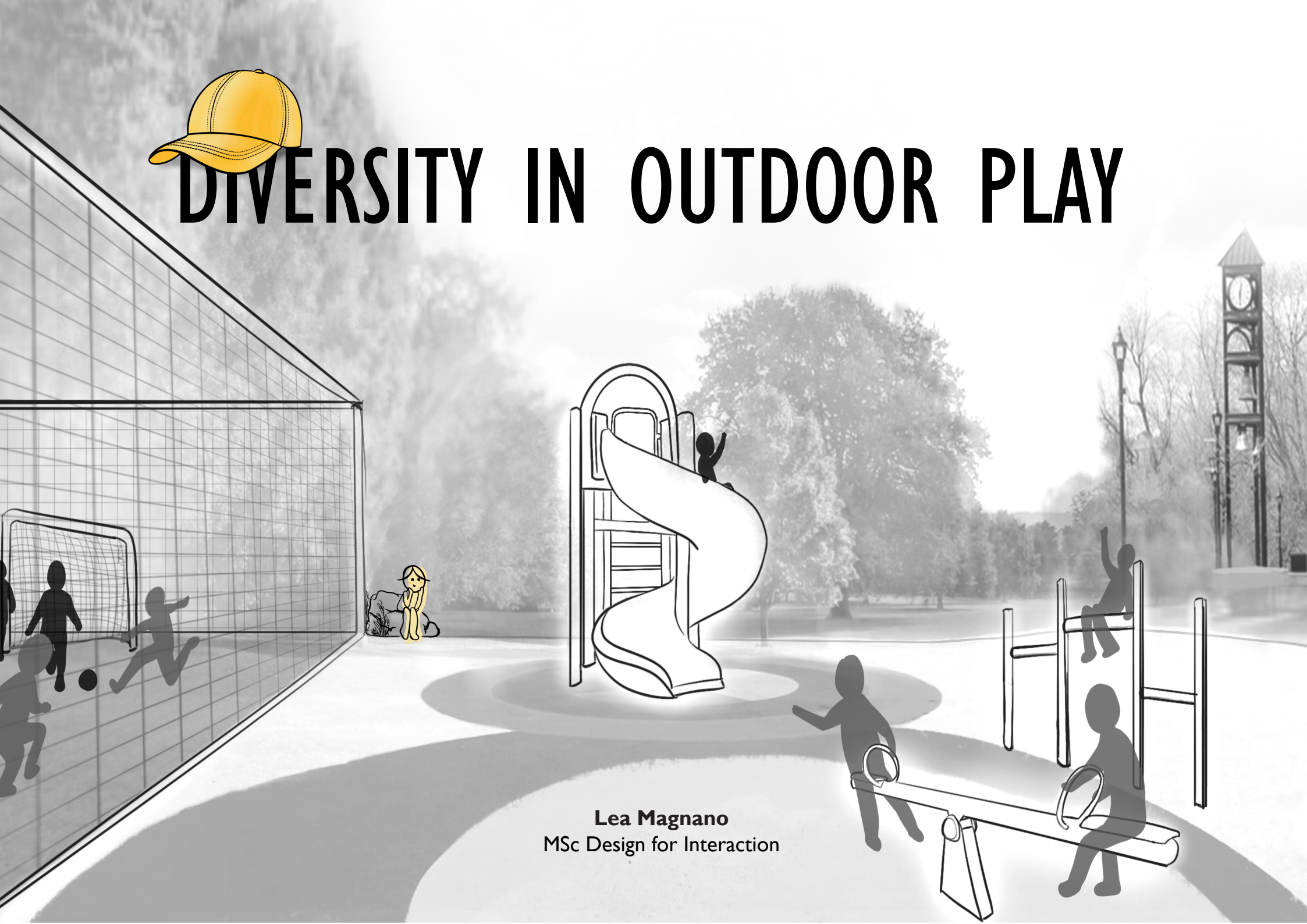




# DIVERSITY IN OUTDOOR PLAY



**Lea Magnano**  
MSc Design for Interaction

Master's thesis

# Diversity in Outdoor Play

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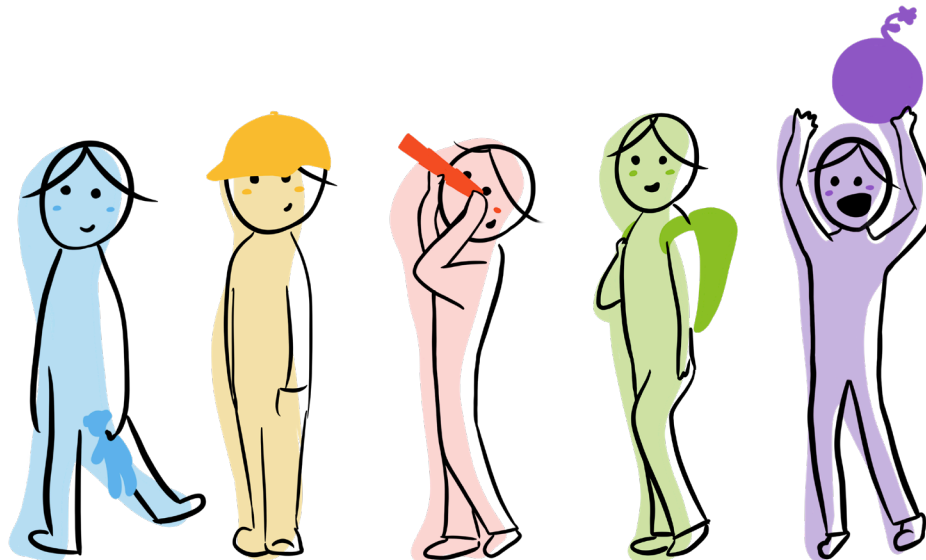
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# ABSTRACT

Outdoor play among children of the new generations is shifting, and not necessarily for the better. A considerable number of kids are missing out on spending their free time outdoors, and those who do engage often lack diversity. For instance, in the Netherlands, only about one-third of children playing outdoors are girls. These observations have prompted numerous studies aimed at observing and understanding children's play behaviors and preferences in outdoor environments. However, these studies often overlook an important group – the children who are not outside.

This graduation project focuses on children aged 8 to 11 who are currently less engaged in outdoor play. A specific approach is used in analyzing children's play preferences, which is to examine the link that exists between outdoor play and their personalities.

The project involves several research activities: literature research on outdoor play and personality models, consultation of experts, direct observations of children, and contextmapping sessions with outdoor play stakeholders. By combining the results of the research, a design framework for outdoor play emerges. The framework features five distinct characters, each representing a different type of child who is often overlooked when designing outdoor play spaces.

Leveraging this framework, a series of design concepts is developed to cater to these five character profiles. These concepts are presented in a booklet, which aims to inspire designers, urban planners, and decision-makers in the field of outdoor play to create more inclusive and engaging play environments for all children.

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# 01

## BACKGROUND

- I.1. Introduction
- I.2. Outdoor play today: what's happening?
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- I.4. Safety
- I.5. Perceived safety
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- I.7. No other kids to play with
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### **Summary**

In this chapter, the current status of children's outdoor play is discussed. The decline in the number of children playing outside compared to past generations observed by researchers is broken down into eight trends that are contributing to preventing modern children from spending their free time outside: lack of space for children in the urban environment, traffic safety, and other elements of danger, adults' raising concerns about children safety, institutionalization of children's leisure time, lack of other kids to play with in the neighborhood, and the emergence of new indoor play alternatives.

Among the different driving forces of these trends, the choice is made to focus on the aspects related to children's intrinsic play preferences.

# INTRODUCTION

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Play is a fundamental human activity, deeply rooted in our nature, because of its essential role in promoting the cognitive, physical, social, and emotional well-being of children. Through play, children can learn to experiment, solve problems, think creatively, cooperate with others, and gain a deeper understanding of themselves and the world (Pellegrini et al., 2007).

When it comes to the characteristics and benefits of play, we can broadly categorize it into two main types: indoor play and outdoor play. While both types offer unique advantages, this work places a specific emphasis on the latter because outdoor play has become increasingly threatened in modern society, as will be discussed later in this report.

There are specific features and stimuli of the outdoor environment that cannot be easily replicated inside. For instance, the outdoors is an open and constantly changing environment, where it is possible to experience freedom, gross movements, and contact with natural elements. While playing outside, children benefit from being exposed to sunlight, natural elements, and open-air, contributing to their bone development, stronger immune system, and physical activity (Bento and Dias, 2017). Moreover, playing outdoors allows children to experience a variety of social interactions they wouldn't have the opportunity to experience in indoor contexts such as their homes or their schools. Indeed, unlike most indoor locations where children are used to playing, outdoor spaces have the characteristic of being open to anyone who might want to use them. This creates an opportunity space (as well as some challenges) for spontaneous social interactions determined by having to share the same play area with others. Although this might not always turn into a pleasant experience for children, it gives them the chance of learning how to play next to or together with strangers.

Despite the well-documented benefits of outdoor play, recent studies show that children play outside less frequently than in previous generations, and when they do, it is often for shorter periods. Several studies have been conducted to frame this trend and to understand its causes. An investigation conducted on 830 families in the US offers a striking comparison of the decline in outdoor play. The study found that 70 percent of mothers reported playing outdoors every day when they were young, while only 31 percent of their children (three to twelve years old) engaged in daily outdoor play (Clements, 2004). Similarly, a study carried out in the Netherlands compared the outdoor play habits of three generations and found that 69% of today's grandparents used to play outside more than inside when they were young. When looking at today's parents, the percentage falls to 63, while among today's children, only 10 percent of kids play outdoors more than they play indoors (Jantje Beton & Kantar Public, 2018).

Another study conducted in the Netherlands compared outdoor play between generations by analyzing play indexes in 1983 and 2008. To calculate the play index, the number of observed children playing in a neighborhood was divided by the number of children living there. The results of the study showed that while in 1983, the play index was 1.68, in 2008 the index dropped to 0.85 (Seghers, 2008).

The studies cited above serve as just a few examples of the significant decline in outdoor play among children that is happening across the last generations. This phenomenon raises concerns about potential negative effects on children's physical and mental well-being, as well as their social and emotional development.



Naturally, researchers have attempted to comprehend the factors that might directly or indirectly contribute to this trend, but complexity of this phenomenon makes it difficult to pinpoint a single prominent element responsible for the reduced outdoor activity among children. Nevertheless, various trends have been found to have a connection with this issue. These trends will be briefly summarized in this report.

Disclaimer: the points addressed in the following paragraph do not encompass all the possible dimensions that influence outdoor play, but rather, they capture the main aspects that represent a substantial change in comparison with the previous generations.

## WHY AREN'T CHILDREN PLAYING OUTSIDE AS MUCH AS THEY USED TO?



Lack of space

Safety

Perceived safety

Institutionalization of childhood

No other children to play with

Indoor play alternatives

## WHAT LIES BEHIND THESE TRENDS?

Urban  
development-  
related factors

Change in social  
structures, habits,  
and beliefs

Children's  
intrinsic play  
preferences

Focus of the project

# *quick overview*

# LACK OF SPACE

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As urban areas continue to develop, available space for informal outdoor activities such as play is becoming scarce. Significant contributors to the reduction of outdoor space are the urbanization of rural areas, the densification of cities, and the increased room given to motorized traffic. In fact, cars parked on streets and in residential areas occupy a significant amount of space, and the growing number and size of vehicles require even more room for parking, taking away outdoor space from children (Jantje Beton & Kantar Public, 2018). Moreover, the construction of new public and private buildings and infrastructure is slowly taking outdoor space away from the cities' landscapes, and even the remaining outdoor areas are being fractionated and allocated to specific purposes, leaving little to no room for free play. In line with this, adults' increasing tendency to value private and indoor play spaces better than public outdoor areas for their children to play also leads to a reduction of open child-friendly areas in the neighborhoods. In fact, while homes in the

past were not usually arranged to provide dedicated play areas and opportunities for children, more and more parents nowadays are willing to opt for housing solutions that can guarantee more spacious areas for their children to play at home (either inside or in the backyard) rather than smaller living spaces that are close to public areas where children can play freely. Next to this, adults are also taking control of the few public open spaces left by delimiting play areas through the use of labels and fences, creating an artificial distinction between play and non-play spaces. Consequently, children are confined to a protected yet limited playscape that typically assumes the form of a playground. While this might sound like a way to preserve some areas in which children can safely play, the creation of formal playspaces seems to have negative effects on outdoor play. This thesis is supported by a study conducted in the Netherlands in 2012, that investigated the correlation between children's outdoor play and neighborhood characteristics. One

interesting finding from the study was that the number of formal outdoor play facilities had a small, yet significant negative correlation with outdoor play (Aarts et al., 2012). Although it is not possible to draw final conclusions about how the trend of formalizing playspaces impacts children's play habits, the authors shed light on a second result that emerged from their research: the presence of sidewalks was positively associated with outdoor play. According to the researchers, these two elements together suggest that informal play areas such as sidewalks might be more crucial for children's outdoor play than formal play facilities like playgrounds or school yards. Aligned with this vision, Colin Ward in 1978 and later Tim Gill in 2021 described their ideas of child-friendly cities as places where no fences and gates are there to confine children in artificial "play reservations", but rather, the urban environment is made accessible for kids to explore by expanding their play space to all sorts of open yet safe public areas (Ward, 1978), (Gill, 2021).

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The rise in car traffic poses a direct threat to the mobility and accessibility of children living in urban areas, making it increasingly difficult for them to safely navigate areas that require crossing busy roads. In most cases, this results in children being confined to the immediate vicinity of their homes, which deprives them of the chance to explore and play in areas further away from their neighborhoods. As a result, their opportunities for outdoor play and all the experiences it offers are significantly limited, especially for those children that live in neighborhoods that don't include child-friendly public spaces. Unsurprisingly, traffic safety concerns have also emerged as one of the primary obstacles identified by parents when it comes to allowing their children to engage in outdoor play. A survey conducted by Jantje Beton in 2011 interviewed children aged 6 to 12, as well as their parents, and a quarter of both groups cited heavy traffic as the most commonly mentioned hindrance to outdoor play (Lucassen, 2020). These findings underscore the significant impact that road traffic has on children's ability to play outside. Moreover, a comprehensive research study carried out by Aarts et al. in 2012 further validated these concerns. The study explored various factors influencing outdoor play and discovered a clear negative correlation between traffic safety and children's participation in outdoor activities (Aarts et al., 2012). In other words, as traffic safety concerns increase, children's engagement in outdoor play decreases.

# SAFETY



# PERCEIVED SAFETY

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In addition to the tangible dangers that children living in urban areas are exposed to as a result of increased traffic, there is another aspect that mines children's freedom to play outside: the emergence of feelings of insecurity and risk-avoiding behavior of parents. These attitudes are not necessarily rooted in an objective increase in the number or severity of hazards that children face, but rather, they reflect parents' perception of the safety of the surrounding environment. Clements' investigation on outdoor play revealed that 82 percent of the 830 mothers considered in the study identified crime and safety concerns as factors that prevent their children from playing outdoors (Clements, 2004). In the same study, 61 percent of mothers identified a lack of adult supervision and a fear of physical harm to their children as reasons why children spend less time playing outdoors.

Additionally, adults' increasing fear for risk is impacting how play areas and objects are designed. The increasing focus on keeping children safe has led urban planners and designers to aim for play spaces that eliminate any potential risks for children, aligning the concept of being "child-friendly" with a completely safe environment. As a consequence, play spaces are becoming more and more standardized and focused on risk-free solutions, while the perspective of children, together with their desires and different play preferences, does not seem to be taken into account in the design of play spaces (Helleman, 2021).

# INSTITUTIONALIZATION OF CHILDHOOD

As opposed to previous generations, modern children's lives are increasingly structured around organized activities such as sports, music lessons, dance classes, and other similar after-school occupations. These organized activities tend to fill up much of their daily schedules, leaving little time for free play and exploration outside. (Seghers, 2008). Furthermore, this trend has an impact on the availability of parents too. Due to the time required to ensure that their children can participate in organized activities, in addition to their jobs and other obligations, parents are often too exhausted to accompany their children for outdoor play. As mentioned earlier, they also tend to restrict unsupervised play. This is supported by Clements' research, which found that 77% of parents today do not have sufficient time to spend outdoors with their children (Clements, 2004).

Not only is having enough space important for outdoor play, but the presence of other children to play is a determinant factor. If there are few children in a neighborhood, it means there is also a small number of potential playmates for kids to interact with. This has been found to impact the willingness to play outdoors by the few children that do live in the area. In fact, in child-poor neighborhoods, a low play index was registered even in the presence of well-equipped outdoor play spaces. Moreover, when there is less social cohesion in a neighborhood, people tend to know each other less, and as a result, mutual communication and trust between families decrease (Seghers, 2008).

According to the Dutch National Sports Survey conducted in 2019, two-thirds of parents believe that their children play outside because other children play outside. The same study also indicated that 29 percent of respondents considered the lack of children playing outside as a significant obstacle to outdoor play. Similarly, the results of the 2011 Jantje Beton survey showed that a quarter of the participating children perceived the poor accessibility of friends as a hindrance to outdoor play (Lucassen, 2020). These findings suggest that it is important to consider not only the physical environment but also the social environment of a neighborhood when promoting outdoor play opportunities for children.

## NO OTHER KIDS TO PLAY WITH

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# INDOOR PLAY ALTERNATIVES

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In the digital age, children have access to plenty of indoor entertainment options that compete for their attention and free time.

Electronic devices such as televisions, smartphones, video game consoles, and tablets have become ubiquitous in modern households, providing a wide range of entertainment alternatives at children's fingertips. The increasing accessibility and affordability of technology have made it easier than ever before for children to fall to these temptations and spend more time in front of screens. The engaging content and instant gratification provided by these technologies make them hard to resist, even when compared to the outdoors. Additionally, these indoor activities require little physical effort or imagination, making them an easy go-to for children looking for quick entertainment. The Internet also provides access to an unlimited number of playmates, often already grouped by similar interests and attitudes. This makes it extremely easy for children to gather with (virtual) friends, erasing the struggle of finding

peers to play with. As a result, children are voluntarily spending more time indoors, even when they have the possibility to play outside. This evidence is supported by several studies showing how the diffusion of such technologies has drastically changed children's play habits. For instance, according to a research study conducted in 2009, watching television was the most common activity for children while they are not at school. This trend was observed in all countries, even after age and sex were taken into account (Singer et al., 2009). In Clements' study, mothers reported that the main reason their children do not play outdoors is their dependence on television and/or computers. This substantiates the possibility that today's children are not only limited from playing outdoors to external conditions, but in some cases, they are choosing not to play outdoors. Some researchers suggest that some children may actually prefer sitting and watching events unfold on television to playing outdoors and creatively thinking of ways to entertain themselves (Benesse Corporation, 1999).

Unlike the other threat to outdoor play mentioned so far, video games and other digital forms of entertainment do not pose an obstacle for children to play outside: they provide an additional opportunity to the kids, but they don't introduce any tangible constraint to their freedom to play outside. Therefore, in this case, the reason that prevents the child from playing outdoors is intrinsic to the child, rather than imposed by external conditions. The fact that these indoor alternatives are so popular among children suggests that there might be some elements characterizing these types of entertainment that are of high value for modern children, which they cannot find in the outdoor space that is given to them for playing.

In contrast to other previously mentioned factors that limit children's outdoor playtime, digital forms of entertainment such as video games do not impose constraints on children's freedom to play outside; rather, they provide an alternative option for leisure activities. As such, the factors that discourage children from engaging in outdoor play seem to be rooted within the child themselves rather than external circumstances. The popularity of these indoor alternatives over outdoor play suggests that they present unique characteristics which are not found elsewhere, that are of high value for children. This raises the question of what specific aspects of digital entertainment are particularly attractive to children, and why children are not able to get them from the outdoor play opportunities that are made available to them.

# CONCLUSIONS

A tangible overview of the impact that the above-mentioned trends had on children's outdoor play, is provided by an Irish case study named "Room to Roam". This story exemplifies the decline in outdoor play across generations by comparing the surface areas that Maureen, Seán, and Noah (who are the grandmother, father, and child of the same family) were allowed to walk in independently as kids (McTeirnan, 2015). As illustrated in figure 1, the difference between the three is striking.

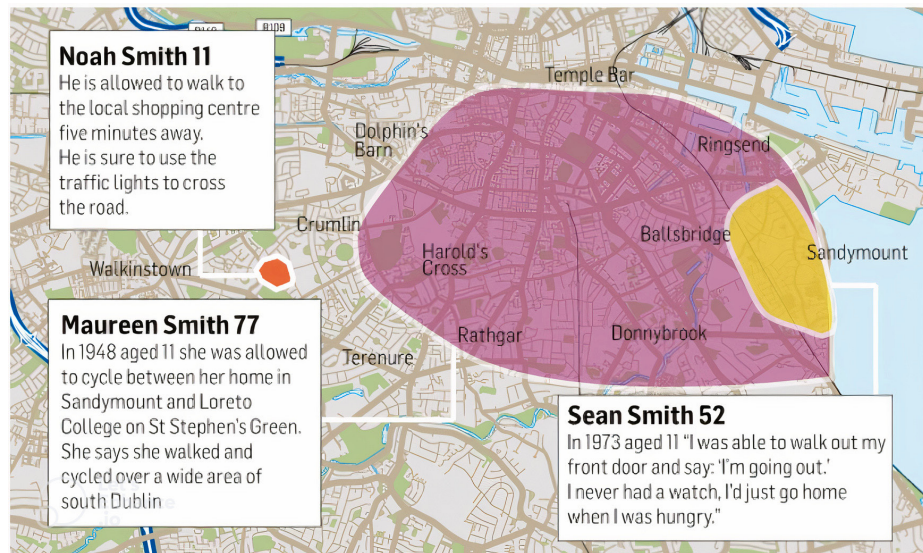


Figure 1: Surface areas that Maureen, Sean, and Noah could reach independently as a child.

To sum up, based on the existing literature, the decline in frequency and time spent by children on outdoor play seem to be correlated to several different motifs that include: (perception of) safety and space, parenting style, time availability, social interactions, and appeal of alternative play choices. By looking at the nature of these different motives, we can derive three macro-categories to encapsulate the different forces that are currently pulling children away from outdoor play:

1. **Urban development-related factors**
2. **Change in social structures, habits and beliefs**
3. **Children's intrinsic play preferences**

While the first two driving forces have received significant attention from researchers, the latter one has been relatively overlooked. However, even if children were granted free and accessible outdoor spaces and given time and company for play, some children may still choose not to engage in outdoor play. Why is this, and how could it be addressed?

Taking these questions as a starting point, this thesis work investigates the intrinsic factors (limitations and opportunities to play that come from the child's own preferences rather than external constraints) that influence children's willingness to play outside, with the aim to explore how these factors might be used to create more engaging outdoor play experiences for children.

02

# PREMISES

Examining children's attitudes towards outdoor play can be a challenging task, as it lacks objectivity and is difficult to quantify. In fact, the boundaries of this concept are not clearly defined, and the variables associated with it are hard to identify and measure accurately. A first distinction that needs to be addressed is: are the intrinsic factors that motivate children to play outside the same for all children?

While most studies previously mentioned in this report have consistently described a decrease in children's outdoor playtime, some researchers have dived deeper into this phenomenon, seeking to uncover the underlying factors that differentiate children who play outside from those who do not. Examining such research may provide valuable insights into possible differences in children's play preferences and attitudes. Specifically, if children living in the same neighborhood, who are assumed to face similar social and urban constraints, exhibit differences in play behaviors, this would suggest that intrinsic factors vary among children. Allegedly, this seems to be the case based on the results of existing research studies.

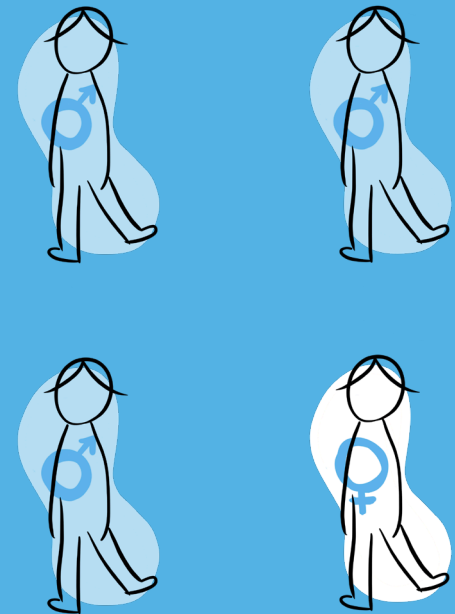
Through their investigations, researchers have observed a notable lack of diversity among the children who utilize public play spaces. Indeed, outdoor areas seem to be dominated by a relatively homogeneous group of kids, while other children are not represented as much. However, it is important to highlight that since researchers have mostly derived their findings from observations, diversity among children was considered in terms of observable

differences, such as biological sex.

A research study conducted in the Netherlands found that 51% of boys play outside for at least an hour daily, compared to only 34% of girls (Vermeulen, 2017). Likewise, a recent observational study based in the Netherlands showed that boys represent two-thirds of children who engage in outdoor play, whereas girls make up only one-third of this group (Helleman, 2021). The same study identified another significant factor related to the diversity of the children's population: the age of the kids playing outdoors. When this factor was taken into account, it was found that girls were notably underrepresented on the playground particularly starting from the age of 9 years old. In fact, among the kids of that age and older, the boys playing outdoors accounted for about 75% of all children playing outside.

These findings do not only show that children of different genders display distinct play preferences, but it also highlights that the current design of outdoor play facilities fails to take into account these intrinsic differences, creating a situation where only a small portion of the population can enjoy the benefits of outdoor play, while others are left out.

**ALMOST 3/4**  
OF THE CHILDREN ABOVE 9 Y.O.  
THAT PLAY OUTSIDE ARE BOYS





Existing research shows that outdoor play is drastically declining among younger generations and that the population of children that still play outside lacks diversity, suggesting that outdoor play design needs to be innovated to meet the different needs of children.

The data currently available, as discussed in the introduction of this report, seems to lead to the conclusion that a child's biological sex influences their interaction with the outdoors. However, this hypothesis is primarily based on observations, which only enable us to identify visible variables. As such, it is important to consider that other factors intrinsic to the child may also contribute to differences in outdoor play behavior.

In light of this, the present research aims to explore differences in play preferences that extend beyond surface-level observable characteristics of children. To achieve this, it is essential to consider the factors that distinguish children from one another organically. One way to do it is by framing children's diversity in terms of personality. Personality, as defined by the Oxford Dictionary, refers to "the various aspects of a person's character that combine to make them different from other people."

Therefore, investigating outdoor play through the lens of children's personalities represents a relevant and unexplored framework for this study.

This thesis proposes that examining outdoor play in relation to children's personalities may yield fresh insights into how to engage a diverse range of children in outdoor play.

## RESEARCH QUESTIONS:

1. HOW CAN CHILDREN'S PERSONALITIES BE DESCRIBED?

2. WHO ARE THE CHILDREN THAT DON'T PLAY OUTSIDE?

3. WHAT ARE THE PERSONALITY OF THESE KIDS?

4. HOW WOULD THEY WANT TO PLAY?

5. HOW CAN OUTDOOR PLAY STAKEHOLDERS DESIGN FOR THEM?

03

# ASSIGNMENT

The purpose of this work is to investigate the personality traits that differentiate children and their impact on outdoor play preferences, with the ultimate goal of inspiring the design of more inclusive outdoor play opportunities for children. To achieve this goal, the project needs to encompass the following three dimensions, schematized in Figure 2.

## RESEARCH

The concept of outdoor play is explored through a review of existing literature as well as by conducting expert interviews and field observations. The findings are posed in relation to established models and theories on children's personalities, with a specific focus on how personality traits impact play preferences. For this, a combination of literature and qualitative research methods such as *contextmapping* are used. The results of the research provide the foundation for the development of a design framework.

## CONCEPTUALIZATION

Using the framework as a guide, a series of inspirational concepts for outdoor play opportunities are generated. These concepts have the purpose to inform future research on the topic and should serve as a valuable resource for professionals in the fields of child development, education, and outdoor recreation.

## COMMUNICATION

The outcome of the project is presented in the form of a "lookbook", whose aim is to inspire the design of innovative outdoor play facilities that reflect the diverse personalities of children. This is achieved by integrating the design framework with open-ended concepts and examples with a narrative that empowers the audience to imagine diverse and inclusive design interventions to engage all different types of children in outdoor play. Since the concepts resulting from this project are not developed to the point of final products, a substantial part of the inspirational power of the project's outcome is determined by the efficacy of the style and format of the lookbook.

## FULL TIMEFRAME: 100 DAYS

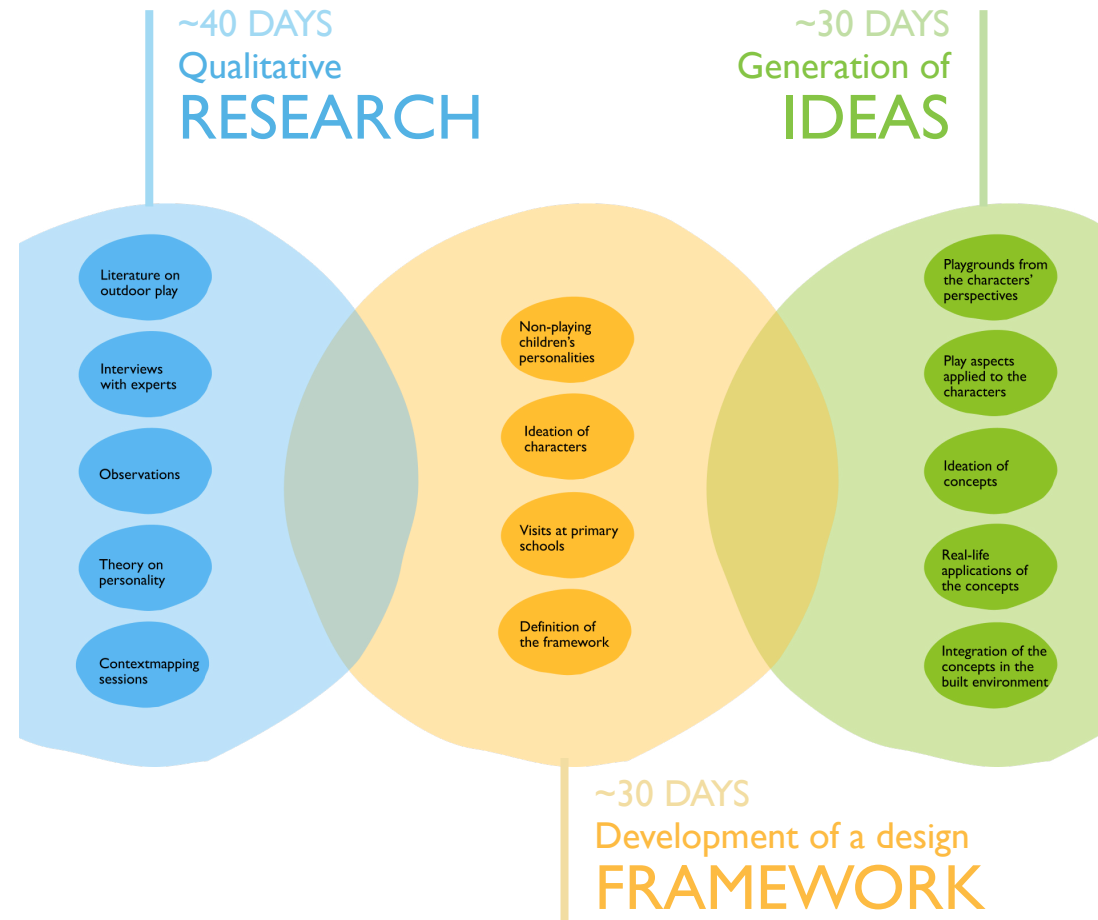


Figure 2: Summary of the project process

# STAKEHOLDERS INVOLVED IN THE PROJECT

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This thesis project has been initiated by the Play Well Lab in partnership with the Dutch organization Jantje Beton and the researcher Gerben Helleman.

The **Play Well Lab** is part of the Delft Design Labs, a platform originated in 2017 in which staff members and students of the Faculty of Industrial Design Engineering of TU Delft can meet to work on design innovation and knowledge development, occasionally in collaboration with external partners. The Play Well Lab aims to develop models, methods, and techniques for designers to facilitate and stimulate flourishing in play, including opportunities for children to participate in the design process.



**Jantje Beton** is a non-profit organization founded in 1968, with the main goal to promote outdoor play among children in the Netherlands. For more than fifty years, the foundation has been committed to improving the play environment for all children by contributing to policy development, organizing campaigns, supporting local initiatives, and researching how to create better play facilities for children.



**Gerben Helleman** is an urban geographer and researcher at The Hague University of Applied Sciences. His most recent works include writing about contemporary trends in relation to the urban landscape. With a user-centered approach, he explores public spaces in the built environment from the perspective of those who use them. At this moment he is doing a two-year research on the factors that influence the outdoor play of primary school children: where do these children play outdoors, what do they do there and with whom? And how do they experience the public space as a play space?



# 04

## OUTDOOR PLAY: A STANDPOINT

- 4.1. Introduction
- 4.2. Definitions of play in literature
- 4.3. Outdoor play in this project
- 4.4. Five aspects of outdoor play

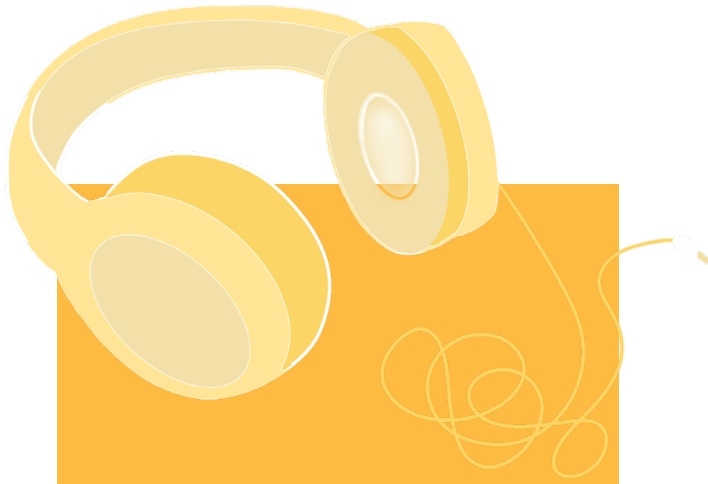
### **Summary**

In this chapter, the chosen standpoint regarding outdoor play and its direct relevance to the scope of this project is explored. Following a concise review of existing literature, a precise definition of outdoor play is formulated for the purpose of this work. Central to this study are five aspects identified as key to make outdoor play engaging for children: freedom, challenge, socialization, safety, and variety.

In chapter 7, these aspects will be amalgamated with other research discoveries for the generation of play design concepts.

# INTRODUCTION

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## WHAT IS OUTDOOR PLAY?

Before starting to design for play, one should first answer the question: what is outdoor play? Understanding the concept of play is essential before embarking on the design process, especially in the context of this thesis where play is the ultimate, although indirect, goal of the project.

Depending on what the designer chooses to include or not include in the definition of outdoor play, the requirements and qualities of the design might change substantially. This appears particularly evident when trying to answer concrete questions related to this work, such as, for instance: is meeting a friend to talk a form of outdoor play? And therefore, are we facilitating play by providing kids with an adequate space for chatting? And also: Does “outdoor play” mean any form of play which takes place outdoors? Is playing a videogame outside a form of outdoor play?

Moreover, the frame used by the designer to define outdoor play not only helps determine what is encompassed within the concept but also gives a direction to the means that will be

adopted to reach the designated goal. Indeed, given the multidimensional nature of play, the designer’s approach to outdoor play will inevitably be influenced by the definition of the concept of outdoor play. For instance, is play defined through its conditions or its effects? Or is it about specific qualities that make play identifiable as such?

By delving into these considerations, the designer is already starting to shape the type of design interventions that will be developed in the project. To formulate a well-informed vision of outdoor play, especially for a designer who may not have extensive familiarity with the subject, the initial step is to examine the perspectives from other researchers who have experience with the topic of play.

# DEFINITIONS OF PLAY IN LITERATURE

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Play, as described by Pellegrini et al., is a **non-serious variant of functional behavior**. The researchers highlight that during play, the behavioral elements are exaggerated and re-arranged, emphasizing the importance of the behaviors themselves rather than their intentions or outcomes (Pellegrini et al., 2006). Alternatively, other researchers focus on the aspect of free will in their definition of play. Drawing upon the UNICEF definition, they stress the point that play can be identified as **any activity freely chosen by the participant for a particular purpose** (Dowdell et al., 2011). While this perspective highlights the voluntary nature of play and the intrinsic motivation that drives individuals to engage in play, it also introduces an element of resolution (purpose) to it, which seems to be in contrast with Pellegrini's standpoint.

Churchman offers a point of view that might bring the previous two visions together, defining play in terms of two fundamental characteristics. Firstly, play is described as an **activity that is undertaken by choice**, emphasizing the freedom associated with engaging in play. Secondly, Churchman states that **play is undertaken for its own sake** (Churchman, 2003). Along these lines, Gielen frames the notion of play in terms of its intrinsic freedom and aimlessness. Play, according to Gielen, is characterized by **"the urge for experiences through self-motivated activities and behavior at one's own discretion and will"** (Gielen, 2010). This vision adds up to Churchman's vision of play, highlighting that play is about the experience of the process rather than the achievement of a result.

Canning's perspective on play, instead, focuses on its effect on participants' capacities. She describes play as **exploring new ways of doing things, developing imagination, and improving problem-solving skills**. This approach looks at play from its developmental aspects and emphasizes its potential for personal growth and cognitive development (Canning, 2007). The Flemish Playground Service (VDS) introduces an additional perspective by distinguishing play from games. They define play as part of **leisure time managed freely by the participant** and highlight the importance of making play **one's own activity**. In contrast, games are described as having pre-set rules, specific goals, and prescribed guidelines. This perspective underlines the flexibility and openness of play, emphasizing the self-making of the rules that are inherent to play.

# OUTDOOR PLAY

## IN THIS PROJECT

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Incorporating insights from play literature, a distinct vision of outdoor play is developed within the context of this thesis. This definition refines existing expert perspectives and tailors them to the project's scope, advancing the understanding of the specific type of outdoor play that is promoted within this study.

*Spontaneity in when and how the play is initiated, as well as its modalities and rules. This aspect incorporates in the definition of outdoor play the distinction between play and game, since a game does not allow for complete spontaneity.*

*The space in which the play happens does not merely serve as a background to the activities, but it is an integral part of the play dynamics. The characteristics of the environment have a direct influence on the play, making it, in some way, unique to that location.*

*"PLAYING AND HAVING TO DO SOMETHING ARE TWO OPPOSITE THINGS. IF YOU HAVE TO PLAY, IS IT STILL PLAYING?"*

*This quote from Speelplein's website perfectly captures the fundamental nature of the act of play: one's own will.*

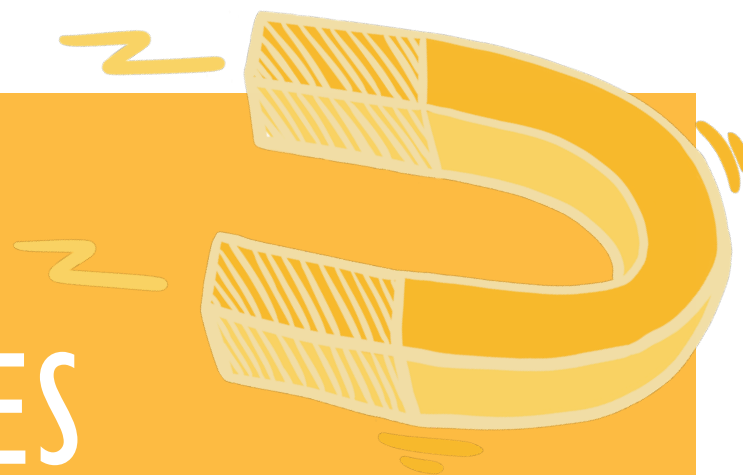
**Outdoor play is a spontaneous and self-motivated activity, inseparable from the particular environment in which it takes place.**

*Environment, as intended here, does not only refer to the physical objects that characterize a play space. Under this term, a wide range of other dimensions are included, such as the presence of others (children, adults, strangers...) and the overall feeling and atmosphere of the area.*

# FIVE ASPECTS OF OUTDOOR PLAY

---

## WHAT MAKES OUTDOOR PLAY ENGAGING?



After developing a vision of outdoor play to be used as a baseline to frame this project, a second question naturally follows: what makes outdoor play engaging?

Defining a general vision is a good beginning, but stopping here would mean not getting to understand the underlying mechanisms of play. In fact, once established what play consists of, the next step is to uncover how to achieve it. In other words: how to make sure that kids will engage in the play.

Once again, reviewing existing literature serves as a solid starting point to gain access to a range of information and insights derived from extensive research conducted by experts.

However, other research methods might offer a different angle to capture the fundamental conditions that facilitate play to happen.

To have a deeper understanding of this topic, two other methods were used to investigate play in this thesis work, next to literature research: direct observations of children playing outdoors during their free time and in depth-interviews with adults that are experts or stakeholders in the context of outdoor play. While a more extensive documentation of the research can be found in Appendix A, in the following paragraph the main insights resulting from these three research methods are summarized, in order to extrapolate the essential mechanisms that lead children to engage in play.

# MAIN INSIGHTS



FROM LITERATURE



FROM INTERVIEWS



FROM OBSERVATIONS

Risk in play allows children to experience moments of failure and success, introducing an element of challenge that makes playing more exciting. (Bento & Dias, 2017)

KFC playgrounds show lower engagement levels compared to natural play areas, as the prompted play behaviors do not fit the desires of all children. (Herrington et al., 2015)

Lack of different play options in the playground leads to segregation among children based on their physical competence. (Herrington et al., 2015)

The interactions happening in the context of outdoor play are less conflicting, while cooperative behaviors where children learn from their peers are enhanced. (Herrington et al., 2015)

*Hazards* = potential causes of harm that may not be immediately apparent to children.  
*Challenges* = identifiable and assessable risks that allow children to decide whether and how to engage with them. (Herrington et al., 2015)

By encountering an adequate level of challenge during their play, children engage in it more for a longer time. (Helleman, 2018)

For older children, going out together is about meeting each other more than playing something.

Children want to “try things” that other kids are playing with.

While younger children form their friendships as a consequence of their play preferences, for older kids being friends is more important than the play.

In a playground, a child tries different play objects for less than a minute because she doesn't find a fun way to play with them.

Children want to experiment. If there is something unexpected, it is definitely triggering.

Kids are looking for stimuli all the time. They want to experience a lot.

