

# A MULTIPURPOSE ACTIVITY STROLLER

MASTER  
THESIS

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The background of the entire page is a repeating pattern of light orange line-art sketches of various stroller models, arranged in a grid-like fashion.

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**A.I. (Avelien) Husen**

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**Delft University of Technology**

**In collaboration with**  
**Bugaboo**

**Supervisory team**  
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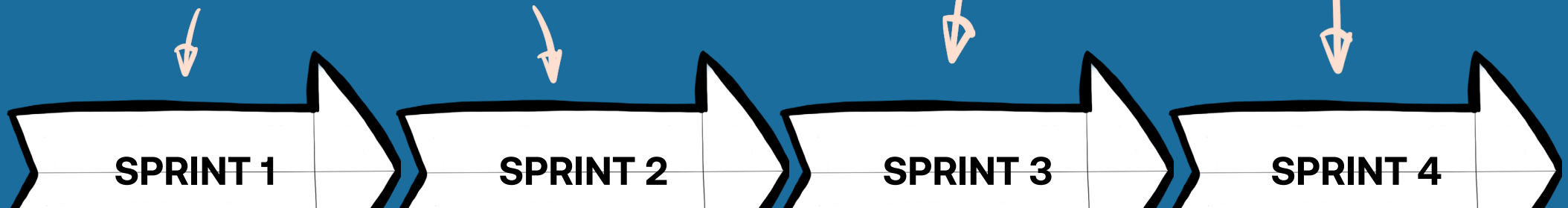
**Mentor**  
**S.C.M. (Susie) Brand-de Groot**

**Company mentor**  
**A.M. (Aernout) Dijkstra-Hellinga**



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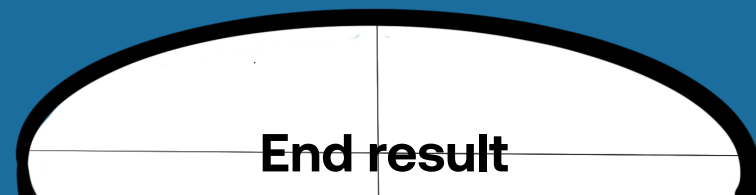
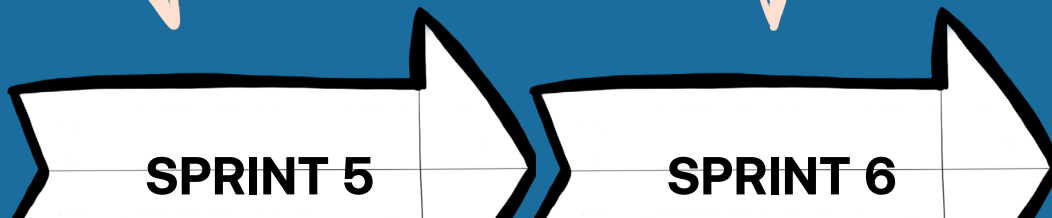
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# PREFACE

Dear reader,

I worked on this graduation project from September 2021 until March 2022. It were turbulent times, because of the COVID-19 pandemic. Sometimes the project was tough, but it was mostly a fun & educational experience.

I got in contact with Bugaboo during the course Advanced Concept Design and felt inspired by the company. Luckily, they gave me the opportunity to graduate at their company. There always was a good atmosphere at their office in Amsterdam, despite the construction work going on for six months.

Thank you Susie & Sylvia. You did not only coach me on my project, but also about life. Our coach meetings always comforted me and inspired me to continue working. I am really glad that you wanted to be my supervisors and I think I'm going to miss you a bit during the rest of my career.

Thank you Aernout, for always asking good questions & helping me with gathering information about Bugaboo. I also want to thank the people from Bugaboo, Jaap, Dejan, Simon, Luuk, Hubert, Stephanie, Rutger, Yoon, Mattijs, Joris, Vera, Antonio, Chantal, Sophia, Miriam and Marco, for helping throughout this project.

I also want to thank my family and friends for always supporting me. Especially, my boyfriend Sjoerd who always helped me, cared for me, and brought me snacks during tough times. My best friend Indah, who made me believe in myself and Thomas & Fay, for being my graduation buddies. Lastly, I want to thank all participants of the interviews, creative sessions and tests. Without you I would not have been able to finish this project.

This project is the final work of my Master Integrated Product Design and from now on I'm ready for a new challenge! Enjoy reading!

Bye!  
Avelien 

# EXECUTIVE SUMMARY

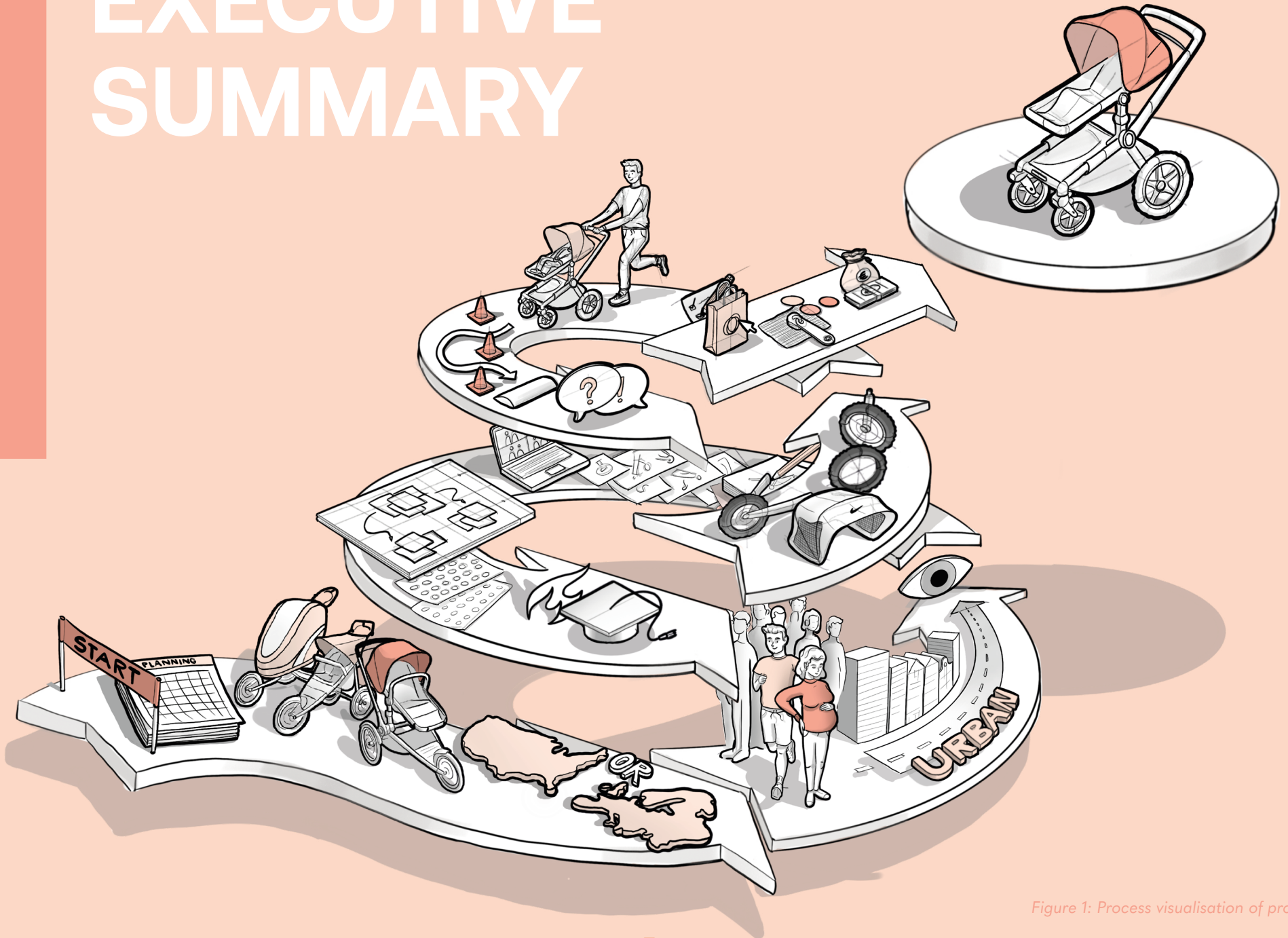


Figure 1: Process visualisation of project

This graduation project consists of six sprints and the assignment was to develop a concept for a modular runner/work-out stroller.

Within Sprint 1 the competitors, the old Bugaboo Runner and market were researched. Thule, Cybex and UPPABaby are the direct competitors for Bugaboo on the runner market. The Bugaboo Runner, a three-wheel runner stroller, was a good product and people who bought it were satisfied. However, the Runner was a relative expensive accessory, given the fact that a 'regular' Bugaboo stroller already costs around €1000.

Within Sprint 2 the consumers and their lifestyle were researched and afterwards a design vision and focus were created. Consumers in the USA like three-wheel strollers, while consumers in Europe prefer four-wheel, more compact, multi-stage (suitable for different ages) strollers. Based on fifteen interviews with parents, the target group of this project can be identified as the Young Urban Fit Parents. The design vision of this project is: 'I want to design a regular stroller that activates and creates the possibility to work out with your child as a busy young fit parent who lives a healthy, active & sporty life in an urban area.' with the design focus: 'How can you run/sport with a regular stroller?'

