A COMPARING RESEARCH METHOD IN COMBINATION WITH PHENOMENOLOGY AND MODERN APPLICATIONS

How can a building volume influence people's experience from the street?

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I INTRODUCTION

In the first lecture of these lecture series, Jorge Mejia Hernandez (2018) stated that architects should have a notion of the importance of the following: “Having the ability to recognize the organized systems of ideas that inform, direct and define any architectural discussion towards the growth and development of knowledge.” I agree with this importance, because architectural decisions are often based on research, which in my opinion only makes sense when is known which methodology has been used to gain the results. That is why for me these lectures on research methodologies were very relevant.

The course gave me as a student a training in ways of collecting information and arranging it. It offered techniques for gathering data appropriate to a certain question and it provided knowledge of tools in order to approach design issues in the most objective way possible. Furthermore, could it be helpful by validating research results of others when I have knowledge of the research methodology that has been used (Kothari, 2008). Before using them, I can determine whether those results are useful for my own report.

The different lectures in this course elaborated on many variants of research methodology, like “praxeology”, the study of human actions and their behaviour in the built environment as stage of their everyday practice (Berkers, 2019). And “Phenomenology”, the study of the way things appear to us and the role of the body in experiencing spaces, subjects and objects. (Havik, 2019).

Thanks to the lecture series, now I know more about these and other research methods with which I was not familiar yet. For the research I am doing for my graduation studio, I have not (yet) used all of them, but some of them were very useful. And I certainly can imagine that some others could form an appropriate starting point for my future design issues.

Figure 1. The urban plan designed for the Minervahaven, Amsterdam (made by author and group).

Now, I give a short introduction about my graduation project and I will describe the research methodologies which I used to develop and enrich my design project. The graduation studio I choose is the Chair of Architecture and Dwelling: “Between standard and ideals – Havenstad Amsterdam” in which I will design a residential block on one of the piers of the Minervahaven. The central question in this studio is: “How do we want to live in the future and what kind of buildings do we need to make that possible?”.

I opted for a waterfront location at the north side of the area (IMAGE). The basic shape of the building block is already determined by an urban plan in which the contour of the block is given. At least 70% of the contour should be built on. There are also rules for the minimum and maximum height. And the total surface of the storeys together should be between 23.200 and 25.520 m^2.

But within the rules there are enough possibilities to create a distinctive variant. According to the requirements, the building block must be recognizable as a whole, although an opening is permitted in the mass. As an extra element, this location is mentioned in the development vision of the municipality of Amsterdam as a possible location for a landmark. Which also offers possibilities to deviate slightly from the rules, for example by placing a high tower.

Due to these rules, the block will be filled with ground scrapers. This building type is characterized by its limited building height, but massive appearance that covers an entire building block (Van Leeuwen, 2007). From the outside it forms one coherent whole, but in the middle an inner square will be created. Nevertheless, the ground scraper is experienced as high at street level. For the perception from the street, the development of the plinth and the connection with the environment are very important. To weaken the negative influence of this massive building type, the building volume plays an important role and can deliver quality.

In this Assessment on Research Methods I will therefore describe the research that I did to find out how the building volume can influence the experience from street. The results of the research show that relatively small interventions can have a lot of influence on the quality and improve people’s experience on the street level.