# (continues...)

Children like playing in nature because it is ever-changing: there is always something new to discover. (Dowdell 2011)

Especially for new generations, who lack meaningful connections and often spend a lot of their free time alone, a fundamental aspect of outdoor play is that it supports social accords. (Altarriba et al., 2022)

In the age of 8-12 years old, kids become more selective in terms of friendships. (Acuff & Reiher, 1997)

Children don't play outside mostly because play areas are boring. (Jantje Beton & Kantar Public, 2018)

A child has to feel safe and at ease. When in a new place with people they don't know, a child might not want to play right away. (van der Bijl, 2000)

A good playground needs to offer a good mix of freedom, interest, comfort and challenge. (VDS, 2023)

When children are left free to play, nature functions as an activity in itself (such as, for example, climbing a rock), rather than simply being in the background. (Skår & Krogh, 2009)

Children seem to find free play more immersive and enjoyable than organized play. (Skår & Krogh, 2009)

Nobody wants to go to an empty play ground

If there was something more challenging for children, they would play more

One observed child never leaves her mum because she is intimidated by the other kids.

One observed kid keeps distance from the others, but still wants to feel part of the group.



The insights presented in the previous pages were clustered into five dimensions, from which five fundamental aspects of outdoor play were distilled:

- Freedom
- Challenge
- Socialization
- Safety
- Variety

These aspects represent the most important elements that should be leveraged by a play design to make sure that children will engage with it. A legitimate question that might emerge here is: how do these aspects account for children's diverse personalities? The answer to this question is that the concepts of freedom, challenge, socialization, safety, and variety are relative to the children's own perspectives. For example, while all children need freedom, each child defines and experience freedom in a different way. Once the topic of children's personalities will be explored, these five aspects can be further specified and tailored to each type of child.

# Main takeaways

## FREEDOM

**Freedom brings lightness to the play.  
If they have nothing to worry about, kids  
can play on and on without feeling tired.**

## CHALLENGE

**Being able to set a level of risk in the play  
makes it more exciting, and not dangerous.**

## SOCIALIZATION

**Who is playing makes a big difference.  
Kids choose carefully their playmates.**

## SAFETY

**If they are not comfortable, children  
will not be fully involved in the play, as  
they will be too self-conscious.**

## VARIETY

**Even what is fun at first becomes boring  
if it is always the same. Variety ensures  
that children always find new stimuli.**

# 05

## DIFFERENT PERSONALITIES IN THE OUTDOORS

### 5.1. Introduction

### 5.2. Comparison between existing personality models

#### 5.2.1. Choosing a personality model for this project

### 5.3. From theory to practice through contextmapping

#### 5.3.1. The contextmapping sessions

#### 5.3.2. Analysis & interpretation

#### 5.3.3 Main takeaways

### Summary

In this chapter, the following research questions are addressed:

- How can children's personalities be described?
- Who are the children that don't play outside?
- What are the personalities of children that don't play outside?

While the first question is explored through a literature review on personality models, the second and third questions are tackled by using the method of contextmapping with experts on children's outdoor play. As a result, four personality types representing different children that don't play outside are found.

# INTRODUCTION

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Examining how children differ in their play preferences and behaviors means entering the domains of psychology and behavioral sciences. However, this thesis is not focused on developing a fresh theory on the various personality types of children. This is not only because it falls outside the scope of this project, but also because there are already several established models that have been created by experts and researchers over the course of the years. These existing models can provide a reliable foundation for this thesis' research and serve as a solid starting point for my investigation.

A direction that one could follow to classify children's personalities within outdoor play could be looking at children's play patterns in the playgrounds. In these regards, some researchers have developed empirical models of children's play attitudes by observing how they behave and what they seek out during outdoor play. In the Netherlands, several companies and organizations in the outdoor play industry use a framework developed by Marianne de Valck. This model identifies four types of outdoor players: Energizers, Structure Seekers, Observers, and Builders (de Valck, 1996), as illustrated in Figure 3.

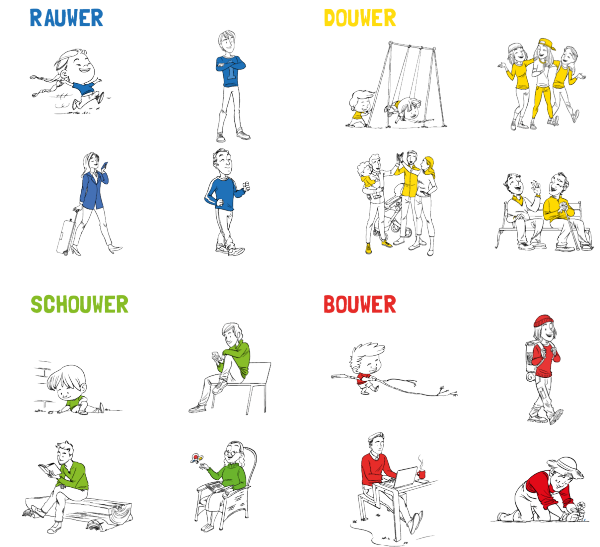


Figure 3: The four types of outdoor players developed by Marianne de Valck

This might seem, at first sight, a fitting model to link differences in children's personalities with outdoor play for this thesis project. However, this framework presents a strong limitation for the purpose of this work: the four play types are derived by clustering the play behaviors of children, but these behaviors are already constrained and influenced by the space and objects that are offered to them to play with. In other words, the model determines play requirements based on currently available opportunities rather than vice versa. This aspect makes the framework suitable for ensuring a diverse range

of play types but does not contribute to identifying the deficiencies in current play facilities or explaining why some children still refrain from playing outside. Instead, an unexplored approach would be to first investigate children's personalities and then identify the play features that would align with each type, which has the advantage of not being influenced by the current outdoor play design. In this chapter, the concept of personality is discussed and several personality models are compared, in order to select one to use as a baseline for this work.

# COMPARISON BETWEEN EXISTING PERSONALITY MODELS

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Personality is a multifaceted and complex construct on which there is still no consensus among experts and researchers. Nevertheless, various personality models have been developed over time in an attempt to explain how different personalities can be defined, measured, and understood. These models offer theoretical frameworks for comprehending how individuals differ in their thoughts, feelings, and behaviors, and how these differences shape their preferences and interactions with the environment. Some personality models are recognized by the scientific community and widely accepted and used by professionals, while others are not considered reliable by academics but still provide an interesting perspective on the topic. Indeed, each personality model offers a distinct view of the nature of personality, depending on the research methodology employed and the variables considered. Despite their differences, each model has its strengths and limitations, and researchers continue to explore ways to refine and optimize these models and their

measurement tools. In light of the fuzzy nature of the concept of personality, this project will not treat the relative theories as a set of principles or strict requirements, but rather, as an opportunity to expand and deepen the notions of play behavior, preference, and engagement beyond the most intuitive and standardized definitions. As of now, no single personality model is believed to comprehensively capture the complexity of human personality. This makes it challenging to say which model is the best. Instead, researchers and practitioners can choose the model that fits their specific research questions or goals. In this section, some of the most used personality models will be reviewed and discussed in their strengths, limitations, and implications for understanding children's attitudes in regard to outdoor play. The models examined in this study have been chosen to showcase diverse approaches to analyzing personality. This selection aims to present a comprehensive exploration of the subject, encompassing a range of

methodologies and perspectives. Additionally, a criterion for identifying the theories to be compared in this thesis is their understandability and usability for the scope of this project. The chosen models offer an intuitive approach to interpreting personality that can be understood by individuals without a background in psychology, thus mitigating the risk of misinterpretation. Furthermore, complexity within a model may hinder its practical application for deriving design inspiration. In conclusion, the following personality models are considered in the context of this project.

- *Leary's Interpersonal circumplex*

- *Thomas and Chess' Temperament theory*

- *Myers-Briggs Type indicator*

- *Goldberg's Big Five personality traits*

# INTERPERSONAL CIRCUMPLEX

Timothy Leary, 1957

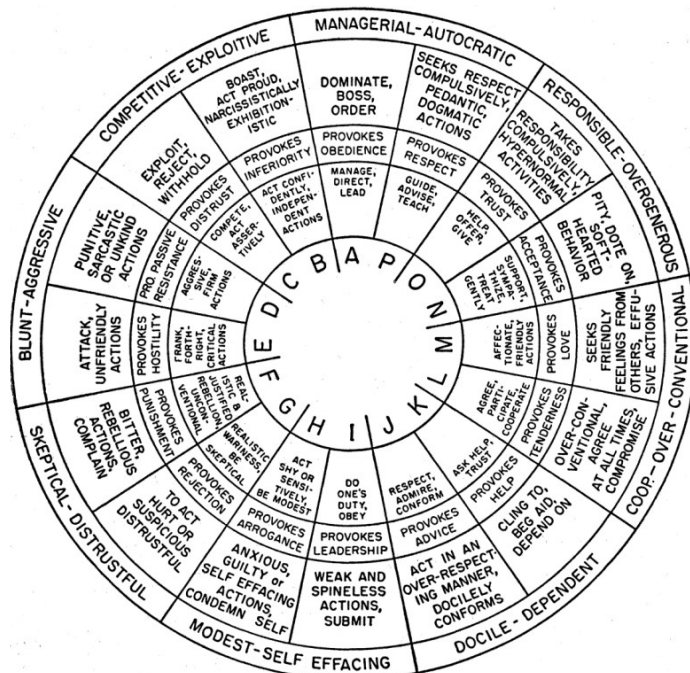


Figure 4: Classification of interpersonal behavior into 16 mechanisms or reflexes

The Interpersonal Circumplex (IPC) is a model that describes different social behaviors and relationships based on two dimensions: power (dominance) versus submissiveness and warmth (love) versus hostility. The model was originally developed by the clinical psychologist Timothy Leary. It is used to study personality traits, social behavior, and social motives, and it serves as a foundation for the principle of complementarity, which states that social behavior tends to elicit similar affiliative responses and opposite control responses. (Smith, 2013). This personality model is composed of 16 mechanisms that resolve into 8 different personality traits; according to Leary, each and every human behavior can be mapped as a vector coordinate within this circle. As shown in Figure 4, the middle ring indicates the type of behavior that this interpersonal reflex tends to “pull” from the other one (Leary, 1957). For instance, the middle ring shows that one who uses mechanism A tends to provoke others to obey. The outer ring shows the most extreme and pathological version of the reflexes, while the inner ring exhibits the moderate expression of the trait.

This model primarily focuses on identifying how an individual’s behavior interacts and affects the behavior of others. In this sense, it does not dive into the individual’s unique personality traits and the corresponding needs but rather examines the causes and consequences of specific behaviors in response to others. Typically, this model is used to identify ways to modify one’s actions to improve relationship dynamics and to detect maladaptive behaviors, rather than pointing at directions to meet one’s unique needs and preferences. Moreover, this model is based on adult behavioral traits, and some of its variables (such as weak and spineless actions or over-conventional), are too complex to be applied to children.

# TEMPERAMENT THEORY

## A. Thomas and S. Chess, 1977

| TEMPERAMENT DIMENSION       | EASY CHILD      | DIFFICULT CHILD  | SLOW-TO-WARM-UP CHILD |
|-----------------------------|-----------------|------------------|-----------------------|
| Activity level              | <i>Varies</i>   | <i>High</i>      | <i>Low</i>            |
| Regularity                  | <i>Regular</i>  | <i>Irregular</i> | <i>Irregular</i>      |
| Approach-withdrawal         | <i>Positive</i> | <i>Negative</i>  | <i>Negative</i>       |
| Adaptability                | <i>Positive</i> | <i>Negative</i>  | <i>Negative</i>       |
| Threshold of responsiveness | <i>Varies</i>   | <i>Varies</i>    | <i>Varies</i>         |
| Intensity of reaction       | <i>Moderate</i> | <i>High</i>      | <i>Low</i>            |
| Quality of mood             | <i>Positive</i> | <i>Negative</i>  | <i>Varies</i>         |
| Distractibility             | <i>Varies</i>   | <i>Varies</i>    | <i>Varies</i>         |
| Persistence/attention span  | <i>Varies</i>   | <i>Varies</i>    | <i>Varies</i>         |

Figure 5: Classification of temperament dimensions in relation to children's categories

Temperament, as conceptualized by Thomas and Chess, refers to a set of behavioral styles that can be identified along nine dimensions: activity level, regularity, approach-withdrawal, adaptability, threshold of responsiveness, intensity of reaction, quality of mood, attention span/persistence, and distractibility. Based on a child's scores on these dimensions, they can be categorized into three types: "difficult", "easy", and "slow to warm". Figure 5 offers a schematized version of the model. For instance, a child with a difficult temperament is characterized by high scores in irregularity, withdrawal, negative mood, intensity of reaction, and resistance to change. (Fu, 2015).

Thomas and Chess' theory was developed specifically for early childhood infants, in an attempt to highlight the temperament style of a person from birth. In this sense, the model would definitely be applicable to this thesis project, as it is based on the most fundamental human responses to external stimuli even before one's personality is formed. On the other hand, this theory groups children according to their behaviors but doesn't provide indications about the concrete needs that children have in relation to their personalities. For example, a child that belongs to the category "difficult", displays negative emotions more frequently than an "easy" child, but the model does not provide a clear explanation of the causes of these negative reactions and or how to tackle them. In fact, the model treats the notion of temperament as distinct from other concepts such as motivations, abilities, and personality. Indeed, the temperament model only refers to the way a certain activity is carried out by a child (for example: how much energy the child is using, the level of persistence, etc.) but not to what activity per se the child is performing (Goldsmith, 1987). As such, this theoretical framework could provide insights into how children respond to a given play stimulus, but it does not facilitate envisioning which prompt would be the most captivating and well-received by children according to their different attitudes.

# MYERS-BRIGGS TYPE INDICATOR

K. Briggs and I. Myers, 1962

|                                                                                                                                                                |                                                                                                                                                            |                                                                                                                                                               |                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ISTJ</b><br>Responsible, sincere, analytical, reserved, realistic, systematic. Hardworking and trustworthy with sound practical judgment.                   | <b>ISFJ</b><br>Warm, considerate, gentle, responsible, pragmatic, thorough. Devoted caretakers who enjoy being helpful to others.                          | <b>INFJ</b><br>Idealistic, organized, insightful, dependable, compassionate, gentle. Seek harmony and cooperation, enjoy intellectual stimulation.            | <b>INTJ</b><br>Innovative, independent, strategic, logical, reserved, insightful. Driven by their own original ideas to achieve improvements.         |
| <b>ISTP</b><br>Action-oriented, logical, analytical, spontaneous, reserved, independent. Enjoy adventure, skilled at understanding how mechanical things work. | <b>ISFP</b><br>Gentle, sensitive, nurturing, helpful, flexible, realistic. Seek to create a personal environment that is both beautiful and practical.     | <b>INFP</b><br>Sensitive, creative, idealistic, perceptive, caring, loyal. Value inner harmony and personal growth, focus on dreams and possibilities.        | <b>INTP</b><br>Intellectual, logical, precise, reserved, flexible, imaginative. Original thinkers who enjoy speculation and creative problem solving. |
| <b>ESTP</b><br>Outgoing, realistic, action-oriented, curious, versatile, spontaneous. Pragmatic problem solvers and skillful negotiators.                      | <b>ESFP</b><br>Playful, enthusiastic, friendly, spontaneous, tactful, flexible. Have strong common sense, enjoy helping people in tangible ways.           | <b>ENFP</b><br>Enthusiastic, creative, spontaneous, optimistic, supportive, playful. Value inspiration, enjoy starting new projects, see potential in others. | <b>ENTP</b><br>Inventive, enthusiastic, strategic, enterprising, inquisitive, versatile. Enjoy new ideas and challenges, value inspiration.           |
| <b>ESTJ</b><br>Efficient, outgoing, analytical, systematic, dependable, realistic. Like to run the show and get things done in an orderly fashion.             | <b>ESFJ</b><br>Friendly, outgoing, reliable, conscientious, organized, practical. Seek to be helpful and please others, enjoy being active and productive. | <b>ENFJ</b><br>Caring, enthusiastic, idealistic, organized, diplomatic, responsible. Skilled communicators who value connection with people.                  | <b>ENTJ</b><br>Strategic, logical, efficient, outgoing, ambitious, independent. Effective organizers of people and long-range planners.               |

Figure 6: 16 personality types

The Myers–Briggs Type Indicator (MBTI) is a popular self-report questionnaire that assesses differing psychological preferences in how people perceive the world and make decisions. The MBTI theory states that each individual has specific preferences in the way they view the world, and this assessment provides insight into the differences and similarities in people’s experiences of life. The model is based on four categories: introversion/extraversion, sensing/intuition, thinking/feeling, and judging/perceiving (Myers, 1995). Unlike most other inventories, people do not obtain numerical scores for each characteristic but instead are assigned to one pole or another of each characteristic. Based on this binary system, each person is assigned one of the 16 possible “types” of personality resulting from the combination of either one or the other extreme of each of the four traits (Ashton, 2023). These types are illustrated in Figure 6.

This personality classification appears to identify fundamental differences in people’s attitudes and preferences, as well as provide insight into how those preferences are formed and directed. For this reason, it might be considered a good theoretical foundation for the context of this project. However, the Myers–Briggs Type Indicator received several criticisms, which put into question its validity for this research.

The first relevant flow of this approach to personality consists of the fact that the direction of the preference (for example, E vs. I) is considered to be more important than the degree of the preference. However, reality is not as “black and white” as this model suggests. Indeed, most people do not exhibit the extreme characteristics of a personality trait, but rather, they fall somewhere inside the spectrum. Moreover, the accuracy of the MBTI depends on honest self-reporting. The MBTI does not use validity scales to assess exaggerated or socially desirable responses, and as a result, individuals motivated to do so can fake their responses. Finally, the Myers–Briggs Type Indicator excludes one important aspect of personality that other models take into account, which is related to one’s emotional stability. The German psychologist Hans Eysenck supports this opinion by arguing that the model entangles the concepts of introversion and neuroticism, while these two variables should be treated as independent personality traits (Eysenck, 1995).



# BIG FIVE PERSONALITY TRAITS

Lewis Goldberg, 1981

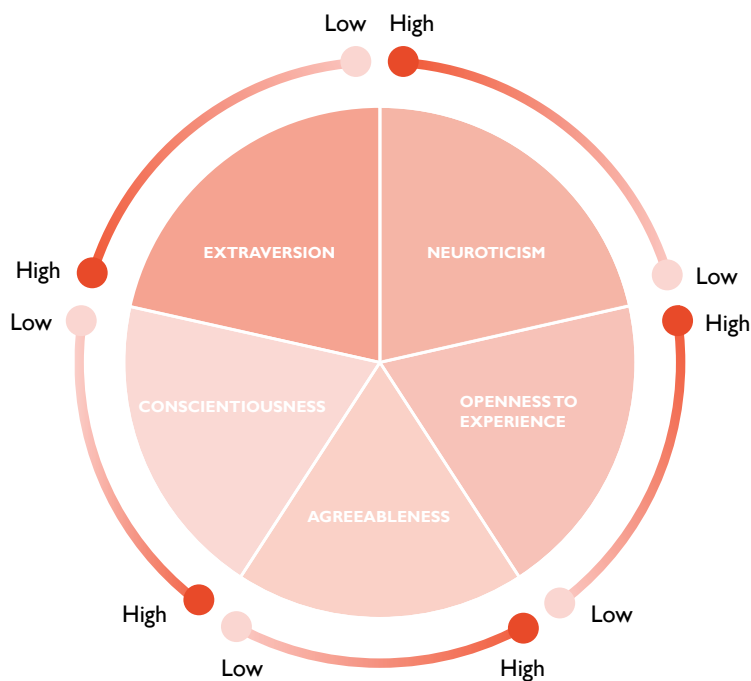


Figure 7: Big Five personality model

The roots of the Big Five model can be traced back to Cattell's research, which initially involved examining 4500 trait terms and developing a 16-factor personality model. In 1981, Lewis R. Goldberg introduced the model as the "Big Five," a name intended to highlight that these five dimensions capture personality at the most general level, but each encompasses a wide range of subtleties and variations (John, 1999). The Big Five personality model identifies five broad dimensions of human personality: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (Figure 7).

This model not only offers an intuitive overview of the main personality traits but also facilitates the understanding of why people react differently to the same stimuli. Moreover, it provides guidelines to predict one's attitudes and preferences if we know their personality traits. However, just as with any other personality model, The Big Five also received some critiques which are worth taking into consideration. One of the main arguments against this model is that it is not theory-driven, but rather, a statistical analysis of a number of descriptors that tend to cluster together (Boyle, 1995). This procedure is less rigorous than a hypothesis-based approach and makes the model more dependent on the interpretation of the researcher who creates it. Nevertheless, this critique is not particularly relevant for the purpose of this study, as the choice of the model does not have based on the most scientifically accurate option, but rather, on the one that can spark the most creative and innovative ideas. Another interesting point that is raised against the Big Five is that the model is missing a sixth factor: the dimension of Honesty-Humility (Ashton, 2014). In regards to this, it is important to consider that in the context of this thesis work, the analysis of personality traits is applied to children. While research has shown that the Big Five, although it was built based on adults, seems to be suitable also for children (Markey, 2004), the concept of honesty might not apply to children in the same way it does to adults. Indeed, Daniel Acuff explains that children start to develop a sophisticated moral sense only between 8 and 12 years old, while before this age they are able to distinguish "good" from "bad" only because someone in authority said so (Acuff, 1997). As a consequence, measuring their level of honesty might not be possible, as they haven't fully developed an independent moral sense.

# Choosing a personality model for this project

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After discussing the pros and cons of the different personality models presented in this chapter, a choice has to be made on what to take as a base for this project. To weigh the models fairly and rigorously, it is advisable to formulate precise selection criteria. These criteria should reflect the requirements that a model has to fulfill to be useful for the purpose of this project. For example, an important requirement is that model needs to apply to children. If a model uses factors that presume a complex and articulated vision of the world, they might not be transferable to individuals from 8 to 11 years old, whose intellectual and emotional intelligence is not fully developed yet. Another aspect to consider is whether the model (explicitly or implicitly) promotes any type of judgment in regard to the different types of personalities. Some models might suggest that certain traits are more “desirable” than others by describing them with more positive terms, as opposed to other traits which are instead presented with a negative connotation. Such a judgemental approach

would represent a drawback in this project, because of the ethical considerations that it would lead to. Another aspect that needs to be considered when choosing the models is the level of nuance that it captures. In fact, although it's easier to categorize personalities in black-and-white terms (such as being either extraverted or introverted), adopting such an oversimplified perspective limits the opportunity to explore the nuances that exist between these two extremes, nuances that are more likely to reflect the complexity of the real world. Finally, the last requirement is referred to the possibility of deriving design insights from a model. Even if each model can potentially lead to producing valuable insights, some utilize a form, terminology, and structure that better facilitate the extrapolation of play preferences and behaviors based on personality types.

The requirements discussed in this paragraph are used to create a Harris Profile (Boeijen et al., 2021), which is displayed on the next page.

# Requirements

## Applicable to children

(The model can be used to describe the personalities of children from 8 to 11 years old)

## Impartial

(The model describes each personality equally, without giving positive or negative connotations to the traits)

## Nuanced

(Personality traits are described as a spectrum rather than being presented as either-or choices)

## Insightful

(The model provides insights into the needs and preferences that derive from a given personality)

| CIRCUMPLEX |    |    |    | TEMPERAMENTS |    |    |    | MBTI |    |    |    | BIG FIVE |    |    |    |
|------------|----|----|----|--------------|----|----|----|------|----|----|----|----------|----|----|----|
| -2         | -1 | +1 | +2 | -2           | -1 | +1 | +2 | -2   | -1 | +1 | +2 | -2       | -1 | +1 | +2 |
| X          |    |    |    |              |    |    | X  | X    |    |    |    |          |    | X  |    |
|            | X  |    |    |              | X  |    |    |      |    | X  |    |          |    |    | X  |
|            |    |    | X  |              |    | X  |    | X    |    |    |    |          |    |    | X  |
|            | X  |    |    |              | X  |    |    | X    |    |    |    |          |    |    | X  |
| -2         |    |    |    | 1            |    |    |    | 1    |    |    |    | 7        |    |    |    |

Figure 8: Comparison of the models' suitability for this project through Harris Profile

# CHOSEN MODEL

Based on the results from the Harris Profile, the model chosen as theoretical foundation for this project is the Big Five personality model. However, for the scope of this project, the model is enriched by adding one dimension taken from Thomas and Chess' temperament theory: the activity level. This is because this aspect is not fully captured by the Big Five, but it has a considerable relevance in the context of outdoor play. As follows, a more detailed explanation of the chosen personality framework.

## ACTIVITY LEVEL

This trait describes a child's inherent energy level, influencing task completion. High activity level is associated with the use of gross motor skills, while a child with a lower activity level usually completes a task using less energy.

## EXTRAVERSION

Extraverts are often seen as sociable, outgoing, and assertive people. They also tend to be more talkative, and they get energized by social interactions. Moreover, they often seek out new experiences and enjoy being around others, as well as engaging in activities such as parties, concerts, and sports events, and tend to be on the leadership side when it comes to group dynamics. In contrast, introverted people usually require less external stimuli and longer periods of solitude. However, this inclination does not indicate unfriendliness or antisocial tendencies; introverts enjoy spending time with others too, but are more reserved and need some time to recharge from social interactions.

## OPENNESS TO EXPERIENCE

This trait is characterized by the willingness to explore new ideas, experiences, and unconventional perspectives. Those high in openness tend to be curious, creative, and imaginative, and do not fear abstract thinking. They are comfortable with ambiguity and complexity and are often open-minded to different cultures, lifestyles, and ways of thinking. On the other hand, people that exhibit low scores in this trait tend to be very practical, focused on facts and evidence, and stick to facts rather than speculations.

## CONSCIENTIOUSNESS

This trait reflects a person's tendency to be reliable, responsible, and self-disciplined. People who score high in conscientiousness are organized and detail-oriented. They are often dependable and have a strong work ethic, and they are motivated to achieve their goals. High conscientiousness is often perceived as being stubborn and focused, and links to the ability to control and actively directing inner impulses. Low conscientiousness, instead, is associated with flexibility and spontaneity, but can also appear as disorganization and lack of reliability.

## AGREEABLENESS

This trait is characterized by a person's tendency to be compassionate, cooperative, and empathetic toward others. People who score high in agreeableness are considerate and sensitive to the needs of others and are often willing to compromise and avoid conflict. They tend to be good listeners and have strong interpersonal skills, which helps them to build and maintain relationships. Personalities characterized by low agreeableness, instead, are often seen as competitive or antagonistic, sometimes ending up being argumentative or untrustworthy.

## NEUROTICISM

Neuroticism reflects a person's tendency to experience negative emotions such as anxiety, sadness, and vulnerability. Those who score high in neuroticism have low tolerance for stress or aversive stimuli and are prone to worrying, overthinking, and mood swings. They may also experience physical symptoms such as headaches, fatigue, and sleep disturbances. However, individuals with high neuroticism can also be highly attuned to their emotions, which can be helpful in certain situations. At the other end of the scale, individuals who score low in neuroticism are less easily upset and are less emotionally reactive. They tend to be calm, emotionally stable, and free from persistent negative feelings.

Another interesting point to note about the Big Five is that the model was developed through a survey that presented a variety of items which respondents had to rank based on how much they related to them. The items that showed a strong correlation with each other were then grouped together to form the personality traits. For example, someone described as conscientious is more likely to be described as “always prepared” rather than “messy”(De Raad, 2020). This list of items can be useful in this project because each item represents a concrete and simplified expression of the correspondent trait. As follows, the items with the strongest correlation with each trait are presented.

## CONSCIENTIOUSNESS

**+ correlated**

Am always prepared.  
Pay attention to details.  
Get chores done right away.  
Carry out my plans.  
Make plans and stick to them.  
Complete tasks successfully.  
Do things according to a plan.  
Am exacting in my work.  
Finish what I start.  
Follow through with my plans.

**- correlated**

Waste my time.  
Find it difficult to get down to work.  
Do just enough work to get by.  
Don't see things through.  
Shirk my duties.  
Mess things up.  
Leave things unfinished.  
Don't put my mind on the task at hand.  
Make a mess of things.  
Need a push to get started.

## EXTRAVERSION

**+ correlated**

Feel comfortable around people.  
Make friends easily.  
Am skilled in handling social situations.  
Am the life of the party.  
Know how to captivate people.  
Start conversations.  
Warm up quickly to others.  
Talk to a lot of different people at parties.  
Don't mind being the center of attention.  
Cheer people up.

**- correlated**

Have little to say.  
Keep in the background.  
Would describe my experiences as dull.  
Don't like to draw attention to myself.  
Don't talk a lot.  
Avoid contacts with others.  
Am hard to get to know.  
Retreat from others.  
Find it difficult to approach others.  
Keep others at a distance.

## AGREEABLENESS

**+ correlated**

Have a good word for everyone.  
Believe that others have good intentions.  
Respect others.  
Accept people as they are.  
Make people feel at ease.  
Am concerned about others.  
Trust what people say.  
Sympathize with others' feelings.  
Am easy to satisfy.  
Treat all people equally.

**- correlated**

Have a sharp tongue.  
Cut others to pieces.  
Suspect hidden motives in others.  
Get back at others.  
Insult people.  
Believe that I am better than others.  
Contradict others.  
Make demands on others.  
Hold a grudge.  
Am out for my own personal gain.

## OPENNESS TO EXPERIENCE

**+ correlated**

Believe in the importance of art.  
Have a vivid imagination.  
Tend to vote for liberal political candidates.  
Carry the conversation to a higher level. Enjoy hearing new ideas.  
Enjoy thinking about things.  
Can say things beautifully.  
Enjoy wild flights of fantasy.  
Get excited by new ideas.  
Have a rich vocabulary.

**- correlated**

Am not interested in abstract ideas.  
Do not like art.  
Avoid philosophical discussions.  
Do not enjoy going to art museums.  
Tend to vote for conservative political candidates.  
Do not like poetry.  
Rarely look for a deeper meaning in things.  
Am not interested in theoretical discussions.  
Have difficulty understanding abstract ideas.

## NEUROTICISM

**+ correlated**

Often feel blue.  
Dislike myself.  
Am often down in the dumps.  
Have frequent mood swings.  
Panic easily.  
Am filled with doubts about things.  
Feel threatened easily.  
Get stressed out easily.  
Fear for the worst.  
Worry about things.

**- correlated**

Seldom feel blue.  
Feel comfortable with myself.  
Rarely get irritated.  
Am not easily bothered by things.  
Am very pleased with myself.  
Am relaxed most of the time.  
Seldom get mad.  
Am not easily frustrated.  
Remain calm under pressure.  
Rarely lose my composure.

# Framing children's personalities in relation to outdoor play

After choosing a reliable and established personality model, the next step is to consider its application within the scope of this research. To determine a valuable way of using the selected theoretical framework, it might be useful to go back to the research questions of this project, which are re-presented in Figure 9. By now, the first research question has been answered. Applying the personality model to the context, should allow to answer the two questions highlighted in white. To answer these questions, several methods could be used.

HOW CAN CHILDREN'S  
PERSONALITIES BE DESCRIBED?

WHO ARE THE CHILDREN  
THAT DON'T PLAY OUTSIDE?

- WHAT ARE THE PERSONALITIES OF THESE KIDS?
- HOW WOULD THEY WANT TO PLAY?
- HOW CAN OUTDOOR PLAY STAKEHOLDERS DESIGN FOR THEM?

A qualitative research approach is preferred because the goal is to gain a deep understanding of the underlying needs and desires of a group of children that is challenging to define using quantitative metrics. Among the qualitative research methods that can be used with children, in-depth interviews could lead to underlying motives that lay behind children's preferences. However, research on children's developmental stages indicates that the target group of this study (8 to 11-year-olds) may lack the ability to reach a sufficient level of abstraction and self-understanding (Acuff, 1997). To avoid this, their parents might be interviewed instead. Nevertheless, parents' perceptions and experiences of their children's personalities may be biased due to their emotional connection with them. Alternatively, researchers who work with children and outdoor play could provide valuable insights into children's behaviors and personalities. They possess significant experience with children but do not have a direct relationship with them, making them a relevant group to involve in this study. For this reason, as well as ease in reaching them, researchers from Jantje Beton were asked to participate in this phase of the research. However, if more time and resources were available, this research phase would benefit from extending the participation in the study to other stakeholders such as parents, school teachers or educators, and children themselves, with the necessary adaptations.

Rather than opting for conventional interviews, a more nuanced approach might give the opportunity to uncover different layers of insights. In these regards, contextmapping is an interesting method because not only it provides insights into the present and past experiences of the participants, but it encourages them to think and experiment with their thoughts and ideas. Such an approach could potentially yield more imaginative and creative insights compared to a purely textual outcome. Moreover, the outcome of this design research method will be combined with insights coming from in-context observations to form a richer understanding of the scenarios of interest, bringing up different layers of reality that might not be expressed only by the participants' answers.

Figure 9: Project's main research questions



# FROM THEORY TO PRACTICE THROUGH CONTEXTMAPPING

Contextmapping is a design research method that can be used to gain insight into the environment, emotions and needs of the stakeholders in a specific context.

A contextmapping study typically involves a series of steps that consist of: preparation, sensitizing participants, group sessions, analysis, and communication (Visser 2005).

In this project, the contextmapping method is used to organize two group sessions, in which the theme of “children not playing outside” is explored from the lenses of different stakeholders.

## GOAL:

**What are the underlying personality characteristics, thought processes, and emotional dynamics associated with children’s (lack of) interest in outdoor play?**

A first contextmapping session is conducted at TU Delft’s Industrial Design Engineering faculty (IDE) with four master’s students (Figure 10). The selection criteria for the participants were based on their past or current involvement in design projects involving children, in order to have a group of participants who closely resemble those who will participate in the session at Jantje Beton.

After a few days, another session is held at Jantje Beton’s office with four of their researchers (Figure 11). As the materials and activities were consistent in both the IDE pilot session and the final session at Jantje Beton, and the outcomes from both sessions were relevant and interesting for the research, all results were included in the analysis.

The consent form used for the sessions can be found in Appendix B.

*Figures 10 & 11: During the contextmapping sessions*



Figure 10



Figure 11



The contextmapping sessions involve 4 participants per session and last about 45 minutes. A few days before the session, the participants are given sensitizing booklets to fill in. The session is composed of three main parts, which are intended to develop as follows:

### COMPOSING

Participants are asked to recall from their experience a situation in which a child had difficulties or did not want to play outdoors. A sheet containing the silhouette of a child is given each participant, which they can use to represent the child that doesn't play outside. Participants are also provided with a set of quotes that they can use to highlight specific traits of the child's personality.

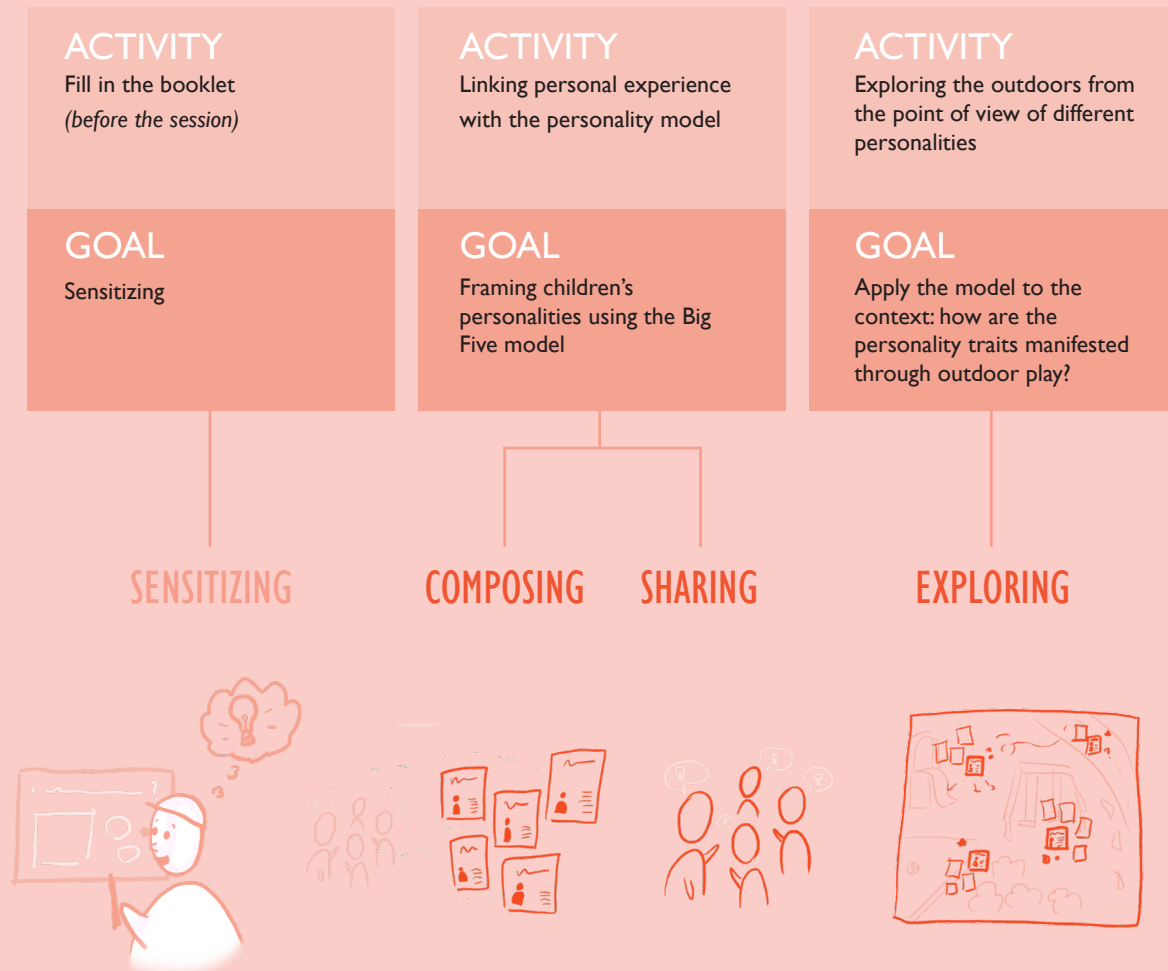
### SHARING

The participants use the given material as a support to share with the other participants their thoughts, describe the personality of the kid they have chosen and why he/she is not playing.

### EXPLORING

A poster showing an outdoor play area is laid on the table. Participants can use it to explore how different children feel about the space, how they use it, and what they need. After some time, more elements are added to the scene and participants can react to them.

## BACKBONE OF THE CONTEXTMAPPING SESSIONS



# quick overview

## THE SENSITIZING BOOKLET

Participants are first provided with a sensitizing booklet to fill in before the days of the workshop, so that they can familiarize with the topic and start recalling their experiences. The booklet is divided into 3 parts, that encourage the participants to reflect first on their present, then their past, and eventually to envision something that might be beyond their lived experience. The first part consists of choosing among a set of words the ones that best describe the participant's personality, with the suggestion of adding more words if necessary. The words printed on the booklet are not picked randomly, but carefully chosen from the descriptions of the personality traits that are part of the Big Five model. Although the primary goal of this exercise is to encourage participants to think of different personality traits, the results might provide some insights regarding the degree of resonance that these terms have with the participants. In the second part, participants are asked to represent their favourite place to play as kids, and reflect on which parts of their personalities they expressed through it. Here, participants are sensitized to make a connection between personality traits and play, as well as to recall which aspects made play fun and engaging for them as kids. In the final part, participants are asked to imagine reasons why a child may not want to play in a given scenario. This exercise is designed to help participants think about the challenges that outdoor play might pose for some children.

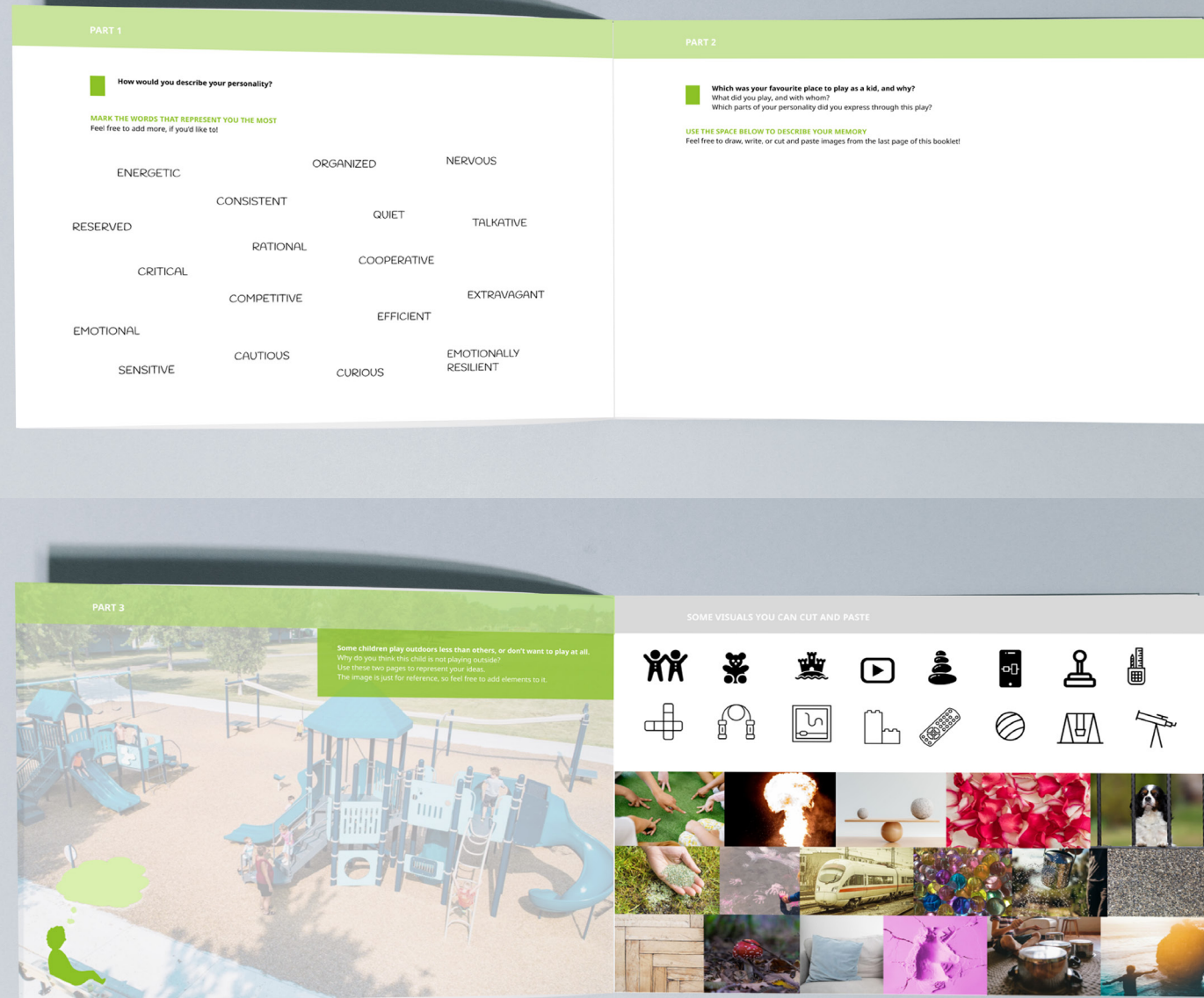


Figure 12: Sensitizing booklets before being filled by the participants

## THE NON-PLAYING CHILD'S PROFILE

The material provided to describe the non-playing child consists of a sheet displaying a gender-neutral silhouette of a child for participants to fill in as they wish, and 20 speech comics to use in describing the child's thoughts, as shown in Figure 13. These quotes are selected from the questionnaires used to define the Big Five personality traits (see page FIXME), with two items displaying high correlation and two items displaying inverse correlation for each of the five traits. The traits that the quotes refer to are unknown to the participants.