Within Sprint 3 and 4 ideas were generated, by organising creative sessions. Four concepts were selected from these ideas. The final concept that was chosen is the stroller with an extendable frame since this concept scores best on all requirements. This concept is called the Fox Active.

Within Sprint 5 the Fox Active is validated by a test with the prototype and parent validation sessions.

The tests proved that the configuration of the final concept with 16" rear wheels and the elongated frame is close to the ideal running situation and performs better than running with a regular stroller. The second test also proved that walking with 16" rear wheels and the normal frame is sufficient and preferred over walking with the elongated frame. All participants of the validation session would consider the regular stroller with sport function if it does not cost too much extra and if it is clear what the benefits over the regular version are.

Within Sprint 6 the implementation of the Fox Active is discussed, which consists of the styling, fit in the Bugaboo Portfolio and costs. The base colour of the styling is black, with bright orange accents. The 'sport buttons' will be coloured bright orange as well, to make clear that these buttons have a special function. The estimated retail price for the Fox Active is €1299-€1499, based on the comparison of the prices of the Bugaboo Fox 3, the price of a Bugaboo Fox 3 and a runner stroller together and the price of the Bugaboo Donkey 5. Finally, some recommendations were made by the Bugaboo designers. They recommend that the joint of the stroller needs to be tested to be strong enough to run with and that it needs to be tested if the stroller is not too heavy.



Figure 2: The Fox Active

2

# INTRODUCTION



# 2.1 DESIGN BRIEF

It is no secret that being active is important to stay healthy, also for (new) parents. After having a child, it might happen that you stop working out, due to all new overwhelming responsibilities and tasks (Ringdahl, 2002). Stroller companies like Bugaboo like to fulfil this need of consumers by designing products that help parents to still be active. Bugaboo already launched a runner stroller back in 2015 to serve this need, but this was not as popular as expected. Chapter 3.3 will go deeper into this.

With this project Bugaboo wants to enter the existing market of runner strollers with a product that meets the Bugaboo standards, stands out from other strollers and that makes it more attractive for parents to work-out together with their (young) child(ren). Figure 4 shows a part of the Project Brief format proposed by the Delft University of Technology. The whole Project Brief can be found in Appendix A. The assignment in short is displayed below.

**Develop a concept design of a modular runner/work-out stroller.**

## PROJECT BRIEF

### Problem Definition

Currently the consumers of Bugaboo are not able to take a run or exercise with their child using a Bugaboo product. Earlier Bugaboo already saw a market for jogging strollers and tried to enter this market. Unfortunately, this did not work since the chassis of the designed stroller was too expensive and the product could not be used for regular things, like buying groceries or walking in the city. Bugaboo still sees a need for a runner/exercise stroller product by their consumers. This need will be further researched during this graduation project since it is not based on elaborate research yet.

### Assignment

During this project I will develop a concept design of a modular runner/work-out stroller. A product like this will be an addition to the Bugaboo portfolio since they do not have a product which makes this possible yet. The goal is to make working-out possible for parent(s) while taking their child with them.

Figure 4: Part of the Project Brief

# 2.2 DESIGN PROCESS

The design process of this project consists of six phases. The phases are so called design sprints and each sprint lasted a few weeks (two to four weeks). The names of the design sprints are:

- Sprint 1 – ‘Competitors & Market’**
- Sprint 2 – ‘Consumers & Lifestyle’**
- Sprint 3 – ‘Conceptualise 1’**
- Sprint 4 – ‘Conceptualise 2’**
- Sprint 5 – ‘Validation’**
- Sprint 6 – ‘Implementation’**

Figure 5 shows a visualisation of the complete design process.

During these sprints, several design methods were used. During Sprint 1 and 2 an Agile design approach was used. This method is described in the Delft Design Guide (van Boeijen et al., 2020). During this design approach ‘uncertainty’, in this case research outcomes, are turned into patterns, which create valuable insights for the design process. These insights are used to create a concept. The result

of these two sprints was a design vision, requirements, and a design focus. See Chapter 4 – Research & Inspiration.

During Sprint 3 and 4 ideas and concepts were generated. This was done by diverging and converging. During the diverging stage, many possibilities are explored and during the converging stage valuable ideas are selected using certain criteria. During these sprints, four (creative) sessions were organised which are represented by the four smaller diamonds within the large diamond which represents the whole ideation process. Each diamond represents one loop of diverging and converging. The methods that were used during the creative sessions can be found in Roadmap for creative problem solving techniques (Heijne, Katrina & Van Der Meer, Han, 2019). See Chapter 4.

Throughout the whole design process, a user centered design approach was used. With this approach the desirability, viability and feasibility of the concept were considered. These three characteristics are also requirements for the final design. The goal of this method was to make sure that design hits the sweet spot of these three important pillars. See Chapter 5.

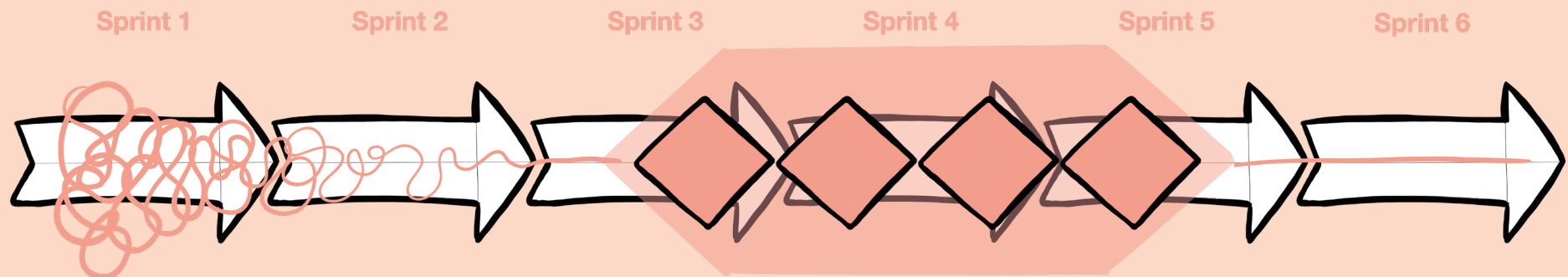


Figure 5: Design Process



Figure 6: Bugaboo 'Adventure Awaits' campaign

# 2.3 ABOUT BUGABOO

## 2.3.1 History

Bugaboo is childcare company, which is known for their high-end Dutch design strollers. The company was founded in 1996 by Max Barenbrug and his brother-in-law, Eduard Zanen. Figure 7 shows the graduation project of Barenbrug from 1994 from The Design Academy in Eindhoven, which was the birth of Bugaboo.

Their first product, The Bugaboo Classic launched in 1999, was a modular stroller which could be used to both have a stroll and to put behind your bike. Later, they launched multiple high-end strollers (Bugaboo Frog, Bugaboo Cameleon, Bugaboo Donkey, Bugaboo Buffalo, Bugaboo Bee, Bugaboo Ant, Bugaboo Fox, Bugaboo Lynx), the Bugaboo Turtle car seat, The Bugaboo Startdust travel cot and multiple accessories. Figure 8 displays a timeline of all products launched by Bugaboo. In the past they collaborated with brands like Diesel, Viktor & Rolf and Marc Jacobs. Figure 10-17 on page 16 & 17 display several special edition Bugaboo strollers.

Bugaboo products are mostly used by consumers, who value freedom, adventure, and high-quality design products. Their current brand focus is to improve the development of the child. The Bugaboo strollers are designed with sustainability in mind, since most parts are replaceable and/or washable (Our Responsibility | Bugaboo.com, n.d.). In 2018 Bugaboo was acquired by Bain Capital (Bugaboo Enters next Growth Phase with New Shareholder Bain Capital Private Equity, 2018). Bugaboo suffered losses in the first few years after this acquisition (Wouda, 2020), but fortunately Bugaboo is a healthy company again.