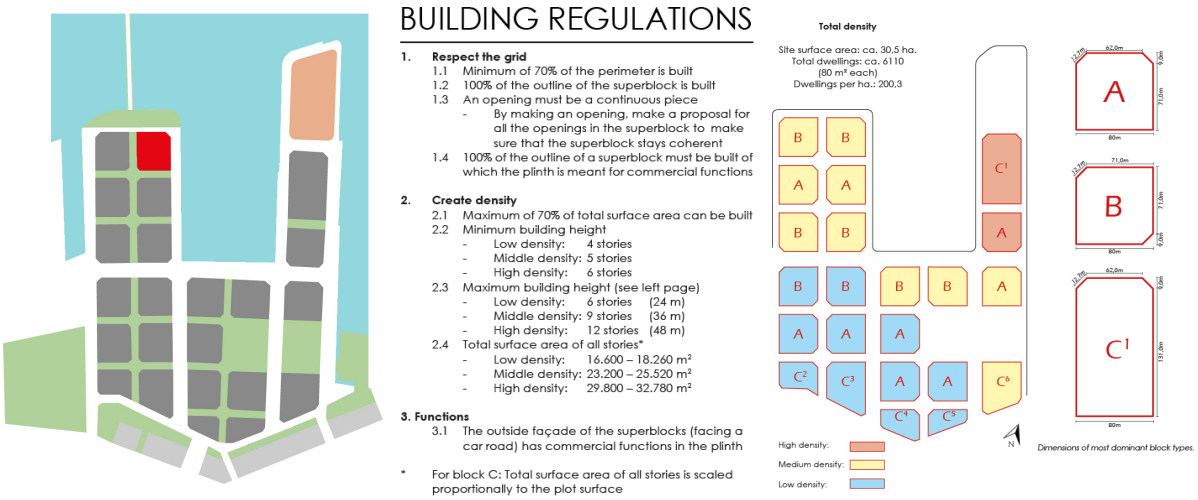

Figure 2. a. the location of the building block, b. the building regulations, medium density (made by author and group).

II RESEARCH-METHODOLOGICAL DISCUSSION

To research how the building mass can influence the perception of the space experience at street level, I used the following research method: Comparing and evaluating drawings, as Professor De Jong described in his book (2002, p.173-175). In the research two impression images will be compared. The impression images both show a different design variant (or intervention) for the same location. Subsequently, different people are asked how they experience the first impression compared to the another and they are also asked to describe the differences.

To make a good comparison according to the mentioned method, it is needed to first create a “zero variant”. This is a basic variant having exactly the same program as the variants it will be compared with. The other variant will be compared to this zero variant: to what extent is it different, better or worse?

The zero variant that I use for this method is the result of a lot of research on reference projects, the required density and the sun orientation on which I will not elaborate in this report on research methodologies. The zero variant (figure 3) shows the outlines of the building as a volume of stacked blocks. The variant with which I will compare it has the same basic, but I made an intervention, as can be seen in the images in figure 4. It shows a selection of the impressions I used for the interviews.

In figure 4, the selection of the research is shown in which setbacks, angled corners and small openings in de building are tested in which “A” is the zero variant and “B” is the other variant. It is certain that a high density is required for this centre location in Amsterdam, but that clearly does not always have a negative effect on the experience of people.

Figure 3. Overview of the zero variant (made by author).