This activity has the goal of understanding how different personality traits might be associated to form the personality of a child that doesn't want to play outside. If the participants use contradicting items in the same personalities (items referring to high and low scores of the same trait), it might imply that the chosen personality model does not work well for this research. Furthermore, by analyzing the items selected by the participants, certain traits may appear to be more or less relevant, depending on how frequently they appear on the sheets. Lastly, this exercise provides an opportunity to question whether the model is a comprehensive tool for describing children's personalities in this context. By examining what participants add to the paper beyond the speech comics, it will become clear which characteristics they believe to be important to depict a child who does not want to play outside.



Figure 13: Provided material to compose the non-playing child profile



## THE SCENARIO

The poster serves as a scenario in which participants role-play the kid that they have just described in the non-playing child profile. Participants can use small paper pawns to move around the environment depicted on the poster, acting accordingly to the personality of the child they represent. Figure 14 shows the initial setup. During the role-playing, post-its of different shapes and colors are available for the participants to use freely. To start the role playing, four questions are introduced: What are you doing? Why? How do you feel? What do you need?

Participants are also invited to interact with each other, if they want. After some time, new elements are introduced to the scene: silhouettes of other children and adults, and some pictures displaying various urban environments (Figure 15). The participants are invited to discuss the changes that these new elements might generate in their kid's behavior. This activity is designed to serve several purposes. One is to identify, among all the elements and variables that one could think of in the context of outdoor play, the ones that are more relevant in influencing children's willingness to play. Another point of interest of this activity is the connection between a child's personality and how this is reflected in the context of outdoor play. Lastly, there is the possibility that specific challenges or opportunities within the outdoors will be identified by the participants that might be inspiring.



Figure 14 & 15: Contextmapping sessions setup



# Analysis & interpretation

## PART ONE: COMPOSING

To begin the analysis, each speech comic that was used by the participants in the first activity is linked back to the corresponding personality trait and its relative intensity. This is done through color-coded dots, as shown in Figure 16. Moreover, since all participants added some extra text to their sheets, when the content of these personal additions is explicitly or very strongly correlated to one trait, that comment is color-coded as well.

For privacy reasons, the participants of the first session are called: P1, P2, P3, P4. Similarly, the participants of the session at Jantje Beton are called 1, 2, 3, 4.

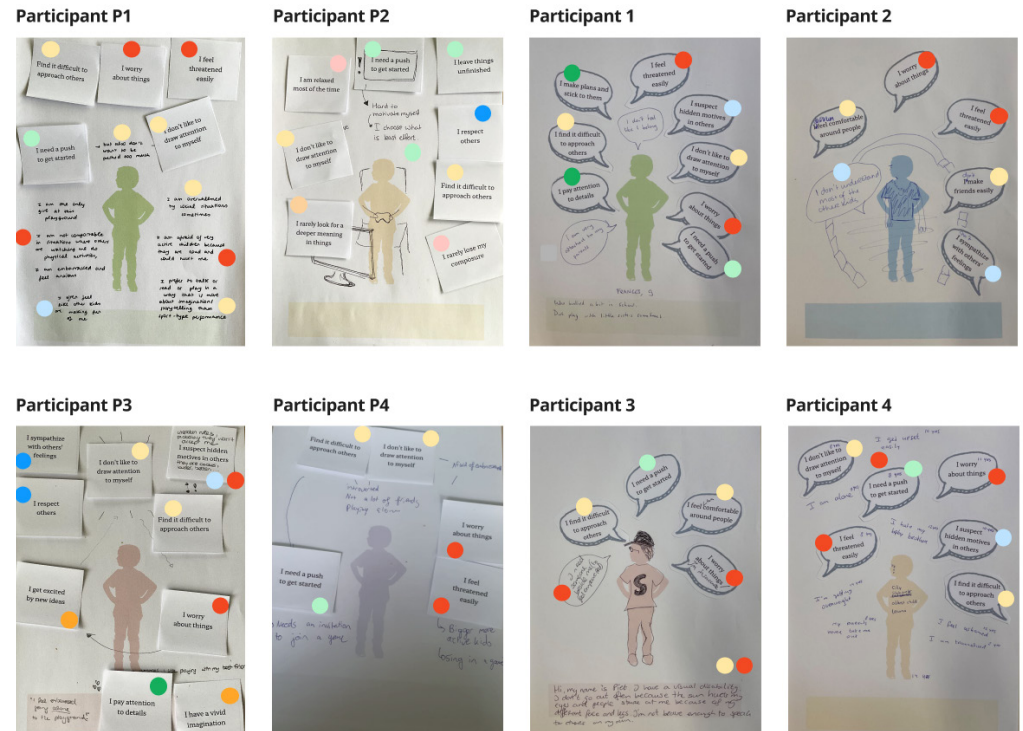
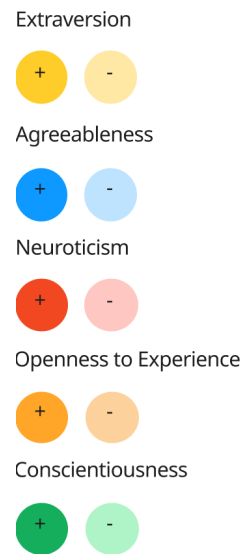


Figure 16: Results of the first activity of the contextmapping sessions

The first interesting finding that appears from this picture is that despite the relatively large number of speech comics used by the participants, there are very few instances where contrasting traits were attributed to the same child. Indeed, the only exceptions are participants P3 and I, who used, respectively, items corresponding to both high and low agreeableness and conscientiousness. However, in both cases, they chose two items representing the high end of the trait and only one item representing the low end, indicating that they still perceived one end of the trait as more dominant. Furthermore, it's possible that their interpretation of the speech bubble was slightly different from the intended meaning, making these exceptions less relevant to the analysis.

Therefore, the first conclusion that can be drawn from these results is that the theoretical framework in the Big Five seems to work well for this context, as the correlations between items in the speech bubble and personality trait worked according to the model in nearly all cases. This point is particularly intriguing if confronted with the answers given by the same participants in the sensitizing booklets. Indeed, in the activity where they had to select the words that best represented their personalities, they often picked contradicting factors (Appendix C). This might indicate that the way in which a specific trait is described (in terms of wording, form, etc.) plays an important role in the clarity of the communication around one's personality.

Another type of analysis that might be interesting to apply to these results is the frequency of occurrence of a specific trait, as this might give insights into which traits have a higher correlation with children's unwillingness to play. The outcome of this analysis is exhibited in Figure 17.

What immediately stands out from the data is that not only was extraversion the most frequently cited trait dimension both overall and among the participants, but also that all participants picked items belonging to the introverted side of the spectrum. Although this study does not aim to take a quantitative approach, and the results cannot be generalized due to the limited sample size, the strength of this finding implies that introversion is a significant personality trait when confronted with the current outdoor play opportunities.

Similarly, high neuroticism seems to be an influential aspect of children's personality in this scenario, with one important note: participant P2 described as calm and relaxed and this time this exception must be taken into consideration because it indicates that there might be kids who, despite showing low neuroticism, find it difficult to play outdoors.

On the contrary, the degree of openness to experience doesn't seem to be particularly influential in refraining kids from playing outdoors, being mentioned by 2 participants out of 8, for a total of 3 times. This does not mean that kids don't exhibit such a trait, but rather, that scoring high or low in this dimension might not make a huge difference in terms of willingness to play outside.

Figure 17: Analysis of the first activity of the contextmapping sessions

| Personality trait      | Occurrence (total) |         | Occurrence (among the 8 participants) |
|------------------------|--------------------|---------|---------------------------------------|
|                        | High-end           | Low-end |                                       |
| Extraversion           | 0                  | 20      | 8 out of 8                            |
| Neuroticism            | 18                 | 2       | 7 out of 8                            |
| Conscientiousness      | 3                  | 7       | 7 out of 8                            |
| Agreeableness          | 3                  | 6       | 6 out of 8                            |
| Openness to Experience | 2                  | 1       | 2 out of 8                            |

One more type of analysis that can be applied to this research results is the associations between different personality traits. A way to see this is by highlighting which traits and corresponding intensity were grouped together to describe the same personality. A schematic representation of the combinations that resulted from the sessions is illustrated in Figure 18. By using these combinations as a baseline for deriving which traits are associated in the personalities of children that don't play outside, it is now possible to try to build the complete personality profiles of these children.

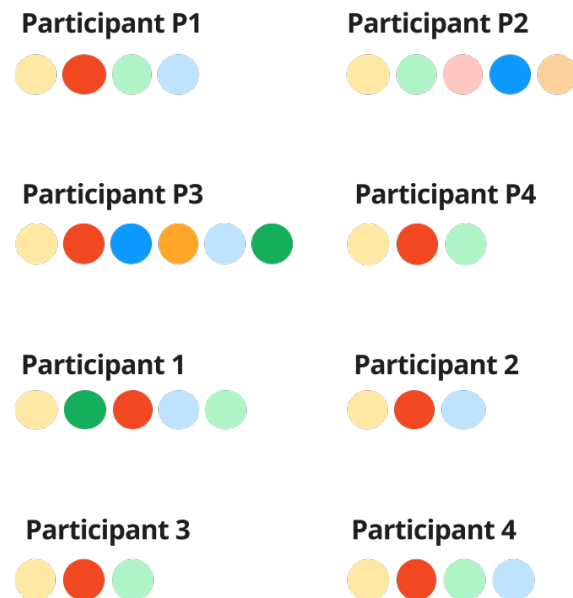


Figure 18: Combinations of traits by each participant

To wrap up, the analysis of the results shown in Figure 17 provides insights into the traits are more relevant and the ones that are more common among the children who don't play outdoors, while the analysis presented in Figure 18 informs about how different levels of the traits are combined together. Elaborating on these insights can lead to a comprehensive set of personality types that encompass the various children who refrain from playing outside.

To generate this set, let's begin by focusing on the traits that have emerged as most significant: extraversion and neuroticism. It is evident that extraversion consistently exhibits low scores, meaning that all personalities should display some degree of introversion. Neuroticism exhibits high scores in all cases except for one. This translates into a first differentiation of non-playing children types: introverted and worrisome (A), and introverted and relaxed (B), as in Figure 19.

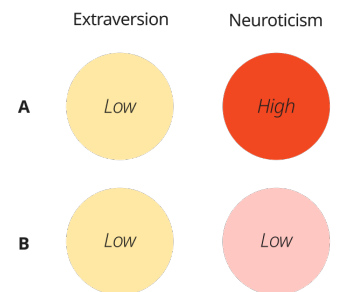


Figure 19: First difference among types of non-playing children

Looking at the dimensions of conscientiousness and agreeableness, it appears that both ends of the traits are present, and in various combinations. However, low conscientiousness is associated with high agreeableness only in the case of low neuroticism. Consequently, the personality types can be further developed by incorporating this information as in Figure 20:

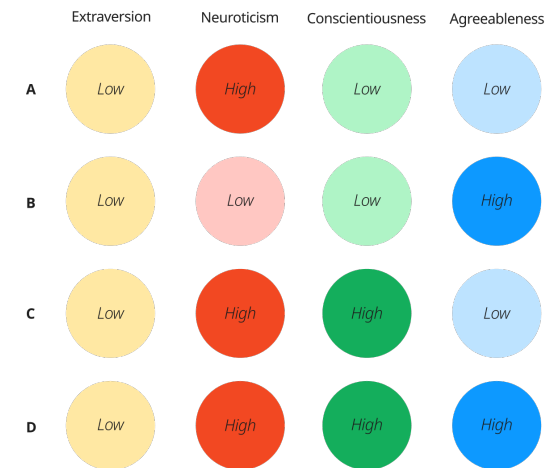


Figure 20: More types of non-playing children are emerging

Regarding the trait of openness to experience, the low frequency of its occurrence poses a challenge when assigning a specific value based on the participants' answers. However, while this aspect may not directly impact the children's willingness to play outdoors in the current environment, it is still valuable to incorporate it, as it can offer inspiration during the design phase and contribute to a more comprehensive representation of personalities.



Considering participant indications, personality type B maintains a low level of openness to experience in the final framework. On the contrary, high openness may arise in the presence of high agreeableness and high conscientiousness, as these two traits together suggest that the child is both determined and self-driven as well as respectful of others' opinions and ideas. In the case of personality type A, the emerging child appears to be introverted, fragile, a bit clumsy, and somewhat distrustful of others. Given their insecurity, it is likely that openness to experience would be relatively low as well. Eventually, to ensure a distinct contrast from personality type A, personality type C is assigned a high degree of openness to experience. This decision is made to avoid a situation where the only differentiating factor between the two types is a single parameter. Figure 21 shows the final build-up of the four different personalities. These four final personalities do not represent all possible combinations of traits that children can exhibit, and should not be considered specifically for their level of accuracy. However, these do represent four fundamental examples of children that do not enjoy playing outdoors in the current play scenario, and therefore they can inspire to look at outdoor play from a different perspective.

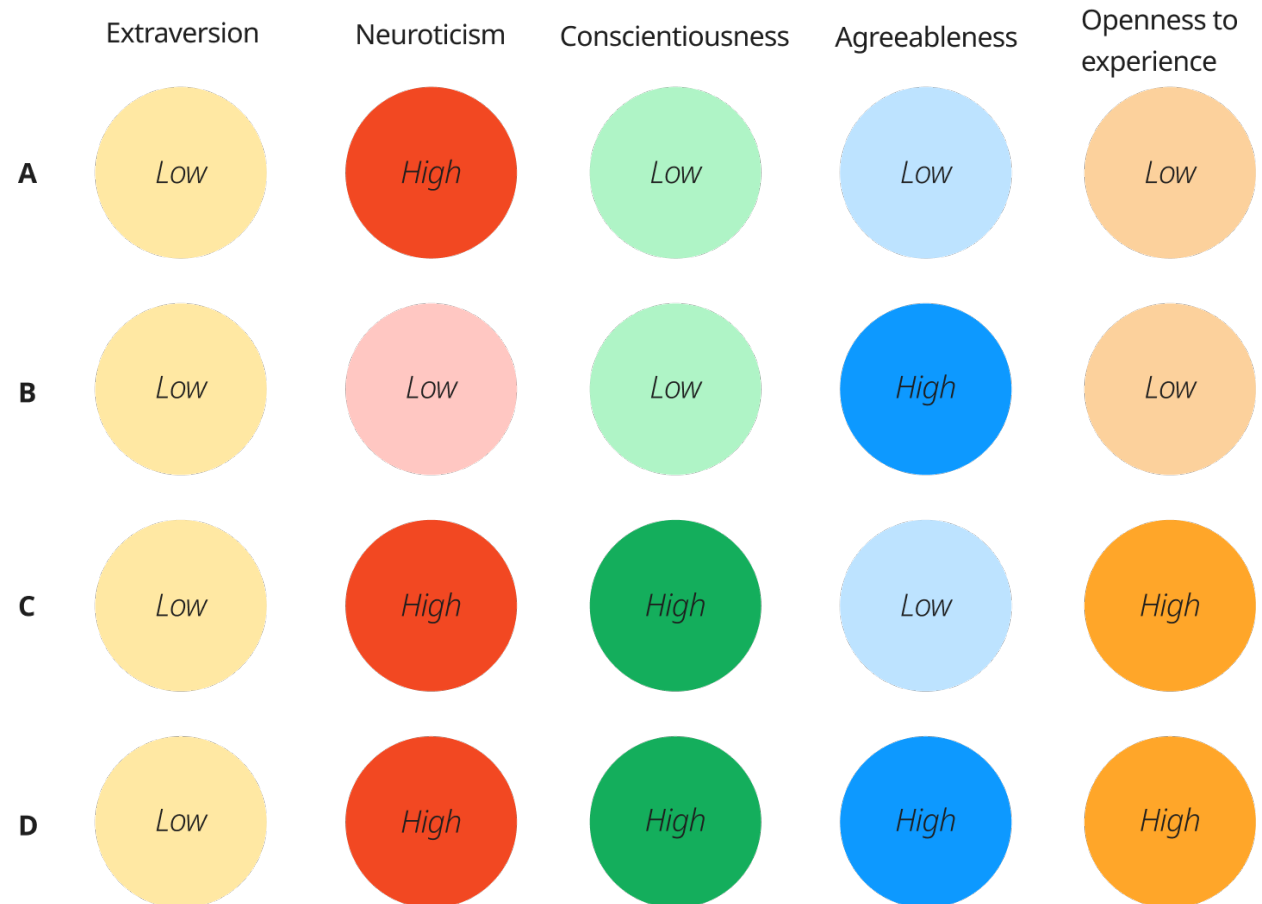


Figure 21: Four personalities of non-playing children

## PART TWO: EXPLORING

To analyse the second activity of the contextmapping sessions, participants' quotes, post-its, and drawings are collected. Each quote is marked with the personality type (A,B,C,D) of the correspondent child. Figure 22 offers a synthetic showcase of the main results from the session at IDE, and Figure 23 from the session at Jantje Beton. More documentation of the results can be found in Appendix D.

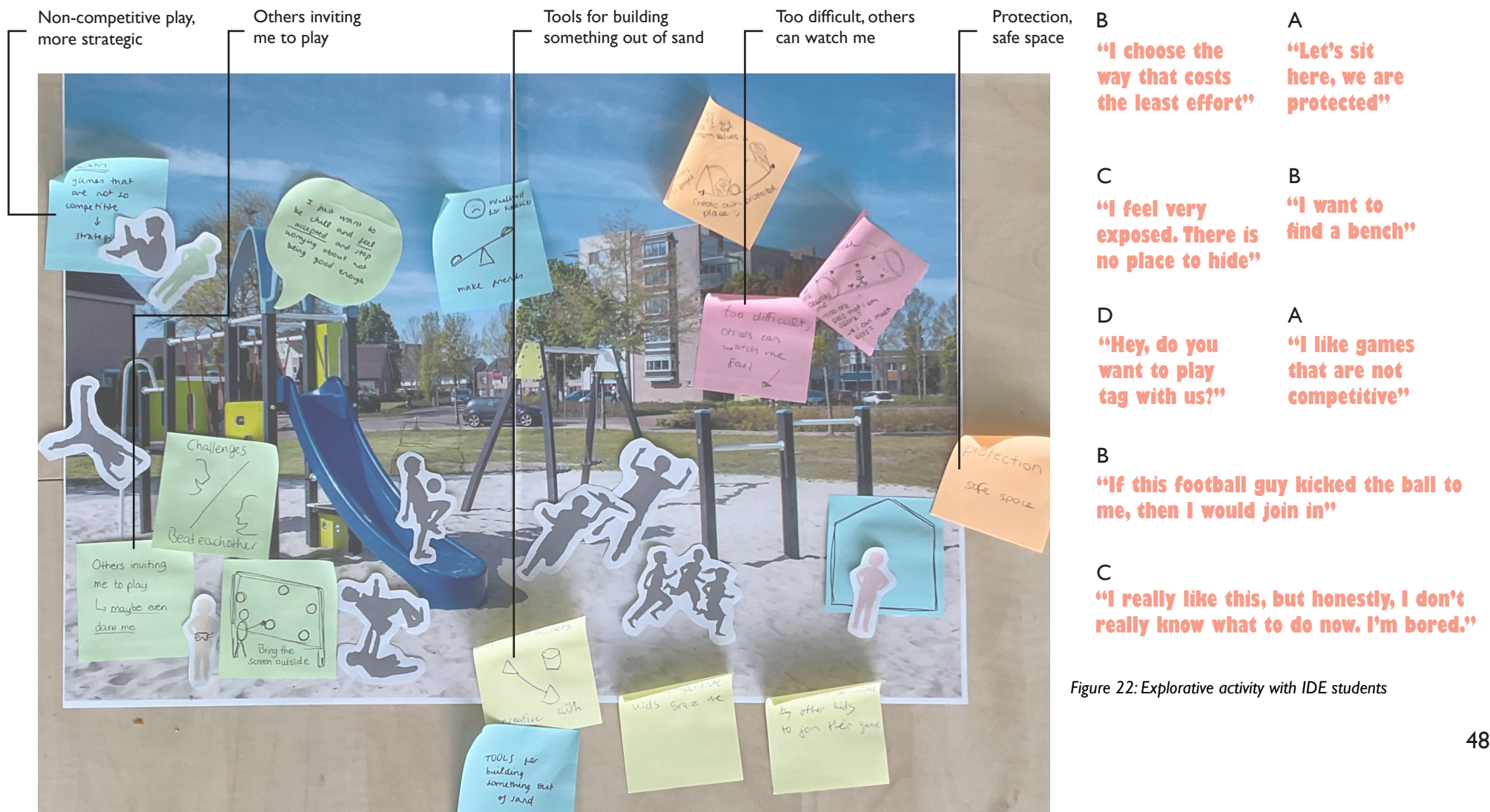


Figure 22: Explorative activity with IDE students



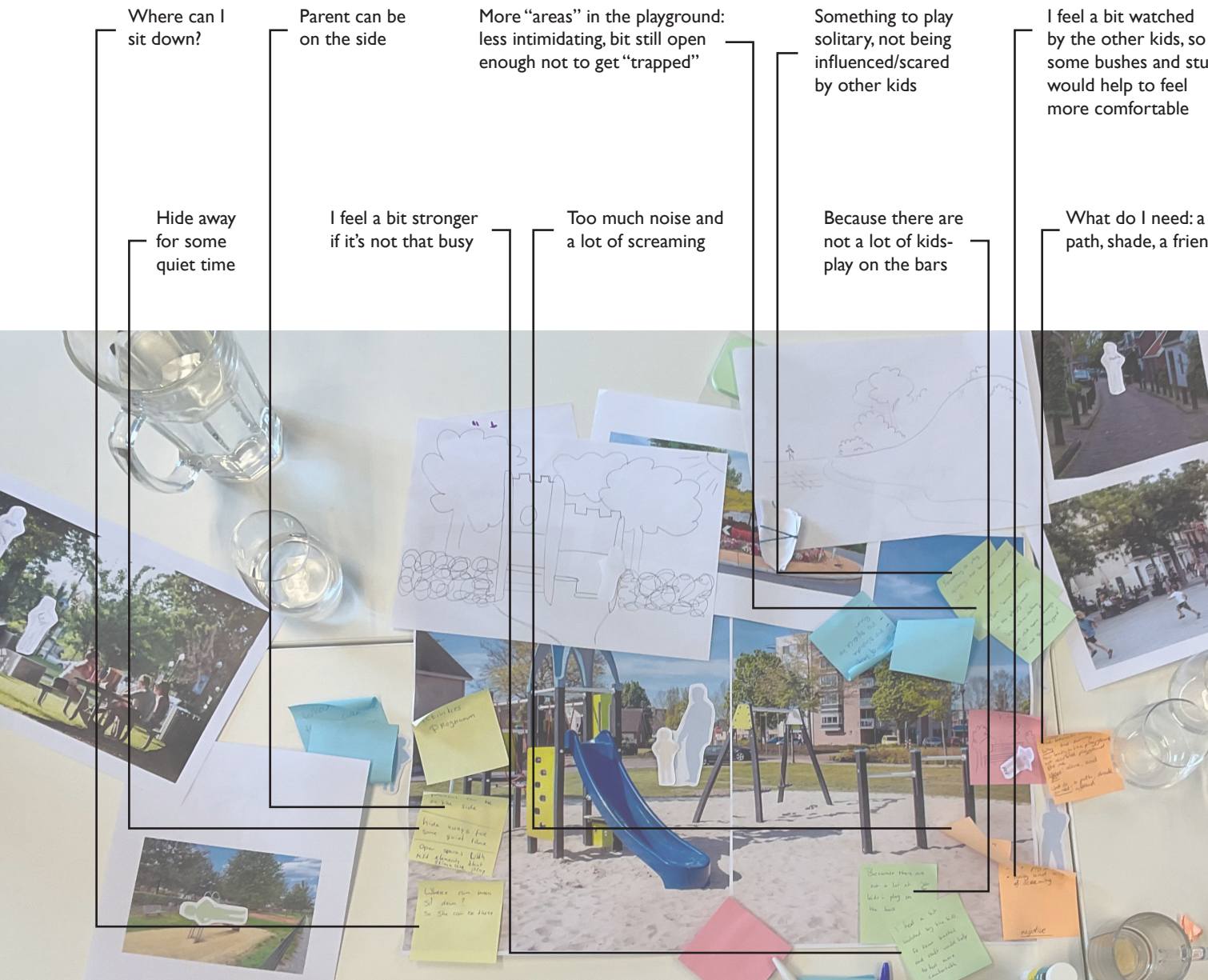


Figure 23: Explorative activity with Jantje Beton researchers

A  
**"I'm comfortable to play now because there are no other kids watching me"**

C  
**"Here we can have a little picnic"**

A  
**"I like that street, there are no cars so I can play using my imagination"**

C  
**"There should be somewhere you could stare at other people, and imagine they were criminals or something"**

A  
**"I don't want to play in the playground, I want to be in the alleys around"**

A  
**"I want to stay near to where my mum sits down"**

D  
**"You are not allowed to go there"**

The second activity of the contextmapping sessions provides valuable insights into how the different personality types translate into the emotions and behaviors in the context of play. By combining these with the information that the Big Five theory provides about the motives that characterize each personality traits, a more organic framework starts emerging.

The research goal of the contextmapping sessions was to explore the underlying personality characteristics, thought processes, and emotional dynamics associated with children's (lack of) interest in outdoor play. After analysing the results of the sessions four personality types have emerged, with corresponding insights into their characteristics, interests, and preference in regards to outdoor play.

## PERSONALITY TYPE

## INSIGHTS

Extra. -  
Neur. +  
Cons. -  
Agre. -  
Open. -

A

- Seeks quietness and protection
- Wants to stay close to parents
- Is intimidated by the presence of other children

Extra. -  
Neur. -  
Cons. -  
Agre. +  
Open. -

B

- Would like to be invited to play by other kids
- Likes to sit on a bench
- Finds it difficult to initiate play

Extra. -  
Neur. +  
Cons. +  
Agre. -  
Open. +

C

- Always looking for something new
- Doesn't like to be observed, but likes to observe others
- Prefers to play in small groups

Extra. -  
Neur. +  
Cons. +  
Agre. +  
Open. +

D

- Prefers cooperative play over competition
- Welcomes other children to join the play
- Likes fair play and always follows the rules

## OTHER INSIGHTS

Instead of shaping their play around the available play facilities, children usually try to adapt the space to fit their play ideas.

Play facilities are as important as the space that surrounds them: children's emotions and actions are influenced by the entire play environment.

# Main takeaways

# 06

## DESIGN FRAMEWORK: OUTDOOR PLAY FOR THE LEFT-OUTS

6.1. From personalities to characters

6.2. Building upon the characters

6.3. Validation of the characters

6.3.1 Main takeaways

6.4. Final framework

### Summary

In this chapter, the four personality types that emerged from the previous research are translated into characters. The form of the characters, as well as the other features that are used to describe them, are iterated several times. After conducting some observations and informal interviews with the children of two different primary schools, the framework is finalized. In its final form, the framework consists of 5 characters (Plush, Cap, Scopy, Rucksack, and Bomb), that represent the personalities of children that don't play outside.

# FROM PERSONALITIES TO CHARACTERS

---

In this chapter, the research insights gathered during the thesis work are synthesized, refined, and translated into a design framework. This step is crucial for the project's purpose because it bridges the gap between theory and practice. In fact, while research has inherent value and can offer inspiring perspectives on outdoor play, it does not necessarily facilitate the audience in applying those reflections in real-world scenarios.

The objective of this project is to produce an outcome that can inspire and be widely used by a diverse range of professionals, including urban planners, architects, policymakers, educators, designers, and other decision-makers involved in outdoor spaces. Not all individuals within this target group have the expertise to directly translate research findings into practical implementation. Therefore, further elaboration is necessary to make the insights more tangible and applicable for effective use by these professionals.

The function of a design framework in this project is to shape the personalities of children that are currently not taken into account in the outdoor play design and decision-making processes. The framework should present them in a way that leads to concrete possibilities to include their diverse needs and desires in the ideation or realization of play spaces for children between 8 and 11 years old. During the research phase, the personalities of children were described as combinations of high and low expressions of five different personality traits. However, this communication style is not effective for the scope of this project for a number of reasons. First of all, as was observed already during the research, the terms used to describe the personality traits are complex and difficult to relate to, causing confusion about their meaning. Furthermore, describing a personality in terms of separate components is cognitively challenging, as it requires first processing the essence of each of the elements, and then understanding the implications of combining them.

Besides the purpose of communication, translating the personality types into a more organic framework means adding more layers to a model that is at this stage still very abstract, bringing it closer to the complexity of our everyday reality. In fact, when applying personalities to real-world scenarios, additional dimensions come into play. These include factors like different responses based on the context, adaptive behaviors influenced by the presence of others, and so on. Merely presenting isolated combinations of personality traits fails to explicitly capture these dynamics.

A common tool used by designers in these sorts of situations is the construction of *personas*, as they offer a way to exemplify different groups of people based on their similarities in lifestyles, interests, goals, and struggles. Typically, each persona is described through fictional information about their life (such as name, age, gender, living situation, habits, aspirations...). These elements are intended to provide a sense of realism to the persona, but they are often based on stereotypes. In the context of this work, introducing additional details that are not necessarily linked to the selected personality traits would generate confusion between the inherent peculiarities of a personality and other characteristics that are arbitrarily assigned to the personas to complete their profiles, which often come from biases and are not based on research conducted for this project.

The approach that is needed for this work is one that accurately captures the essence of a personality within a real-world context. Therefore, the design framework should be narrowed to one single perspective (the one of personality), rather than trying capture all aspects of the identity of a child. In light of this, the non-playing children's personalities will be translated into characters created ad hoc for this project, characters that express the different types of children that emerged from the research and show how personality translates to outdoor play preferences.

## CHARACTERS' REQUIREMENTS

1. **Balance** between being too **simplistic** (stereotypes) and too **complex** (too difficult to work with)

2. **Balance** between being too **specific** (representing a very small group of children) and too **vague** (fails to capture the extremes of children's diversity)

3. **Anyone should be able to identify in any of them:** no added characteristics that are not functional for the understanding of the personality

4. The personalities should be **graspable at first glance**, without the need of a long explanation

Using the requirements as a starting point, the personalities A,B,C,D are translated into sketched figures. Figure 24 briefly capture the iteration process that preceded the final shape of the characters.

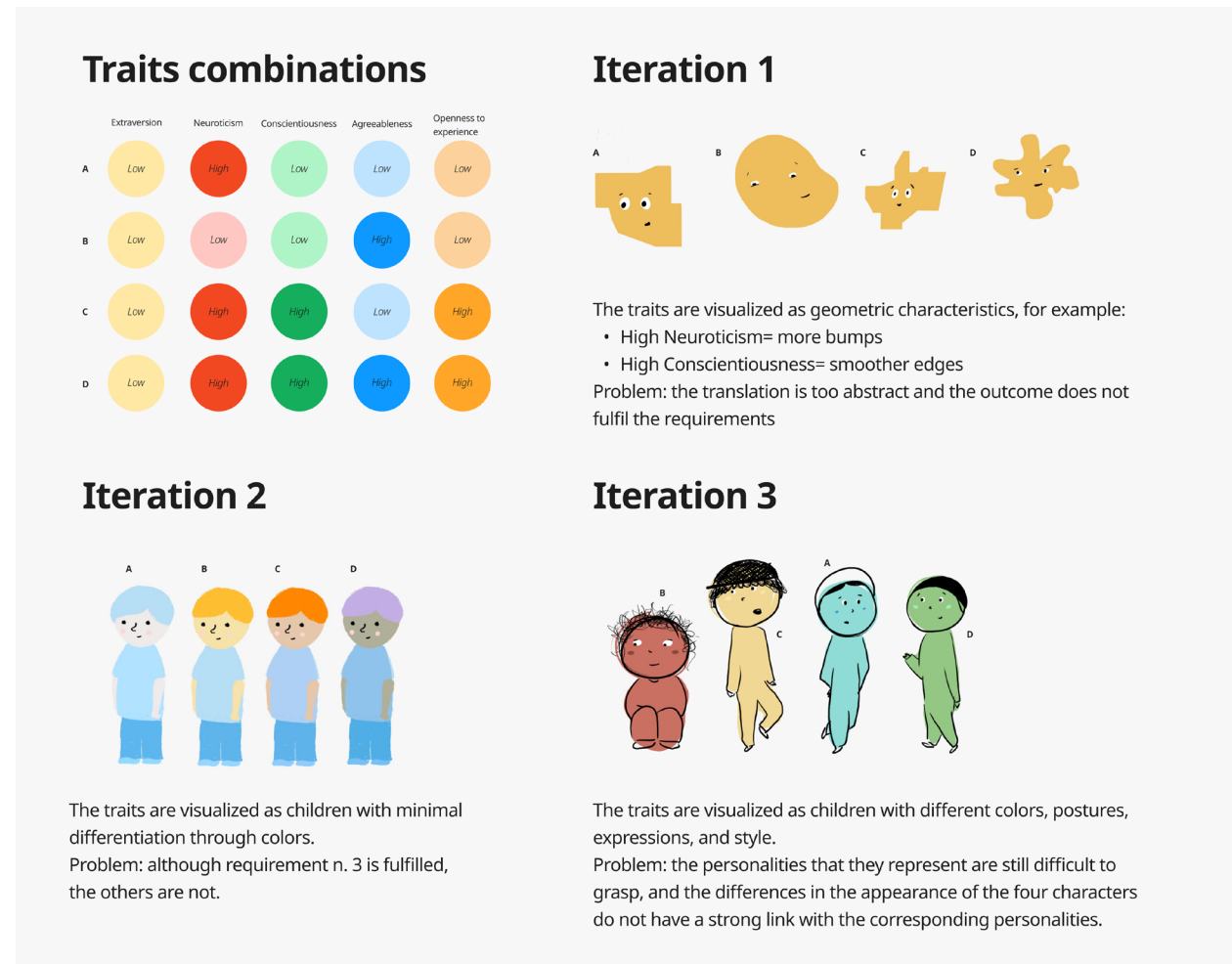


Figure 24: Iterations on the character's format



# BUILDING UPON THE CHARACTERS

After several iterations, a more refined version of the characters is reached, as shown in Figure 25. In this version, the characters are differentiated by an object they are carrying, which expresses their personality.

To enrich the framework, additional details are incorporated to insert the characters in a broader context. Another series of iterations leads the refinement of the framework.

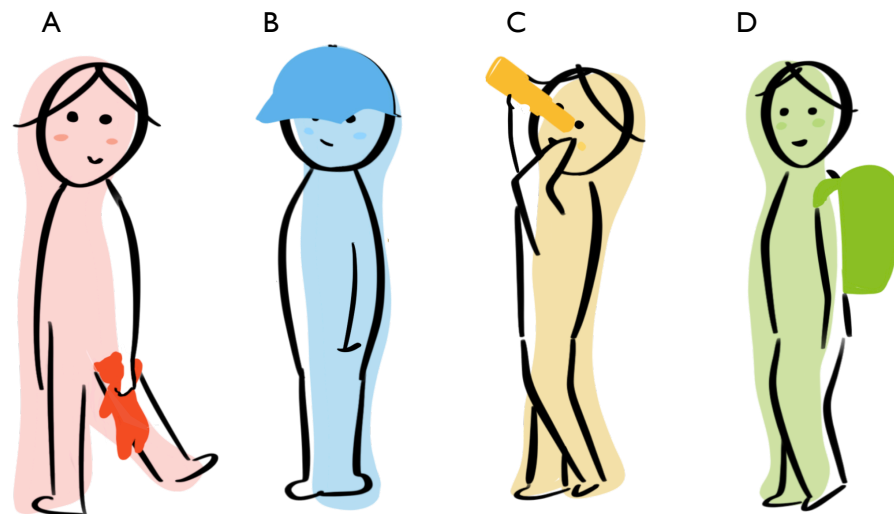


Figure 25: Chosen format of the characters

## OVERVIEW OF ITERATIONS

In the first iteration, each character is assigned a name that reflects the object they carry, accompanied by a set of three adjectives that convey their key personality traits. The intensity of each trait is displayed by using sliders, offering a visual and more immediate representation. Additionally, to make the character easier to understand and relate to, three curiosities about the character are presented alongside the sliders (Figure 26).

In a second iteration, the sliders are removed because the terminology used to describe the traits is difficult to understand. Instead, a visual representation of the character's typical behavior during play is shown (Figure 27). While this version of the framework is easier to understand and connect to the real world compared to the previous one, it now lacks information about the reasoning behind the elements that compose each character. Indeed, although the bullet points that provide insights into the characters' lives are inspired by contextmapping sessions, they lack a solid theoretical foundation. A solution to this problem is reached in the final form of the framework, which is developed after the validation phase (see page FIXME).



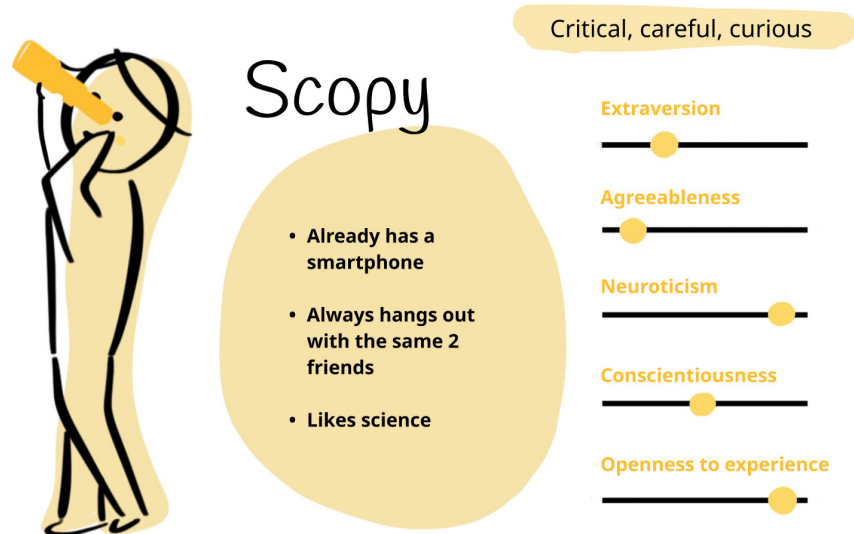
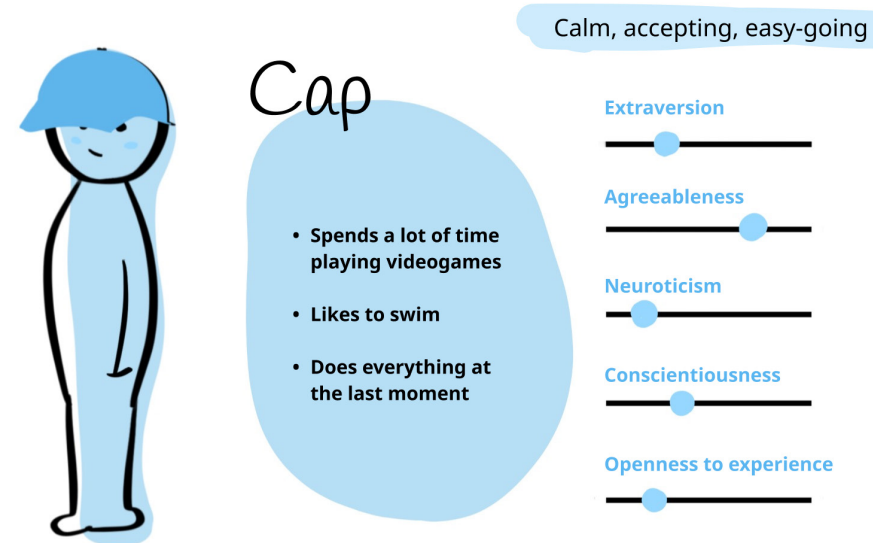
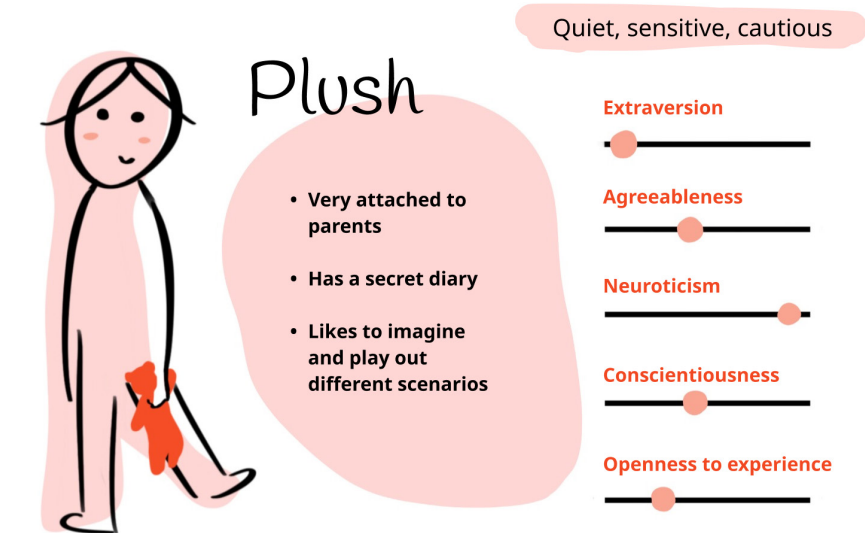
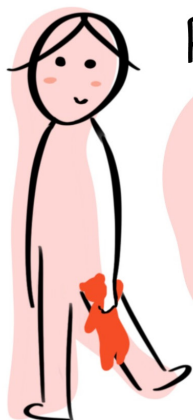


Figure 26: First attempt to present and describe the characters

Quiet, sensitive, cautious

## Plush

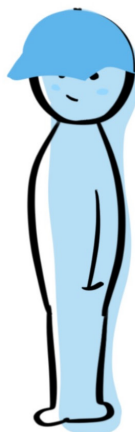
- Very attached to parents
- Has a secret diary
- Likes to imagine and play out different scenarios



Calm, accepting, easy-going

## Cap

- Spends a lot of time playing videogames
- Likes to swim
- Does everything at the last moment



Critical, careful, curious

## Scopy

- Already has a smartphone
- Always hangs out with the same 2 friends
- Likes science



Cooperative, anxious, organized

## Rucksack

- Has a dog
- Practices bouldering once a week
- Always brings nice snacks at school and shares them with friends



Figure 27: Second attempt to present and describe the characters

# VALIDATION OF THE CHARACTERS

---

For validating as well as finalizing the framework, the characters need to be confronted with real-life behaviors of children during free outdoor play. However, visiting outdoor play areas wouldn't serve the purpose of validation, as the framework is based on children who typically don't engage in outdoor play. Thus, it becomes improbable to observe the children represented by the characters actually playing outdoors.