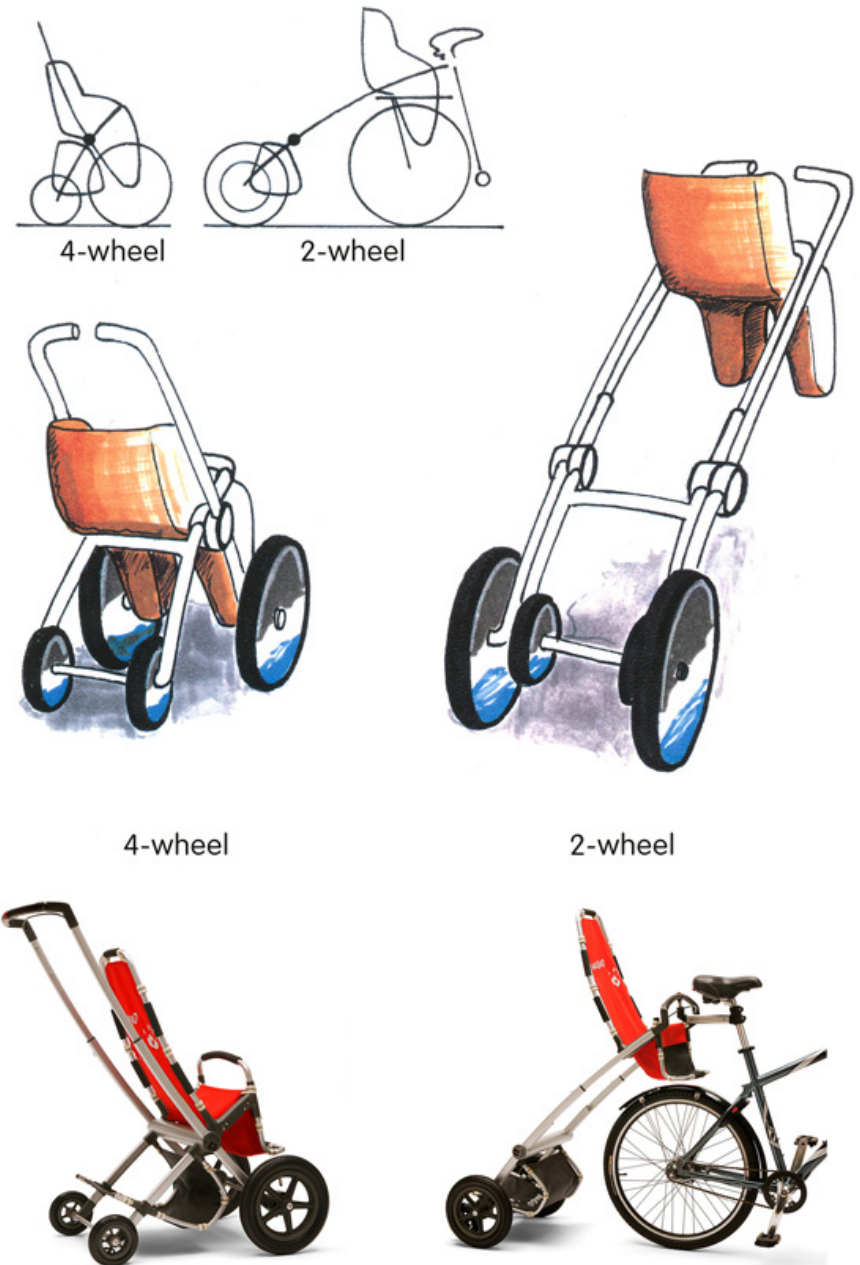


Figure 7: Graduation project by Max Barenbrug 1994

## 2.3.2 Product Portfolio



Figure 8: Timeline of Bugaboo products

Bugaboo currently sells seven types of strollers. These strollers can be seen in figure 9. The Fox 2, Fox 3, Cameleon 3 and Lynx fall in the category of a luxury stroller. The Bee 6 is a compact stroller, and the Ant is an ultra-compact stroller. The Donkey 3 is a versatile stroller which can be bought in different configurations: Mono, Duo and Twin. Each stroller comes with a canopy, under seat basket, bassinet, and seat. All strollers can be purchased in different colors and together with multiple accessories, like a foot muff, diaper bag, rain cover or snack tray. Besides these seven strollers, Bugaboo also sells the Turtle Air car seat and the Stardust travel cod (Bugaboo Strollers and More | Official Website, n.d.).

What makes Bugaboo stand out from other stroller brands is that most Bugaboo strollers have the option to change the position of the seat from facing parent to facing world. The strollers are built to last since they are designed to last a decade. The strollers are also relatively lightweight and compact when folded.



Figure 9: Current stroller portfolio of Bugaboo

Figure 10: Bugaboo Niark1 special 2017



Figure 11: Bugaboo van Gogh special 2015



Figure 12: Bugaboo Viktor & Rolf special (My First Car) 2012



Figure 13: Bugaboo Andy Warhol special 2014



Figure 14: Bugaboo Bas Kosters special 2019



Figure 15: Bugaboo Product RED special 2010



Figure 16: Bugaboo Diesel special 2014



Figure 17: Bugaboo Missoni-special 2011



# RESEARCH & INSPIRATION

In this chapter, the first and second sprint of the design process will be discussed. In the first sprint - 'Competitors & Market' the Bugaboo Runner, competitor products & the runner stroller market are analysed. In the second sprint - 'Lifestyle & Consumer' the consumers and their lifestyle were analysed. This analysis led to personas, a specific target group and a design vision. Figure 18 gives a visual overview of sprint 1 and 2.

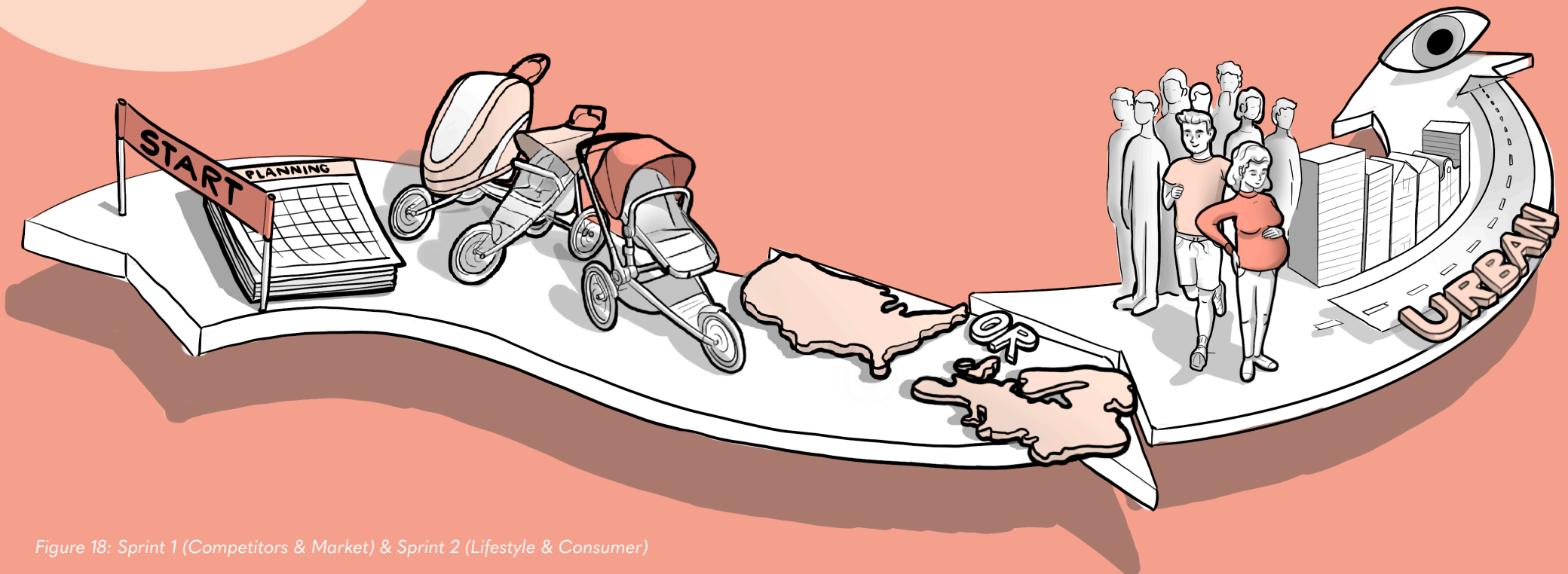


Figure 18: Sprint 1 (Competitors & Market) & Sprint 2 (Lifestyle & Consumer)



Figure 19: Bugaboo Runner promotion photo

# 3.1 RESEARCH APPROACH

During these first two sprints desktop research has been performed. Academic papers, blogs and websites were used to gather information relevant for this project.

Besides this, expert interviews have been performed with designers at Bugaboo. The designers at Bugaboo have a lot of knowledge, since they work with strollers every day and a few designers even worked on the design of the Bugaboo Runner. Besides this, a run test with the Bugaboo Runner has been done and a questionnaire has been sent out in the Bugaboo newsletter. This questionnaire contained questions about the purchase of the Bugaboo Runner. These elements provided information for sub chapter 3.3.

Lastly, fifteen interviews with consumers have been conducted. The goal of the interviews was to gain insights of parents lives and what moments they value together with their children. For the parents who own a runner stroller, the goal was to find out what they like and dislike about this stroller. Figure 20 shows a visual overview of the interview participants. These elements provided information for sub chapter 3.5 and 3.6.