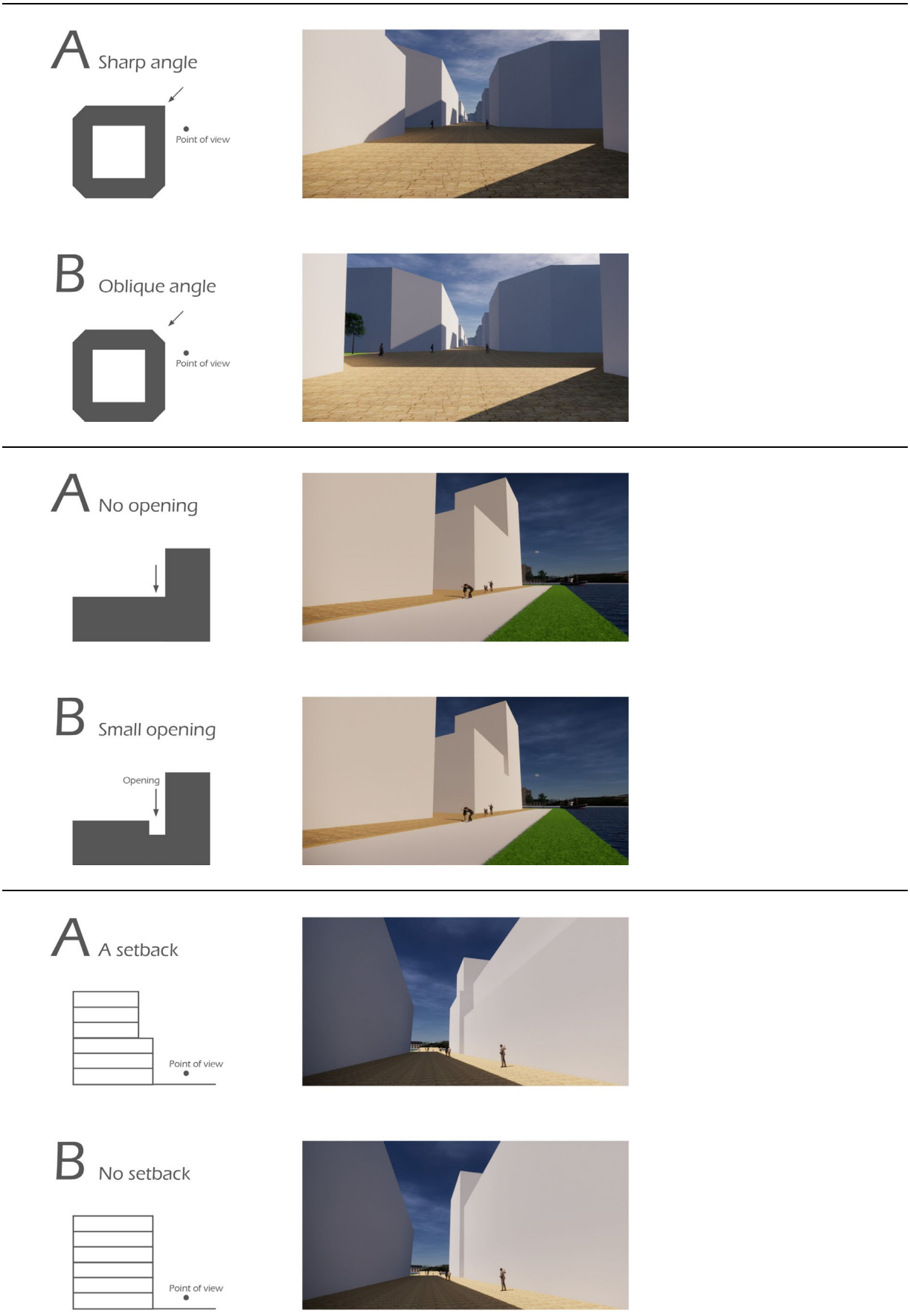

Figure 4. Comparation options. A is the zero variant and B is the other variant (made by author).

In order to make a fair comparison, a number of conditions are set in this method for the two impression images that are compared. At first the impressions need to be outspoken by leaving as less as possible to people's imagination about the point which is compared. So the compared impressions can be judged according to a scientifically principle (Groat & Wang, 2013).

To make it a valid comparison, the two impressions should be completely identical, except for the aspect on which they need to be compared. So, all the factors that could cause a different experience should be prevented (Groat & Wang, 2013). Impressions having a different scale or another resolution are hard to compare (De Jong, 2002). The same counts for the position and the perspective of the impression and its context and time of the day and shading. These properties should all be the same in a comparison to enable scientific judgement.

Therefore (as can be seen in de impressions used in figure 4) all the environmental factors and qualities of the impressions are equal. Figure 5 shows two images which are not comparable for that reason. One picture is in colour and the other one is in black and white.

Because this research is about people's experience of the architectural building volume, the link with phenomenology is a logical one, because phenomenology as a social science method suits the best for getting information about people's experience. To obtain this information, interviewing people is a very convenient way, because this study approach respects the intention of the subjects and the symbolic character of language (Boland, 1985).

Therefore, the next step was to ask people which of the two variants felt the most comfortable to them. I interviewed several people because it is important in phenomenology to compare more (and probably different) opinions, because not everyone has the same experience at the same place (Havik, 2019). To bring the research to a higher level, I asked them subsequently to mention the difference between the two variants and why one them felt more comfortable to them than the other.

I choose for interviewing people, because I think the experience of the future users forms an important starting point. Schematically and in theory the design can be just right, but you only know if it works the way you intended if you know the experience of the user. By comparing two variants, by adding the results, I can draw a conclusion about which variant works best. When I would ask people: "How would you improve the building mass?", then I get a different answer from everyone. In this way I use the knowledge I have thanks to my education to create two possible variants. Then I ask people for their opinion to be able to estimate the experience of future users.