To observe the children that are (supposedly) represented by the framework's characters, it is necessary to find a play area that provides a diverse and randomized selection of children in terms of personality. In other words, a place where the presence of children is not filtered according to their personalities. Schools fulfill this requirement, as they might attract children with similar residential locations or economic status, but this does not affect the heterogeneity of their personalities. Due to the language barrier, two international schools were selected for the validation activities: the British School in the Netherlands (Junior School Leidschenveen) and the International School Delft. These two schools present a radically different offers in terms of outdoor facilities (Figures 28 and 29), which provides an excellent opportunity to discern which behaviors are influenced by the play space's design and which ones are independent, thereby inherently connected to the concept of personality.



Figure 28: Junior School Leidschenveen's playground



Figure 29: International School Delft's playground

The validation of the framework is planned as a series of visits to the schools (3 days for the British School in the Netherlands, 3 days for the International School Delft) during their recess time. During the visits, an iPad is used to make annotations and quick sketches, and the insights are collected through a mix of:

- Observations
- Informal interviews with the children
- Informal interviews with the school staff

The purpose of the visits, however, extends beyond the simple validation of the framework. In fact, in the school playground, even kids who don't play outdoors during their free time (outside of school) spend their break in the playground. This circumstance represents a unique opportunity to observe how these children play outdoors (although in a more protected environment) and identify the elements and mechanisms that engage them in outdoor play. This could provide insights into how to recreate this engaging atmosphere within a public setting.

Through observing the children and talking to their teachers, the researcher pointed out the ones that seemed to represent the characters and took notes about them. In the next pages, some examples of the notes that were taken during the schools' visits are illustrated.

## BACKBONE OF THE SCHOOL VISITS

### ACTIVITY

Observations of children's different play preferences and behaviors

### GOAL

Identifying and verifying if some children correspond to the characters

### ACTIVITY

Observations of children's movements, emotions, and play patterns

### GOAL

Generating insights on how personalities relate to the elements of outdoor play

### ACTIVITY

Informal talks with children while they are outside

### GOAL

Gaining a deeper understanding of the children's needs and dreams

## WHERE & WHEN

British School in the Netherlands: May 22-23-24

International School Delft: May 8, June 15-16

## DATA COLLECTION

Real-time annotations and sketches

## ETHICAL CONSIDERATIONS

The research was approved by the Human Research Ethics Committee of TU Delft .  
To see the full HERC application, go to Appendix E.

*quick overview*



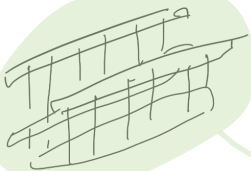
## CHILDREN AND PLAY OBJECTS



→ Very contended



→ Not too busy, but there is always someone



→ used for very short times

→ Small play objects are very important



The nest swing is the most popular object in the playground. Diverse types of children gather around it, but they want to play with their own group of friends. For this reason, they need to make turns. This object allows for different types of play at the same time (for example: being inside or pushing from outside).

The bars are not as popular, but there are always a few children playing there. The bravest kids use them without minding if someone is watching, while others are more concerned about their abilities and don't dare to try to do something they might not be able to perform.

While all the most energetic and loud children are on the football pitch, the ones that are less competitive but still like thrilling play are found around the big wooden ship or the giant slide. Here, they spend most of their time climbing and sliding in various ways. Sometimes they enact more complex play scenarios in which a group of kids defends a territory (for example, the boat), while others try to conquer it with imaginary weapons.

Play objects like log walks are used for very short periods of time, often while kids are roaming around the space by Rucksack children.

Plush children prefer to play in enclosed spaces such as small huts where they can play with their imagination without being bothered by others.

Some Scoopy children look for loose and smaller play objects, which they use either alone or in small groups. These objects can be more easily manipulated and adapted to the play they have in mind, and they can move with them to a different location if where they are it becomes too crowded.

The sandpit is not very used by children that are older than 8, maybe because the available tools are more suitable for younger kids. Compared to the younger ones, children above 8 use less of the play equipment overall.



→ Climbing up and down  
→ "Us vs them"

favorite place:



Because we can play family

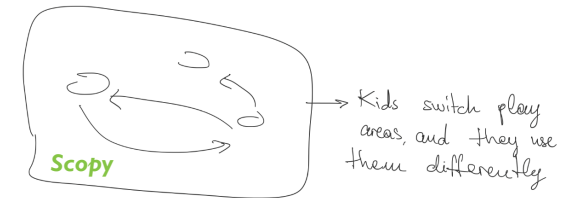
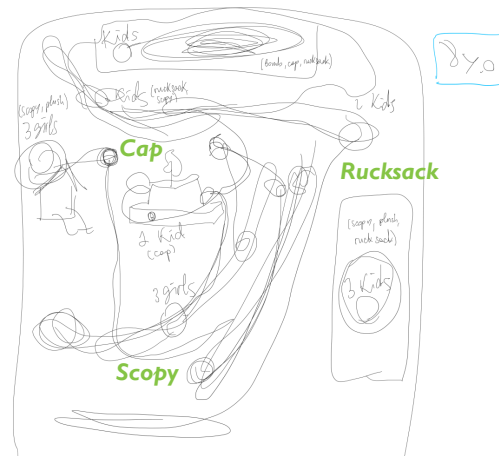
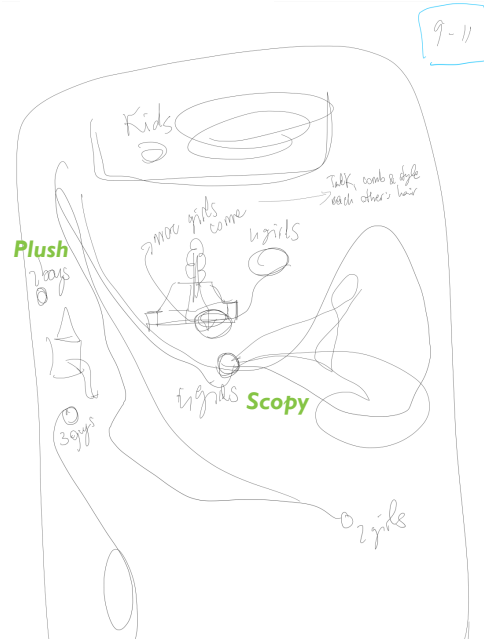
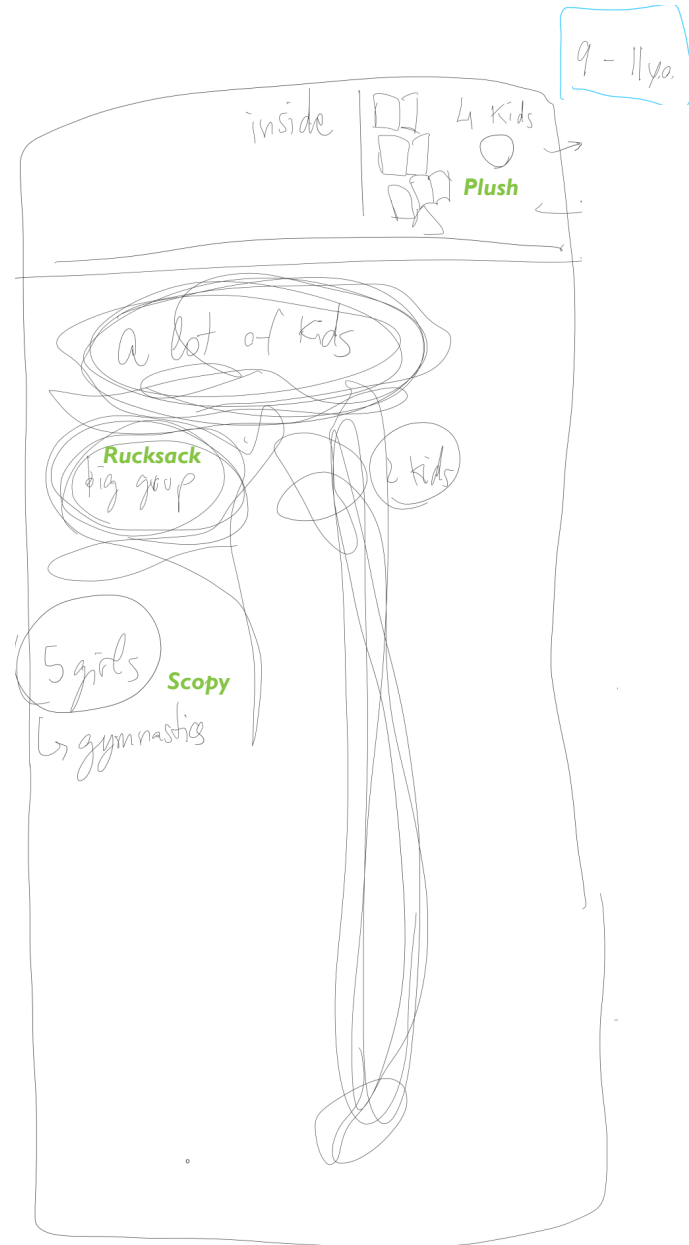
8y.o

→ No one in the sandpit  
→ Play with purpose

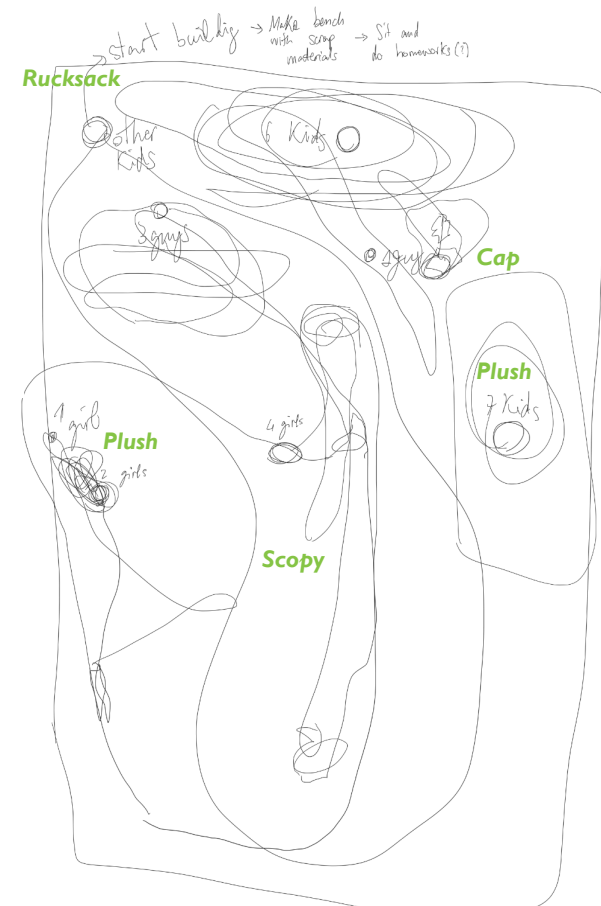
9-11 y.o

## CHILDREN AND PLAY SPACE

The spacial movements of the children that seemed to identify in one of the characters are tracked over their 30-minutes playtime.

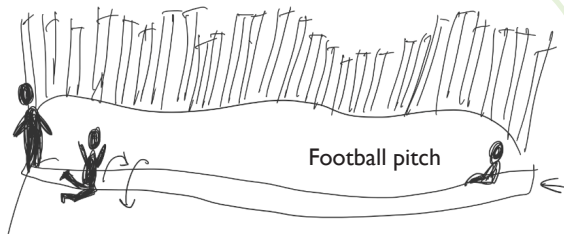


→ Mostly, they gather in groups of 3-5



## PLAY MOTIVES, CHILDREN'S THOUGHTS, AND EMERGING IDEAS

→ No one is just sitting and talking (unless for short periods)  
They are all playing.



→ He likes to sit next to other kids and watch them play.  
He switches between different locations

→ Once he is invited to play, he joins the other kids & he looks happier

Kids that go in the "huts" are not necessarily quieter or more reserved

During recess at the British School, where the space and the facilities accommodate a wide variety of children's play preferences, all children are playing at all times.

"There should be a room to put the crazy kids"

"I want to be away from parents but with friends"

"I like to stay in the back [of the school playground] because there I can train and become stronger"

A child stands at the border of the football pitch but doesn't enter the play area. However, when asked what he is doing, he answers that he is playing football with his friends. After watching the others play for some time, he seems interested in taking part in the play but doesn't feel comfortable joining in. He then moves where some other kids are playing with a ball and starts observing them until they invite him to play. He looks happy and starts playing with them.

Rucksack kids walk around the playground exploring the different areas that are there, and they rarely stop to play in one place. This is rarely possible outside of the school because the playground areas are often limited in space and they don't encompass various environments.

A Scopy child is playing with her friend hidden in a secluded area with many trees around. When I pass by and try to interact, she doesn't want to reveal what they are doing and she runs away to a more hidden spot.

Kids that go to the "huts", labelled as more relaxing and quiet play areas, are not necessarily the quieter kids: some louder kids use them too as hiding places and they even have small fights inside.

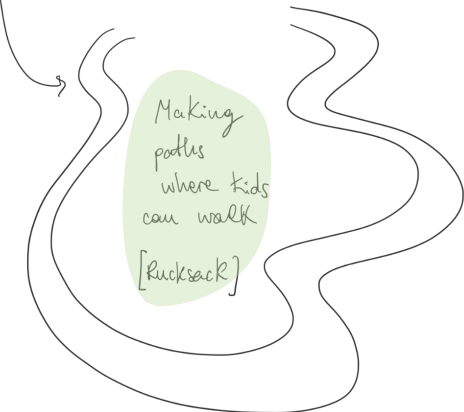
"There should be a room to put the crazy kids"

"I want to be away from parents but with friends"

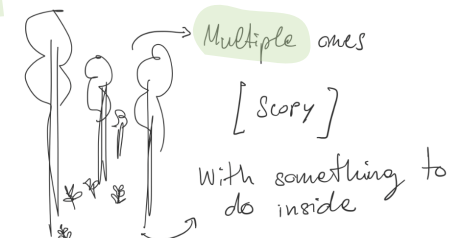
"I like to stay in the back because there I can train to be stronger"

→ Space for roaming!!

NATURE → Most of the older kids don't only use play objects



→ Space for hiding!!





The school visits provided valuable insights that helped refine the framework and generate initial ideas. Observing and talking to the children at the schools, especially throughout several days, made it possible to identify the characters in the personalities of the children. With some fine-tuning, the four personalities and their translation into characters appear to be fitting and representative of the children that they intend to depict. Moreover, a better understanding of the motivations of their play behaviors is gained. These insights are used to complete the framework with detailed explanations of what each character thinks and feels in relation to outdoor play. Secondly, based on the observations, it was decided to incorporate a new character into the framework: Bomb. This decision stemmed from the realization that some children, even if they enjoy playing outside, are not completely satisfied with the provided play facilities. These children feel that the level of physical challenge and sense of achievement offered by the facilities does not meet their expectations. As a result, they become frustrated and display a negative attitude toward others. Including Bomb in the framework ensures that designers address the needs and aspirations of these children as well.

## CHARACTER

## INSIGHTS

### PLUSH

Usually engages in more imaginative types of play, where they don't need a vast play space, but rather, one that contains small-scale details

### CAP

Before approaching other kids, they spend some time observing them. Being at the edges of play areas feels like playing to them.

### SCOPY

Likes to stay in hidden play areas with a few friends, and among them, often takes the lead. They switch between active and relaxing play.

### RUCKSACK

Spends most of the time roaming and meeting different children for short times. They also like to build things together with others.

New character!

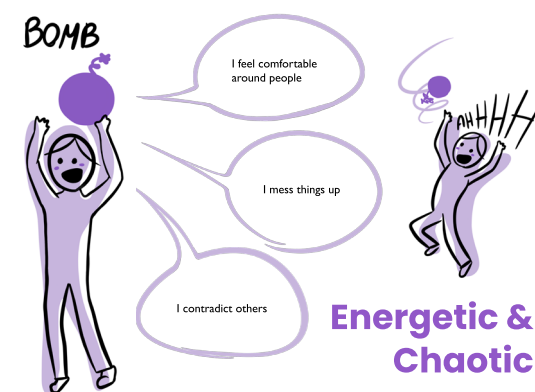
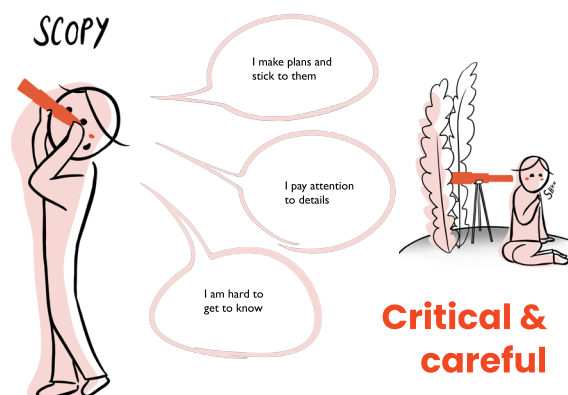
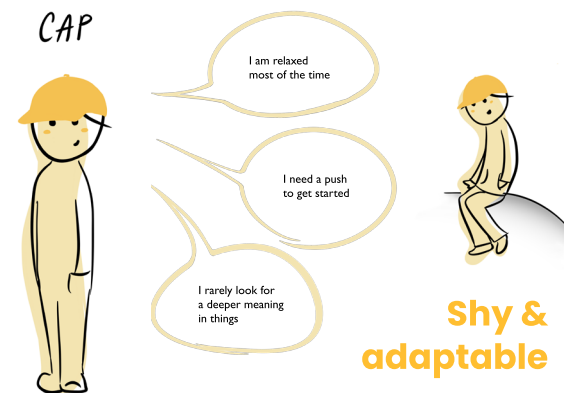
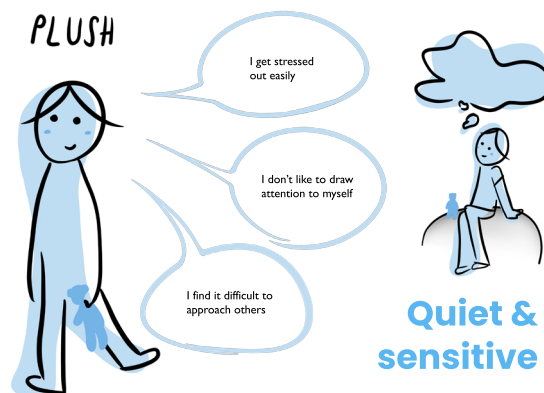
### BOMB

Is full of energy and loves risky play. Doesn't really listen to the teachers and tends to use the play equipment improperly.

# Main takeaways

# FINAL FRAMEWORK

The insights gained from observing and talking to children during their school breaks are used to reach the final form of the framework. In the next pages, each character is fully described in terms of their personality, outdoor play behavior, needs, and dreams.



PLUSH



I get stressed out easily

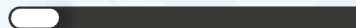
I don't like to draw attention to myself

I find it difficult to approach others



**Quiet & sensitive**

#### ACTIVITY LEVEL



EXTRAVERTED

INTROVERTED



COOPERATIVE

COMPETITIVE



SENSITIVE

STABLE



TASK-FOCUSED

DISORGANIZED



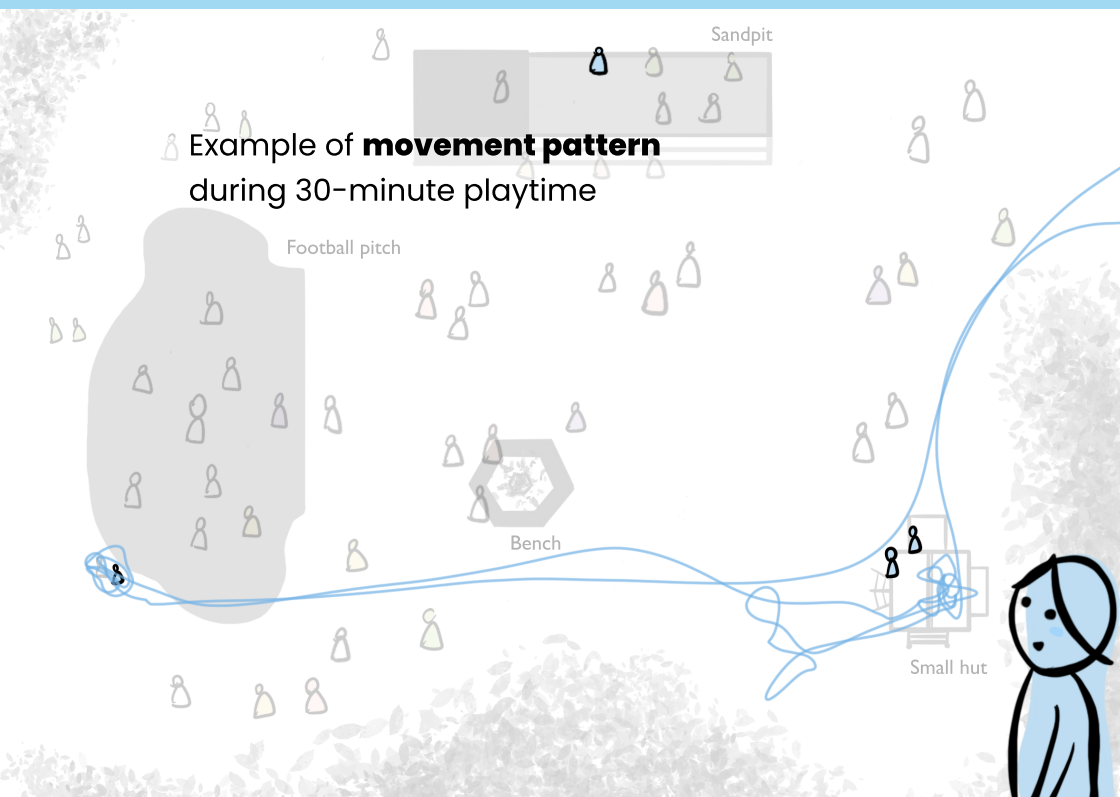
CURIOUS

CAUTIOUS

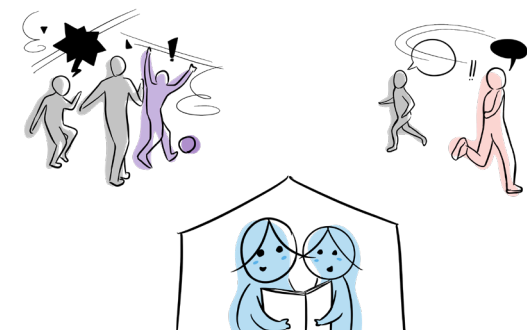


## DESCRIPTION

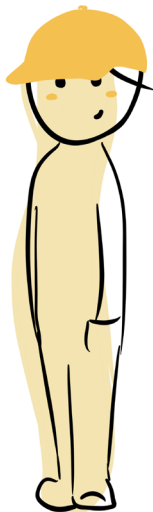
Plush is a quiet and imaginative kid who loves to create different make-believe stories and engage in activities that require fine movements. Plush can get easily scared around older or louder children, so preferring the company of a trusted adult as they feel understood and protected. When Plush goes outside to play, they stick close to their parents because they feel uncomfortable interacting with unfamiliar kids. Plush doesn't go much to play outside because most outdoor play areas focus on physically challenging play rather than offering objects and spaces that support more creative and delicate interactions. Plush dreams of a place where they can use their imagination freely and be themselves without judgment or interruptions by other children.



Plush starts the play by finding a cosy and protected space, away from the noise and chaos of other kids. Together with their best friend, Plush spends most of the playtime there. In the last 10 minutes, Plush gains enough confidence to venture somewhere else, and finds some other comfortable and secluded spots to play.



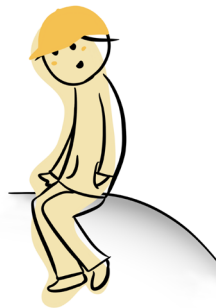
CAP



I am relaxed  
most of the time

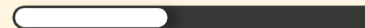
I need a push  
to get started

I rarely look for  
a deeper meaning  
in things



**Shy &  
adaptable**

#### ACTIVITY LEVEL



EXTRAVERTED

INTROVERTED



COOPERATIVE

COMPETITIVE



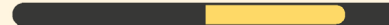
SENSITIVE

STABLE



TASK-FOCUSED

DISORGANIZED



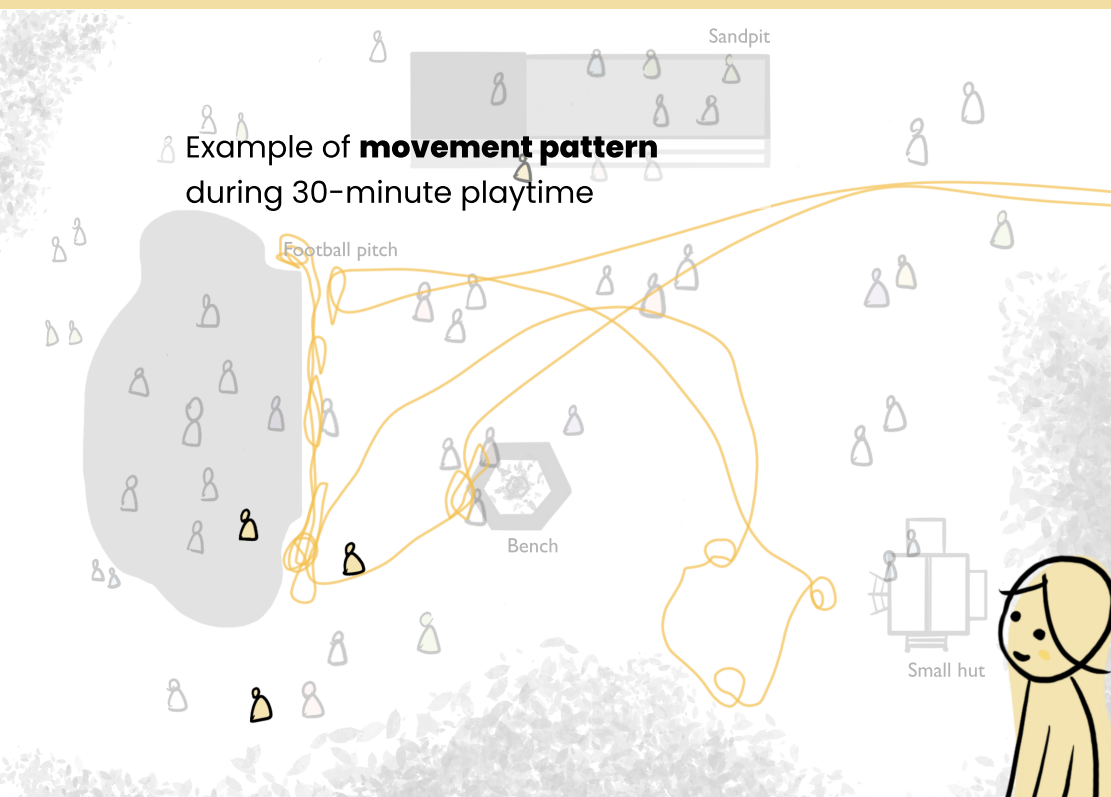
CURIOUS

CAUTIOUS

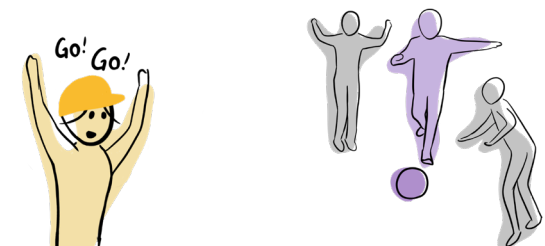


## DESCRIPTION

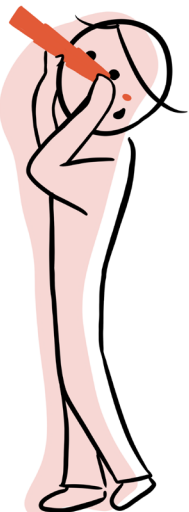
Cap is an easy-going and adaptable child, who enjoys being part of a group and spending time with other kids. They are generally relaxed and prefer to join in activities organized by others. Cap tends to follow rather than lead during playtime, finding comfort in more structured games that don't require much inventiveness. Even if they don't mind being in the spotlight for a short span of time, Cap often feels more comfortable being in the background, and enjoys observing others play. Although they would like to play with other kids, Cap doesn't go too far outside because they are too shy to join the game of children they don't know. For this reason, they rather play videogames, as there it is easier to interact with other players even if you don't know them.



Cap starts by sitting on a bench while observing other kids play football on the pitch. As time passes by, Cap starts approaching the football pitch, moving around its borders. When they notice some other kids playing with the ball on another side of the playground, which is less crowded, they move to that area. Cap starts following the other kids around until they ask them to join their game. At this point, Cap starts playing with them and follows their movement.



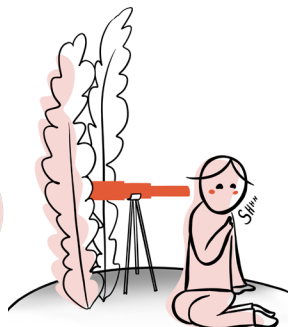
Scopy



I make plans and  
stick to them

I pay attention  
to details

I am hard to  
get to know



**Critical &  
careful**

#### ACTIVITY LEVEL



EXTRAVERTED

INTROVERTED



COOPERATIVE

COMPETITIVE



SENSITIVE

STABLE



TASK-FOCUSED

DISORGANIZED



CURIOUS

CAUTIOUS

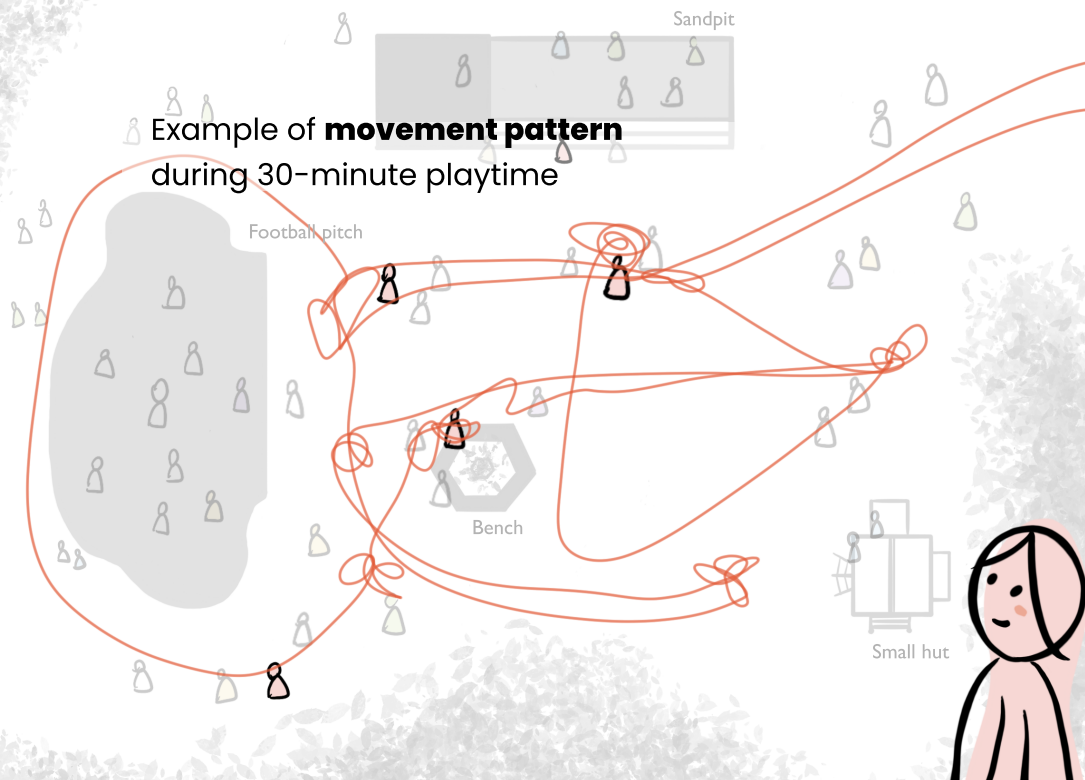


## DESCRIPTION

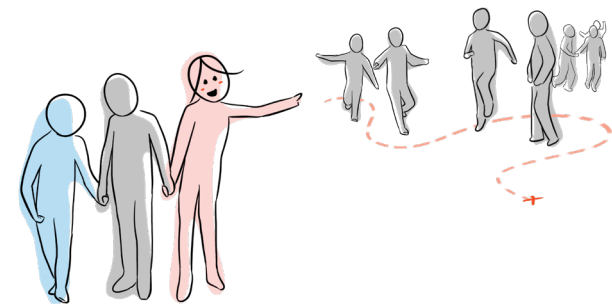
Scopy is a careful and well-organized child who values having a small circle of trusted friends. Scopy feels insecure around unfamiliar adults and children, but when in the company of their close friends, their protective and confident nature emerges. Scopy enjoys making decisions and leading friends on various activities and explorations, as well as coming up with little challenges. Scopy doesn't want to interact with children they don't know, but rather, they like to observe them from a distance without being noticed. Scopy doesn't like playgrounds because they have no place to hide and the play facilities are too predictable for allowing decision-making. Instead, they would like a place where they can choose, create, and switch between different play modalities, without being watched by other children or adults.



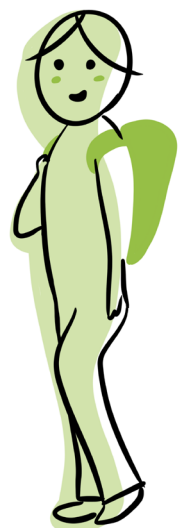
Example of **movement pattern**  
during 30-minute playtime



Scopy starts playing together with a few friends in the least crowded area of the playground. However, they keep switching between different games and locations, alternated by short runs around the play area. As time passes by, they become less active and start to settle in one location. Their type of play becomes less physical and more focused on cognitive and fine motor skills.



## RUCKSACK



I am always prepared

I worry  
about things

I treat all  
people equally



**Organized &  
cooperative**

### ACTIVITY LEVEL



### EXTRAVERTED

### INTROVERTED



### COOPERATIVE

### COMPETITIVE



### SENSITIVE

### STABLE



### TASK-FOCUSED

### DISORGANIZED



### CURIOUS

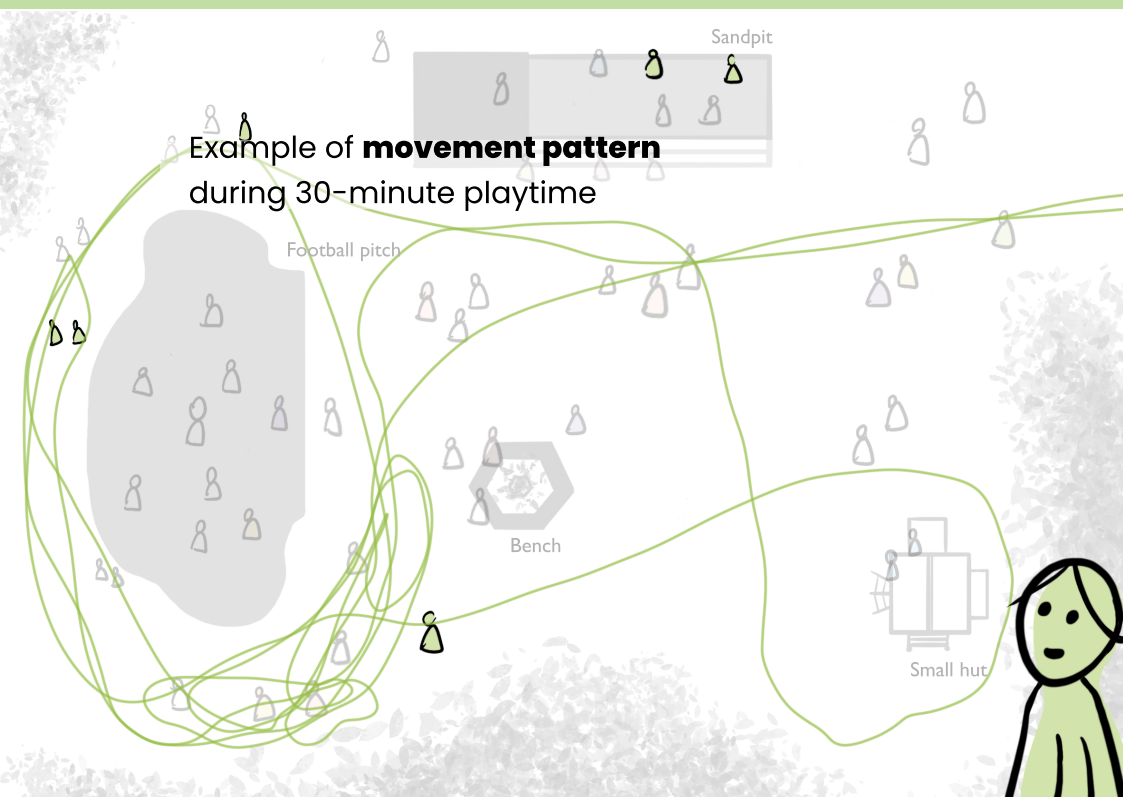
### CAUTIOUS



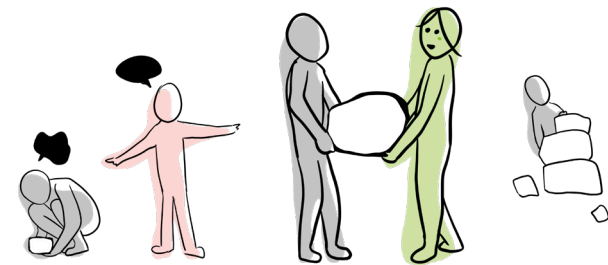
## DESCRIPTION

Rucksack is a collaborative and curious kid that likes to be prepared for any situation. They are generous with everyone even if they are not close friends, as they enjoy sharing and working together with other children. Rucksack tends to be quite independent: they don't need others to tell them what to do. They are inventive and proactive, but without ever imposing themselves on other children.

Always eager to learn something new, Rucksack likes to discover the world around them and the reasons why things are the way they are. When they play, they like to have a purpose or mission to achieve by collaborating with other kids. If they could, Rucksack would love to roam around the city unsupervised and have small adventures with their friends.



As soon as they enter the playground, Rucksack starts to roam around with their friends to check out what is going on. When they pass next to other children, they might join their play for a brief moment but they soon leave to continue their walk. The moment Rucksack finds an interesting opportunity to play, they start transporting materials and building different sorts of objects that are needed for the play.





I feel comfortable  
around people

I mess things up

I contradict others



## Energetic & Chaotic

### ACTIVITY LEVEL



### EXTRAVERTED

### INTROVERTED



### COOPERATIVE

### COMPETITIVE



### SENSITIVE

### STABLE



### TASK-FOCUSED

### DISORGANIZED



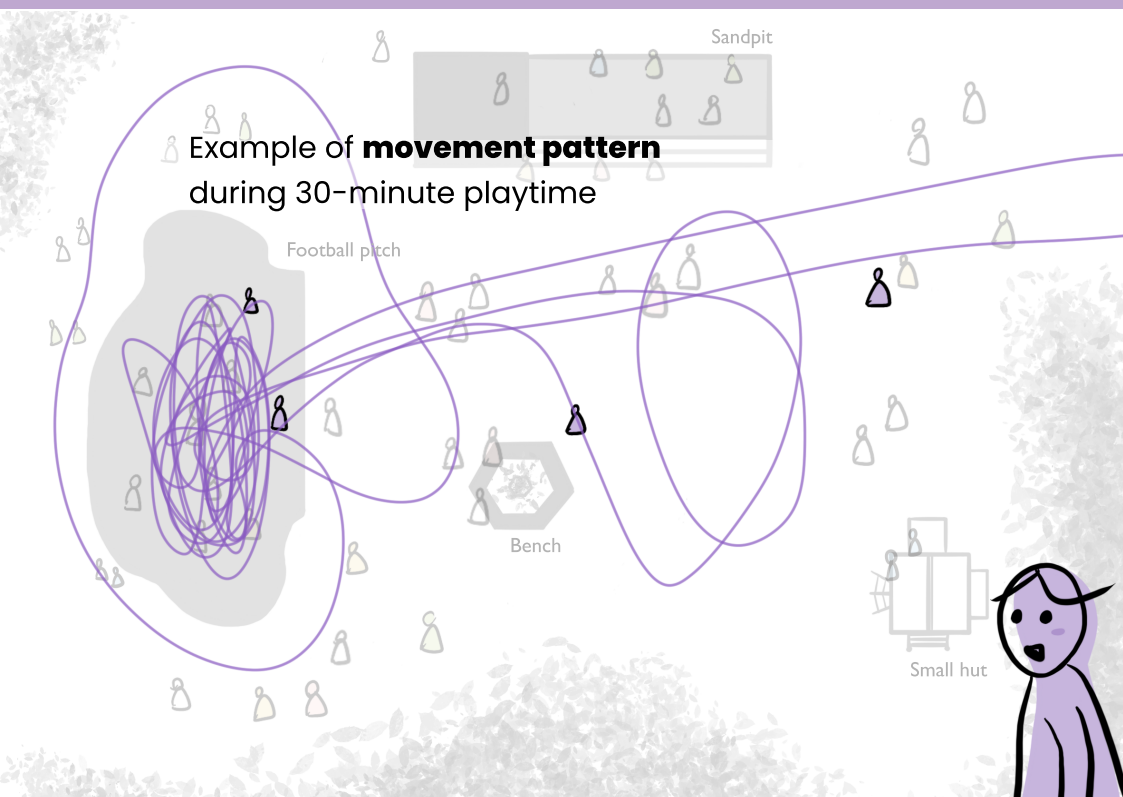
### CURIOUS

### CAUTIOUS

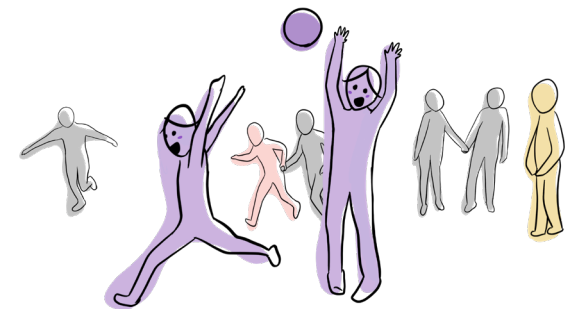


## DESCRIPTION

Bomb is a loud and lively kid, always full of excitement and a strong desire to play. They thrive in physically active play, as it gives them the opportunity to release their boundless energy. They tend to be quite competitive and like to test their own and others' limits. For this reason, bomb dislikes feeling restricted by rules imposed by adults, and often breaks them. They really hate being told "no", and preventing them from releasing their energy through play can make them act rude or aggressive toward others, even their peers. Although they often go outdoors to play, the lack of stimulating experiences for their age quickly leads them to boredom, which brings them to start bothering other children.



