a resource for design. In Proceedings of the SIGCHI conference on Human factors in computing systems, pp. 233-240. ACM.

Gaver, W. W., Boucher, A., Pennington, S., & Walker, B. (2004). Cultural Probes and the Value of Uncertainty. Interactions, 11(5), 53-56.

Gaut, B. (2003). Creativity and imagination. The creation of art, 148-173.

Gendler, T. (2011). Imagination. The Stanford Encyclopedia of Philosophy (Summer 2018 Edition), Edward N. Zalta (ed.).

Gibson, J. J. (1986). The ecological approach to visual perception. Chapter 8, p.127-143. Psychology Press.

Hara, K. (2018). Designing Design. Lars Müller Publishers. 4th edition.

Junte, J. (2013) Dit is design? : 20 objecten die je moet begrijpen. Terra, cop. 2013.

Matherne, S. (2015). Images and Kant's theory of perception. Ergo, an Open Access Journal of Philosophy, 2.

McGinn, C. (2004). Mindsight, Chapter 11, pp. 140-143. Harvard University Press.

Norman, D. A. (1999). Affordance, conventions, and design. interactions, 6(3), 38-43.

Norman, D. A. (2008). Signifiers, not affordances. interactions, 15(6), 18-19.

Latour, B (1992): Where are the missing masses? The sociology of a few mundane artifacts. Bijker, W. and Law, J.: Shaping technology/building society. MIT Press, Cambridge, MA, USA, Sleeswijk, pp. 225 – 258.

Lloyd, P., & Snelders, D. (2003). What was Philippe Starck thinking of?. Design Studies, 24(3), 237-253.

Redström, J. (2008). RE: Definitions of use. Design studies, 29(4), 410-423.

Stevenson, L. (2003). Twelve conceptions of imagination. The British Journal of Aesthetics, 43(3), 238-259

Vervoort, J. M., Bendor, R., Kelliher, A., Strik, O., & Helfgott, A. E. (2015). Scenarios and the art of worldmaking. Futures, 74, 62-70.

Willis, A. M. (2006). Ontological designing. Design philosophy papers, 4(2), 69-92.

Zakkas, A. (2011). Modes of Use.

Zakkas, A., Boess, S. & Kuijer, L. 2011. Product-Friendly User Design: a Critical Discourse on User-Centered Methodology.

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