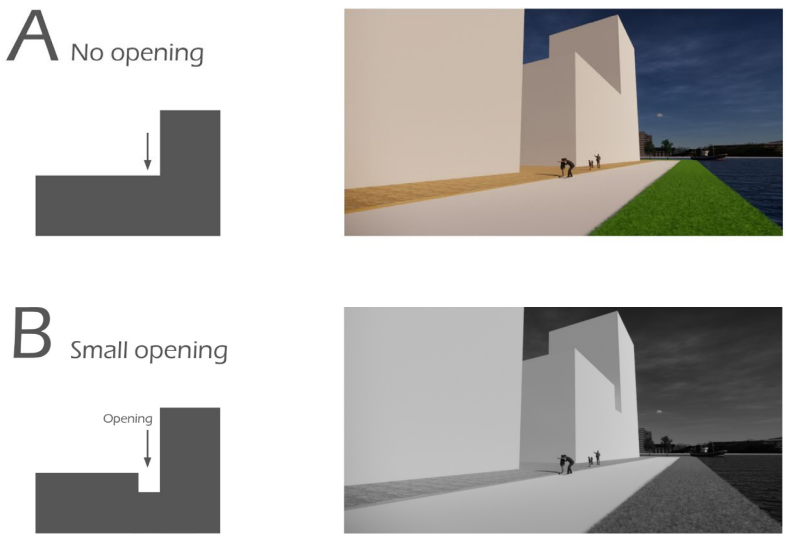

Figure 5. Two images that can not be compared because the properties are not the same (made by author).

III RESEARCH-METHODOLOGICAL REFLECTION

The method described in Chapter II is based on a theory written in 2002 that in my opinion certainly offers a competent approach of comparing variants. The study results shown in figure 6 could be the outcome of such a study comparing the experience of a building volume of different variants. But since it concerns the experience of a space and phenomenology is an important part of this comparative study, there are some aspects that can be carried out differently today than when the method was introduced.

The results from the study of image 6 are interesting, but as a criticism you could argue that all photos are viewed from the same perspective. Since phenomenology is about the experience of space, I think that a number of parts are still missing. Klaske Havik (2019) described in her lecture on phenomenology that the eyes play a crucial role in the experience of a space, but that all senses should be stimulated by a design. So, to really experience the place a design variant can not only be judged by visual perception like in the described method (chapter II).

Therefore, in my research I introduced virtual reality (VR) as a modern variant to create impressions. I asked people to walk in the virtual world to let them experience my variants. By clicking on the keyboard of the computer I switched from the zero variant to the other. For example, by changing the angle of the corner or turning the setback on and off. Instead of two photos of variants side by side, both variants are now visible (alternately) in the same model. In this way, a number of the conditions discussed in Chapter II no longer form an obstacle, because the context is the same in both situations, just like the time of day and the shadow.

In VR there is no longer the danger that the chosen perspective influences the choice for a certain variant, as described in Chapter II. In the model, it is possible to move around the model, so that both variants can be viewed from different perspectives. The images shown in figure 4 are screenshots from a VR model. In this document it has the same appearance as the research in figure 6, but the people I interviewed could walk around it in a virtual model.

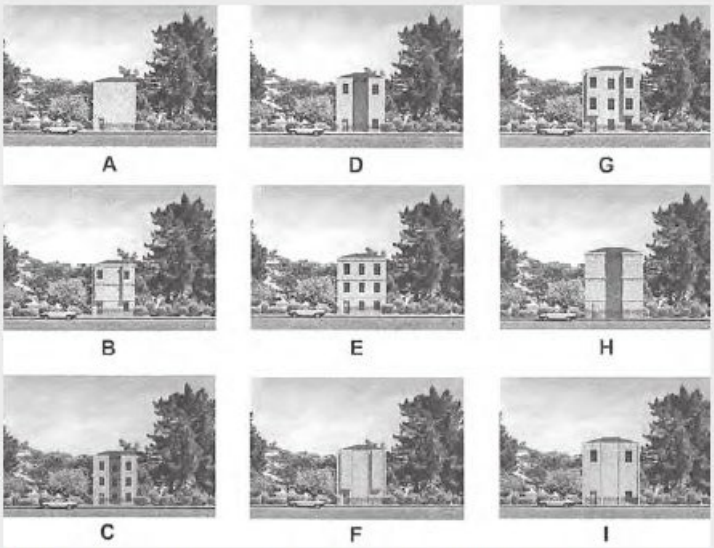

Figure 9.22 Computer-generated facade stimuli from Arthur Stamps. Courtesy of Pion Limited, London.