Even before stepping into the play area, Bomb already knows what they are going to play. They run to the football pitch and start kicking the ball as hard as they can. They spend most of the playtime on the football pitch, but towards the end of the school break, they start running around and exploring other areas too, in search of new challenges.



# REFLECTIONS ON THE FRAMEWORK

The framework aims to provide a comprehensive and easily graspable portrayal of the characters. It serves as a standalone tool for designers, allowing them to apply it in their preferred manner. While the framework is utilized in this project to generate inspirational ideas for outdoor play, readers are empowered to find themselves the most beneficial approach to use the characters for their specific case. Refined through multiple iterations, the framework has reached its ultimate format, ensuring that each element is thoughtfully designed to facilitate effective communication. On the right side of this page, the rationale behind each communication choice is elaborate.

## APPEARANCE

The graphic style used to sketch the characters utilizes a minimal amount of detail. The characters' drawings are abstract enough to allow anybody to identify with them, but figurative enough to resemble real children. Factors such as gender, cultural background, and social status are intentionally left out, as they do not affect children's personalities. For the same reason, characters are not given a real name, but rather, a nickname that originates from the object they are carrying.

## OBJECTS

Each character is distinguished by a different object (as well as a specific color and body posture). The choice of using a particular accessory to differentiate each character is motivated by the values within the use, interactions, looks, and associations that come with these objects. In this sense, the objects do not represent necessarily something that children physically carry around with them, but rather, they are used for their symbolic value, which makes it easier to understand the personality of the character at first glance.

## SPEECH BUBBLES

The quotes placed in the speech bubbles come from the results of the context mapping sessions, based on an adaptation of the Big Five personality model (see page FIXME).

## DESCRIPTIVE WORDS

For allowing a quick scanning and interpretation of the characters, two words were chosen to immediately convey the essence of their personality. These two terms are selected within the domain of the two most prominent traits of the character.

## SLIDERS

The first slider (activity level) is a measurement that belongs to the Thomas & Chess temperament model and refers to the level of motor activity employed by a child while engaged in a specific task. The other five sliders are derived from the Big Five personality model, and describe the personality of the character across the five personality traits developed in the model. The terminology used to indicate the traits is not exactly the same as the one used in the original theory, because it was found to be too complex and misleading. Therefore, the traits are rephrased to be easily understandable by a non-expert audience, as well as being applicable to children.

## CHARACTER DESCRIPTIONS

These paragraphs provide a brief yet detailed description of the characters. The text goes beyond surface-level details and dives deeper into the thoughts, feelings, and preferences of the characters. Rather than focusing on their life story, the description aims to explain the reasons and motivations behind the particular play behaviors of the characters.



# 07

## DESIGN OUTCOME: INCLUDING DIVERSE CHILDREN IN OUTDOOR PLAY

### 7.1. From characters to ideas

#### 7.1.1. Engaging for all

### 7.2. Concepts

### Summary

In this chapter, the following research questions are addressed:

- How do the *left-out* children want to play?
- How can outdoor play stakeholders design for them?

To answer these questions, the framework is applied to assess, describe, and envision play objects and spaces. In the first section, a traditional playground is explored through the lenses of each one of the five characters. Afterward, the insights from Chapter 4 are expressed from the characters' perspectives, leading to the development of five concepts.

# FROM CHARACTERS TO IDEAS

Once the framework is established, the personality of each character can be further explored in relation to outdoor play, and translated into concrete ideas and examples of play designs.

To begin with, the framework can be used to assess the current outdoor play options that are offered to most children today (traditional playgrounds) and determine what is perceived as engaging or not engaging for each character. This approach gives the opportunity to analyze the preferences and experiences of the characters, helping to identify the elements that fit their personalities and the ones that fall short of capturing their interest during outdoor play.

In the following pages, a traditional playground is described through the lenses of the different characters (Figure 31, 32, 33, 34, 35).

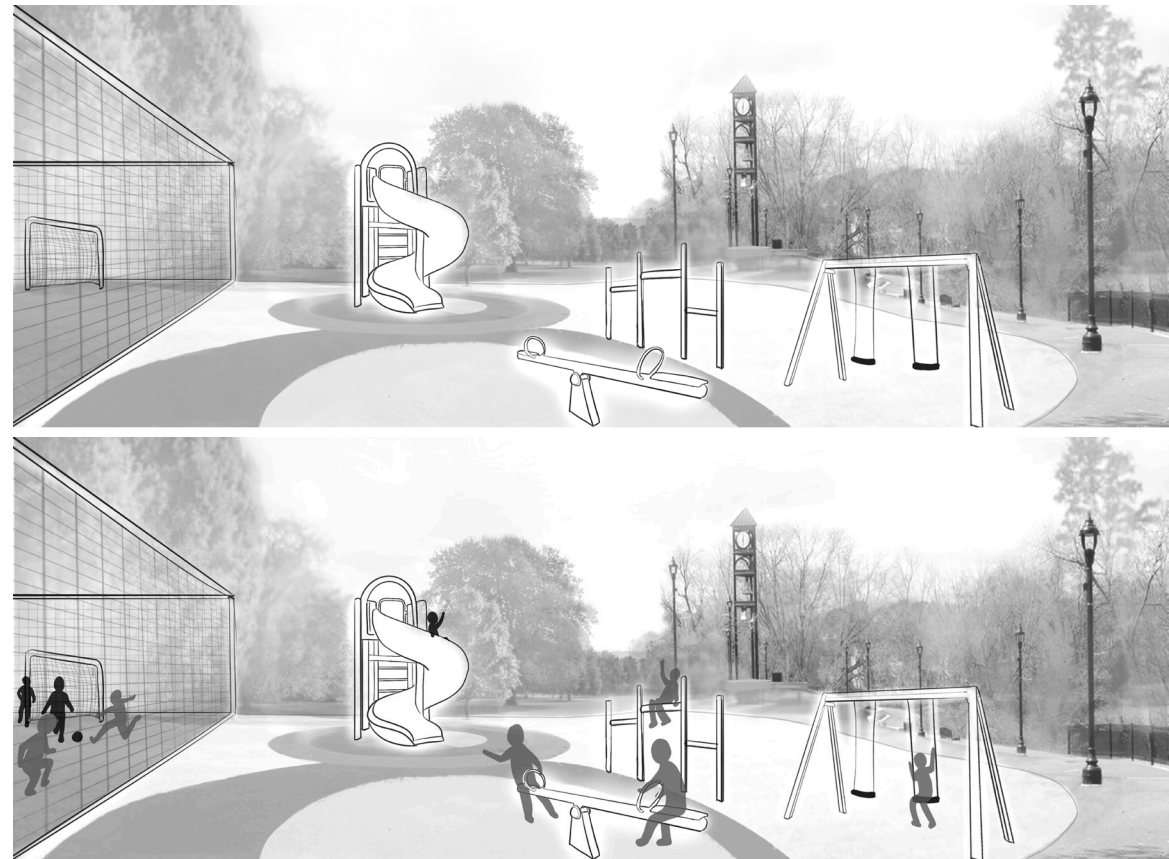


Figure 30: Traditional playground without and with children

# How would **Plush** experience this space?

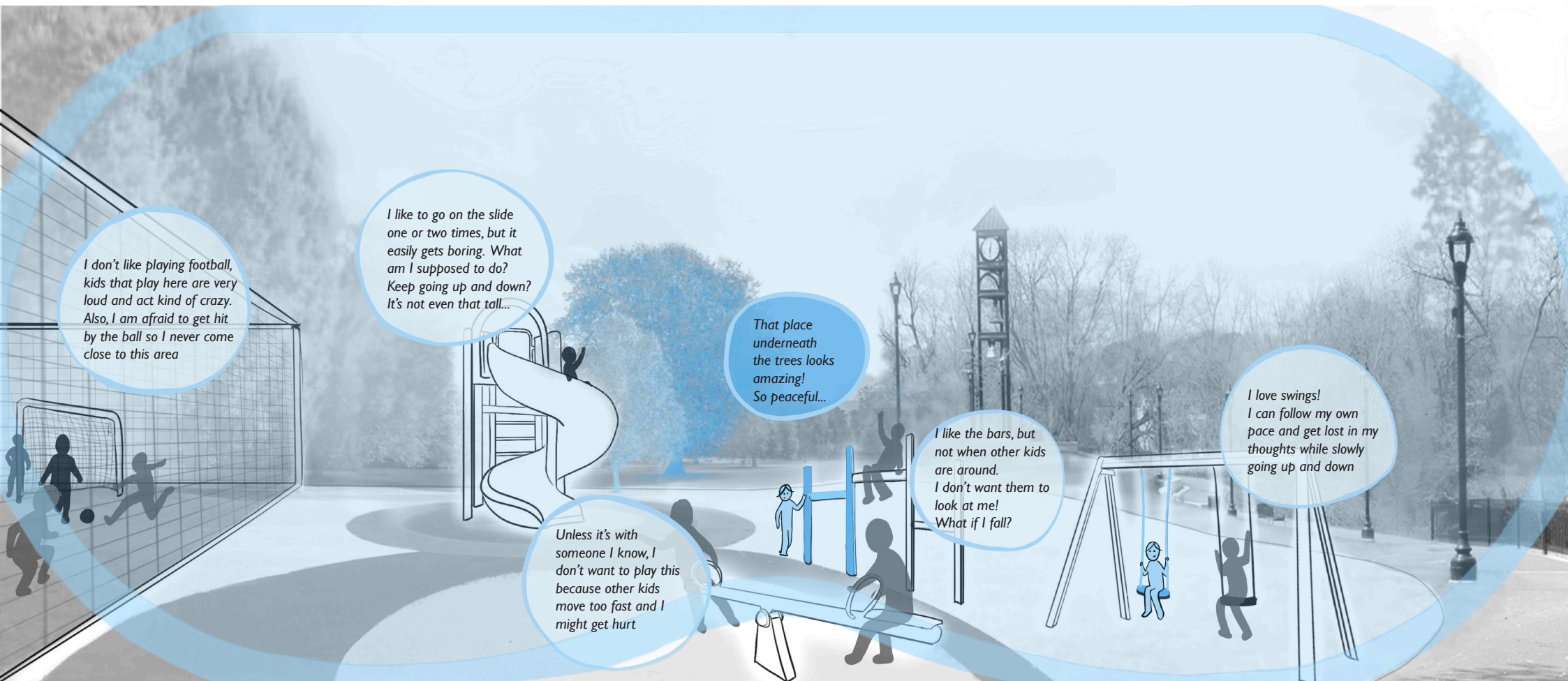


Figure 31: Traditional playground seen through the lenses of Plush



# How would **Cap** experience this space?



Figure 32: Traditional playground seen through the lenses of Cap

# How would **Scopy** experience this space?

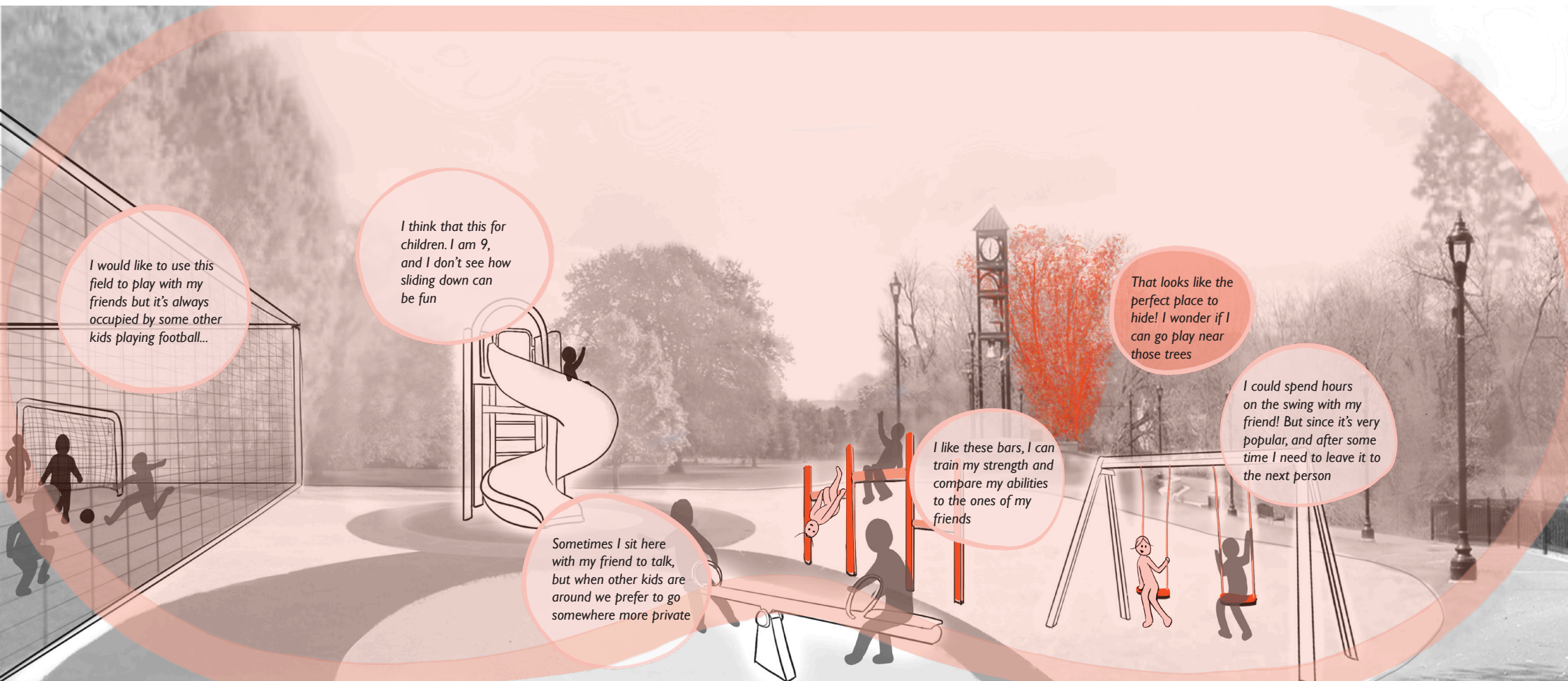


Figure 33: Traditional playground seen through the lenses of Scopy



# How would **Rucksack** experience this space?



Figure 34: Traditional playground seen through the lenses of Rucksack



# How would Bomb experience this space?

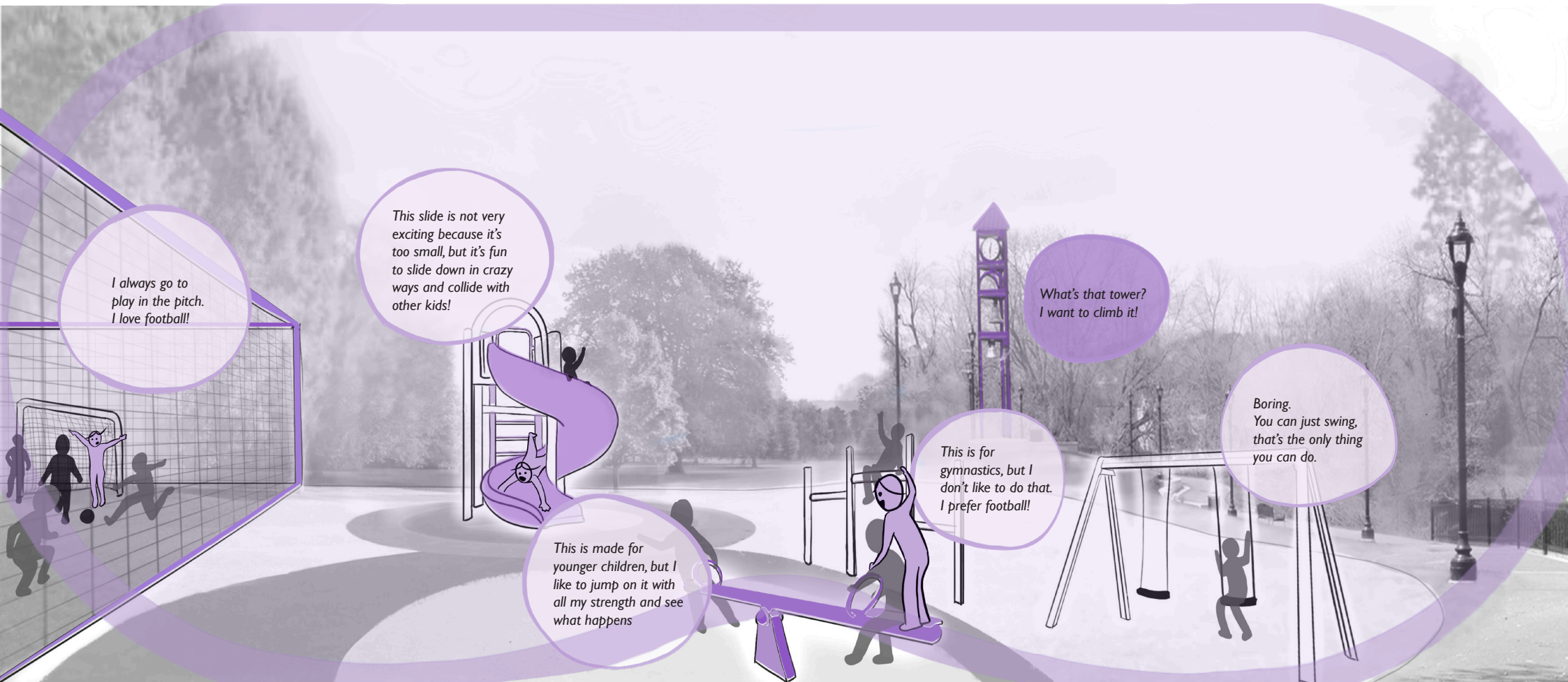


Figure 35: Traditional playground seen through the lenses of Bomb

# Engaging for all

## 5 ASPECTS OF PLAY



## DESIGN FRAMEWORK

The assessment of existing play spaces through the framework highlights current limitations and opportunities for outdoor play, but it is still not easy to translate them into design ideas. To facilitate this translation, it is helpful to revisit the conclusions drawn from the literature research on outdoor play (see page FIXME). These conclusions provide a set of general guidelines that highlight what aspects make play engaging for children, and by linking them to the characters of the framework, they can facilitate the elaboration of ideas to concretize each character's play preferences. To incorporate these guidelines into the framework, however, an intermediary step can be implemented. This is because the current expression of these guidelines appears somewhat abstract and generic. Moreover, they give the impression of being a set of "parameters" that adults have formulated to enhance children's play experiences. Instead, the objective of this project is to empower children and place them at the forefront, opting for a narration that takes their perspective as a starting point. Consequently, the insights from the literature research on outdoor play are reformulated as if they were pronounced by children. With the five aspects now presented in sentence form, which aligns better with the framework's intent, these quotes can be applied to each one of the five characters and tailored to their respective personalities. This allows for a more cohesive integration of the guidelines into the framework, ensuring that each character's traits and preferences are appropriately addressed and reflected.

### FREEDOM

*"I want to be free to..."*

### CHALLENGE

*"Am I able to...?"*

### SOCIALIZATION

*"We can be friends if..."*

### SAFETY

*"I feel safe because..."*

### VARIETY

*"Look there! It's a new...."*

# MAKING OUTDOOR PLAY ENGAGING FOR PLUSH



*"I want to be free to...  
play without being  
bothered by other kids"*



*"Am I able to...  
get there without  
any help?"*



*"We can be friends if...  
you are kind and  
thoughtful"*



*"I feel safe because...  
my parents are nearby"*



*"Look there! It's a new...  
flower that started  
growing next to the swing"*

# MAKING OUTDOOR PLAY ENGAGING FOR CAP



*"I want to be free to...  
remain in my comfort  
zone"*



*"Am I able to...  
reach where those  
kids are?"*



*"We can be friends if...  
you invite me to join  
your game"*



*"I feel safe because...  
I am friends with the  
older kids"*



*"Look there! It's a new...  
game they are playing"*

# MAKING OUTDOOR PLAY ENGAGING FOR SCOPY



*"I want to be free to...  
decide how to play"*



*"Am I able to...  
do a backbend without  
falling?"*



*"We can be friends if...  
you agree to play my  
game"*



*"I feel safe because...  
my best friends are here"*



*"Look there! It's a new...  
insect I found on our  
favorite tree"*



# MAKING OUTDOOR PLAY ENGAGING FOR RUCKSACK



*"I want to be free to...  
explore the places  
around me"*



*"Am I able to...  
make a walking stick  
from this branch?"*



*"We can be friends if...  
you are able to share"*



*"I feel safe because...  
I have the right tools to  
face any situation"*



*"Look there! It's a new...  
nest on the tree, which means  
that spring is coming!"*



# MAKING OUTDOOR PLAY ENGAGING FOR BOMB



*"I want to be free to...  
release all my energy"*



*"Am I able to...  
run faster, climb higher,  
jump further?"*



*"We can be friends if...  
you are fun and cool"*



*"I feel safe because...  
I am stronger than you"*



*"Look there! It's a new...  
way to slide down that  
I have never tried!"*

# CONCEPTS

After exploring and refining the behaviors, preferences, and aspirations of each character, and translating them into different aspects of their play experiences, a series of concepts can be developed as an example of how these insights can be applied to existing urban spaces. These concepts aim to inspire designers, urban planners, and decision-makers in providing play opportunities for children who are currently not actively involved in outdoor play.

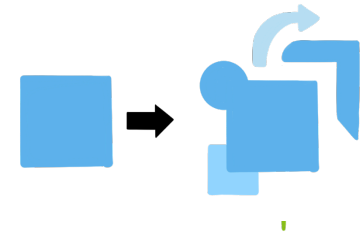
The following paragraphs illustrate the concepts for each character through a combination of visual and textual material.\* The concepts are presented with the following structure:

1. Concept: core idea, interaction qualities, and play attributes
2. Example of application of the concept in a real-life scenario
3. Example of integration of the concept in the urban landscape

*\*A more detailed explanation can be found in Appendix F.*

## OVERVIEW OF THE CONCEPTS

COMPOSE YOUR  
WORLD



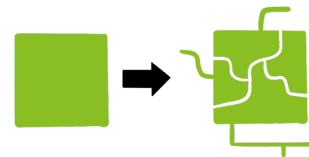
BETWEEN IN  
AND OUT



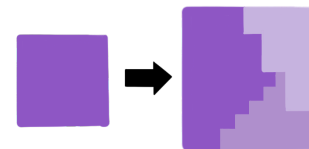
DIVIDE  
AND HIDE



A PATH TO  
EXPLORE

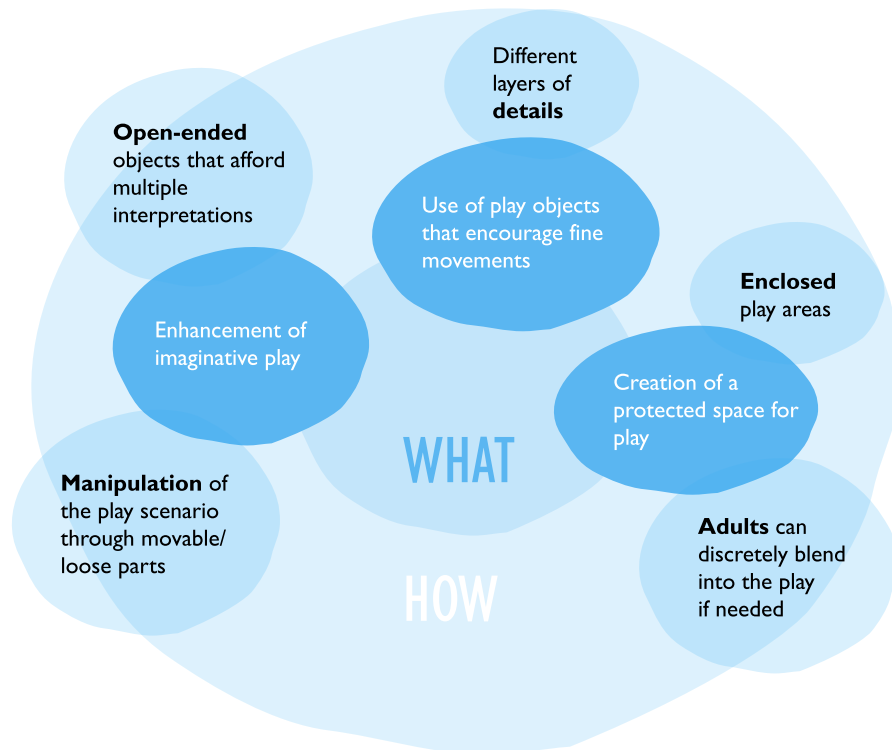
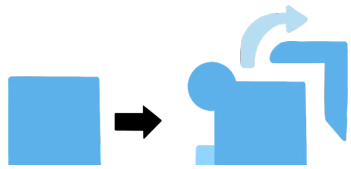


YES,  
YOU CAN



# COMPOSE YOUR WORLD

*Transformable design for open-ended play*



## INTERACTION QUALITIES

**Slow pace, self-expression, personalization**

## PLAY ATTRIBUTES

**Open-ended, constructive, non-competitive, protecting**

For Plush, ideal play areas empower their imaginative abilities by providing open-ended objects that can be manipulated and used in different ways. A space that accounts for the presence of parents and allows to create enclosed areas helps Plush feel secure and at ease. Small scale-details can be added to the playscape to foster the use of fine-motor skills.

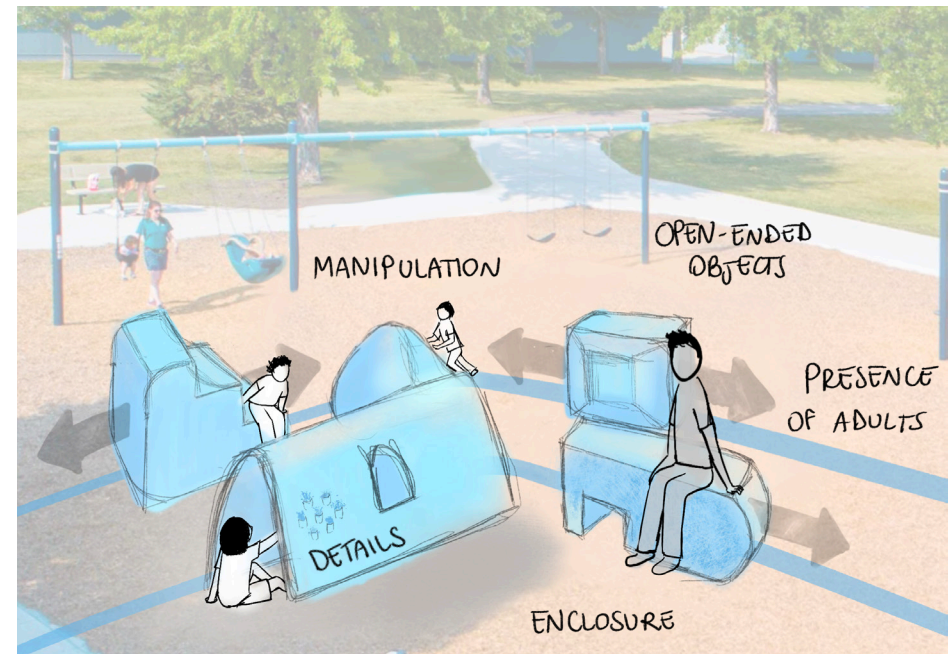
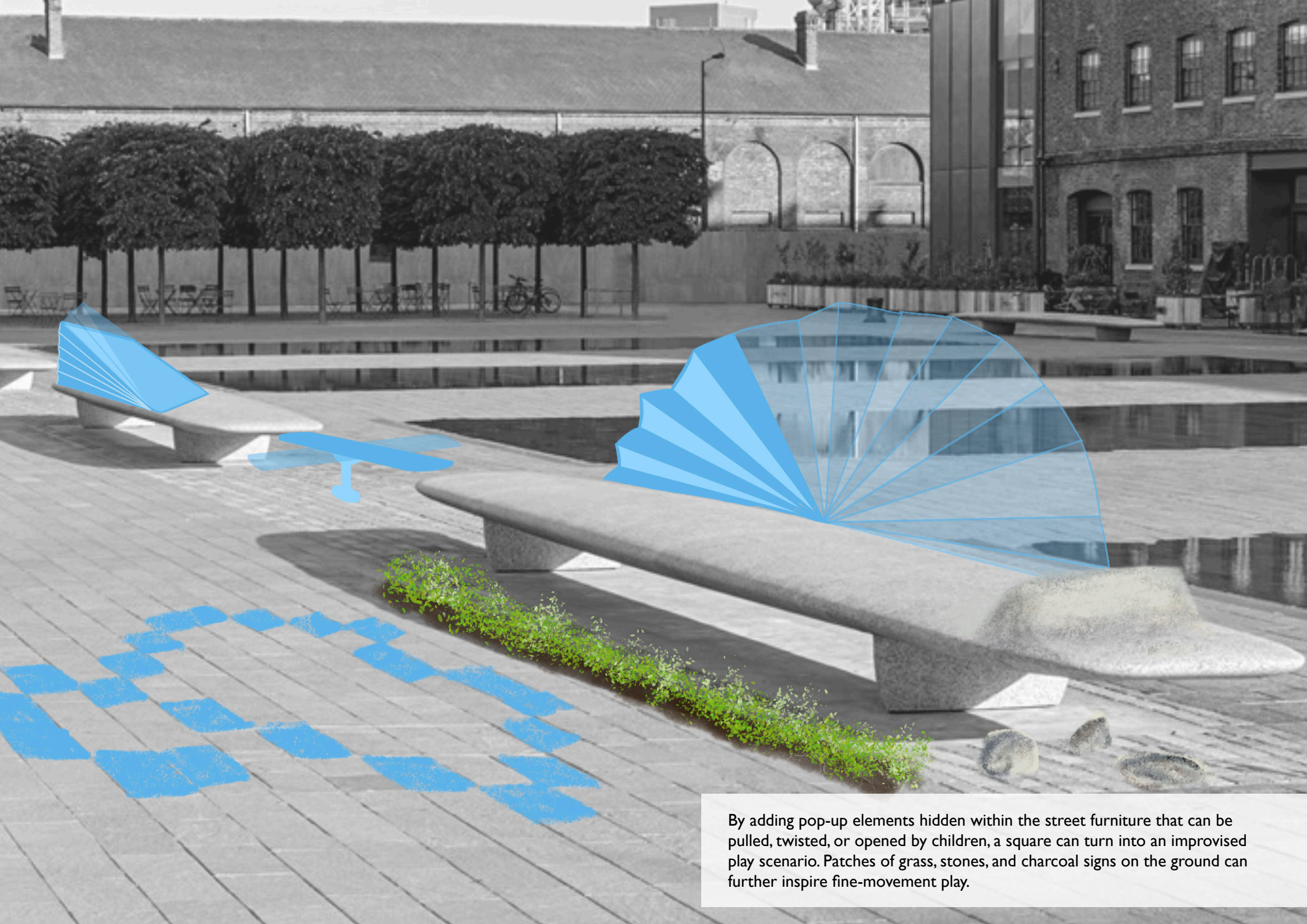
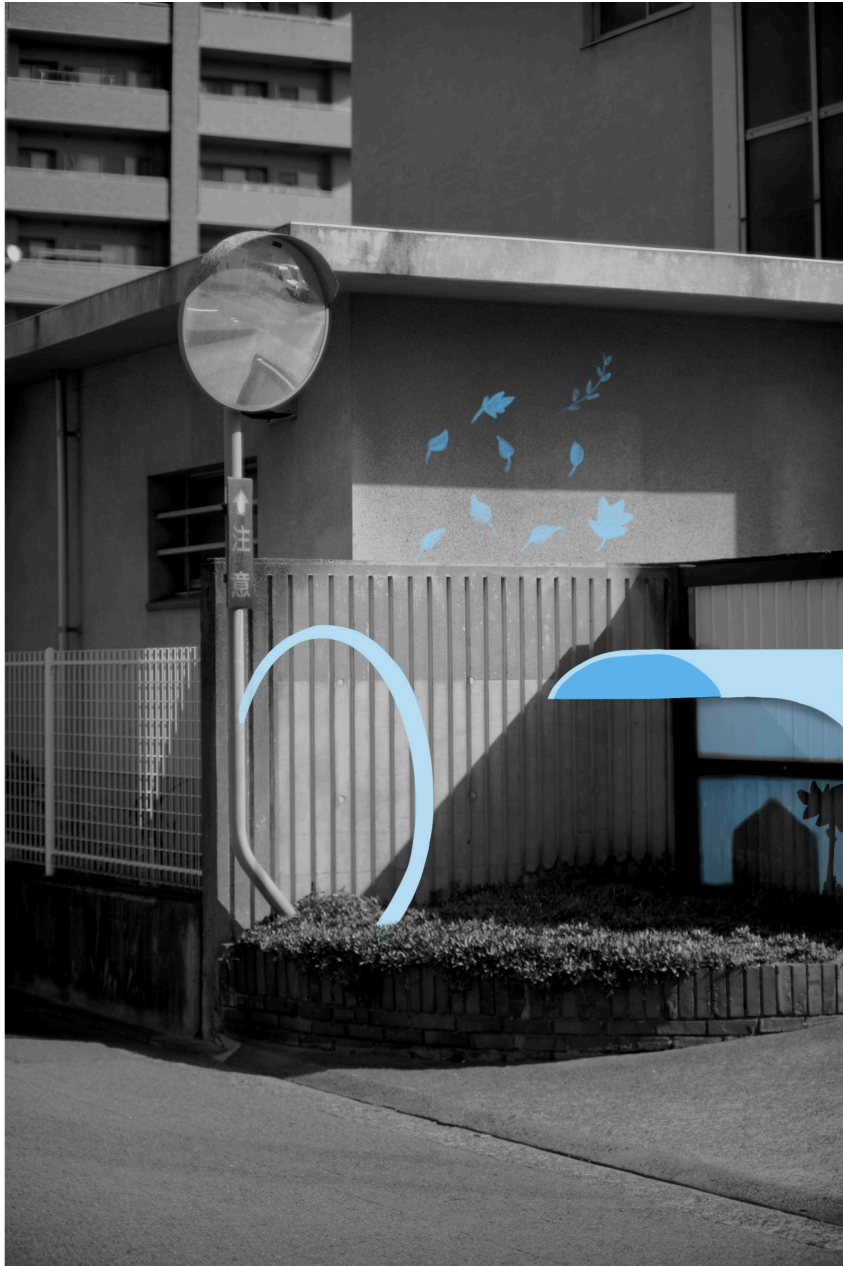


Figure 36: Representation of the interaction qualities and play attributes of the concept





By adding pop-up elements hidden within the street furniture that can be pulled, twisted, or opened by children, a square can turn into an improvised play scenario. Patches of grass, stones, and charcoal signs on the ground can further inspire fine-movement play.

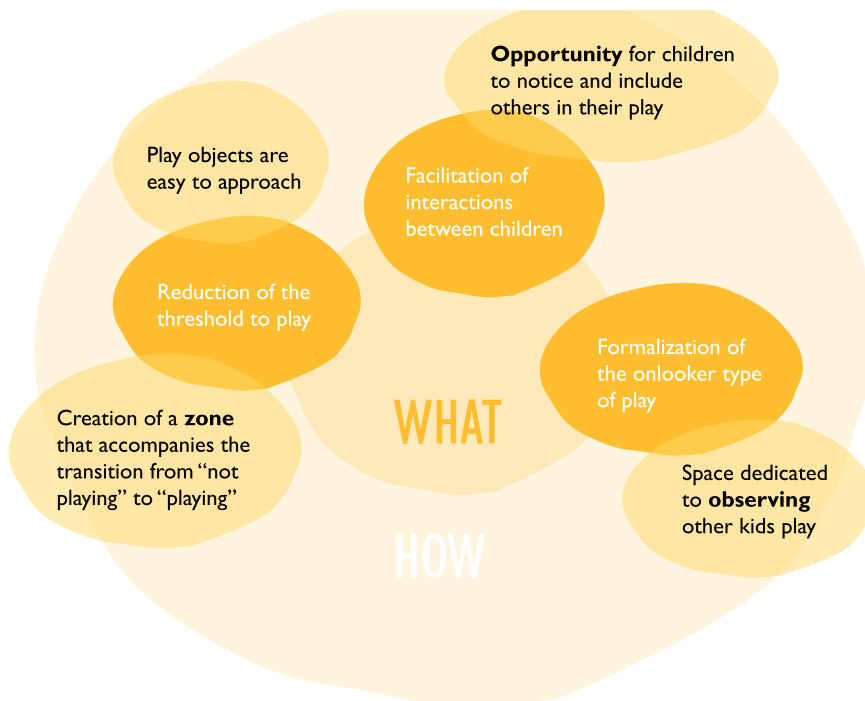


Design for outdoor play doesn't necessarily have to be limited to predefined play areas, but can permeate the entire urban space. Some street corners already contain elements such as reflecting surfaces, grass pavings, different textures, and sharp shadows, which can become appealing as play objects for children like Plush with the addition of small playful details.



# BETWEEN IN AND OUT

*Blurring the boundaries of play*



## INTERACTION QUALITIES

**Large-group socialization, observation, guidance**

## PLAY ATTRIBUTES

**Accompanying, inclusive, easy-to-start**

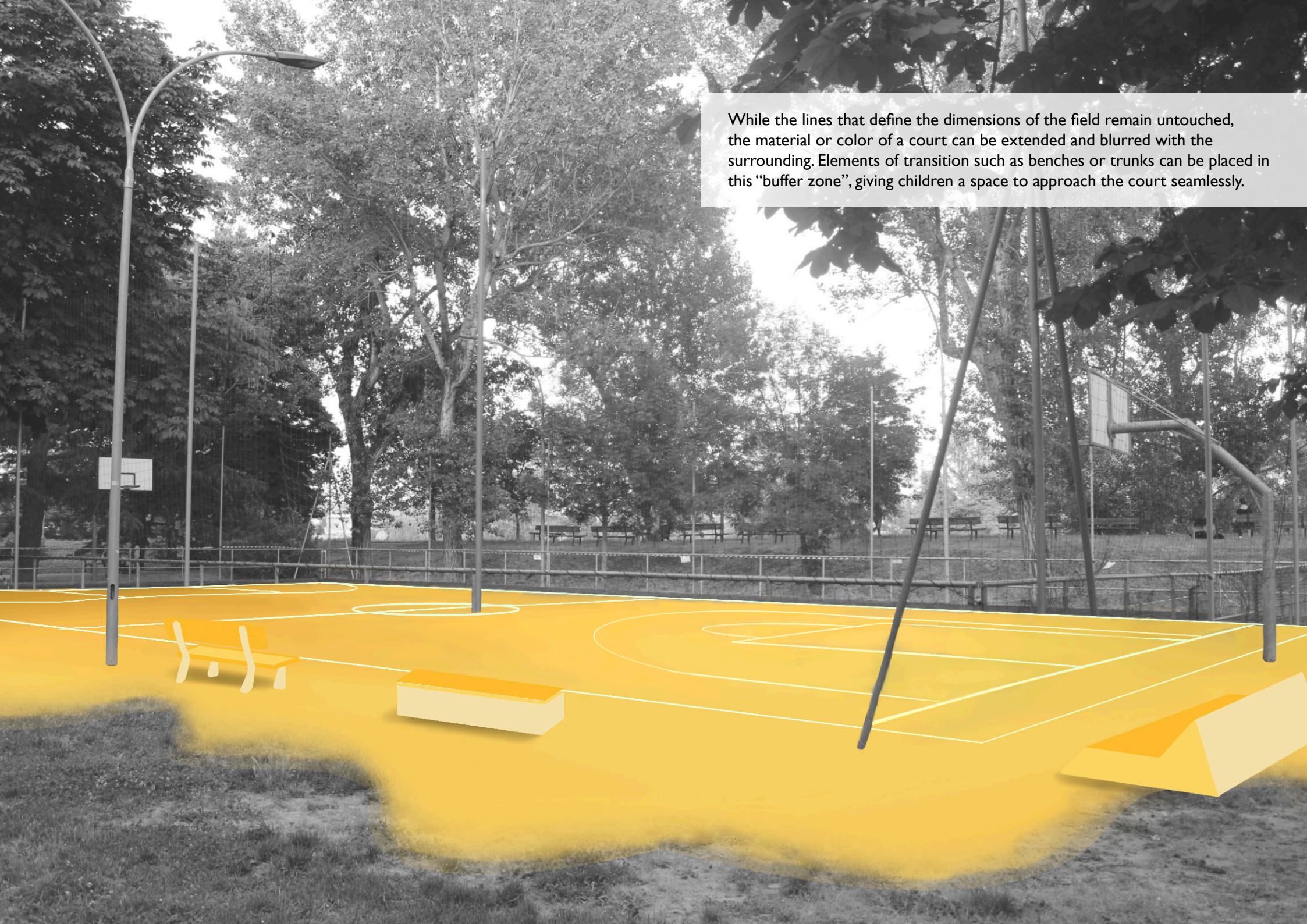
Cap's engagement in outdoor play can be facilitated by blurring the boundaries that divide play and non-play areas, creating a “buffer zone” between the two. This new intermediary space is characterized by elements and structures that support observing play and that empower children like Cap to smoothly approach the kids that are already playing.



Figure 37: Representation of the interaction qualities and play attributes of the concept



While the lines that define the dimensions of the field remain untouched, the material or color of a court can be extended and blurred with the surrounding. Elements of transition such as benches or trunks can be placed in this “buffer zone”, giving children a space to approach the court seamlessly.