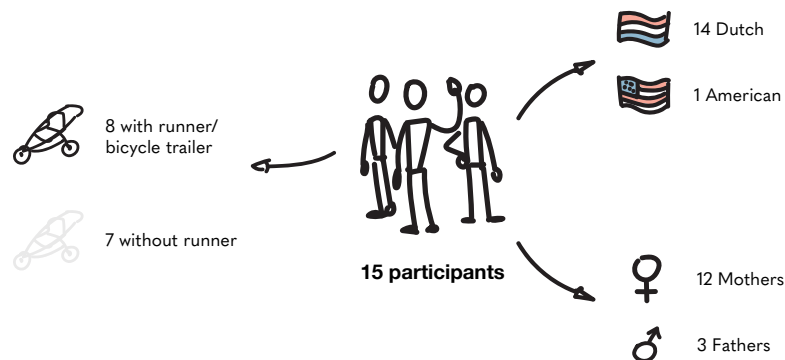


Figure 20: Overview of participants interviews

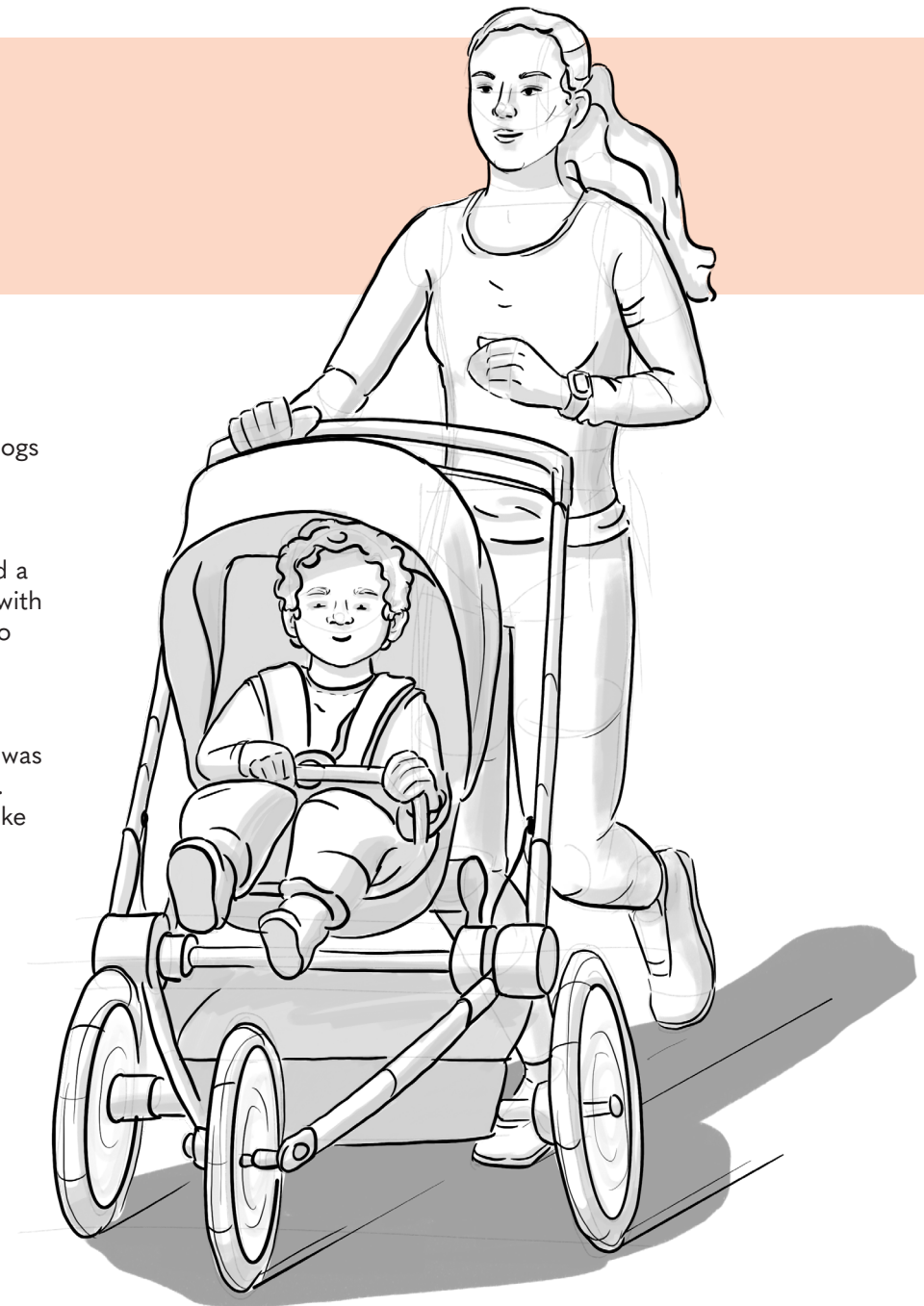


Figure 21: Mother with child in runner stroller

# 3.2

## DIFFERENCES BETWEEN A RUNNER STROLLER & A REGULAR STROLLER

### 3.2.1 Runner stroller

A runner stroller is usually stable and bulky and due to its large frame it keeps on course. It facilitates a smooth bump free ride, even on rough terrain due to the big tires. A runner stroller cannot be used with a child under six months. (Jogging Stroller vs Regular Stroller, 2020). See figure 22 for an overview of the features of a runner stroller.

**Weight** 11-19 kg

**Tire type** Air filled tires

**Wheels** 3 large wheels,  
front wheel lockable or fixed

**Brakes** Active brake, foot brake, wrist strap

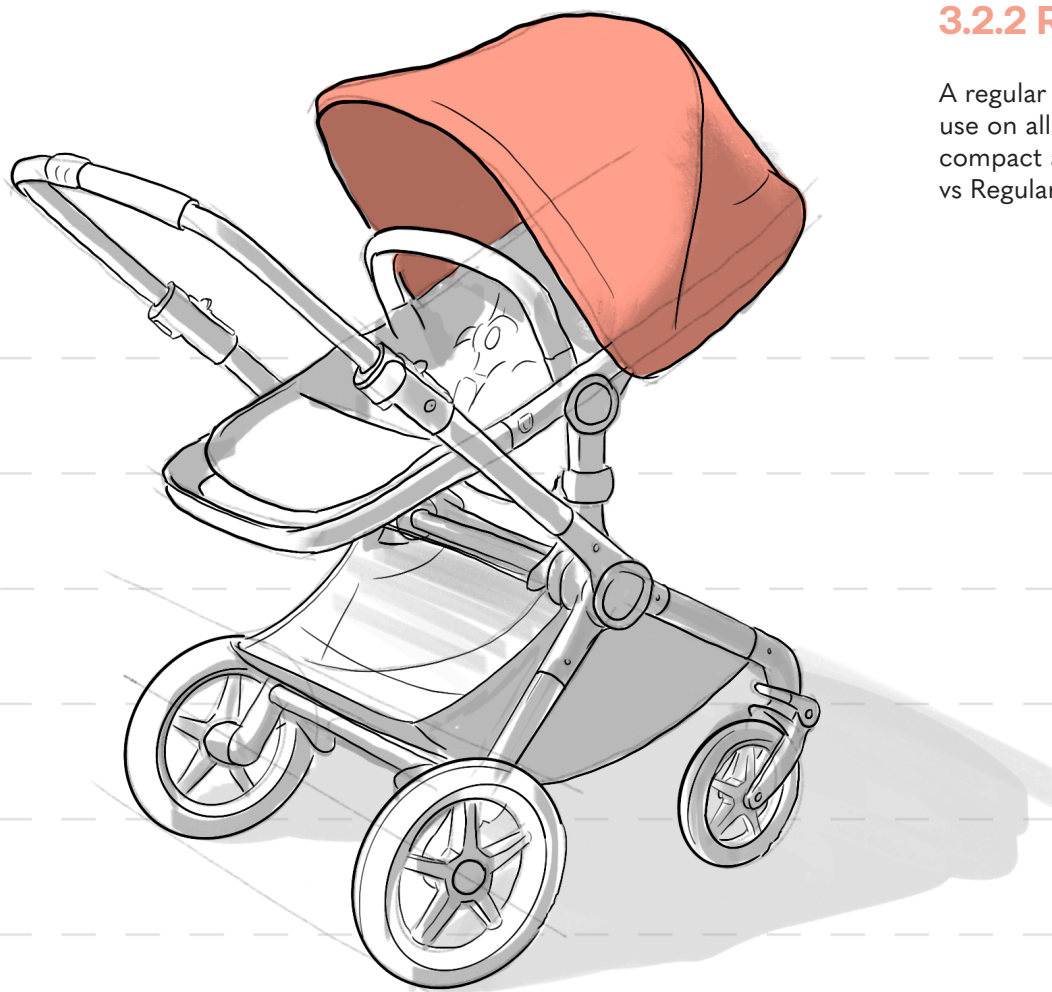
**Handlebar** Usually adjustable

**Suspension** Often additional suspension

**Seat** Does not recline fully



Figure 22: Features of a runner stroller



### 3.2.2 Regular stroller

A regular stroller is usually versatile and easy to manoeuvre. Some of them are suitable to use on all terrains, while others with smaller wheels do not perform well on all terrains. Some compact and light weight regular strollers are designed especially for travelling (Jogging Stroller vs Regular Stroller, 2020). See figure 23 for an overview of the features of a regular stroller.