The results of Stamps's study indicate that the most influential variable by far was visual area, which can be modified *in situ* by setback requirements. Fenestration treatments had a much more modest impact on perception of mass, and both articulation of the facade plane and the partitioning of facade elements had minimal impact.

Figure 6. Computer-generated facade stimuli from Arthur Stamps. Screenshot from the book Research Methods (Groat & Wang, 2013, p. 340).

Steen Eiler Rasmussen (1962) mentioned the different atmospheres a place can have during the day caused by the changing position of the sun or the changing activities causing different types of sounds. VR offers the possibility to simulate those changings during the day. Different sounds can be added and the position of the sun in the model can be adapted. This is an interesting perspective for the issue of Bernard Tschumi who tries to connect space, movement and event. In his work (1996) he mentions the paradox about architecture: on the one hand it is a product of the mind and on the other hand it needs to be experienced with the body. Also on this part, VR offers new possibilities. Walking through the virtual model makes it easy to understand the scale and estimate distances, which would be more complicated when only 2D images were available to compare the different variants.

The importance of this became clear in my own research as well, as the next example will show. From my sketches from bird's-eye perspective it seemed like a good idea to connect the inner square of the building block with the park at the other side of the block. But when I checked it in VR, the scale of the whole became clear. The square I created was enormous which made it hard to get an overview. Therefore, the square was like an undefined place. In a later variant I separated the park from the inner square by a building, which made the inner square more intimate and well-arranged.

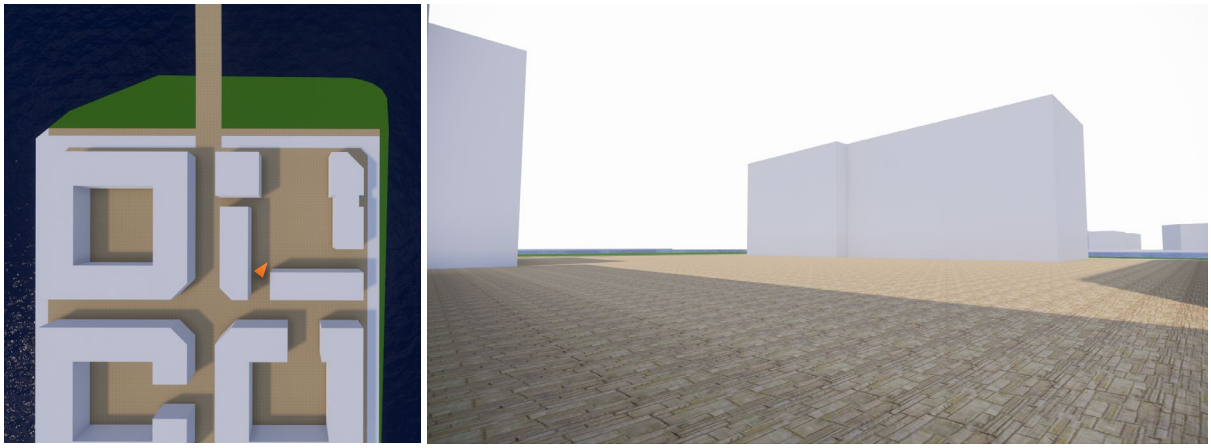

Figure 7. Difference between bird's-eye perspective and virtual reality (made by author).