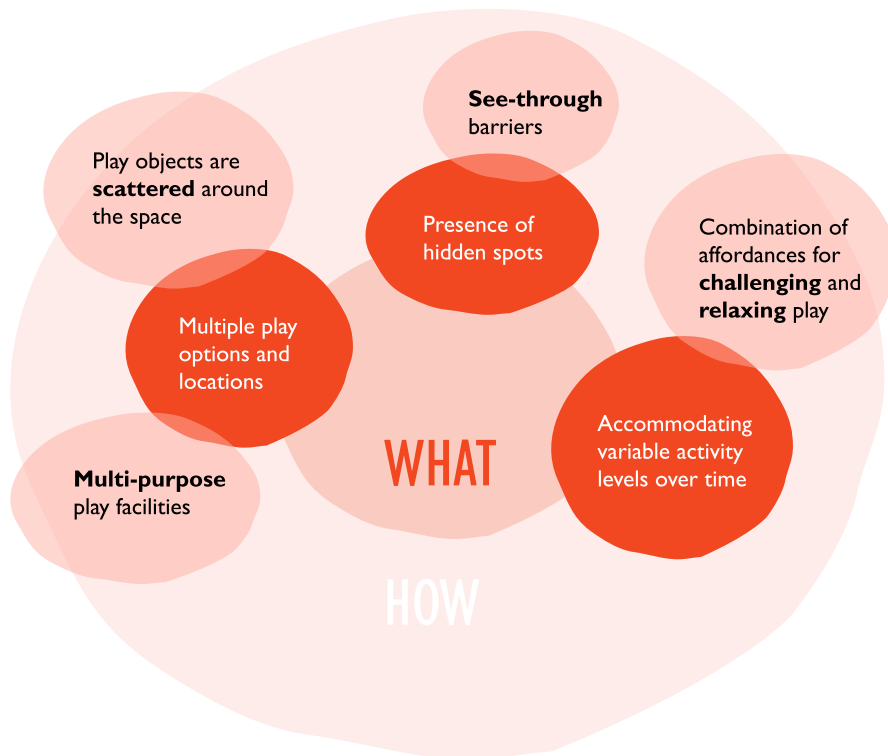




Urban spaces can encourage play on the way to specific spots. For children like Cap, hesitant to join ongoing activities, placing play objects near benches offers new opportunities: other children with more self-initiative might start to play around Cap, sparking their interest to join, or Cap might play independently as the objects are easily accessible.

# DIVIDE AND HIDE

*Scattered play areas for independent decision-making*



## INTERACTION QUALITIES

**Decision-making, small-group socialization, fast pace**

## PLAY ATTRIBUTES

**Competition, spying, multi-purpose, challenge, relax**

Scopy's ideal play environment offers multiple play options, scattered in different locations and semi-enclosed by subtle barriers such as bushes. This gives Scopy the chance to decide and direct the play as they wish. Both relaxing and physically challenging play facilities are present, and their design ensures that children are able to choose their preferred level of risk.

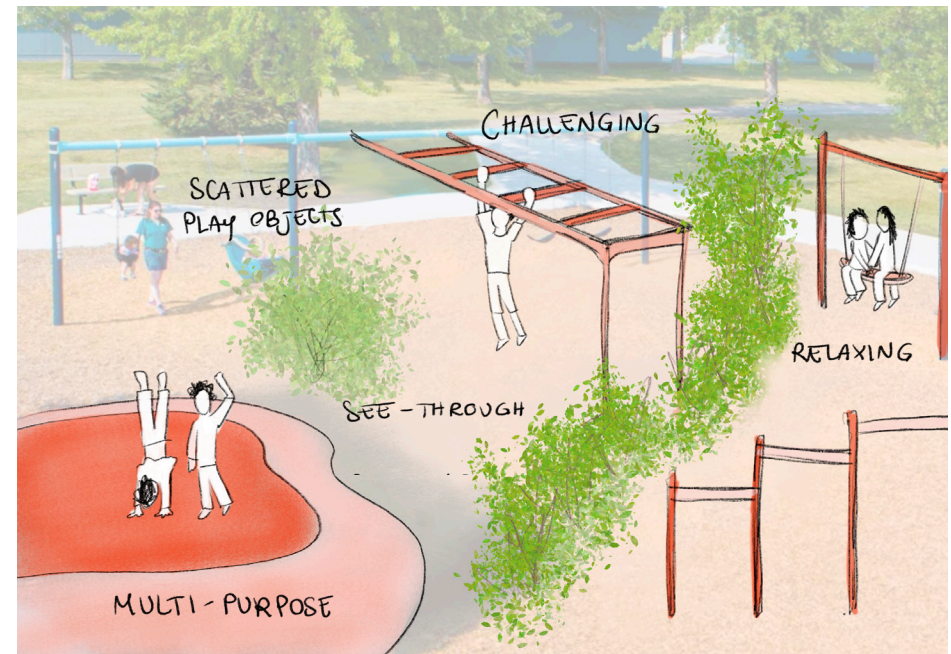


Figure 38: Representation of the interaction qualities and play attributes of the concept



Hidden play elements scattered around create a playful atmosphere without disrupting the surrounding environment. These play prompts offer semi-enclosed spaces where children can fully immerse themselves in play.



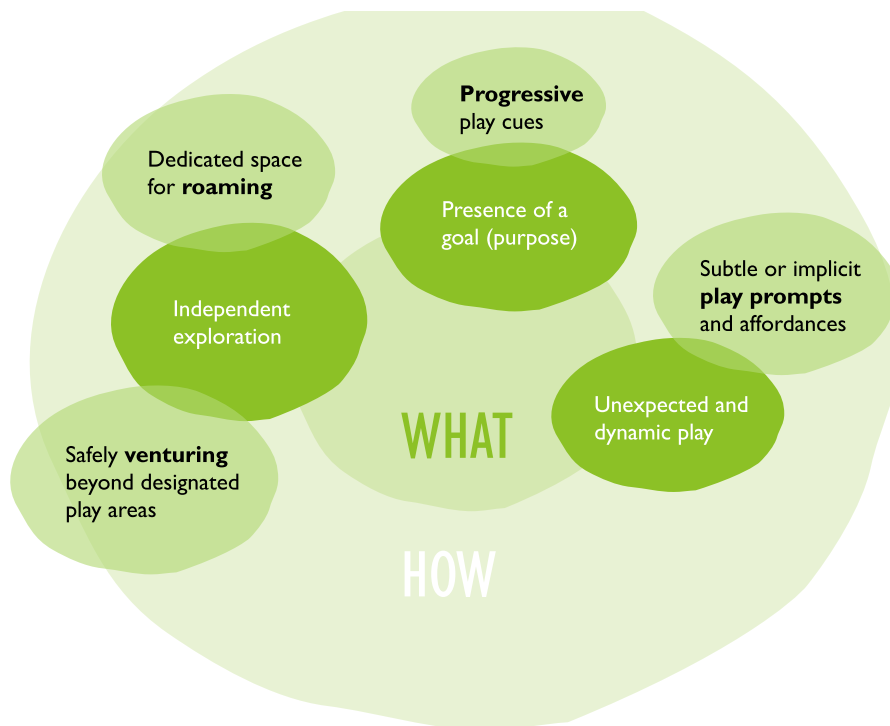
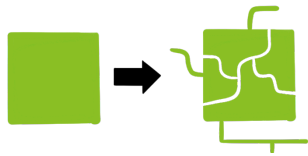




In urban areas where space is more exposed, there is still potential to create small enclosures that can be perceived as intimate and safe by the kids. These spaces can provide a sense of ownership and comfort for children like Scopy, allowing them to gain confidence and serving as a launching pad for play.

# A PATH TO EXPLORE

*Venturing outside the borders*



## INTERACTION QUALITIES

**Roaming, exploration, completing a mission**

## PLAY ATTRIBUTES

**Cooperative, adventurous, independent**

Rucksack's desire to independently venture in the neighborhood is translated into a child-friendly path that extends through the playground and beyond, crossing multiple points of interest where children typically gather. The path also contains subtle play prompts that add excitement to the experience and create a sense of purpose.

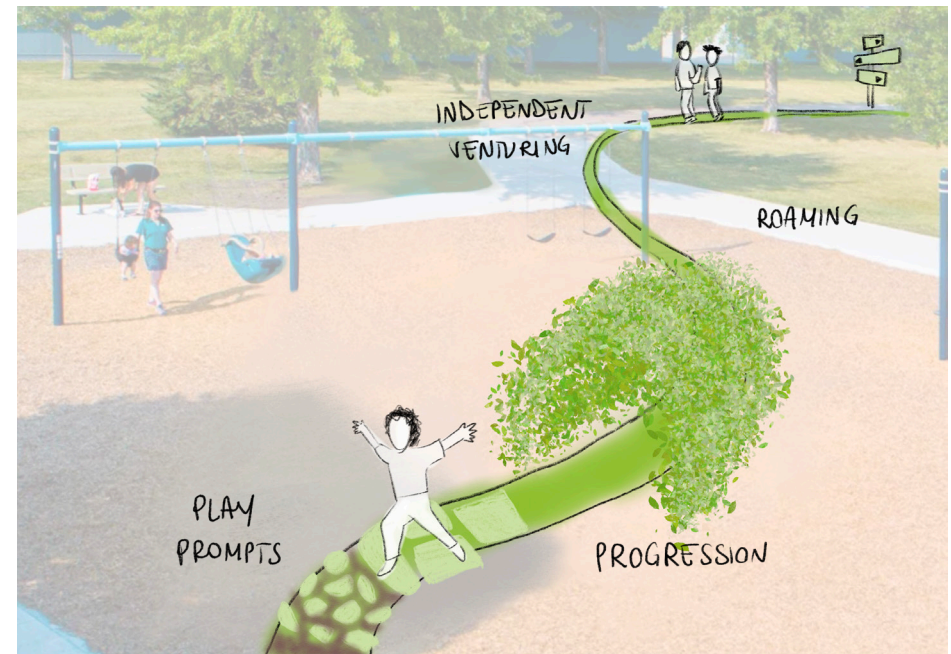
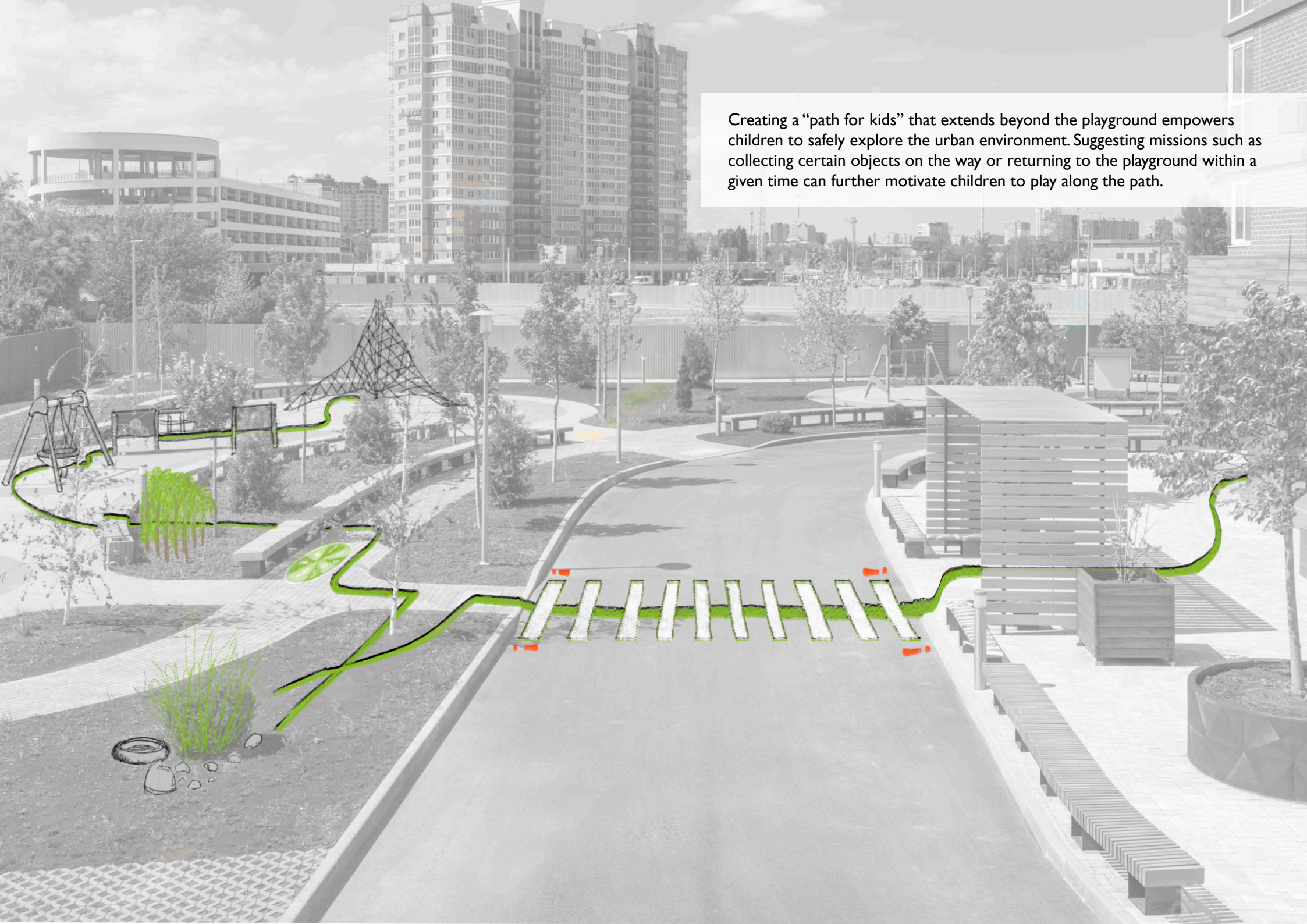
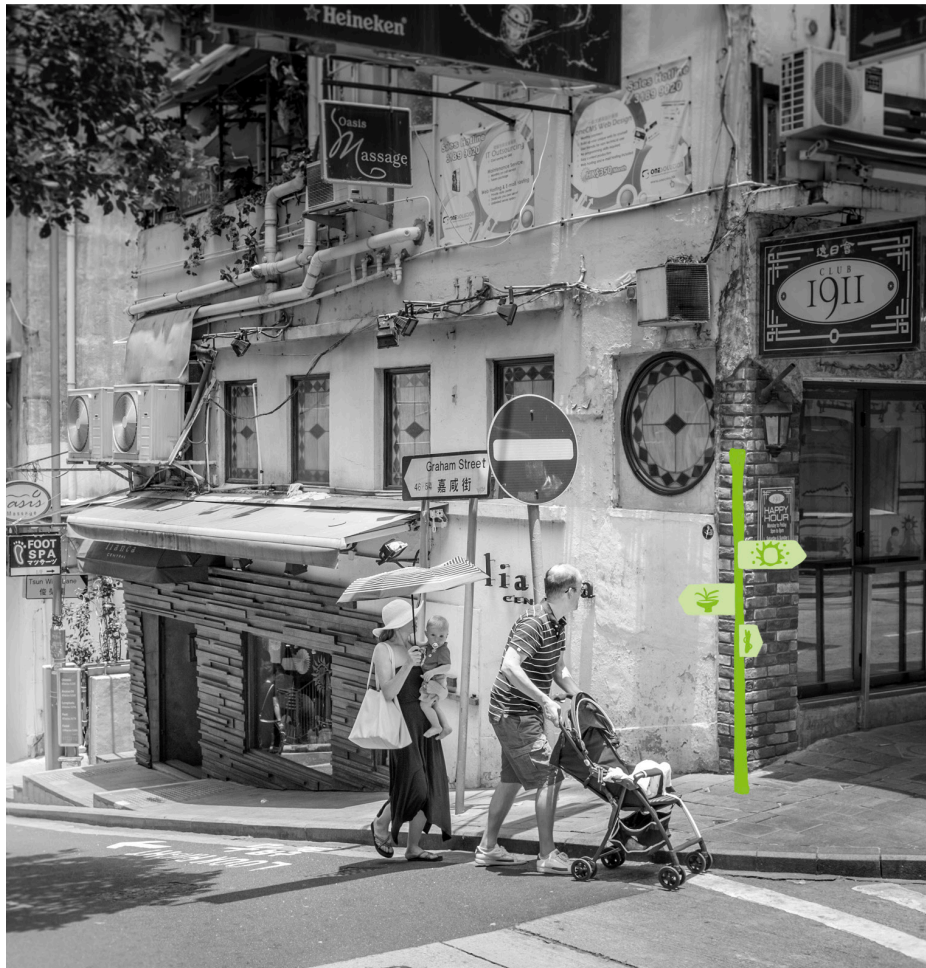


Figure 39: Representation of the interaction qualities and play attributes of the concept



Creating a “path for kids” that extends beyond the playground empowers children to safely explore the urban environment. Suggesting missions such as collecting certain objects on the way or returning to the playground within a given time can further motivate children to play along the path.



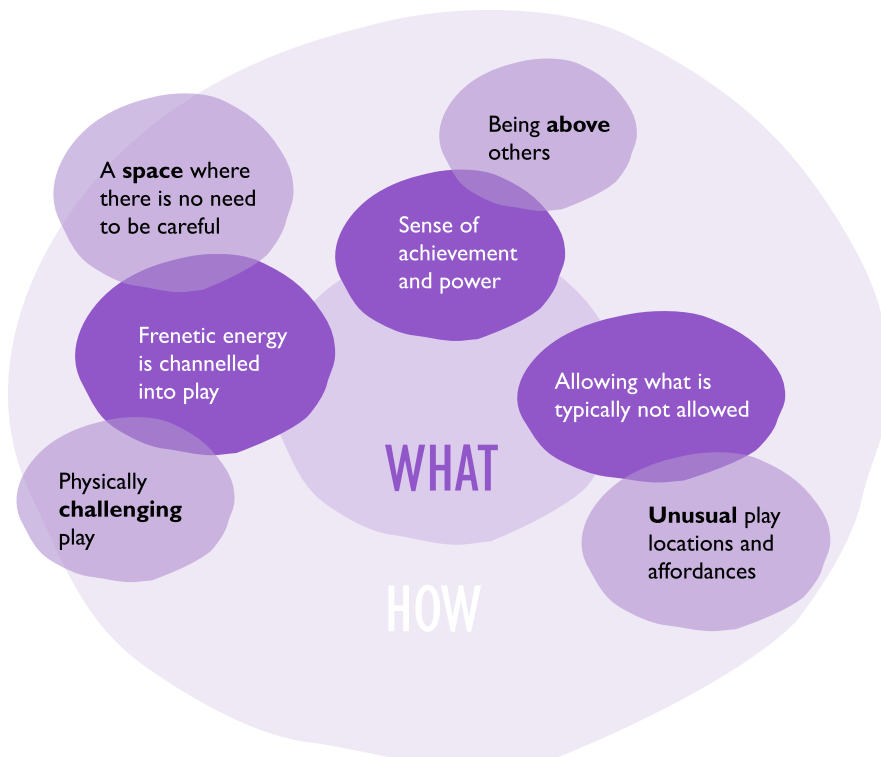
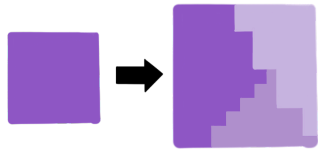


By introducing street signs designed specifically for children, they are invited to playfully engage with their surroundings. These signs not only encourage children to discover and locate secret elements of the city, but they show that even ordinary urban spaces can hide pockets of excitement and intrigue.



# YES, YOU CAN

*The thrill of risky play*



## INTERACTION QUALITIES

**Climbing, jumping, observing from the top**

## PLAY ATTRIBUTES

**Risk-taking, competitive, achievement**

Through active and competitive play, Bomb can freely liberate their boundless energy. An elevated platform can be designed to be difficult to reach, making it a exciting challenge for children like Bomb. Once on the top, Bomb doesn't need to worry about harming the other children around them, as only the older and stronger kids reach the platform.

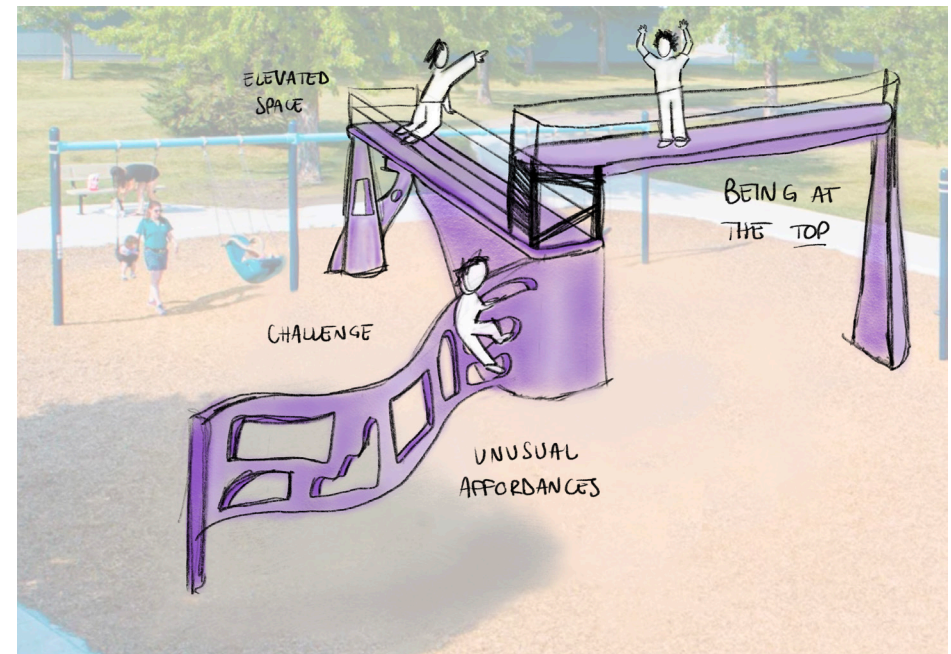
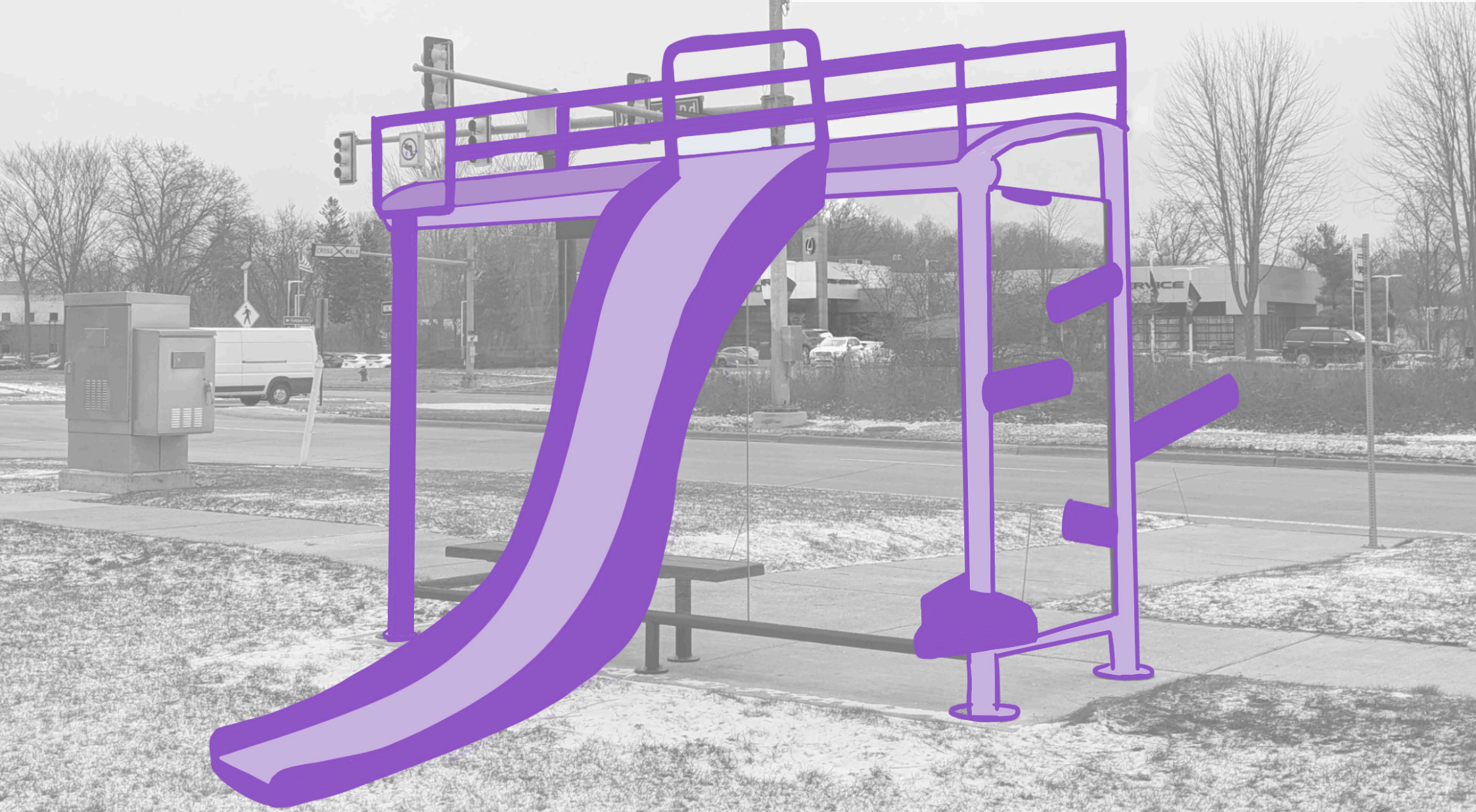


Figure 40: Representation of the interaction qualities and play attributes of the concept

Play structures can be integrated into existing elements of the urban environment. A bus stop can become an even more exciting play opportunity, as it is an object outside of the conventional domain of outdoor play and it is typically off-limits for climbing.







The built environment is filled with elements that hold the potential for playful experiences. However, concerns about safety and permission often hinder their utilization. By providing street objects with a subtle play prompt, such as a hanging rope, children are encouraged to play outdoors even in spaces that are not explicitly labelled as playgrounds.

# 08

# FINAL REFLECTIONS

## **In this chapter**

- 8.1. Contributions
- 8.2. Limitations
- 8.3. Experts' feedback
- 8.4. Future work
- 8.5. Conclusions



# CONTRIBUTIONS

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## TO ACADEMIA

This graduation project contains significant contributions to the academic field, especially within the research process that was employed. The research approach employed in this work adheres to the principles of human-centered design, but it applies them to a different user group than the one typically targeted by researchers. Instead of focusing on children who engage in outdoor play, this thesis project centers its attention on children who do not play outside. The aim is to draw inspiration from their needs and preferences rather than those of the current users of outdoor play facilities. Furthermore, these “non-users” are not treated as a singular target group; they are subject to further analysis and subdivision into various categories. This approach underscores that innovation doesn’t only arise from better aligning a product, service, or system with the present and future needs of its users. Instead, it can also emerge from examining who is excluded from its use and why. Another aspect to note about this project is that it offers an example of how to combine a psychological theoretical framework such as the Big Five personality model with the design research method of contextmapping. In fact, the model was embedded within the material created for the contextmapping sessions, but it did not constrain or influence the participants’ contributions. This allowed to both validate the fit of the Big Five model for the project, and also to use it for analyzing the results of the sessions. Furthermore, this approach made it possible to generate insights on how to apply and illustrate the Big Five theory in the domain of children’s outdoor play in a way that is meaningful, understandable, and usable by professionals in the field that are not familiar with psychological frameworks on personalities.

## TO THE INDUSTRY

The research process in this work has the peculiarity that the project’s domain (diversity in outdoor play) was not addressed directly from the beginning. In the initial research phases, the primary focus was on personality types. Only after, the findings from the personality analysis were applied to the context of outdoor play. In other words, instead of starting with observations of children who are actively playing, children’s personalities were examined independently of play, and only after, they were linked to the project’s domain. This reverse approach allows for the formulation of insights and design ideas that are not constrained or influenced by the existing designs of outdoor play facilities. Instead, it offers a fresh perspective to the field and leads to less conventional intuitions and “out of the box” concepts. Moreover, the output of this project is presented in a way that can be read and used by different stakeholders, offering both high-level insights and concrete inspirational material. The concepts illustrated in the booklet allow the reader to understand how to practically translate the framework into outdoor play designs while keeping a level of abstraction that empowers the reader to shape the ideas according to his/her specific context. In this sense, the output of the project intentionally overlooks any context-specific considerations such as local regulations, social and natural characteristics of the environment, climatic conditions, and spacial limitations, because these elements need to be addressed case-by-case by the designated professionals. However, knowing the opportunities and limitations offered by a particular context, the results of this project can inspire outdoor play stakeholders to incorporate different perspectives into their work.

# LIMITATIONS

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## **Contextmapping sessions**

In this work, the personalities of the children that don't play outside were identified based on the experiences of researchers and designers that work in close contact with kids, and were lately validated with real-life observations of children.

However, more research on the personalities of children who don't play outside is necessary to produce reliable and representative data. Specifically, the contextmapping sessions that were conducted in this project could include a higher number of participants, as well as involve from the start not only researchers but also the children themselves.

This was not possible in this graduation project due to the difficulty of recruiting such participants, and also due to the ethical and practical implications of including children in this phase of the research. Indeed, in case children are directly involved in the contextmapping sessions, the structure and materials would need to be adapted to allow children to comfortably express themselves in regards to their personalities and how these influence their play preferences.

As of now, the sessions included terminology and questions that are too abstract and complex for an 8-year-old to be discussed.

## **Observations and talks with children**

Due to time and privacy constraints, the interactions between the researcher and the children at the schools did not allow to dig deep into the children's behaviors and emotions during play. While the researcher got some insights into the kids' underlying motives in play, some of the conclusions that were derived from these insights were closer to "well-informed guesses" than accurate descriptions of the children's play preferences and needs.

To improve this, the researcher would need to spend a considerable amount of time getting to know the children personally, in order to deeply understand how their personalities translate into outdoor play.

## **Project audience**

The results of the project are collected and presented in a booklet that aims to reach and be used by a wide range of stakeholders in the domain of children's outdoor play. However, because of its versatility, the booklet does not always provide significant or comprehensive information to each stakeholder. Therefore, the project outcome could be further elaborated into different formats to suit the diverse needs of each stakeholder.

# EXPERTS' FEEDBACK

## INQUIRY

A digital version of the booklet was sent to several outdoor play stakeholders, accompanied by a polite request for feedback. While few basic details regarding the project were provided, the booklet was presented as a stand-alone item, with almost no explanation about its content. The following questions were prompted as a guide for the requested feedback:

1. *After reading the booklet, what thoughts, reflections, or ideas sparked in your mind?*
2. *Was there anything that you did not understand, or that you would want to know more about?*
3. *Which parts of the booklet are more meaningful to you, and why?*
4. *How would you use the booklet in your work?*
5. *Could this booklet be integrated into your current work process as it is?*

## FEEDBACK

### Works well

- The characters' descriptions resonate with stakeholders, that described the characters as relatable to some children they know.
- The differences among the five non-playing characters are recognised to be something new, as typically only few of them are considered when attempting to make outdoor play more inclusive.
- The content of the booklet provokes an impressive amount of reactions and stimulates stakeholders to reflect on their design process.

### To be improved

- Incorporating real quotes from children could offer deeper insight into their thoughts and emotions, fostering a stronger connection with their play experiences.
- Adding clearer classifications of play types, such as imaginative play or construction play, could provide a more precise understanding of the play experiences that the designs should supported.
- Mentioning the stages of a play experience the concepts refer to (invitation to play, exploration, etc.) would help readers to better contextualize the ideas.

## DISCUSSION

The feedback received from the six stakeholders was predominantly positive, acknowledging the booklet's inspirational value. The offered suggestions have the potential to significantly enhance the work's quality, and with further research and design efforts, their integration appears feasible. In certain instances, the feedback included inquiries about the characters' development process. While an additional page of clarification could be incorporated, explaining in details how the characters were identified and elaborated would not be interesting for all stakeholders, and would make the booklet more lengthy. Nonetheless, incorporating a link for those interested in delving deeper could be a good addition. Lastly, some stakeholders expressed concerns regarding safety regulations. While this aspect is intentionally excluded from the work, articulating this choice more explicitly could help stakeholders look beyond these details when reading the booklet.

# FUTURE WORK

As discussed in the limitations section of this report, there are several ways this thesis project could be expanded and improved. On one hand, involving children more directly could provide stronger insights and a wider range of ideas related to the characters. On the other hand, presenting the project's findings in different formats tailored to different audiences could enhance communication.

Looking ahead, there are potential paths for further development. One approach would involve applying the insights from the booklet in real-world situations and creating case studies to demonstrate the impact of using this project as a source of innovation for designing outdoor play spaces.

Another important area for future work is considering inclusive outdoor play from a service perspective. Encouraging children to play outdoors isn't just about designing play equipment and spaces; it also involves actions taken before they even go outside.

As discussed in the background section of this report, the challenges that prevent children from playing outdoors begin well before they leave their homes. Many children today don't view cities as places for play, and they often only go outside to play if their parents plan it for them. However, cities should and often do account for the presence of children. Therefore, there's a need to develop services that empower children to be aware of, access, and take ownership of their urban environments. Figure 41 offers an example of how to approach this direction.

Lastly, future work should focus on a more comprehensive level, understanding how to connect the various stakeholders involved in children's outdoor play. This field involves a wide range of individuals, including children, parents, caregivers, neighbors, designers, urban planners, schools, organizations promoting outdoor play, researchers, and more. These stakeholders use different language and communication methods, making it challenging to drive meaningful innovation. Even when intentions and knowledge are present, they're often scattered among stakeholders, along with decision-making power. To foster better involvement and collaboration, efforts are needed to bridge the gaps between these different groups.

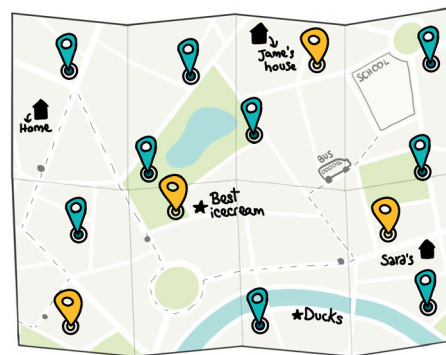


Figure 41: Kids' Neighborhood Map in which children, municipalities, and neighbors mark informal play places that could interest children. Each child in the neighborhood receives the map.



# CONCLUSIONS

At the start of this graduation project, a set of research questions were formulated:

1. HOW CAN CHILDREN'S PERSONALITIES BE DESCRIBED?

2. WHO ARE THE CHILDREN THAT DON'T PLAY OUTSIDE?

3. WHAT ARE THE PERSONALITY OF THESE KIDS?

4. HOW WOULD THEY WANT TO PLAY?

5. HOW CAN OUTDOOR PLAY STAKEHOLDERS DESIGN FOR THEM?

The initial research stages of the project yielded insights that effectively addressed the first two preliminary questions. These insights led to the identification of four distinct personality types (A, B, C, and D), which emerged from the analysis of the contextmapping sessions conducted at the end of the research phase of this project. However, it is important to note that the responses to the research questions developed within this work are not intended to be exhaustive or the sole definitive conclusions.

Rather than striving for a precise representation of reality, the research findings serve as a provocation for professionals engaged in designing children's outdoor play spaces. They prompt reflection on the factors contributing to the exclusion of some children from outdoor play and how play design can work with the concept of personality to foster inclusivity and engagement among all types of children.

The third research question was addressed by creating the five-character framework. The refinement of the framework extended beyond the content itself, including several iterations aimed at reaching an effective communication of the framework to the stakeholders. While the framework already partially tackles the fourth question, this is further elaborated through the development of outdoor play concepts for each one of the characters. These concepts serve as a bridge, connecting research findings on outdoor play, personality theory, and the preferences of children that don't currently play outdoors.

The conclusive research question is tackled by

presenting practical illustrations of how these concepts can seamlessly integrate into urban environments. These illustrations, alongside the previous outcomes, are showcased in an inspirational booklet.

The insights that emerged from this project seem to suggest that personality plays a significant role into children's motivations and attitudes towards outdoor play, although more research is needed to explore this.

In this project, gender differences among children were not considered neither emerged during the research. Although gender disparities were observed in the preferences of children playing outdoors, these differences don't directly relate to distinct personality types. Instead, they seem to reflect how personality is expressed differently depending on gender, likely due to the influence of societal examples and norms.

In conclusion, this project offers an alternative look on outdoor play, inspiring stakeholders to explore new design possibilities to engage a more diverse population of children in outdoor play.

09

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*10*

# APPENDIX

# IDE Master Graduation

## Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

### ! USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

### STUDENT DATA & MASTER PROGRAMME

Save this form according to the format "IDE Master Graduation Project Brief\_familyname\_firstname\_studentnumber\_dd-mm-yyyy". Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !



family name Magnano  
initials L. given name Lea  
student number \_\_\_\_\_  
street & no. \_\_\_\_\_  
zipcode & city \_\_\_\_\_  
country \_\_\_\_\_  
phone \_\_\_\_\_  
email \_\_\_\_\_

Your master programme (only select the options that apply to you):

IDE master(s): ☐ IPD ☒ Dfl ☐ SPD

2<sup>nd</sup> non-IDE master: \_\_\_\_\_

individual programme: - - (give date of approval)

honours programme: ☐ Honours Programme Master

specialisation / annotation: ☐ Medisign

☐ Tech. in Sustainable Design

☐ Entrepreneurship

### SUPERVISORY TEAM \*\*

Fill in the required data for the supervisory team members. Please check the instructions on the right !

\*\* chair Mathieu Gielen dept. / section: DCC

\*\* mentor Pieter Jan Stappers dept. / section: DCC

2<sup>nd</sup> mentor Marlies Bouman

organisation: Jantje Beton

city: Utrecht country: The Netherlands

comments (optional) Pieter Jan's experience in contextmapping and visualization can help structure my research and develop effective communication, while Mathieu's expertise in children's play can support and inspire my design direction

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..



Second mentor only applies in case the assignment is hosted by an external organisation.



Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

## Diversity in Outdoor Play

project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 08 - 03 - 2023

08 - 08 - 2023 end date

### INTRODUCTION \*\*

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

The Graduation Project: Diversity in Outdoor Play aims at investigating the inspirational impact of individual personality traits on outdoor play. The assignment originates from a collaboration between the Play Well Lab at TU Delft's Faculty of Industrial Design Engineering and Jantje Beton, a non-profit organization focused on promoting and researching outdoor play for children.

Outdoor play is a critical aspect of children's overall development, as it contributes to their physical, social, and emotional well-being (Herrington and Brussoni, 2015). However, there is a growing concern that children are spending less time playing outdoors, which Jantje Beton is working to address through its research initiatives. The decline in outdoor play can be attributed to several factors, including a shift towards indoor activities due to advancements in technology and the lack of safe, free, and diverse outdoor play spaces (Rixon et al., 2019). Moreover, not all children have equal access to outdoor play facilities, as only 27% of children over the age of nine who play outside are girls, while 73% are boys. This disparity has been attributed to various factors, such as parenting reasons and the design of play facilities based on wishes of boys more than of girls (Helleman, 2021).

However, to address this topic comprehensively and without biases, it may be more valuable to consider differences in children's behavior that go beyond gender. Research is needed to explore whether the root cause of these differences lies only in gender, or if there are other personal characteristics that have a direct impact on playing preferences. To this end, this project will explore the relationship between children's personality traits and outdoor play. The objective is to provide insightful and innovative design ideas to advance the field of outdoor play facilities and promote diversity and inclusion\*.

### NOTES

\*In the context of this thesis, the terms diversity and inclusion are used in relation to the cognitive, emotional, and behavioral differences that exist among children.

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space available for images / figures on next page

introduction (continued): space for images



image / figure 1: Children having fun in a playground



image / figure 2: Child engaging with the outdoors by drawing

**PROBLEM DEFINITION \*\***

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

The existing research on disparities among children who play outdoors has not yet produced a sufficient understanding of how to approach inclusivity in outdoor play. The decline in the amount of time children spend playing outside highlights the pressing need to create new outdoor facilities that encourage all children to play and engage with the outdoors, taking into account their unique differences. A fresh outlook, grounded in both stable and dynamic personality traits, might provide insights on the influence of these traits on children's attitudes and behaviors during outdoor play. This project aims to explore this hypothesis, to investigate whether such an approach could provide a more nuanced understanding of how to design outdoor play spaces that are more inclusive and appealing to a wider range of children. Once research has been conducted, the inspirational power of such outcomes should also be investigated, in terms of if and how the results of the project might provide valuable design directions in the work field.

**ASSIGNMENT \*\***

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... . In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

In this project, I plan to investigate the diversity of personality traits in children through a comprehensive review of existing models and theories in the literature, as well as through qualitative design research methods and expert consultation. This project will be addressing children within 6 and 12 years old, but the specific age group will be defined within the first weeks of research.

The objective of this thesis project is to establish a framework for generating concepts that leverage the unique needs and interests of children with diverse personalities, with the ultimate goal of encouraging outdoor play and exploration. The outcome of this project will be presented in the form of a "lookbook", which aim is to inspire the design of innovative outdoor play facilities that reflect the diverse personalities of children.

## PLANNING AND APPROACH \*\*

start date 8 - 3 - 2023 8 - 8 - 2023 end date

[illegible]

For my graduation project, I would like to answer the following research questions:

How can outdoor play be inclusive for children with different personalities?

- How do children's personality models inform their attitudes toward outdoor play?
- How can personality traits be translated into elements/characteristics of outdoor play?
- How can children's diverse personalities inspire the design of outdoor play facilities in the built environment?

My research plan involves two main phases: a first research phase and a design phase. In the first research phase, I will conduct an investigation into the relationship between children's personality types and outdoor play. For this, I will use a variety of research methods, including a literature review, consultation with experts in the field, and observation of children engaging in outdoor play. In addition, I plan to engage with stakeholders through design research methods such as context mapping, and to examine existing examples of diverse outdoor play facilities to gain insight into the design process behind them.

The results of this research phase will provide the foundation for the development of a framework or vision. Once the framework is developed, I will validate it with experts to ensure that it accurately reflects the current state of knowledge and best practices.

Following the validation of the framework, I will move into the design phase. Using the framework as a guide, I will generate innovative and radical concepts for outdoor play facilities that can inspire the field to create new ways for children to explore the outdoor environment.

## MOTIVATION AND PERSONAL AMBITIONS

As an advocate for an inclusive society, I am passionate about exploring how design can facilitate and celebrate diversity among individuals. I believe that play is a crucial component in nurturing a community that values and understands the diversity of personality types, and it is, therefore, important for children to have opportunities to express and develop their unique traits through play.