4-15 kg

**Weight**

Solid rubber tires

**Tire type**

4 smaller wheels,  
swivel front wheels

**Wheels**

Foot break

**Brakes**

Often adjustable

**Handlebar**

Usually no additional  
suspension

**Suspension**

Reclines fully

**Seat**

Figure 23: Features of a regular stroller

# 3.3 BUGABOO RUNNER

## 3.3.1 Analysis

The Bugaboo Runner is a 3-wheel runner stroller chassis that was launched by Bugaboo in 2015. It could be used to run with your children aged 9 months and older. The product was positioned as an accessory for your 'regular' Bugaboo, on which you could put your existing seat. The price of this chassis was \$425/€400 including adapters for the seat. There also was the option to buy the Bugaboo Runner as complete stroller including a seat, which costed \$815/€710. Figure 26 displays all parts of the Bugaboo Runner bought as a complete stroller. The Bugaboo Runner was launched in Australia, New Zealand, USA, Canada, and Europe.

In 2015 the Bugaboo Runner was promoted via multiple platforms, like advertisements, magazines, influencers, and videos (see page 25 for a collection of Bugaboo Runner advertisements and page 27 for some photos of the launch event). The Bugaboo Runner was focused on the USA, Canadian and Oceanic market since runners and 3-wheel strollers are popular in these parts of the world (see Appendix B for the sales percentages figure). A visual of the target group can be found in this Appendix B as well.



Figure 24: Bugaboo Runner

### 3.3.2 Consumer opinions

To find out what consumers think of the Bugaboo Runner, a questionnaire has been sent out via the Bugaboo newsletter. The questionnaire has been sent to all consumers who bought a Bugaboo Runner and subscribed to the newsletter. The email that has been sent out can be seen in figure 25. The consumer that responded are from Sweden, Scotland, Spain, Norway. Unfortunately, only five consumers responded to the questionnaire, however the information they provided was valuable. This information was combined with the outcomes of an interview with one participant who owns a Bugaboo Runner.

The consumers who bought the runner found it comfortable to run with because of the locked front wheel, the option to change the direction of the seat, large air-filled tires, special under seat basket and sturdy frame. Five out of six consumers bought the Bugaboo Runner as an accessory frame for their regular Bugaboo and the consumers scored the stroller with a 9.2/10 on average.



One consumer commented:

*'I absolutely LOVE my bugaboo runner and so does my son. We have averaged nearly 1000 miles with running. The best bit is the choice to front or parent face as we actually preferred the parent facing option up until my son turned 3 so we could see each other, chat, sing, interact. ... I wouldn't change a thing about it.'*

Another consumer also agreed on this by saying:

*'Love that you can give the kid face towards you, that is otherwise rare at other runner strollers from other brands.'*

All outcomes of the questionnaire can be found in Appendix E.

Figure 25: Questionnaire sent out via Bugaboo Newsletter



Figure 26: Parts of Bugaboo Runner



# R U N F R E E

INTRODUCING BUGABOO RUNNER



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bugaboo

One base fits all\*

The Jogging Extension



## Run Baby Run!

Je bent graag in de buitenlucht, in beweging en in shade. Dit begrijpen de ontwerpers van Bugaboo als geen ander, en speciaal daarom is de Bugaboo Runner ontwikkeld. Deze lichtgewicht hardlooperwagen biedt ouders de mogelijkheid om zich vrij door de wereld te blijven bewegen. De ideale combinatie van een goede work-out en qualitytime met je kind. Voel je vrij. Run Free!

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# Bugaboo Runner

The Jogging Extension

One base fits all



bugaboo

Figure 27: Bugaboo Runner advertisements

### 3.3.3 Insights

The Runner is a relative expensive accessory, given the fact that a 'regular' Bugaboo stroller already costs around €1000. The cheaper option to buy the Runner as complete stroller however was not sufficient, since it was not a multi-stage\* stroller (no bassinet included and no car seat option). Another downside is that the Runner takes up extra storage space in the consumers' house apart from their regular stroller. This could be a problem for people living in urban areas. Besides this, it was difficult to steer while walking due to the permanently locked front wheel.

However, the Bugaboo Runner was a good product and people who bought it were satisfied. Consumers liked the option to change the direction of the seat, the special under seat basket and the big air-filled tires. Figure 28 shows an overview of all pros and cons of the Bugaboo Runner.

In May 2019 Bugaboo stopped selling the Bugaboo Runner, because the sale numbers were not as high as expected.



\*Multi-stage means suitable for different ages of children.

Figure 28: Bugaboo Runner pros and cons



# 3.4 COMPETITORS

There are currently several competitors in the market of runner strollers. Figure 30 displays that Thule (Buggy's En Kinderwagens | Thule | Nederland, n.d.), Cybex (Best Strollers Collections from CYBEX, n.d.) and UPPABaby (UPPAbaby, n.d.) are the direct competitors for Bugaboo on the runner market since they sell runner strollers like the Bugaboo Runner. Other brands like Babytrend (Strollers – Baby Trend, n.d.), Graco (Graco Strollers | Graco Baby, n.d.), Hauck (Hauck Collections, n.d.), Joovy (Joovy Home Page, n.d.), Jeep (Jeep® Strollers and Baby Gear, n.d.), Bob Gear (BOB Gear, n.d.), Chicco (Baby Strollers | Infant Strollers at Chicco, n.d.) and Baby jogger (Baby Jogger, n.d.) also sell runner strollers, but these have either different functionalities, aesthetics and/or price. The biggest difference between these runner strollers and the Bugaboo Runner is a swivel wheel versus a fixed front wheel and the option to change the direction of the seat. These products serve the same customers, but have a slightly different solution.

There are also brands like Qeridoo, Croozier, Burley, Yepp, Hamax and Fillikid, who also sell a product for parents who like to be active with their child. These brands sell products that serve a similar need as the Bugaboo Runner but have a different solution. They sell bicycle trailers and/or bicycle seats for children.

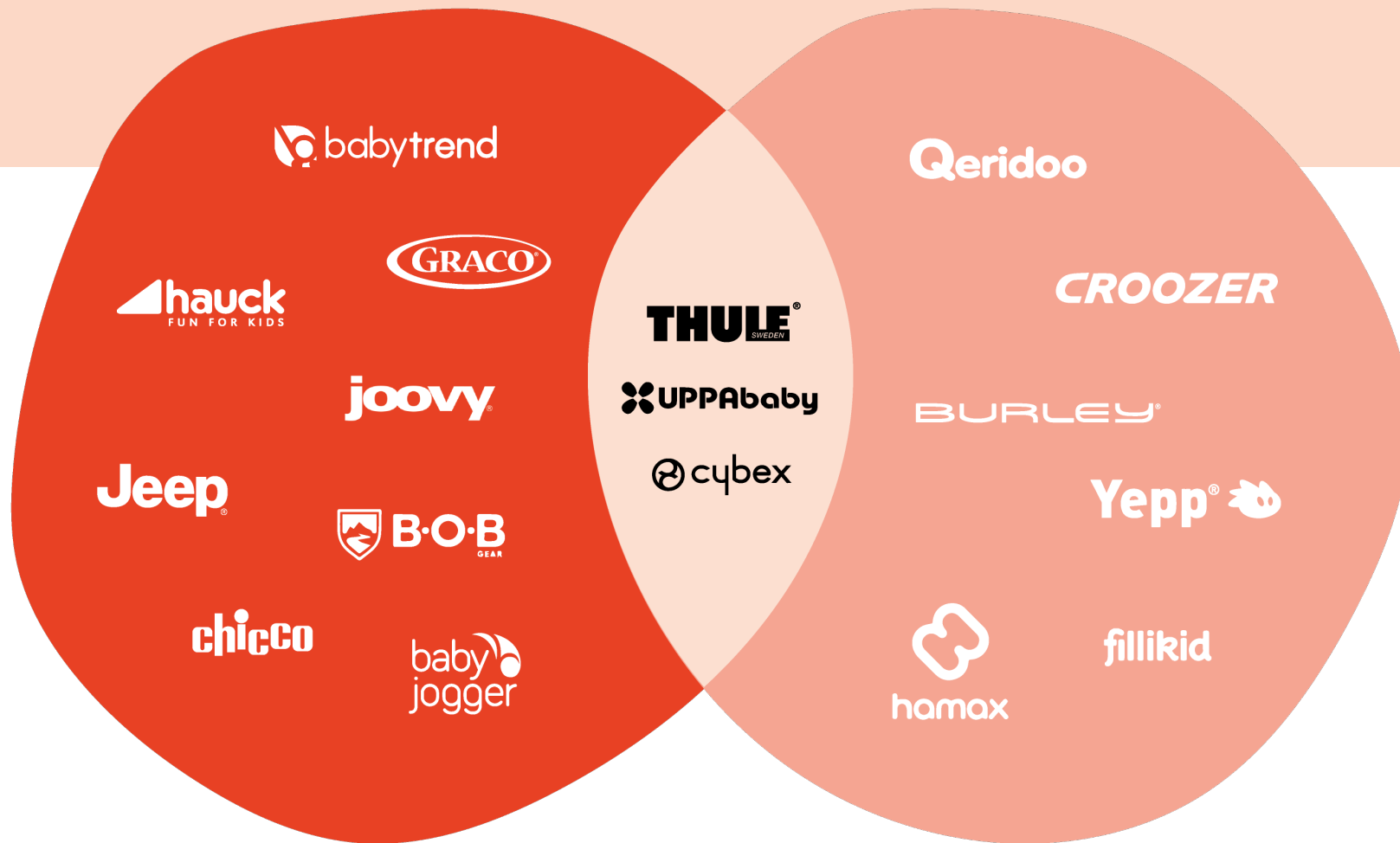
The current runner strollers on the market vary from around \$140 to around \$900. Brands like Bob Gear, Baby jogger and Babytrend are brands from the USA and Thule is a European brand. Currently, all runner strollers that are on the market have 3-wheels. Page 31 with figure 32-35 shows advertisement images of the Cybex Avi & Zeno, the Thule Urban Glide 2, The Bob Gear All Terrain Pro and the UPPA Baby Ridge. All these advertisements give a feeling that you can conquer

everything if you buy their runner stroller. Especially the Bob Gear and UPPA Baby advertisement show a rough terrain which gives it a sporty and outdoor feeling. The Cybex advertisement gives more of an elegant feeling and implies that you can run very fast with your runner stroller. The Thule advertisement gives more of a calm feeling, because the woman is just walking with her stroller.