There are already several architectural offices that make use of VR to research phenomenology or compare different variants. It is often used because design variants can be tested in a fast and accessible way (Architectenweb, 2019). By using virtual models in an early stage, it can have a lot of influence on the design process. The internationally operating engineering firm Arup uses VR to create an ‘immersive experience’ by combining VR and a 360º sound environment. Arup claims that the user of it will be totally integrated in the design and therefore can experience the space in a very realistic way. Neutelings Riedijk Architecten made use of VR as well in the design of the Naturalis museum in Leiden (The Netherlands). It gave them the possibility to compare different options for the concrete façade elements for the “glaskroon”. They tried different heights, depths and widths which could be tested on actual size. According to Mecanoo, VR makes it easier to communicate architectural ideas with the clients. VR is relatively cheap and easy to use in combination with BIM programmes like Revit, which makes it possible to provide valuable feedback in a simple way (Pielkenrood, 2017).
This underlines that VR could be used successful to research phenomenology. Due to the already mentioned possibilities, the two compared variants can be experienced in a way which is far more realistic than just comparing two variants in 2D from a screen or a piece of paper.

IV POSITIONING

Even though experiencing space is something personal I understand the relevance of researching it. Personally, I think phenomenology is a very important research method, because experience of a place and people's opinion about that should be taken seriously. They are the future users and I as an architect cannot make all choices on my own without using their input. Everyone experiences space in a different way (Havik, 2019) and as a result, the research only becomes more valuable when more people are interviewed. There is no problem when people have different opinions. They can reinforce each other, because the bigger the group is, the more certain the result will be (Freedman et al, 2007).

Since phenomenology describes human experiences, I totally agree with the fact that all senses should be used. So next to the visual aspects also sound for example plays an important role. I also understand the importance of scale in a model and the possibility to estimate distances to get a realistic representation of experience. I really think that VR could be a way to bring the phenomenological research to a higher level. Sound, distance, 3D impressions instead of 2D and the sense of scale can all be research in a VR model. It is also possible to go through the environment at walking speed, making the experience realistic to the experience of the future user. Nevertheless, architects still should be aware of the fact that the experience in VR is not exactly the same as a "real" situation, but by using VR within this method much more dimensions have already been added than would have been possible in a 2D drawing, which makes the comparison between the two options much more realistic. I expect that its possibilities will improve in the future, so the importance of VR within the field of phenomenology will only grow.

The use of computer technology in doing research has enormously increased. It offers many possibilities and that is why I think it is good to make use of it. It works much faster than, for example, making a model and it is also more effective, because different variants can be viewed in the same simulation. The sense of scale is also better, and you can really walk around the design to experience it from different angles. Simulation is a very effective way to investigate people's reaction to various variants (Groat & Wang, 2013). My position towards simulation research is therefore positive.

Computer programs like Revit are much "smarter" because it helps to make design decisions in an early stage (Groat & Wang, 2013). The design can be elaborated in a very detailed way in an early stage. But I think we should watch out for this. In my research I tried to focus only on the building mass, but when at the same time I would have added all windows and textures of materials, those "details" could influence the experience of the variants, while those details were not yet thought out.

Groat (et al, 2013) states that simulation research is useful in developing a theory and testing it. My position about simulation research is that it is a way to check what you have already been working on, to test if a material fits like you expected, or to check whether a building volume is as inviting as you expected. Comparing different options of materials or building volumes is very useful in my opinion. But I believe that is works better to compare different options which were first worked out in theory than just randomly placing materials to see whether they fit or not. I think that we should watch out that the simulation is not going to think for us.

The use of simulation research goes even further. It is possible to explore architectural variants by a model-based approach that chooses the most suitable variant from a whole lot of data (Le Noir et al., 2016). The advantage of analysis of the architectural variants based on such a software system, is that it is much faster and the choice for the "best variant" is objective by judging all the determined criteria. So, by combining all criteria (set by human), the system makes a choice for the best variant. I would position myself as an opponent of this research method, because I think that especially for this field of phenomenology, the human experience is crucial. And I understand that in the software it would be possible to insert human arguments and interests, but I can hardly imagine that in this case human interviews could be replaced by a machine. Even when it is possible in the system to make certain criteria more important by giving them a heavier weight, I can't imagine that a machine reacts in the same way on unexpected changing circumstances as people would do.
Because this phenomenological research is about the experience of the space, I am convinced that the opinion of (possible) future users should be taken seriously. This can not be replaced by a system.

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