My academic career has consistently centered around diversity and inclusion. I currently work as a student assistant for the TU Delft Diversity & Inclusion Office and as an assistant and facilitator for the Diversity & Inclusion collective of the Industrial Design Engineering faculty, where I gained experience in dealing with the topic of diversity by balancing its complexity with a pragmatic approach. Moreover, during my studies in the field of Design for Interaction, I had the opportunity to explore and understand how to translate users' characteristics and needs into interaction qualities of products and services. I believe that this ability will lead me to generate authentic and relevant ideas for this project.

My personal connection to outdoor play comes from my experience as a Scout group member, where I was challenged to find new and diverse ways for young children to discover and connect with the environment. This experience prompted me to consider how to offer children opportunities to engage with the outdoors in a personalized and meaningful way, reflecting their unique strengths and interests. Now, after pursuing a design education, I am prepared to answer this question with more solid research and ideation methods.

Through this project, I hope to enhance my skills in translating relatively abstract ideas, such as 'Diversity' and 'Inclusion' into tangible design solutions that effectively capture the complexity and meaningfulness of these concepts. Indeed, I believe that a significant gap exists between how topics such as diversity and inclusion are discussed and addressed on a high level (where experts make great efforts into deeply identify, define, and describe current issues) and how these discussions are eventually implemented (where this depth gets often lost, and the design outcomes fail to translate the high-level insights into the everyday reality). I would like to intervene to fill this gap by finding a way to represent, visualize and communicate the results of my project so that they concretely inspire future designers without overly simplifying the research insights.

## FINAL COMMENTS



# Appendix A

## RESEARCH ON OUTDOOR PLAY: OBSERVATIONS

When the other kids leave some space, the girl became more confident and started to play away from her mum



When the boys are not playing with it anymore, the girl starts playing with the ball



An open plastic bottle containing water

Some kids want to play with it by kicking it and spilling the water on the ground

Other kids like to pour the water on the ground and then play with the water



She wants to "try things" that other kids are playing with (like remote controlled car) but she gets scared because it's too fast and aggressive

The girl doesn't interact much with the boys, she looks intimidated

Scared  
Fragile  
Needs reassurance  
Wants to stay away from the other kids, but still wants to feel part of the group



They try different play objects but leave after less than a minute because they don't find a fun way to play with them



One girl wants to play and she does it with her mum. She keeps switching between things because nothing is very fun

Two girls just want to find a place to sit to eat their ice cream and talk



When someone starts to use a play object, it becomes interesting





# RESEARCH ON OUTDOOR PLAY: EXPERTS' CONSULTATION

## M. (Architect and researcher at Speelplan)

### Playgrounds

"In schools is that the more green you have, the less bullying you have."

New trend: play with water --> flexibility.

Experimentation. They want to experiment. If there is something unexpected, it is definitely triggering

Municipalities work on a broader scope. More layout level.

For girls: It's about meeting each other more than playing --> social aspect.

For (older) boys: same, + football. But maybe if there was something more challenging for them, they would play more

Play facilities cannot be too open, otherwise they don't know what to do with them. For instance: a big rock, you can do different things but it's too abstract and not inviting for kids.

It is quite expensive to make your own play facility. You can do it, but you need to certify it. So normally you buy the facility from manufacturing companies.

The safety thing is very strict. There are many rules about this. This is especially for the Netherlands (a check-up is 500eur), but in other countries like Belgium it's much easier.

### How to work with children

We take 10 children between group 3 and 8. We walk around their playgrounds and ask them questions and observe them. We like to see, not only talk about play. When you are doing something, it's easier to talk about it. Also, observing is very important, because they won't tell you everything.

We make a scan of the play area so we know the area. We also consider the areas around, like forests. For children in more challenging and exciting to go there. Because the playgrounds offer very limited activities you can do with those facilities. For older kids (10-12), if there is good nature around they have more fun there.

Children can only say what they know already. Possibility to overcome this: present some picture and ask about those. You can inspire them to think.

Use cultural probes to see the kids' perspectives. See what they tell you about their day.

Kids (8 y.o) can put themselves in the shoes of other people. Like: we don't want to be mixed with very young or very old kids. Very young kids copy the bad language of older kids. They are also able to consider that you are blind, or in a wheelchair.

Don't use ultimate questions like "the worst" or "the best". Give them examples.

Conversations with multiple children & Get to talk about something they are comfortable about

### **A. (Educator, consultant)**

Start from the inclusion: what does inclusion, diversity, and equity mean for me? Ethics!

9 SCHEMAS (Kathy Brodie)

The outdoor as an extension of the indoor

Risky play

Use of informal (loose parts)

Look at the space, not only objects. Mountains.

Two thinking routines:

Parts, People, Interactions

Parts, Purposes, Complexity

Think on how to expand the space and the target (by having loose parts!)

Sensorial development

Forest schools

Reggio Emilia approach

### **G. (urban planner)**

Design professionals are obsessed with aesthetics and safety.

We need human-centered approach!

Free play --> guided play --> games --> instructions

PLACES FOR CHILDREN

SPACES FOR CHILDREN

CHILDREN'S PLACES (not given by adults!)

Importance of risky play

To play, children need to feel comfortable

Constructed play vs Natural play --> dynamism

### **J. (Day-care worker)**

"Even if they have a lot of options, they are going to play what they see someone else is doing, or what I tell them to do"

"Different personalities playing together doesn't come as easy, but it could be fun. For example, for more active and extraverted kids to explain games to others"

"Some kids are 'caretakers', they like helping others and sharing"

"Some kids are good at playing alone, others can't. Some kids make friends with everyone, others have their few friends and only play with them"

"For some kids it's harder to tell what they want to do"

"After they get older, the friendship becomes more important than the type of play"

"When they choose their friends, they want to find someone that likes to play in a similar way"

"If you look closely enough, everything is interesting"

"Kids are looking for stimuli all the time. They need to experience a lot"

"It used to be that noticing something unusual was already valuable, but now it's different, kids are used to constant, very strong stimuli from screens"

### **R. (PhD candidate, architect)**

Children perspective is missing. Researchers look at the urban perspective, they talk to parents and municipalities, but no one talks to the kids. About age division of children: after 11 y.o., they are more independent and can go out by themselves in different parts of the city. This gives them access to a much wider range of activities and it's easier to find something to do. So focusing on younger children might be more relevant.

## **M. (Designer and researcher at Jantje Beton)**

Age division: 4 to 6, 7 to 10, and 11 to 12.

Even for an inclusive playground, if there is no kids there, nobody wants to go.

About separation of playground zones: in schools you have some places behind the bushes, where you have more peace.

Older children: they are bored more easily. Younger children: they don't have a place where they can play

How to think of nature: compare it to the artificial element. And think of the safety. Example: Tiles. If you put a gutter in it, you add a dynamic point to a static object.

If you design something that you can make yourself as a city or school, you bypass the play facility companies

Durability is an important factor. Vandalism and overview of teachers. But the playgrounds become boring. One of the things we often advise is to add nature and make it more exciting.

A lot of new people that make playgrounds are inspired by other playgrounds.

It's nice if you can copy paste things. But it's also nice to make it more personal, specific to the context

Three steps in children interviews:

1. Assess the situation of the playground with children interviews. Ask why.

2. How could it be. Try to find what's missing. But kids tend to stay with what they know

3. Dream of what they want

Biggest challenge: go beyond play OBJECTS. We would like to hear more of their underlying value. Get verbs instead of objects.

Teachers tend to send extraverted kids. So then we mostly focus on those.

But we ask kids to imagine what other kids that are different than them would want.

Most kids are quite creative. They don't use the play equipment as it should be used. Example: table tennis that becomes a fort. But if it is in their own neighbourhood, they tend to be less "creative" in how they play. (Maybe it's about comfort?)

Some objects can only be used by one kid at a time. Open-end play equipment are more suitable for bigger group, but you can make a combination.

Loose parts play project: they give kids open ended objects to play with. The

challenge would be to transform loose parts into permanent objects. Nature knows how to do that. Or, play object that you can add to. Like locks on bridges.

Latest big program is called healthy neighbourhoods. Nature, play, meet. It's not only about the kids. It's also about other people, so that parents have more reasons to bring kids outside.

Go visit diverse playgrounds, like The speeldernis (rotterdam), nature playground (delft), sport playgrounds. What kinds of kids go to which playground?

About openness of play: It should be so intuitive that they immediately know what to do with it.

Don't make them draw. They will just draw what they are good at drawing.

Difference between play types and personalities

# RESEARCH ON OUTDOOR PLAY: LITERATURE REVIEW

When examining outdoor play, researchers consistently emphasize the crucial role of risk in children's learning and development. This aspect is often discussed within the context of critiquing contemporary society, which is argued to neglect the importance of risk in children's play. With safety being the central point of attention in the discussions and decisions regarding play facilities, society often underestimates what children are capable of, creating an environment that hinders their ability to learn through firsthand experiences and develop essential skills through facing risk in play (Bento & Dias, 2017). In the same paper, the authors argue that the presence of risk in play allows children to experience moments of failure and success, introducing an element of challenge that makes playing more exciting. In addition to this, Herrington et al. make a distinction between challenges and hazards in play. They describe hazards as potential causes of harm that may not be immediately apparent to children, while challenges are defined as identifiable and assessable, allowing children to decide whether and how to engage with them (Herrington et al., 2015). Gerben Helleman, in his blog *Urban Springtime*, talks about the challenge as an essential element to make a space appealing for children. He explains by encountering an adequate level of challenge during their play, children engage in it more for a longer time (Helleman, 2018).

Another theme that appears in the literature on outdoor play is one of socialization. Altarriba et al. affirm that a fundamental aspect of outdoor play is that it supports social accordances. They highlight that this is extremely important for the new generations of children, who lack meaningful connections and often spend a considerable amount of their free time alone (Altarriba et al., 2022). Regarding the specific types of socialization that occur among children during outdoor play, Herrington et al. observed in their research that the interactions happening in the context of outdoor play are less conflicting, while cooperative behaviors where children learn from their peers are enhanced (Herrington et al., 2015). This element is also of particular interest for this thesis work because it appears to be a significant as well as critical topic for the age group considered for the project (8 to 11 years old). Indeed, experts explain that the age of 8-12 years old is characterized by an increase in the concerns children have about the opinions that their peers

have about them. This is the age when they start worrying about fitting in, and become more selective in terms of friendships (Acuff & Reiher, 1997). This makes it clear that in designing for play when the target is pre-teens, the aspect of socialization needs to be intentionally addressed by the designer: the space and play objects need to afford a type of interaction that takes into account the complexity of socialization dynamics for this age group. In one of the interviews conducted during this thesis work, an architect from Speelplan (a consultancy specializing in outdoor play design) explained that for older children, going out together is about meeting each other than playing something. In this sense, socialization becomes more of a motivation, rather than an outcome of play. During another interview with an after-school educator, the interviewee mentioned having observed a change in the significance of friendship in relation to play through the evolution of children's dynamics. The phenomenon that was observed is that while younger children form their friendships as a consequence of their play preferences (I like playing "family", you like it too, hence we can be friends), as children get older, being friends becomes more important than the type of play (you are my friend, hence we play together). This suggests that in the case of pre-teens, providing children with opportunities for socialization that take into consideration this complexity is necessary to create an environment in which they will be willing to engage with play.

Some researchers have tried to understand which aspects make play more attractive for children by comparing their play engagement in different types of outdoor areas and environments. For example, Herrington et al. discussed the differences in play that takes place in natural settings and equipment-based playgrounds. In their work, they observed that natural play spaces better afforded unstructured play, allowing children to explore and use natural elements in their preferred ways (climbing, jumping, sitting, etc.). Instead, equipment-based play spaces like KFC (Kit, Fence, and Carpet) playgrounds, provided a more restricting set of alternatives for play, leaving children with limited a choice for play. This resulted in lower engagement levels compared to natural play areas, as the prompted play behaviors were not fitting the desires of all children (Herrington et al., 2015). Even within the context of natural play

spaces, researchers observed some differences in children's perception of play according to the type of activities they are doing. For instance, Skår & Krogh conducted a research study in the context of the "Let's Go Out Days", in which they observed and interviewed children during an outdoor camp event for families. The program consisted of different play activities, both planned and not. The researchers noticed that during most of the organized play time, children's play behaviors and experiences could have been the same regardless of location: nature was functioning more as a frame for the play, rather than being part of it. Children were in nature but did not really interact with it. Instead, when children were left free to play, nature functioned as an activity in itself (such as, for example, climbing a rock), rather than simply being in the background. Moreover, children seemed to find free play more immersive and enjoyable than organized play. During the camp days, Skår & Krogh mentioned observing parents trying to convince their children to stop their play because a new activity was starting. Once, after children were provided with wood to carve by the organizers of the camp, the researchers heard a 7-year-old girl ask her mother: "May I please go and play now?" (Skår & Krogh, 2009).

Overall, the literature seems to indicate that when children are given the chance to interact with the environment freely, given that the environment is sufficiently varied and open-ended (as in natural play spaces), the play results are far more engaging and rich in experiential qualities. This suggests that the presence of elements of novelty and variety in the environment, as well as giving children the freedom to play in their own way, are aspects that strongly relate to the degree of engagement in play.

Regarding the concept of variable play space, Herrington et al. conducted a study to compare play behaviors and peer relationships of children on two playground designs, which were distracted by having different degrees of variety. The first playground, labeled Playground A, featured equipment primarily oriented towards exercise, with limited space for other forms of play. It had minimal loose parts, with only a ball available for play in the adjacent sports field. In contrast, Playground B offered a more diverse range of active play options and was designed to accommodate various activities. It included multiple loose parts such as blocks, planks, and tires, providing children with a wider range of affordances for play and exploration. Children that participated in the study were selected to encompass different levels of physical competence, from high physical abilities to very low. The research

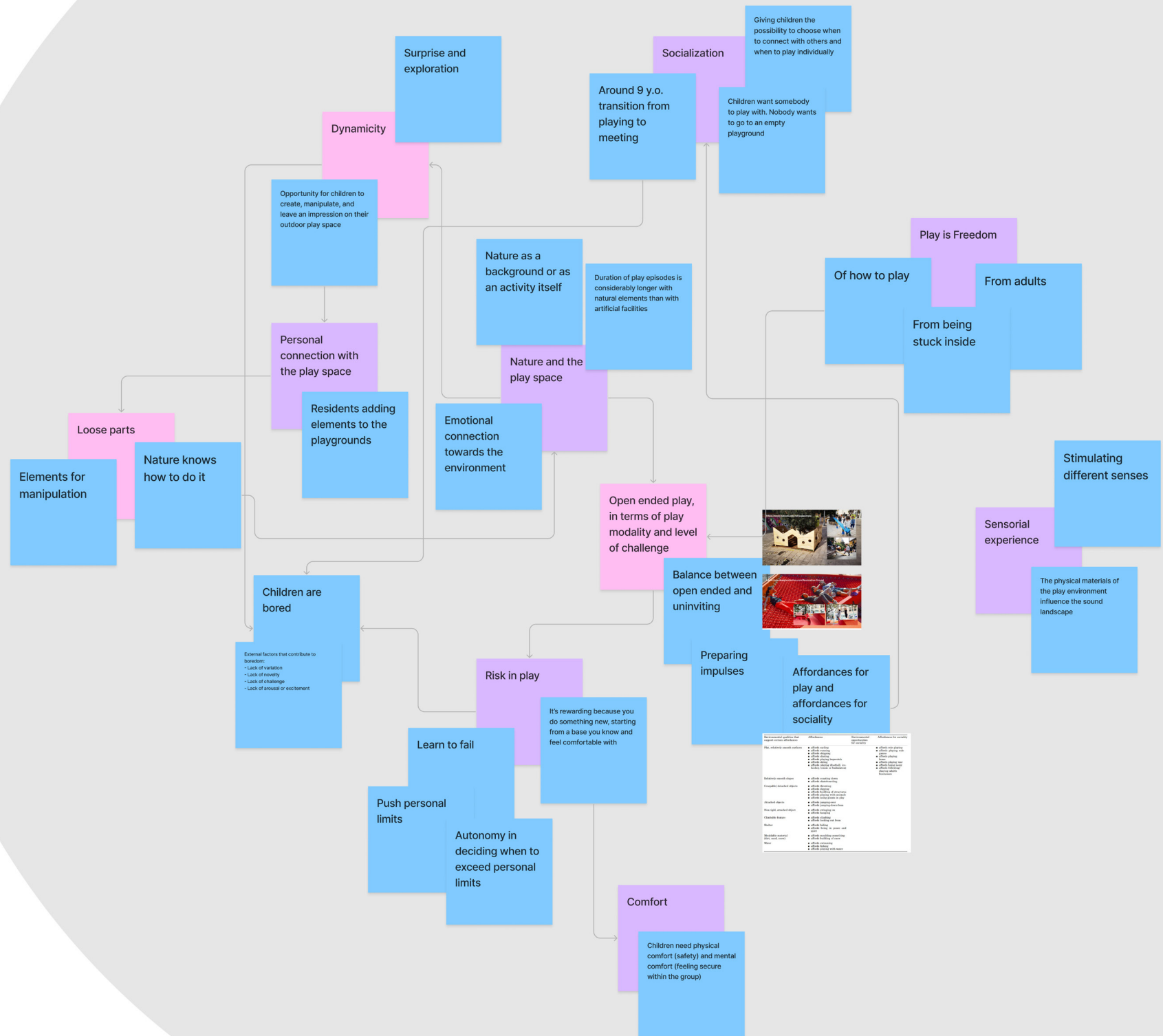
findings revealed that in playground A, children with low physical competence were not able to engage in the play, due to their lack in physical abilities. Moreover, the restricted play options in Playground A resulted in increased segregation among children based on their physical competence. In contrast, Playground B, with its abundant play affordances, fostered a more inclusive and less segregated play environment (Herrington et al., 2015). This example highlights the influence that play design has on children's dynamics that extend even beyond localized play behaviors. Although the study focused on physical abilities, the same logic could be applied to other types of ability (for instance: imaginative, cognitive, social, etc.), leading to the insight that a lack of variety in play design can result in children being excluded and experiencing discomfort during play.

Variety is also a strategy to escape children's boredom, as kids can choose among several play options which one suits them best at a given moment. Moreover, they can switch play objects over time and therefore they are more likely to stay engaged in the play for longer. This is an extremely important point in playground design because as mentioned in the introduction to this thesis work, the most significant barrier for children to play outside consists in the fact that they find play areas boring (Jantje Beton & Kantar Public, 2018). As mentioned earlier in this chapter, introducing a higher degree of challenge can represent a way to address this issue. Nevertheless, challenges without variations would lead to repetitive play behaviors over time. Introducing a form of variety, instead, could further push the potential of children's long-term engagement in play, as well as make play more inclusive.

Last but not least, one more element emerged as essential for children's play to take place: safety. This might appear, at first glance, in contrast with the argumentations that were brought forward in this thesis work. However, this point does not contradict other previously mentioned concepts, such as freedom or challenge, that also represent important aspects of children's play. In this case, the term safety is not referred to the elimination of potential risks, nor to the perception that parents have of the play environment. The notion of safety expressed in this paragraph is to be intended as a feeling of comfort and confidence that children need to have in order to engage in play. When children play, they enter a world of imagination where they can momentarily forget about their surroundings. However, for them to fully immerse themselves in play, they need to feel safe and free from anything that might make them too self-conscious or worried.



# INSIGHTS MAP



# Appendix B

## CONTEXT MAPPING SESSIONS: CONSENT FORM

### Informed Consent Form

You are being invited to participate in a research study titled Diversity in Outdoor Play. This study is being done by Lea Magnano from the TU Delft, as part of her MSc Graduation Project in Industrial Design Engineering.

The purpose of this research study is to investigate the relation between personality traits and attitudes toward outdoor play. Participants will be asked to share and discuss personal experiences and ideas related to children's personalities and how these affect their behaviour outdoors. The study will take you approximately 1 hour to complete.

During the session, data such as pictures and audio recording will be collected. Data will be processed anonymously, and any identifiable information will be anonymized. The raw data will only be accessible by the research team, while the results derived from the data might be included in the final thesis report, that will be published in the TU Delft Repository. Your participation in this study is entirely voluntary and you can withdraw at any time. You are free to omit any questions. No financial compensation will be provided for your participation in this research.

If you agree to participate in the study, please sign below to acknowledge that you have read the provided information about the research and understand the nature of your participation.

| PLEASE TICK THE APPROPRIATE BOXES                                                                                                                                                                                                      | Yes                      | No                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|
| <b>A: GENERAL AGREEMENT – RESEARCH GOALS, PARTICIPANT TASKS AND VOLUNTARY PARTICIPATION</b>                                                                                                                                            |                          |                          |
| 1. I have read and understood the study information, or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.                                              | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.                                        | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. I understand that taking part in the study involves:<br>- Sharing opinions, ideas, and memories with others<br>- Use the provided materials to envision different scenarios                                                         | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. I understand that there will be no financial compensation for the study                                                                                                                                                             | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. I understand that the study will end in approx. 1 hour                                                                                                                                                                              | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>B: POTENTIAL RISKS OF PARTICIPATING (INCLUDING DATA PROTECTION)</b>                                                                                                                                                                 |                          |                          |
| 6. I understand that the following steps will be taken to protect my identity:<br>- Raw data such as pictures and recordings will be deleted at the end of the project<br>- All data collected will be anonymized in the thesis report | <input type="checkbox"/> | <input type="checkbox"/> |

| PLEASE TICK THE APPROPRIATE BOXES                                                                                                                                                                                                            | Yes                      | No                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|
| 7. I understand that taking part in the study also involves collecting specific personally identifiable information (PII) and associated personally identifiable research data (PIRD) with the potential risk of my identity being revealed. | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. I understand that personal information collected about me that can identify me, such as your name, will only be accessible by the researcher.                                                                                             | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. I understand that the (identifiable) personal data I provide will be destroyed at the end of the project.                                                                                                                                | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>C: RESEARCH PUBLICATION, DISSEMINATION AND APPLICATION</b>                                                                                                                                                                                |                          |                          |
| 11. I understand that after the research study the de-identified information I provide will be used for academic publication(s).                                                                                                             | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. I agree that my responses, views or other input can be quoted anonymously in research outputs                                                                                                                                            | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>D: (LONGTERM) DATA STORAGE, ACCESS AND REUSE</b>                                                                                                                                                                                          |                          |                          |
| 13. I give permission for the de-identified data that I provide to be archived in the 4TU Delft Data Repository so it can be used for future research and learning.                                                                          | <input type="checkbox"/> | <input type="checkbox"/> |

#### Signatures

\_\_\_\_\_  
Name of participant [printed]      Signature      Date

I, as researcher, have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

\_\_\_\_\_  
Researcher name [printed]      Signature      Date

Study contact details for further information: Lea Magnano, L.Magnano@student.tudelft.nl

# Appendix C

## CONTEXTMAPPING SESSIONS: RESULTS FROM THE SENSITIZING BOOKLETS

PI ← Participant's code

PART 1

How would you describe your personality?

MARK THE WORDS THAT REPRESENT YOU THE MOST  
Feel free to add more, if you'd like to!

|           |             |                       |
|-----------|-------------|-----------------------|
| ENERGETIC | ORGANIZED   | NERVOUS               |
| RESERVED  | CONSISTENT  | QUIET                 |
| CRITICAL  | RATIONAL    | COOPERATIVE           |
| EMOTIONAL | COMPETITIVE | EXTRAVAGANT           |
| SENSITIVE | CAUTIOUS    | EFFICIENT             |
|           | CURIOUS     | EMOTIONALLY RESILIENT |

PI



PART 2

Which was your favourite place to play as a kid, and why?  
What did you play, and with whom?  
Which parts of your personality did you express through this play? → dreamer

USE THE SPACE BELOW TO DESCRIBE YOUR MEMORY  
Feel free to draw, write, or cut and paste images from the last page of this booklet!

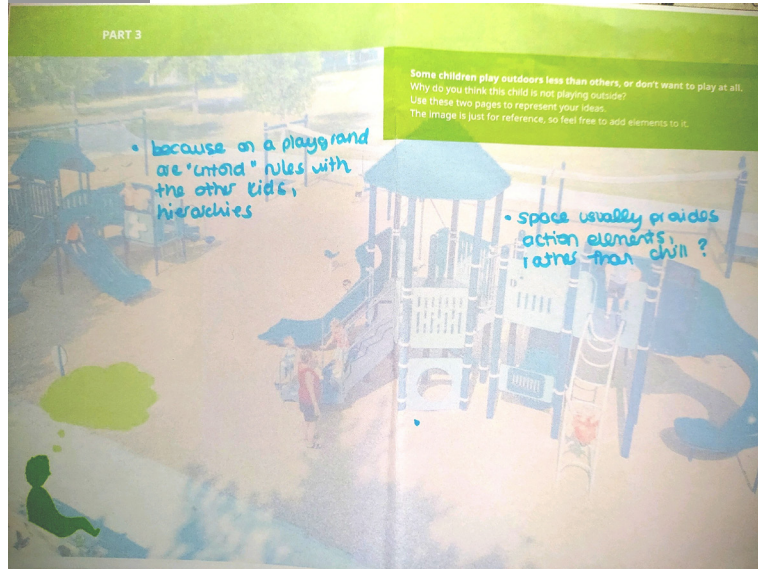
played Playmobil with my brother (9-13y.)  
→ we had one room only for that!

and I always played with a good friend in the garden & exploring nature, climbing trees & telling stories

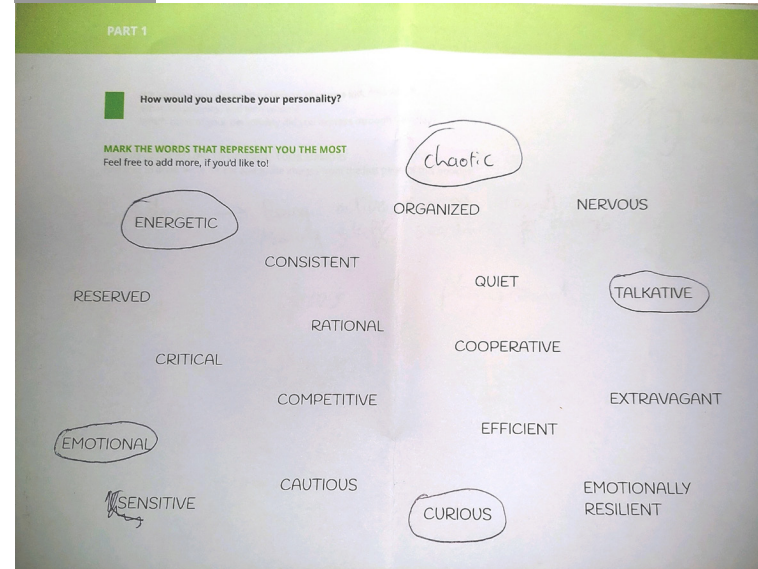




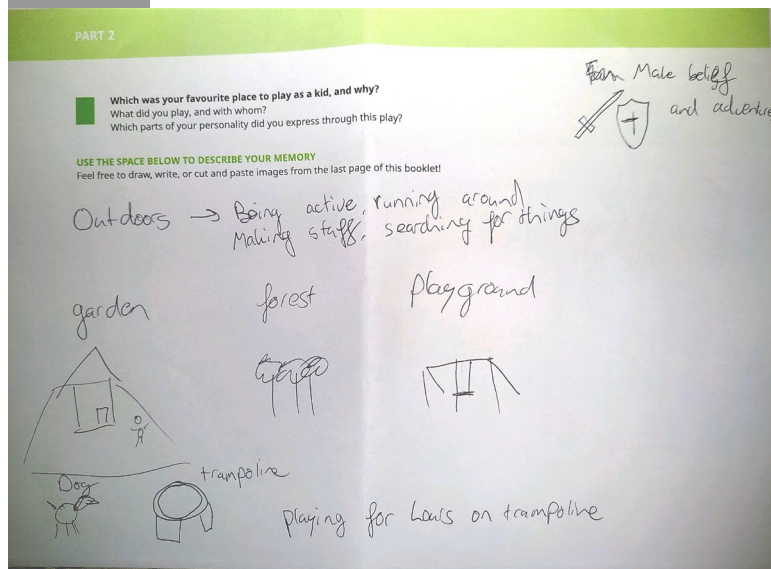
P1



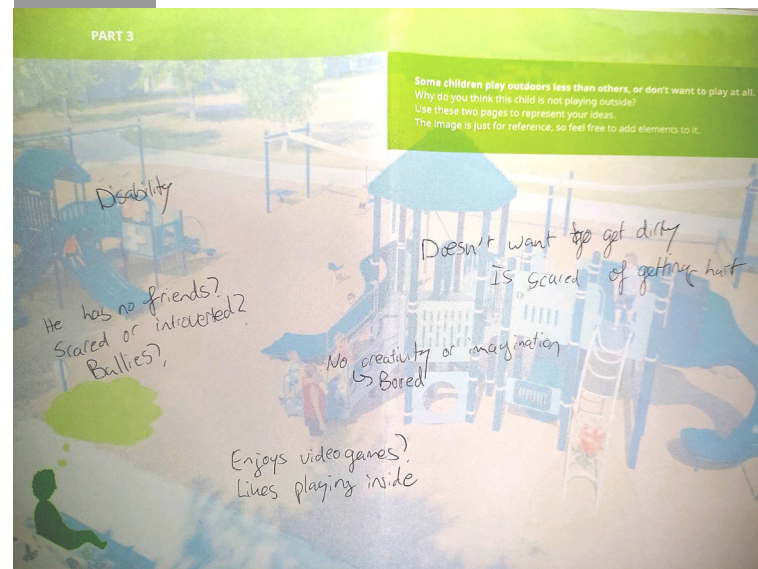
P2



P2



P2



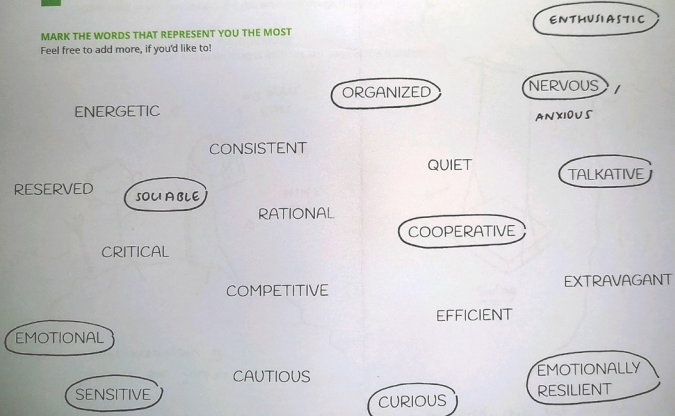


P3

## PART 1

How would you describe your personality?

MARK THE WORDS THAT REPRESENT YOU THE MOST  
Feel free to add more, if you'd like to!

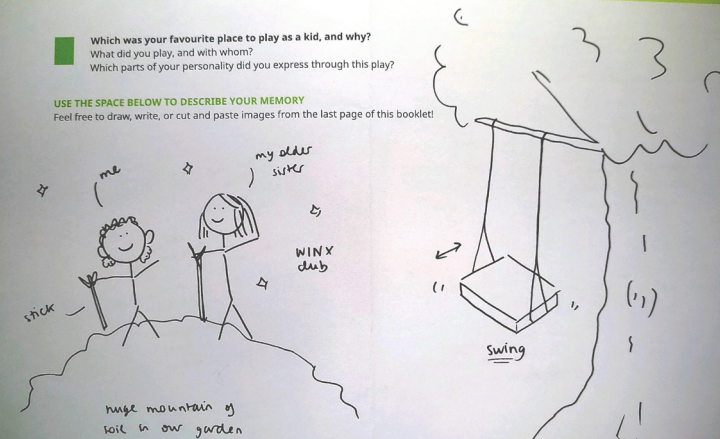


P3

## PART 2

Which was your favourite place to play as a kid, and why?  
What did you play, and with whom?  
Which parts of your personality did you express through this play?

USE THE SPACE BELOW TO DESCRIBE YOUR MEMORY  
Feel free to draw, write, or cut and paste images from the last page of this booklet!

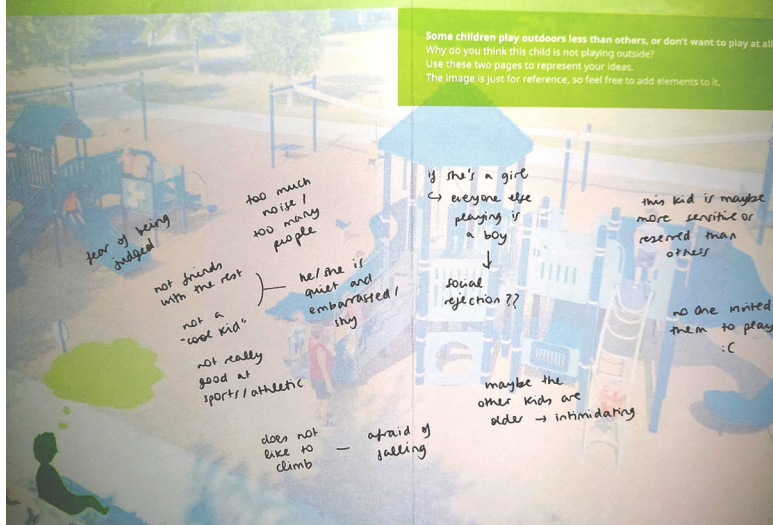


what I expressed: imaginative, fantasy-oriented, amazed at the world, chill but energetic

P3

## PART 3

Some children play outdoors less than others, or don't want to play at all.  
Why do you think this child is not playing outside?  
Use these two pages to represent your ideas.  
The image is just for reference, so feel free to add elements to it.

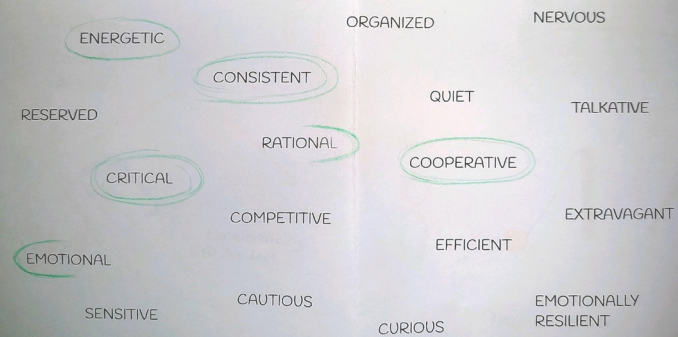


P4

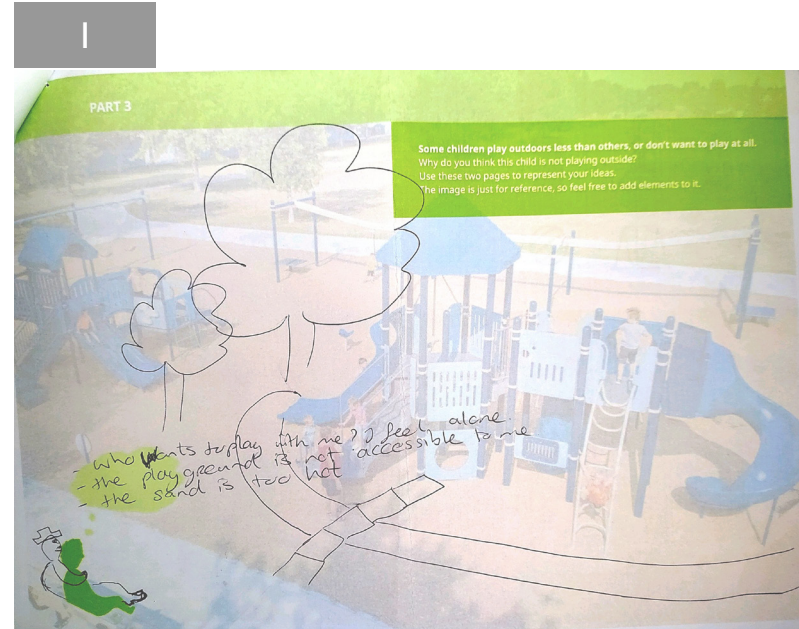
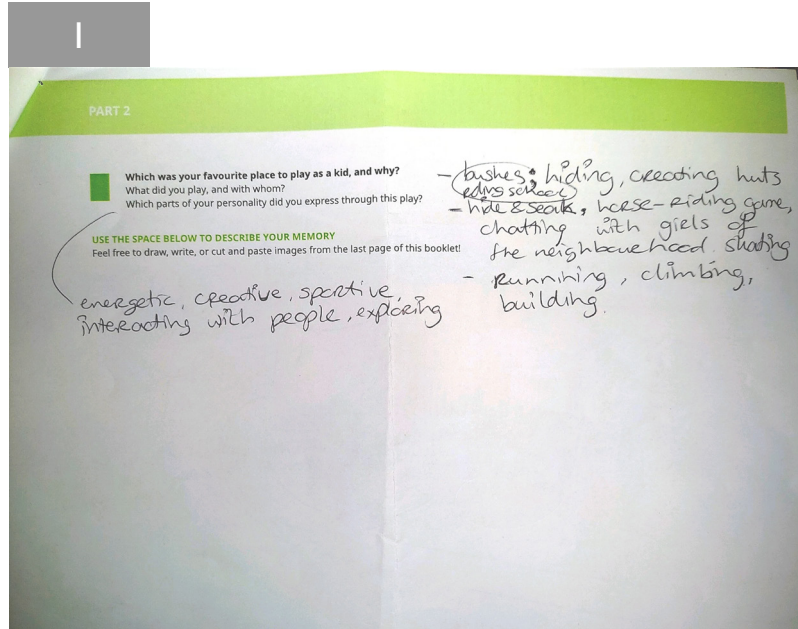
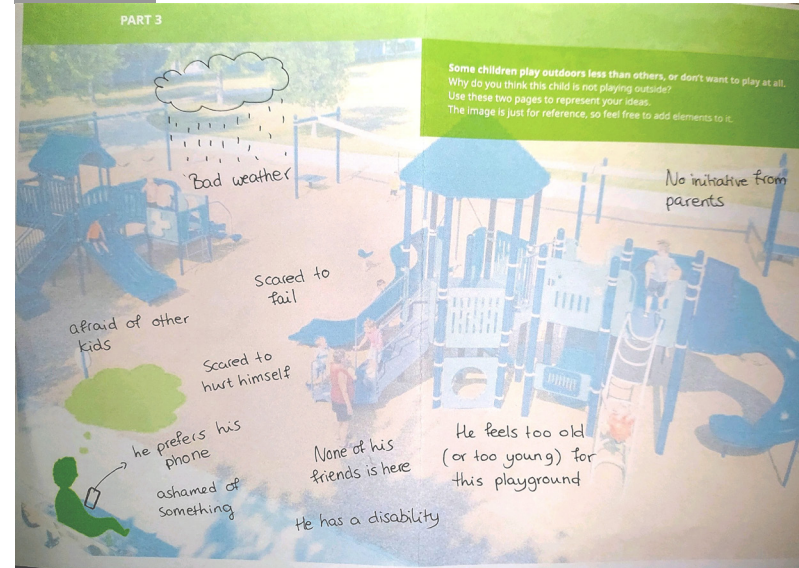
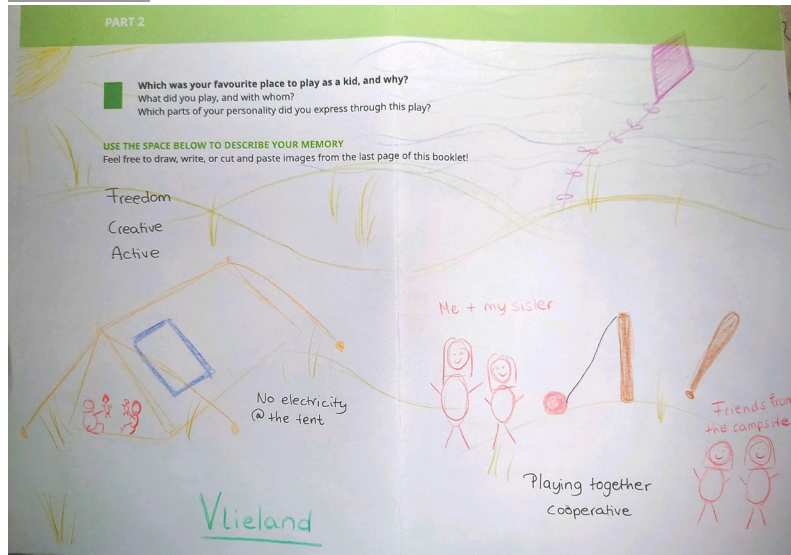
## PART 1

How would you describe your personality?

MARK THE WORDS THAT REPRESENT YOU THE MOST  
Feel free to add more, if you'd like to!









2

## PART 1

How would you describe your personality?

MARK THE WORDS THAT REPRESENT YOU THE MOST  
Feel free to add more, if you'd like to!

ENERGETIC ORGANIZED NERVOUS  
RESERVED CONSISTENT QUIET TALKATIVE  
CRITICAL RATIONAL COOPERATIVE  
EMOTIONAL COMPETITIVE EFFICIENT EXTRAVAGANT  
SENSITIVE CAUTIOUS CURIOUS  
Creative EMOTIONALLY RESILIENT

2

## PART 2

Which was your favourite place to play as a kid, and why?  
What did you play, and with whom? Mostly with school friends  
Which parts of your personality did you express through this play?  
energetic

USE THE SPACE BELOW TO DESCRIBE YOUR MEMORY  
Feel free to draw, write, or cut and paste images from the last page of this booklet!



3

## PART 1

How would you describe your personality?

MARK THE WORDS THAT REPRESENT YOU THE MOST  
Feel free to add more, if you'd like to!

ENERGETIC ORGANIZED NERVOUS  
RESERVED CONSISTENT QUIET TALKATIVE  
CRITICAL RATIONAL COOPERATIVE CREATIVE  
EMOTIONAL COMPETITIVE EFFICIENT EXTRAVAGANT  
SENSITIVE CAUTIOUS CURIOUS  
EMOTIONALLY RESILIENT

3

## PART 2

Which was your favourite place to play as a kid, and why?  
What did you play, and with whom?  
Which parts of your personality did you express through this play?

USE THE SPACE BELOW TO DESCRIBE YOUR MEMORY  
Feel free to draw, write, or cut and paste images from the last page of this booklet!

In alleys, hidden places (open spots in the bushes etc.), walking around  
on a grass hill. We'd make up detective stories (follow the 'bad guys'), research,  
and stuff, explore. Also more active: build huts, rafts, play ball or make fire.