Figure 31 shows a comparison of five out of seventeen runner strollers that represent the current market during the end 2021. In the comparison the weight, folded dimensions, swivel wheel, car seat adapter, the option to change the direction of the seat and the price are put next to each other. The full comparison can be found in Appendix C.

In the budget segment the Babytrend Manta scores best since it has all options and only costs \$170. This product can be bought in the USA (Baby Trend Manta Snap Gear Jogger - Lava, n.d.). The Thule Urban Glide 2 scores best in the luxury market since it's the lightest in relation to having most of the features. This product can be bought in Europe as well as in the rest of the world (Thule Urban Glide 2 | Thule, n.d.).

Currently there are no compact runner strollers on the market. Also, there are no four-wheel strollers on the market that are suitable to run with. This is a direction that was explored further in this project since designing a product in this category will be unique.




**Same customer  
Different solution**


**Direct competitor**


**Same need  
Different solution**

Figure 30: Runner stroller competitors

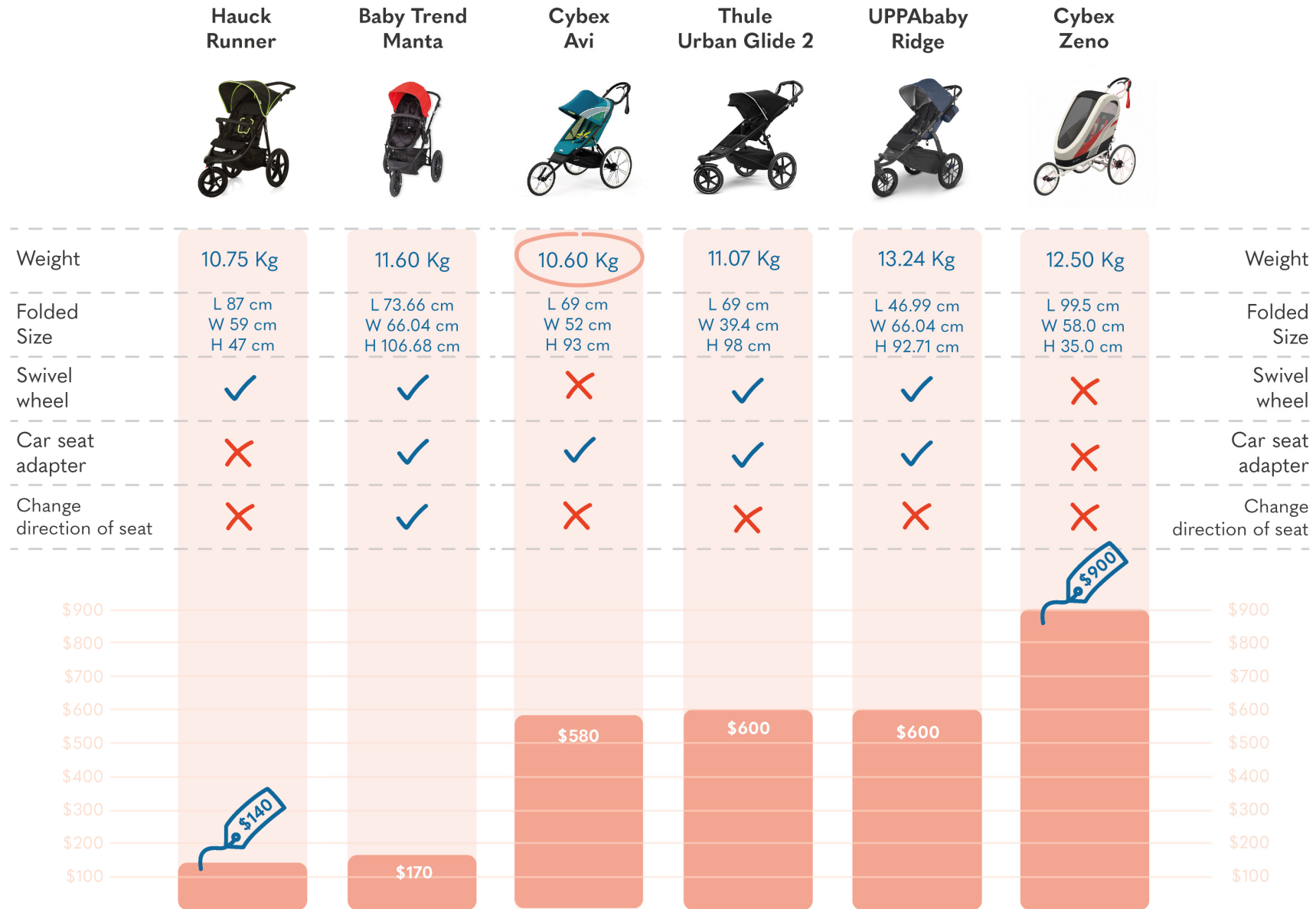


Figure 31: (Part of the) Runner comparison



Figure 32: Cybex Avi & Zeno



Figure 33: Thule Urban Glide 2



Figure 34: Bob Gear All Terrain Pro



Figure 35: UPPABaby Ridge

# 3.5 MARKET

Something that stood out during this research was that the runner stroller market differs per region of the world. In this sub chapter the focus will be on the differences between the USA and European stroller market. These two regions are compared because the USA is known for runner strollers and because Europe is known for luxury strollers and is the home of Bugaboo. Figure 37 shows a visual overview of the differences between the American and European market. The statements are based on a talk with the Business Development Director, an American consumer, and blogs and are explained below.

10,9% of the USA stroller market consists of three-wheel jogger strollers (see Appendix B). 'The larger rear wheels make three-wheel strollers much better than four-wheelers for all-terrain activities.' ('3 Wheel vs 4 Wheel Stroller', 2019). In general, American consumers buy a different stroller for a different purpose, which mean they own different types of strollers. The average American family owns two to three strollers (The Washington Post, 2013). It is common to have one stroller in the trunk of your car and one or more stored in your garage.

When American consumers buy a runner stroller the size does not matter since they usually have enough space to store it and mostly use it go out around their house. So, it is most important that the runner stroller is practical and comfortable for both the child and parent. Figure 36 shows an American mother with a three-wheel stroller, to give an impression of the American consumer.



American families generally have more room than most European parents because many American parents live in the suburbs of the city. The average house in America is 463 m<sup>2</sup> while the average house in Europe is 148 m<sup>2</sup> (Interior Design Differences Between Europe and the United States, n.d.), which means that a European family has around 3 times less space than an American family. In the USA 77% of the people live in a house (detached, attached, or mobile homes) and 20% in an apartment (Do Many Americans Live in Apartments or Do They Have Houses like on TV Shows?, n.d.), while the percentage of people in Europe living in an apartment is 46,1% (This Is the Most Popular Type of Home in Europe Right Now, n.d.).

Three-wheel strollers are also very popular in other countries where people live in big houses like Canada and Australia/New Zealand. Three-wheel strollers represent 17,7% of the stroller market there (see Appendix B).

European consumers like multi-stage strollers (Carola, 2021) and find design important. Only 5% of the market consists of three-wheel strollers and 63,8% consists of comfort four-wheel strollers (see Appendix B). The traditional runner strollers are less popular in Europe because they are not multi-stage, heavy and bulkier than regular strollers (see sub chapter 3.2). European parents find it important that a stroller is light weight since this makes it easier to move around, especially in urban areas. Within the urban areas people tend to have even less storage room for a second or third stroller.

Given the fact that the previous design of a traditional runner stroller of Bugaboo did not sell well (see sub chapter 3.3), there are no four-wheel strollers on the European market that are suitable for running yet and this project is based in Europe, the focus of this project will be on the European Urban market. Within this urban market the focus will lie on people who live in apartments and smaller houses. There is an opportunity to design a new valuable product for this region.

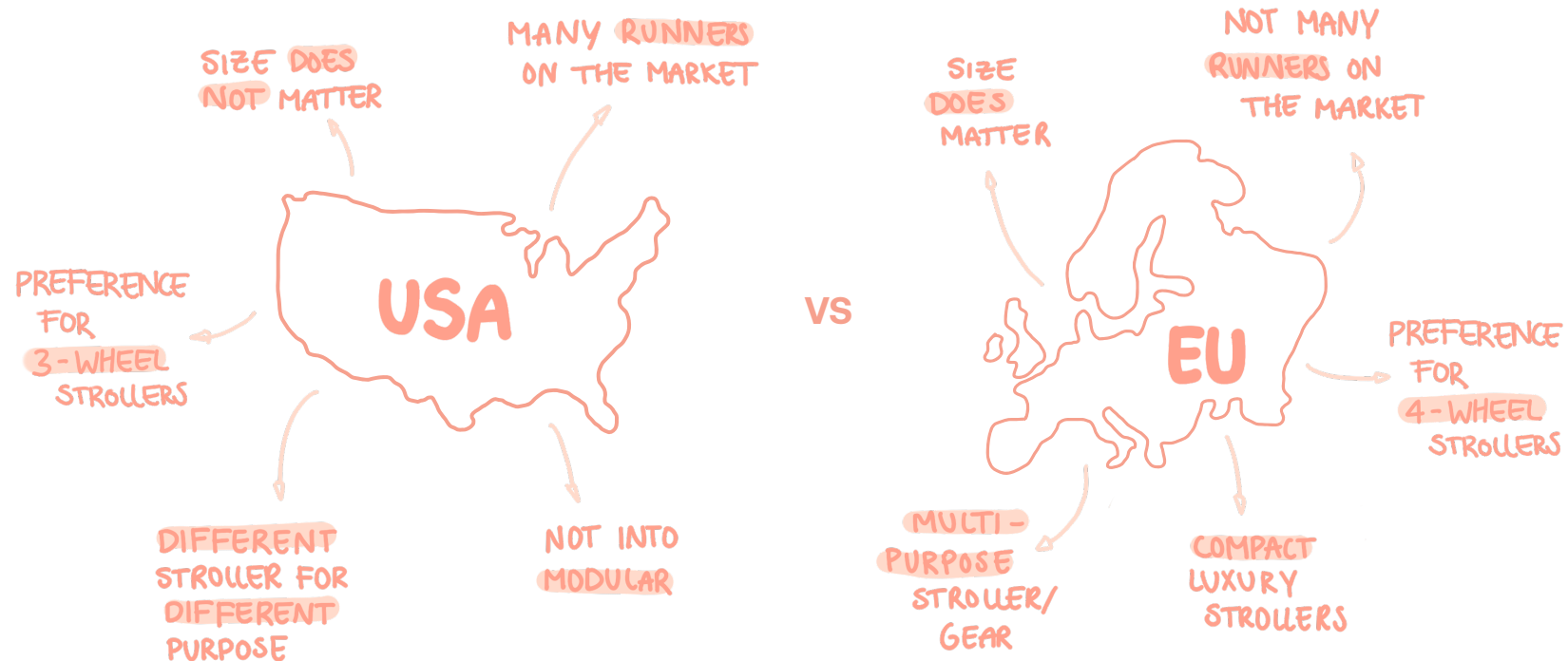


Figure 37: The American stroller market versus The European stroller market

# 3.6 CONSUMERS

For this research, fifteen consumers have been interviewed, who all do at least one type of sport. The goal of this research was to gather insights in the lives of parents, especially on their sport behaviour in relation to their child(ren). Each participant was interviewed during a phone call. The flowchart of questions that was followed can be found in Appendix D. Figure 20 in sub chapter 3.1 already showed an overview of the participants of this interview. The participants age varies between 30 years and 44 years. They have between one and three children varying from 1 month old to 10 years old.

Most of them do a variety of sports like running, hockey, tennis, football, cycling, swimming, bootcamp. The Dutch participants find it important that a stroller is light weight and compact. They share the opinion that big wheels are comfortable to ride with.

The parents who are not fanatic with sports mostly have one multi-purpose stroller and find it too expensive to buy a runner stroller, since they would not use that enough. This group can be defined as The Young Urban Parents; they are somewhat sporty and buy one practical good-looking and reliable stroller. They like to have a 'moment for themselves' while doing sports, so they do not feel the need to buy a stroller dedicated to running. Besides this, they mentioned that they are used to a four-wheel stroller, so would not consider buying a three-wheel stroller. Some of them tried running with regular stroller, but this did not work out and is not recommended by stroller companies. They currently would buy a stroller like the Bugaboo Cameleon, Bugaboo Fox or a similar stroller from another brand. A persona of the Young Urban parent couple can be found in Appendix D.

The parents that already buy a runner stroller or bicycle trailer can be defined as the Fit parents; They sport most days of the week and are both very sporty. They use their runner stroller to train with, even for marathons or triathlons. They love to be able to go out and be active with their child and both enjoy this moment together. They currently would buy the Thule (Urban) Glide 2, Thule Chariot or a similar stroller from

another brand. However, some of these parents did mention that the folding process of a runner stroller feels like a lot of work and this type of stroller is not convenient in the city centre. A persona of the Fit Parent couple can be found in Appendix D as well.

However, these two personas do not cover all parents, because each individual within a couple differs in needs & wishes. It could be that one of them is sporty and the other is not so sporty. With the current products on the market, the assumption is that they would buy a regular stroller, like the Bugaboo Cameleon or Bugaboo Fox or a similar stroller from another brand. Because they live in Europe, they do not have enough space for another stroller and find a separate runner stroller too expensive since it is not something they both want. A couple like this is a combination of the Young Urban Professional Parents and Fit parents. You can see a photo of these two types of parents in figure 38. This group can be defined as the Young Urban Fit Parents and a persona of this type of couple can be seen in figure 39. Figure 40 of page 37 shows a compilation of photos that display the lifestyle of this target group.

*'I would go for a run more often if I had a stroller like that, but it does not fit in my apartment.'*

*'If it would be possible to run with my current stroller, I would definitely try it.'*

*'A runner stroller is too expensive to use for just half an hour a week.'*

So, the Young Urban Fit Parents will be the target group of this project, since there currently is no ideal product on the market that suits their needs & wishes. They would currently not buy a separate runner stroller, but would consider running with their regular stroller if this was possible. The lifestyle of this target group can be defined as busy, hard-working, care about being fit and adventurous.

# Young Urban Parents

# Fit Parents



EMMA FRANK



VERA  
MICHAEL



# The Young Urban Fit Parent

Living in

Rotterdam, The Netherlands

Sports

Hockey, Tennis, Running

Sport frequency



Brands they like



SUSAN BIJL



in an apartment

'I want a **safe & practical** stroller'

works as a doctor



pregnant with first child



31 years  
EMMA

34 years

MICHAEL

'I want a stroller I can **train** with'



works as an IT consultant

What do they buy now?  
?



Figure 39: Persona Young Urban Fit parents



# 3.7 DESIGN VISION, REQUIREMENTS & FOCUS

## 3.7.1 Design vision

Based on the research performed in the previous chapter the following design vision was created:

**Design a regular stroller that activates and creates the possibility to work out with your child as a busy Young Fit Parent who lives a healthy, active & sporty life in an urban area.**

## 3.7.2 Requirements

Based on research the most important requirements for choosing a final concept are:

### 1 Improving handling

This requirement is important because the stroller needs to have a stable feel, must be easy to control and should not be wobbly. This is important because running will happen at a higher speed than regular strolling.

### 2 Limit spare parts

This requirement is important because the target group of this concept are Young Urban Fit Parents who have limited space at home.

### 3 Easy to use

This requirement is important because the lifestyle of these Young Urban Fit Parents is busy, and it is not convenient to have to take multiple steps to make sure you are ready to go for a quick run.

### 4 Easy to implement

This requirement is important because it would be convenient for Bugaboo if it is possible to implement this solution soon.

Besides these four requirements, feasibility, desirability, and viability are also important since this is a user-centered design project (see sub chapter 2.2).

### 3.7.3 Design focus

Within the design vision the focus of this design project will be 'how can you run/sport with a regular stroller?', because the target group is the Young Urban Fit Parents who does not want a separate stroller to run with, like described in sub chapter 3.6. So, the question is how you can adjust the stroller so that it is convenient to run with, optionally after some possible small adjustments? This focus is visualised in figure 41 below. Currently it is not ideal to run with a regular Bugaboo stroller yet, because the frame feels too unstable. Some of the regular Bugaboo strollers already have the option to lock the front wheels, which would already improve the stability of the stroller while running. The unstable feeling during running could be caused by a relatively short wheelbase. During ideation this direction 'How can you run/sport with a regular stroller?' will be explored.