Personality: curiosity, energetic, cooperative, creative



↑ it had to  
feel a bit dangerous  
(although it wasn't)



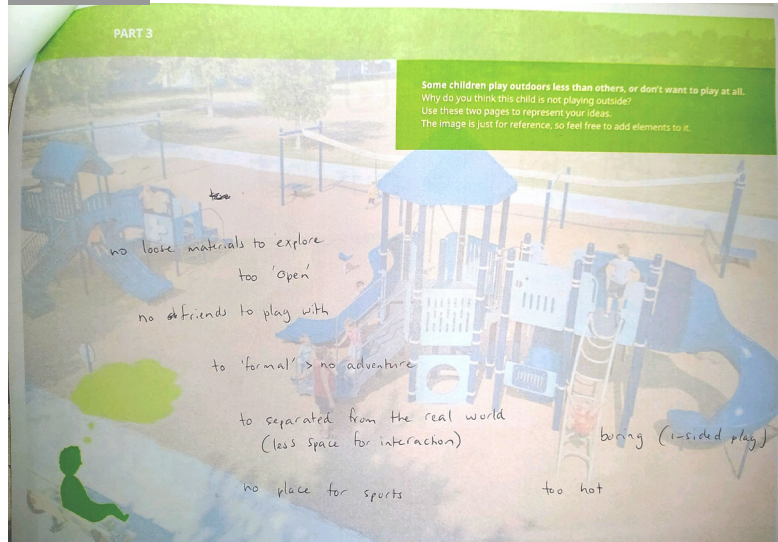
↑ in the free space,  
not in formal playgrounds



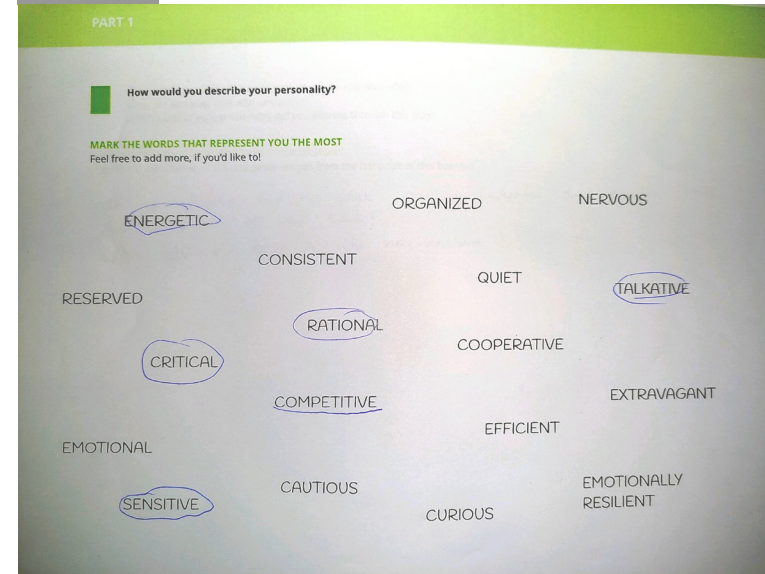
↑ I also used to play  
with marbles in 'the square'  
nonspot, at the square in  
front of our house with my  
brother + other kids



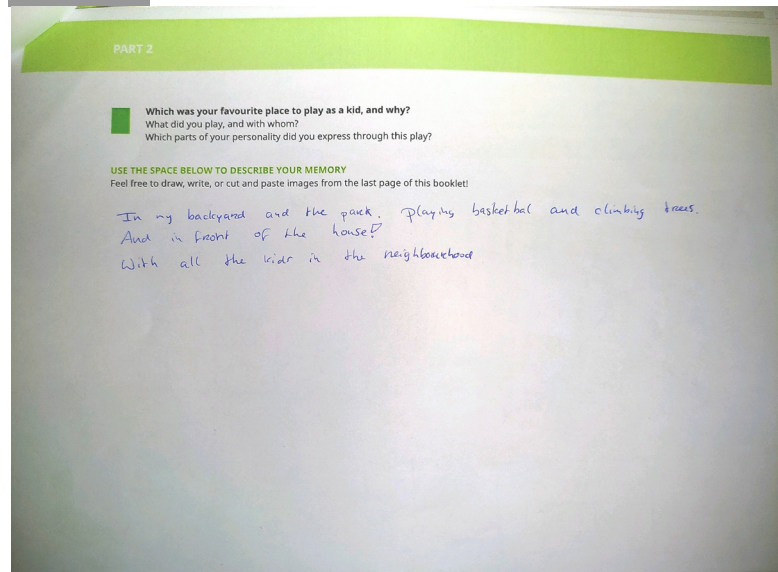
3



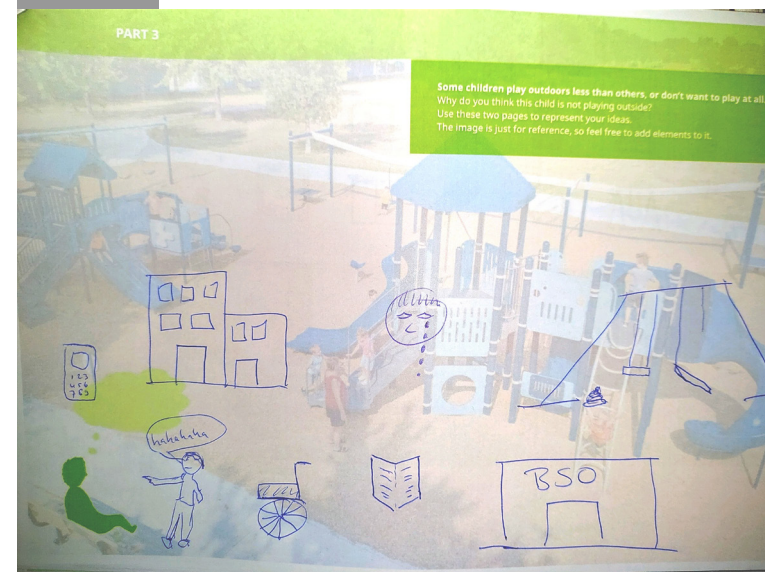
4



4



4





# Appendix D

## CONTEXTMAPPING SESSIONS: EXPLORATION ACTIVITY RESULTS

Jantje Beton

Something to play  
solitary, not being  
influenced/scared  
by other kids

- hot play equipment
- noisy and a lot of screaming

I feel a bit  
watched by the kids,  
so some bucket  
and stuff would help  
to feel more  
comfortable

Where can mom  
sit down?  
So she can be there

negative

positive

- open space  
to run, climb
- nature
- hiding objects
- water
- other children

Some loose materials,  
a ball, skipping rope,  
... I could use

What?

try to work out  
the situation

- not too many  
people
  - quiet resting spot
  - a place that you  
can easily walk/  
cycle/skate on
  - stuff to build  
things and hide
- positive

Parent can be  
on the side

What: I'm sitting on  
the bench in the shade  
Why: too sunny,  
too busy in the playground  
not accessible playground  
for me  
How: alone, sad  
What do you need: a friend

Because there are  
not a lot of  
kids - play on  
the bars

I feel a bit  
stronger  
now it is not  
that busy

hide away for  
some quiet time

Open spaces with  
1st elements that  
stimulate play

negative

- a lot of traffic
- no shade
- no space to  
run

More 'areas' / zones  
in the playground:  
less intimidating,  
but still open enough  
to not get 'trapped'




Activities  
Program

IDE

Others inviting  
me to play  
↳ maybe even  
dare me

WANT  
games that  
are not so  
competitive  
↓  
strategic

spade & buckets  
  
creative with  
sand

TOOLS for  
building  
something out  
of sand



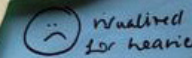
Bring the  
screen outside

eg. Shans  
to project  
Create own protected  
place  
eg. Shans  
to project  
Create own protected  
place

I just want to  
be chill and feel  
accepted and stop  
worrying about not  
being good enough

protection  
safe space

I want to be invited  
by other kids  
to join their game



wild competitive  
kids scare me

too difficult,  
others can  
watch me  
fail



make friends

Challenges

Beat each other



no one  
observes  
me  
- no one  
sees that I am  
alone?  
- I can meet  
kids?



# Appendix E

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## APPROVED HERC APPLIACTION

### **I. Data Management Plan**

# Master's thesis - Diversity in Outdoor Play

## 0. Administrative questions

1. Name of data management support staff consulted during the preparation of this plan.

Question not answered.

2. Date of consultation with support staff.

Question not answered.

## I. Data description and collection or re-use of existing data

3. Provide a general description of the type of data you will be working with, including any re-used data:

| Type of data                                           | File format(s)                                             | How will data be collected (for re-used data: source and terms of use)? | Purpose of processing                                                    | Storage location      | Who will have access to the data     |
|--------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------|--------------------------------------|
| Anonymous qualitative data on children's personalities | written statements, drawings, digitalized versions of them | Informal interviews and observations                                    | Clustering children's personality types and linking them to outdoor play | Project Storage Drive | Only the research staff and director |
|                                                        |                                                            |                                                                         |                                                                          |                       |                                      |
|                                                        |                                                            |                                                                         |                                                                          |                       |                                      |
|                                                        |                                                            |                                                                         |                                                                          |                       |                                      |

4. How much data storage will you require during the project lifetime?

- < 250 GB

## II. Documentation and data quality

5. What documentation will accompany data?

- I will adhere to disciplinary metadata standards - please explain which standards in the box below
- Methodology of data collection

Metadata standards:  
Data creator, Subject, File types, Location,  
Archiving data, Version

## III. Storage and backup during research process

6. Where will the data (and code, if applicable) be stored and backed-up during the project lifetime?

- Project Storage at TU Delft

## IV. Legal and ethical requirements, codes of conduct

7. Does your research involve human subjects or 3rd party datasets collected from human participants?

- Yes

8A. Will you work with personal data? (information about an identified or identifiable natural person)

If you are not sure which option to select, ask your [Faculty Data Steward](#) for advice. You can also check with the [privacy website](#) or contact the privacy team: [privacy-tud@tudelft.nl](mailto:privacy-tud@tudelft.nl)

- Yes

Data will be collected anonymously. If in the raw data appears any information that could make a participant identifiable, the information will not be shared in the research and will be deleted at the end of the project.

8B. Will you work with any other types of confidential or classified data or code as listed below? (tick all that apply)

If you are not sure which option to select, ask your [Faculty Data Steward](#) for advice.

- No, I will not work with any confidential or classified data/code

9. How will ownership of the data and intellectual property rights to the data be managed?

For projects involving commercially-sensitive research or research involving third parties, seek advice of your [Faculty Contract Manager](#) when answering this question. If this is not the case, you can use the example below.

The datasets underlying the published papers will be prepared to make the data publicly available following the TU Delft Research Data Framework Policy, but the final decision on whether to publish the data will be made later. During the active phase of research, the project leader from TU Delft will oversee the access rights to data (and other outputs), as well as any requests for access from external parties. They will be released publicly no later than at the time of publication of corresponding research papers.

10. Which personal data will you process? Tick all that apply

- Other types of personal data - please explain below

Quotes, statements, and drawings based on informal interviews and observations.

11. Please list the categories of data subjects

- Children (7 to 11)
- Primary school teachers

**12. Will you be sharing personal data with individuals/organisations outside of the EEA (European Economic Area)?**

- No

**15. What is the legal ground for personal data processing?**

- Informed consent

Participants below 18 years will be asked by their legal representative to fill in a consent form before the interview session takes place.

**16. Please describe the informed consent procedure you will follow:**

The consent form will be provided to the recruiting party (primary schools), which will be responsible for ensuring the approval of the children's parents in participating in the research.

**17. Where will you store the signed consent forms?**

- Same storage solutions as explained in question 6

**18. Does the processing of the personal data result in a high risk to the data subjects?**

If the processing of the personal data results in a high risk to the data subjects, it is required to perform [Data Protection Impact Assessment \(DPIA\)](#). In order to determine if there is a high risk for the data subjects, please check if any of the options below that are applicable to the processing of the personal data during your research (check all that apply).

If two or more of the options listed below apply, you will have to [complete the DPIA](#). Please get in touch with the privacy team: [privacy-tud@tudelft.nl](mailto:privacy-tud@tudelft.nl) to receive support with DPIA.

If only one of the options listed below applies, your project might need a DPIA. Please get in touch with the privacy team: [privacy-tud@tudelft.nl](mailto:privacy-tud@tudelft.nl) to get advice as to whether DPIA is necessary.

If you have any additional comments, please add them in the box below.

- None of the above applies

**22. What will happen with personal research data after the end of the research project?**

- Anonymised or aggregated data will be shared with others
- Personal research data will be destroyed after the end of the research project

**23. How long will (pseudonymised) personal data be stored for?**

- 10 years or more, in accordance with the TU Delft Research Data Framework Policy

**24. What is the purpose of sharing personal data?**

- For research purposes, which are in-line with the original research purpose for which data have been collected

**25. Will your study participants be asked for their consent for data sharing?**

- Yes, in consent form - please explain below what you will do with data from participants who did not consent to data sharing

If the participants did not give their consent, they will not be observed and asked any questions by the researchers.

## V. Data sharing and long-term preservation

**27. Apart from personal data mentioned in question 22, will any other data be publicly shared?**

- All other non-personal data (and code) underlying published articles / reports / theses

**29. How will you share research data (and code), including the one mentioned in question 22?**

- I will upload the data to another data repository (please provide details below)

Anonymized quotes and digital drawings based on the sessions might appear in the report, but they won't make it possible to identify the participants.

**31. When will the data (or code) be shared?**

- At the end of the research project

## VI. Data management responsibilities and resources

**33. Is TU Delft the lead institution for this project?**

- Yes, leading the collaboration - please provide details of the type of collaboration and the involved parties below

The Play Well Lab of TU Delft is the leading institution of the project, which will be conducted in collaboration with the organization Jantje Beton. However, Jantje Beton only provides additional support and resources for the project but does not have access to the raw research data.

**34. If you leave TU Delft (or are unavailable), who is going to be responsible for the data resulting from this project?**

In case I am leaving, my supervisor Mathieu Gielen, head of the Play Well Lab, will be responsible for the data.  
[M.A.Gielen@tudelft.nl](mailto:M.A.Gielen@tudelft.nl)

**35. What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?**

Data will be stored in the Play Well Lab's research archive. I do not expect to exceed the Play Well Lab's storage limit and therefore there are no additional costs for long-term preservation.

## 2. Checklist

### I. Applicant Information

|                                                                                                                                                                                                                         |                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>PROJECT TITLE:</b>                                                                                                                                                                                                   | <b>Diversity in Outdoor Play</b>                                                                                                  |
| <b>Research period:</b><br><i>Over what period of time will this specific part of the research take place</i>                                                                                                           | The research period corresponds the duration of the master thesis and will take place within 1 semester (February to August 2023) |
| <b>Faculty:</b>                                                                                                                                                                                                         | Industrial Design Engineering (IO)                                                                                                |
| <b>Department:</b>                                                                                                                                                                                                      | Human-Centered Design                                                                                                             |
| <b>Type of the research project:</b><br><i>(Bachelor's, Master's, DreamTeam, PhD, PostDoc, Senior Researcher, Organisational etc.)</i>                                                                                  | Master's thesis                                                                                                                   |
| <b>Funder of research:</b><br><i>(EU, NWO, TUD, other – in which case please elaborate)</i>                                                                                                                             | Delft Design Labs: Play Well Lab                                                                                                  |
| <b>Name of Corresponding Researcher:</b><br><i>(If different from the Responsible Researcher)</i>                                                                                                                       | Lea Magnano                                                                                                                       |
| <b>E-mail Corresponding Researcher:</b><br><i>(If different from the Responsible Researcher)</i>                                                                                                                        | L.Magnano@student.tudelnt.nl                                                                                                      |
| <b>Position of Corresponding Researcher:</b><br><i>(Masters, DreamTeam, PhD, PostDoc, Assistant/ Associate/ Full Professor)</i>                                                                                         | Masters                                                                                                                           |
| <b>Name of Responsible Researcher:</b><br><i>Note: all student work must have a named Responsible Researcher to approve, sign and submit this application</i>                                                           | Mathieu Gielen                                                                                                                    |
| <b>E-mail of Responsible Researcher:</b><br><i>Please ensure that an institutional email address (no Gmail, Yahoo, etc.) is used for all project documentation/ communications including Informed Consent materials</i> | M.A.Gielen@tudelft.nl                                                                                                             |
| <b>Position of Responsible Researcher :</b><br><i>(PhD, PostDoc, Associate/ Assistant/ Full Professor)</i>                                                                                                              | Assistant professor                                                                                                               |

### II. Research Overview

*NOTE: You can find more guidance on completing this checklist [here](#)*

#### a) Please summarise your research very briefly (100-200 words)

What are you looking into, who is involved, how many participants there will be, how they will be recruited and what are they expected to do?

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Add your text here – (please avoid jargon and abbreviations)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p>This research aims to understand how children's different personalities influence the way they play outdoors. The research will mainly consist in observing how children (age 7 to 11) interact with the environment, play facilities, and with each other when they are free to play outside. To better understand the reasons behind their behavior, I will occasionally join them in their play activities and ask them about the games they are playing.</p> <p>Participants will be recruited by contacting International Schools, and the times and durations of the sessions will be arranged with them according to their internal regulations.</p> |

#### b) If your application is an additional project related to an existing approved HREC submission, please provide a brief explanation including the existing relevant HREC submission number/s.

|                                                                     |
|---------------------------------------------------------------------|
| <i>Add your text here – (please avoid jargon and abbreviations)</i> |
|                                                                     |



### III. Risk Assessment and Mitigation Plan

*NOTE: You can find more guidance on completing this checklist [here](#)*

Please complete the following table in full for all points to which your answer is “yes”. Bear in mind that the vast majority of projects involving human participants as Research Subjects also involve the collection of **Personally Identifiable Information (PII)** and/or **Personally Identifiable Research Data (PIRD)** which may pose potential risks to participants as detailed in Section G: Data Processing and Privacy below.

To ensure alignment between your risk assessment, data management and what you agree with your Research Subjects you can use the last two columns in the table below to refer to specific points in your Data Management Plan (DMP) and Informed Consent Form (ICF) – **but this is not compulsory**.

It’s worth noting that **you’re much more likely to need to resubmit your application if you neglect to identify potential risks**, than if you identify a potential risk and demonstrate how you will mitigate it. If necessary, the HREC will always work with you and colleagues in the Privacy Team and Data Management Services to see how, if at all possible, your research can be conducted.

|                                                                                                                                                                                                                                                                                                                                                                                                     |     |    | <i>If YES please complete the Risk Assessment and Mitigation Plan columns below.</i>                                                                                                                          |                                                                                                                                                                                                                                                                  | <i>Please provide the relevant reference #</i> |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----|
| ISSUE                                                                                                                                                                                                                                                                                                                                                                                               | Yes | No | RISK ASSESSMENT – what risks could arise?<br><i>Please ensure that you list ALL of the actual risks that could potentially arise – do not simply state whether you consider any such risks are important!</i> | MITIGATION PLAN – what mitigating steps will you take?<br><i>Please ensure that you summarise what actual mitigation measures you will take for each potential risk identified – do not simply state that you will e.g. comply with regulations.</i>             | DMP                                            | ICF |
| <b>A: Partners and collaboration</b>                                                                                                                                                                                                                                                                                                                                                                |     |    |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                  |                                                |     |
| 1. Will the research be carried out in collaboration with additional organisational partners such as: <ul style="list-style-type: none"> <li>One or more collaborating research and/or commercial organisations</li> <li>Either a research, or a work experience internship provider<sup>1</sup></li> </ul> <i><sup>1</sup> If yes, please include the graduation agreement in this application</i> | X   |    | The project is carried with the Play well Lab of TU Delft, in collaboration with the organization Jantje Beton.                                                                                               | The Play Well Lab and Jantje Beton does not have access itself to the raw data. The researcher is responsible to ensure the participants privacy by making pictures not identifiable. The researcher presents only results to the organisations and no raw data. | 9,33                                           |     |
| 2. Is this research dependent on a Data Transfer or Processing Agreement with a collaborating partner or third party supplier?<br><i>If yes please provide a copy of the signed DTA/DPA</i>                                                                                                                                                                                                         |     | X  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                  |                                                |     |
| 3. Has this research been approved by another (external) research ethics committee (e.g.: HREC and/or MREC/METC)?<br><i>If yes, please provide a copy of the approval (if possible) and summarise any key points in your Risk Management section below</i>                                                                                                                                          |     | X  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                  |                                                |     |
| <b>B: Location</b>                                                                                                                                                                                                                                                                                                                                                                                  |     |    |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                  |                                                |     |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |           |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |           | <i>If YES please complete the Risk Assessment and Mitigation Plan columns below.</i>                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <i>Please provide the relevant reference #</i> |            |
| <b>ISSUE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Yes</b> | <b>No</b> | <b>RISK ASSESSMENT – what risks could arise?</b><br><i>Please ensure that you list ALL of the actual risks that could potentially arise – do not simply state whether you consider any such risks are important!</i>                                                                                                                                                            | <b>MITIGATION PLAN – what mitigating steps will you take?</b><br><i>Please ensure that you summarise what actual mitigation measures you will take for each potential risk identified – do not simply state that you will e.g. comply with regulations.</i>                                                                                                                                                                                                                                                                                                                                                                | <b>DMP</b>                                     | <b>ICF</b> |
| 4. Will the research take place in a country or countries, other than the Netherlands, within the EU?                                                                                                                                                                                                                                                                                                                                                                     |            | X         |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                |            |
| 5. Will the research take place in a country or countries outside the EU?                                                                                                                                                                                                                                                                                                                                                                                                 |            | X         |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                |            |
| 6. Will the research take place in a place/region or of higher risk – including known dangerous locations (in any country) or locations with non-democratic regimes?                                                                                                                                                                                                                                                                                                      |            | X         |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                |            |
| <b>C: Participants</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |           |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                |            |
| 7. Will the study involve participants who <b>may</b> be vulnerable and possibly (legally) unable to give informed consent? (e.g., children below the legal age for giving consent, people with learning difficulties, people living in care or nursing homes,).                                                                                                                                                                                                          | X          |           | The target group involves children, which are vulnerable participants. Following risks arise:<br>- Children come up with personal sensitive information (e.g. trauma)<br>- Children come up with sensitive information about parents<br>- Child is not feeling comfortable sharing their emotions<br>- Some play dynamics are disrupted, leading to tensions among the children | The sessions will always take place within the school context, with responsible adults supervising at all times. If anything slips out of control, teachers, who are trusted and respected figures by the children, will be able to intervene.<br><br>Moreover, as a researcher, I will take one step back if I see that my presence is causing children to be uncomfortable. For this reason, I will have multiple sessions one after the other, in which I will first only observe children without interacting with them, and then I will slowly start to speak to some of them once they are more used to my presence. | 15,16                                          |            |
| 8. Will the study involve participants who <b>may</b> be vulnerable under specific circumstances and in specific contexts, such as victims and witnesses of violence, including domestic violence; sex workers; members of minority groups, refugees, irregular migrants or dissidents?                                                                                                                                                                                   |            | X         |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                |            |
| 9. Are the participants, outside the context of the research, in a dependent or subordinate position to the investigator (such as own children, own students or employees of either TU Delft and/or a collaborating partner organisation)?<br><i>It is essential that you safeguard against possible adverse consequences of this situation (such as allowing a student's failure to participate to your satisfaction to affect your evaluation of their coursework).</i> |            | X         |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                |            |
| 10. Is there a high possibility of re-identification for your participants? (e.g., do they have a very specialist job of which there are only a small number in a given country, are they members of a small community, or employees from a partner company collaborating in the research? Or are they one of only a handful of (expert) participants in the study?                                                                                                       |            | X         |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                |            |

|                                                                                                                                                                                                                                                                                                            |     |    | If YES please complete the Risk Assessment and Mitigation Plan columns below.                                                                                                                                 |                                                                                                                                                                                                                                                                                          | Please provide the relevant reference # |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
| ISSUE                                                                                                                                                                                                                                                                                                      | Yes | No | RISK ASSESSMENT – what risks could arise?<br><i>Please ensure that you list ALL of the actual risks that could potentially arise – do not simply state whether you consider any such risks are important!</i> | MITIGATION PLAN – what mitigating steps will you take?<br><i>Please ensure that you summarise what actual mitigation measures you will take for each potential risk identified – do not simply state that you will e.g. comply with regulations.</i>                                     | DMP                                     | ICF |
| <b>D: Recruiting Participants</b>                                                                                                                                                                                                                                                                          |     |    |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                          |                                         |     |
| 11. Will your participants be recruited through your own, professional, channels such as conference attendance lists, or through specific network/s such as self-help groups                                                                                                                               | X   |    | Participants will be recruited through schools. Potential risks are the safety of personal data such as names, gender and age.                                                                                | Personal information of the participants will not be used in the research. The data about behaviors, emotions, and personality traits of children that might come up will be collected independently from the child's identity, who will remain unknown to the researcher.               | 8A, 22                                  |     |
| 12. Will the participants be recruited or accessed in the longer term by a (legal or customary) gatekeeper? (e.g., an adult professional working with children; a community leader or family member who has this customary role – within or outside the EU; the data producer of a long-term cohort study) | X   |    | Participants will be recruited through contacting external organizations (schools) which can build up contacts to families.                                                                                   | The recruiting party (schools) will not have access to the raw data and information collected during the research sessions.                                                                                                                                                              |                                         |     |
| 13. Will you be recruiting your participants through a crowd-sourcing service and/or involve a third party data-gathering service, such as a survey platform?                                                                                                                                              |     | X  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                          |                                         |     |
| 14. Will you be offering any financial, or other, remuneration to participants, and might this induce or bias participation?                                                                                                                                                                               |     | X  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                          |                                         |     |
| <b>E: Subject Matter</b> <i>Research related to medical questions/health may require special attention. See also the website of the <a href="#">CCMO</a> before contacting the HREC.</i>                                                                                                                   |     |    |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                          |                                         |     |
| 15. Will your research involve any of the following: <ul style="list-style-type: none"> <li>Medical research and/or clinical trials</li> <li>Invasive sampling and/or medical imaging</li> <li>Medical and <i>In Vitro Diagnostic Medical Devices</i> Research</li> </ul>                                  |     | X  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                          |                                         |     |
| 16. Will drugs, placebos, or other substances (e.g., drinks, foods, food or drink constituents, dietary supplements) be administered to the study participants?<br><i>If yes see here to determine whether medical ethical approval is required</i>                                                        |     | X  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                          |                                         |     |
| 17. Will blood or tissue samples be obtained from participants?<br><i>If yes see here to determine whether medical ethical approval is required</i>                                                                                                                                                        |     | X  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                          |                                         |     |
| 18. Does the study risk causing psychological stress or anxiety beyond that normally encountered by the participants in their life outside research?                                                                                                                                                       | X   |    | Some children might find it uncomfortable to be asked about the way they play, especially if they are experiencing negative emotions related to their play activities.                                        | The researcher will not ask direct questions that address negative emotions to the children. If negative emotions come up during the conversation, the researchers will not insist on the them, but rather, move the conversation towards what the child might feel more positive about. |                                         |     |

|                                                                                                                                                                                                                                                                                                                                                                                  |            |           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                             |                                                |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------|
|                                                                                                                                                                                                                                                                                                                                                                                  |            |           | <i>If YES please complete the Risk Assessment and Mitigation Plan columns below.</i>                                                                                                                                 |                                                                                                                                                                                                                                                             | <i>Please provide the relevant reference #</i> |            |
| <b>ISSUE</b>                                                                                                                                                                                                                                                                                                                                                                     | <b>Yes</b> | <b>No</b> | <b>RISK ASSESSMENT – what risks could arise?</b><br><i>Please ensure that you list ALL of the actual risks that could potentially arise – do not simply state whether you consider any such risks are important!</i> | <b>MITIGATION PLAN – what mitigating steps will you take?</b><br><i>Please ensure that you summarise what actual mitigation measures you will take for each potential risk identified – do not simply state that you will e.g. comply with regulations.</i> | <b>DMP</b>                                     | <b>ICF</b> |
|                                                                                                                                                                                                                                                                                                                                                                                  |            |           |                                                                                                                                                                                                                      | Teachers as trusted caretakes for the children will be informed in case of possible serious negative consequences of the conversation could occur.                                                                                                          |                                                |            |
| 19. Will the study involve discussion of personal sensitive data which could put participants at increased legal, financial, reputational, security or other risk? (e.g., financial data, location data, data relating to children or other vulnerable groups)<br><i>Definitions of sensitive personal data, and special cases are provided on the TUD Privacy Team website.</i> |            | <b>X</b>  |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                             |                                                |            |
| 20. Will the study involve disclosing commercially or professionally sensitive, or confidential information? (e.g., relating to decision-making processes or business strategies which might, for example, be of interest to competitors)                                                                                                                                        |            | <b>X</b>  |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                             |                                                |            |
| 21. Has your study been identified by the TU Delft Privacy Team as requiring a Data Processing Impact Assessment (DPIA)? <i>If yes please attach the advice/ approval from the Privacy Team to this application</i>                                                                                                                                                              |            | <b>X</b>  |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                             |                                                |            |
| 22. Does your research investigate causes or areas of conflict?<br><i>If yes please confirm that your fieldwork has been discussed with the appropriate safety/security advisors and approved by your Department/Faculty.</i>                                                                                                                                                    |            | <b>X</b>  |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                             |                                                |            |
| 23. Does your research involve observing illegal activities or data processed or provided by authorities responsible for preventing, investigating, detecting or prosecuting criminal offences<br><i>If so please confirm that your work has been discussed with the appropriate legal advisors and approved by your Department/Faculty.</i>                                     |            | <b>X</b>  |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                             |                                                |            |
| <b>F: Research Methods</b>                                                                                                                                                                                                                                                                                                                                                       |            |           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                             |                                                |            |
| 24. Will it be necessary for participants to take part in the study without their knowledge and consent at the time? (e.g., covert observation of people in non-public places).                                                                                                                                                                                                  |            | <b>X</b>  |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                             |                                                |            |
| 25. Will the study involve actively deceiving the participants? (For example, will participants be deliberately falsely informed, will information be withheld from them or will they be misled in such a way that they are likely to object or show unease when debriefed about the study).                                                                                     |            | <b>X</b>  |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                             |                                                |            |
| 26. Is pain or more than mild discomfort likely to result from the study? And/or could your research activity cause an accident involving (non-) participants?                                                                                                                                                                                                                   |            | <b>X</b>  |                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                             |                                                |            |



|                                                                                                                                                                                                                                                                                                                                  |     |    |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                      |                                         |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|
|                                                                                                                                                                                                                                                                                                                                  |     |    | If YES please complete the Risk Assessment and Mitigation Plan columns below.                                                                                                                                 |                                                                                                                                                                                                                                                      | Please provide the relevant reference # |     |
| ISSUE                                                                                                                                                                                                                                                                                                                            | Yes | No | RISK ASSESSMENT – what risks could arise?<br><i>Please ensure that you list ALL of the actual risks that could potentially arise – do not simply state whether you consider any such risks are important!</i> | MITIGATION PLAN – what mitigating steps will you take?<br><i>Please ensure that you summarise what actual mitigation measures you will take for each potential risk identified – do not simply state that you will e.g. comply with regulations.</i> | DMP                                     | ICF |
| 27. Will the experiment involve the use of devices that are not ‘CE’ certified?<br><i>Only, if ‘yes’: continue with the following questions:</i>                                                                                                                                                                                 |     | X  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                      |                                         |     |
| • Was the device built in-house?                                                                                                                                                                                                                                                                                                 |     |    |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                      |                                         |     |
| • Was it inspected by a safety expert at TU Delft?<br><i>If yes, please provide a signed device report</i>                                                                                                                                                                                                                       |     |    |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                      |                                         |     |
| • If it was not built in-house and not CE-certified, was it inspected by some other, qualified authority in safety and approved?<br><i>If yes, please provide records of the inspection</i>                                                                                                                                      |     |    |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                      |                                         |     |
| 28. Will your research involve face-to-face encounters with your participants and if so how will you assess and address Covid considerations?                                                                                                                                                                                    | X   |    | Preferably, the interaction is face-to-face. Potential risks are in raise of COVID or personal needs.                                                                                                         | In case of a raise in COVID the governmental regulations will be considered and the session will not involve face-to-face interactions, limiting the research to observations from distance.                                                         |                                         |     |
| 29. Will your research involve either:<br>a) “big data”, combined datasets, new data-gathering or new data-merging techniques which might lead to re-identification of your participants <b>and/or</b><br>b) artificial intelligence or algorithm training where, for example biased datasets could lead to biased outcomes?     |     | X  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                      |                                         |     |
| <b>G: Data Processing and Privacy</b>                                                                                                                                                                                                                                                                                            |     |    |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                      |                                         |     |
| 30. Will the research involve collecting, processing and/or storing any directly identifiable PII (Personally Identifiable Information) including name or email address that will be used for administrative purposes only? (eg: obtaining Informed Consent or disbursing remuneration)                                          |     | X  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                      |                                         |     |
| 31. Will the research involve collecting, processing and/or storing any directly or indirectly identifiable PIRD (Personally Identifiable Research Data) including videos, pictures, IP address, gender, age etc and <b>what other Personal Research Data</b> (including personal or professional views) will you be collecting? |     | X  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                      |                                         |     |
| 32. Will this research involve collecting data from the internet, social media and/or publicly available datasets which have been originally contributed by human participants                                                                                                                                                   |     | X  |                                                                                                                                                                                                               |                                                                                                                                                                                                                                                      |                                         |     |
| 33. Will your research findings be published in one or more forms in the public domain, as e.g., Masters thesis, journal publication, conference presentation or wider public dissemination?                                                                                                                                     | X   |    | The research report will be published in the TU Delft educational repository, which indicates that it is accessible for everyone.                                                                             | Participating subjects have to be informed about the usage of their data and to which extent they will be published.                                                                                                                                 | 16, 22, 29                              |     |
| 34. Will your research data be archived for re-use and/or teaching in an open, private or semi-open archive?                                                                                                                                                                                                                     | X   |    | Some of the results included in the final report might be used by the Play Well Lab and/or Jantje Beton.                                                                                                      | Raw data which might make participants identifiable will not be shared in the final reports, and will be destroyed at the end of the project.                                                                                                        | 33                                      |     |

## H: More on Informed Consent and Data Management

*NOTE: You can find guidance and templates for preparing your Informed Consent materials [here](#)*

Your research involves human participants as Research Subjects if you are recruiting them or actively involving or influencing, manipulating or directing them in any way in your research activities. This means you must seek informed consent and agree/ implement appropriate safeguards regardless of whether you are collecting any PIRD.

Where you are also collecting PIRD, and using Informed Consent as the legal basis for your research, you need to also make sure that your IC materials are clear on any related risks and the mitigating measures you will take – including through responsible data management.

*Got a comment on this checklist or the HREC process? You can leave your comments [here](#)*

## IV. Signature/s

*Please note that by signing this checklist list as the sole, or Responsible, researcher you are providing approval of the completeness and quality of the submission, as well as confirming alignment between GDPR, Data Management and Informed Consent requirements.*

### Name of Corresponding Researcher (if different from the Responsible Researcher) (print)

Lea Magnano

Signature of Corresponding Researcher:



Date: 01.05.2023

### Name of Responsible Researcher (print)

Signature (or upload consent by mail) Responsible Researcher:



Date: 10-5-2023

## V. Completing your HREC application

Please use the following list to check that you have provided all relevant documentation

### Required:

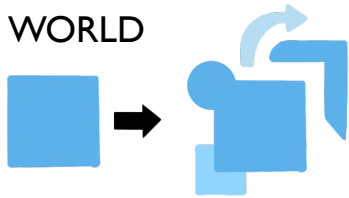
- **Always:** This completed HREC checklist
- **Always:** A data management plan (reviewed, where necessary, by a data-steward)
- **Usually:** A complete Informed Consent form (including Participant Information) and/or Opening Statement (for online consent)

# Appendix F

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## EXTENSIVE EXPLANATION OF THE CONCEPTS

### COMPOSE YOUR WORLD



Plush wants play facilities that support them to come up with their own play, which typically includes the creation and enactment of imaginative scenarios. They already have the fantasy and the drive to come up with different play ideas, so a design with limited and explicit affordances would not be appealing for Plush as it would restrict their play possibilities. Instead, open-ended or movable objects enhance creativity and foster imagination. Plush needs to be surrounded by a calm and reassuring environment to play. This can be achieved by designing a space that offers enclosed play areas, providing a sense of security. Additionally, the design should consider the presence of adults nearby, allowing Plush to both play independently but also to involve their parents in the play if they want to. If parents participate in the play, this should happen without an abrupt interruption of the natural flow and dynamics of children's play, so that Plush would not feel embarrassed by their parent's presence.

Plush's low activity level suggests a tendency to use fine movements over gross motor skills. Incorporating in the play design different levels of details, from large to very small-scale, is a way to respond to this preference. By providing semi-movable, open-ended objects or structures, a play space offers an appealing play opportunity for Plush. The objects can be used to create scenarios and stories but can be also climbed on or passed under, forming a dynamic and stimulating environment for play. Additional small-scale elements, such as details on the surface of the play objects, support fine movements and careful interactions. The layout of the play objects allows the child to create a more enclosed area by disposing of them in a way that creates a barrier with the rest of the space. The play space also allows adults to stand nearby or participate in the play (by helping the child to move the objects or by sitting on one of them) without having to act in a way that would look odd as an adult.

## BETWEEN IN AND OUT



Cap enjoys playing outdoors but struggles to do so due to the initial effort that they need to put into interaction with other kids or with the play environment. Therefore, play design should make it easier for them to engage in play from the start. This can be achieved by bridging the gap between non-playing and playing states, allowing children to transition more seamlessly between the two. Moreover, by making play objects readily accessible from a non-play starting position, children can engage in play more effortlessly. The importance of onlooker play can be recognized and empowered by providing dedicated spaces for observing and appreciating the play of others. This can be done by expanding the play space beyond the formal play area so that children around can feel part of what is happening even without fully participating in the play. The creation of such an area also facilitates the interactions between the children that are playing and the ones that are not, creating opportunities for them to notice and include others in their play. This makes Cap's life easier, as they might be invited to play without having to explicitly ask for it. Cap's engagement in outdoor play can be facilitated by blurring the boundaries that divide play and non-play areas, creating a "buffer zone" between the two. This area seamlessly connects the children "out" with the ones "in", offering a formal invitation to the latter ones to approach the core of the play area. This new intermediary space can be further improved by incorporating elements that facilitate both easy entry into the play space and passive engagement in the play dynamics: on one side, the buffer zone ensures a smooth transition and effortless access into the play area, and on the other side, it offers opportunities for passive participation, empowering children like Cap to observe the play activities happening around them.

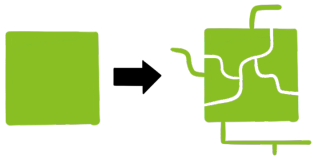
## DIVIDE AND HIDE



Scopy's ideal play environment is one that offers multiple play options and locations, giving them the opportunity to choose and direct the play as they wish. This can be achieved by incorporating different functions and affordances in the same play object, as well as by scattering the play objects throughout the space so that part of the play becomes also moving from one to another. Moreover, this makes sure that if one play zone is already being used by other kids, similar play alternatives can be found elsewhere. The design should also include hidden spots, utilizing see-through barriers that add an element of intrigue and discovery. In this way, Scopy would still be able to observe other kids and the adult's supervision would not be impaired, but the play space would allow for a higher degree of privacy and enclosure. Scopy's play patterns indicate that they like to alternate between challenging and relaxing activities. By providing play facilities that support both types of interactions, the play space creates a stimulating and adaptable environment that caters to the diverse and varying interests of Scopy. Similar play objects are not grouped together, but rather, they are scattered in different locations within the space and semi-enclosed through the use of subtle barriers such as bushes. The play objects are either open-ended or allow for a wide range of uses. The scale and form of the play facilities are designed for supporting play in small groups. Both relaxing and physically challenging play facilities are present, and their design ensures that children are able to choose their preferred level of risk.



## A PATH TO EXPLORE

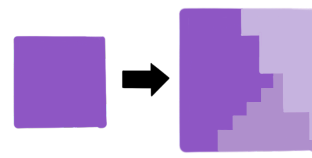


Rucksack would enjoy a play design that allows them to independently venture in their neighborhoods and discover intriguing play opportunities on the way. To support this, creating a dedicated space for roaming and self-guided exploration both in and outside play areas can be a fitting design direction. Additionally, the design should incorporate prompts or cues that give a sense of purpose to the play experience, inspiring children's curiosity and guiding their engagement. These playful elements should be subtle, hidden in the roaming space, to stimulate the children's initiative to explore.

However, implicit play cues can be alternated with more evident prompts such as proper play facilities, allowing children like Rucksack to socialize and mingle with other kids that might be playing along their way.

Rucksack's desire to explore is fulfilled by the design of a path that ventures around the space, crossing multiple points of interest where children typically gather. The path itself also contains play prompts in the form of, for example, changes in the composition of the terrain and additional elements placed on and around the path, preferably some that dynamically evolve over time such as natural objects. This path is not limited by the borders of a designated play area but forms a long ring that extends to the space that surrounds the play zone. However, the route that the path follows is planned to ensure that children who stay on it will not be exposed to dangerous situations.

## YES, YOU CAN



Bomb dreams of a space to freely liberate their boundless energy through active and competitive play. To support this, play design should incorporate challenges that align with the abilities of the children, as well as provide a space where children like Bomb can freely express themselves without the concern of intimidating or negatively impacting other kids who may have different play styles or preferences.

The design of this space should ensure that Bomb does not feel segregated from other children but instead empowered by their strength, creating a sense of ownership and territory. One way to achieve this is by creating an elevated area that is challenging for other children to reach, making it a special domain exclusive to Bomb. This elevated space allows Bomb, with their physical abilities, to play from above without disrupting the play of others. By being positioned higher than their peers, Bomb can experience a sense of power and control, which aligns with their natural inclination. Moreover, if the play design is embodied in unusual objects or makes use of atypical affordances, not only it enhances the degree of challenge but it also procures the feeling of excitement that usually accompanies the act of doing something that is not allowed.

The concept is based on the vertical use of the space, by introducing one or more elevated levels that can be accessed through climbing. However, the play design does not offer convenient methods or shortcuts like stairs to reach the platforms above the ground level. This is to challenge children like Bomb to rely on their physical abilities and problem-solving skills to ascend to the upper levels, but it also ensures that younger kids, for whom it would be too dangerous to reach such heights, are not able to climb up. Once Bomb has reached the top, they can freely engage in play on the platforms, ensuring that their activities do not disrupt or harm other children's play experiences.