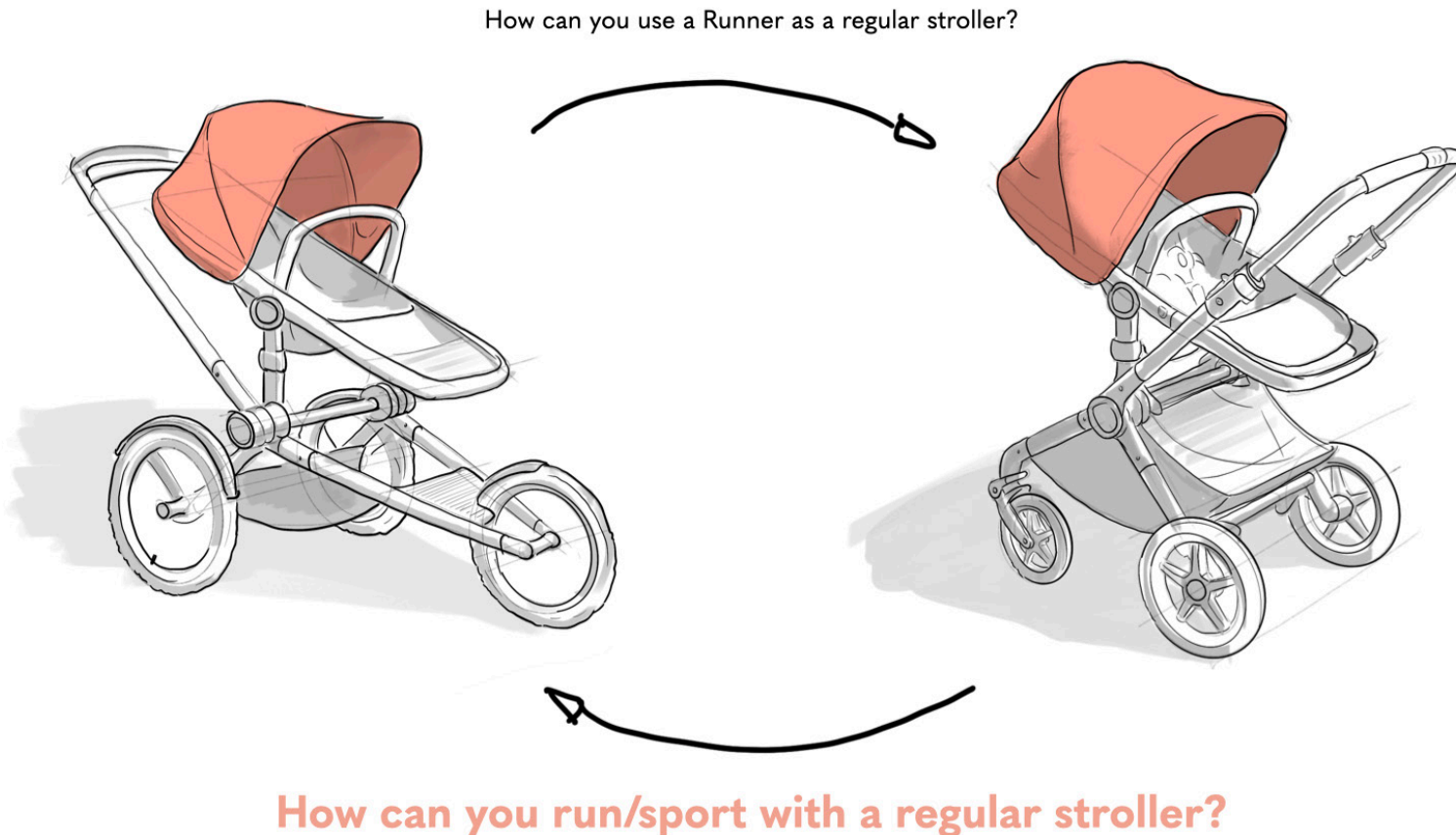


Figure 41: Focus of the design project

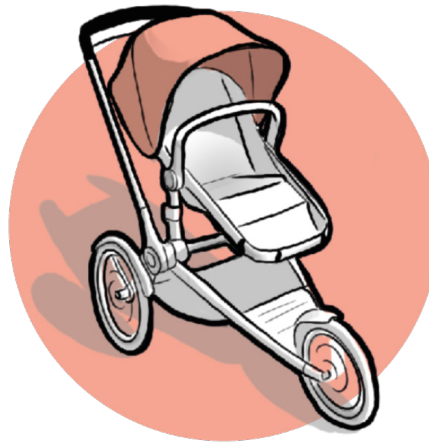
# 3.8 INSIGHTS



## 3.8.1 Competitors

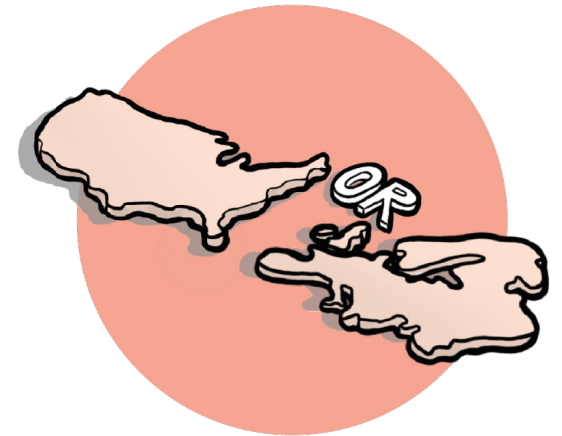
Thule, Cybex and UPPABaby are the direct competitors for Bugaboo on the runner stroller market since they sell runner strollers like the Bugaboo Runner. In the budget segment the Babytrend Manta scores best since it has all options and only costs \$170. The Thule Urban Glide 2 scores best in the luxury market since it's the lightest in relation to having most of the features.

Currently there are no compact runner strollers on the market. Also, there are no four-wheel strollers on the market that are suitable to run with.



## 3.8.2 Bugaboo Runner

The Bugaboo Runner was a good product and people who bought it were satisfied. Consumers liked the option to change the direction of the seat, the special under seat basket and the big air-filled tires. However, the Runner was a relatively expensive accessory, given the fact that a 'regular' Bugaboo stroller already costs around €1000. The cheaper option to buy the Runner as complete stroller however was not sufficient, since it was not multi-stage stroller (no bassinet included and no car seat option).



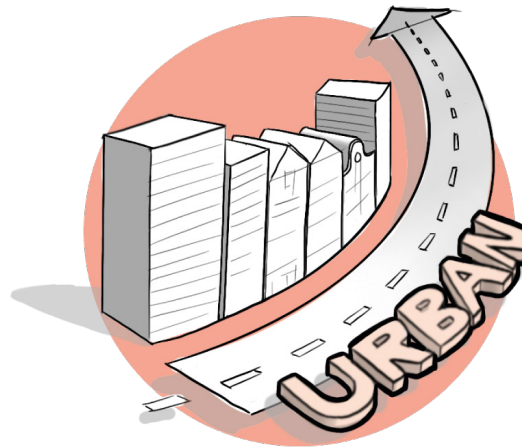
## 3.8.3 Market

There is a big difference between the European and American stroller market. Consumers in the USA like three-wheel strollers, while consumers in Europe prefer four-wheel, more compact, multi-stage strollers. This is mostly because American families usually have a larger house than European families and thus have more room for strollers. The focus of this project will be on the urban European market since there are no four-wheel strollers on the market that are suitable for running yet, while on the other hand there are already many three-wheel strollers on the market.



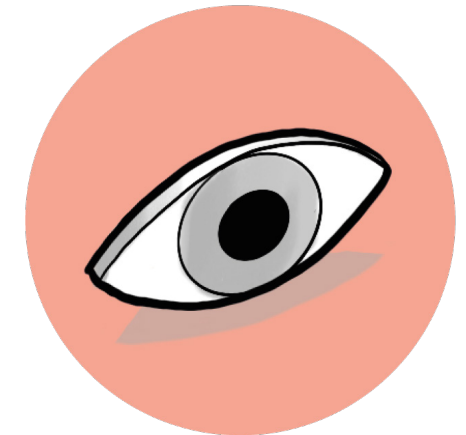
### 3.8.4 Consumers

From fifteen interviews with parents, two personas were distinguished. One group was identified as the Young Urban Parents and the other group as the Fit Parents. The Young Urban Parents find it too expensive to buy a runner stroller, since they would not use it enough and most Fit Parents already own a runner stroller or a similar product. However, most couples consisted of these two personas together. This group can be identified as the Young Urban Fit Parents, which will be the target group of this project. Currently there is no suitable product on the market for this group yet.



### 3.8.5 Focus

Since this project will be on urban Europe, the design focus will be: 'How can you run/sport with a regular stroller?'



### 3.8.6 Design vision

The design vision of this project is: 'I want to design a regular stroller that activates and creates the possibility to work out with your child as a busy young fit parents who lives a healthy, active & sporty life in an urban area.'



# 4

# DESIGN

In this chapter, the third & fourth sprint of the design process will be discussed. In the third sprint – ‘Conceptualise 1’ a creative session with designers from Bugaboo was organized. After that a creative session with students, a creative session with the target group and another session at Bugaboo were organized during the fourth sprint – ‘Conceptualise 2’ to gather many ideas and insights concerning the first ideas. During both sprints there were also individual brainstorms.

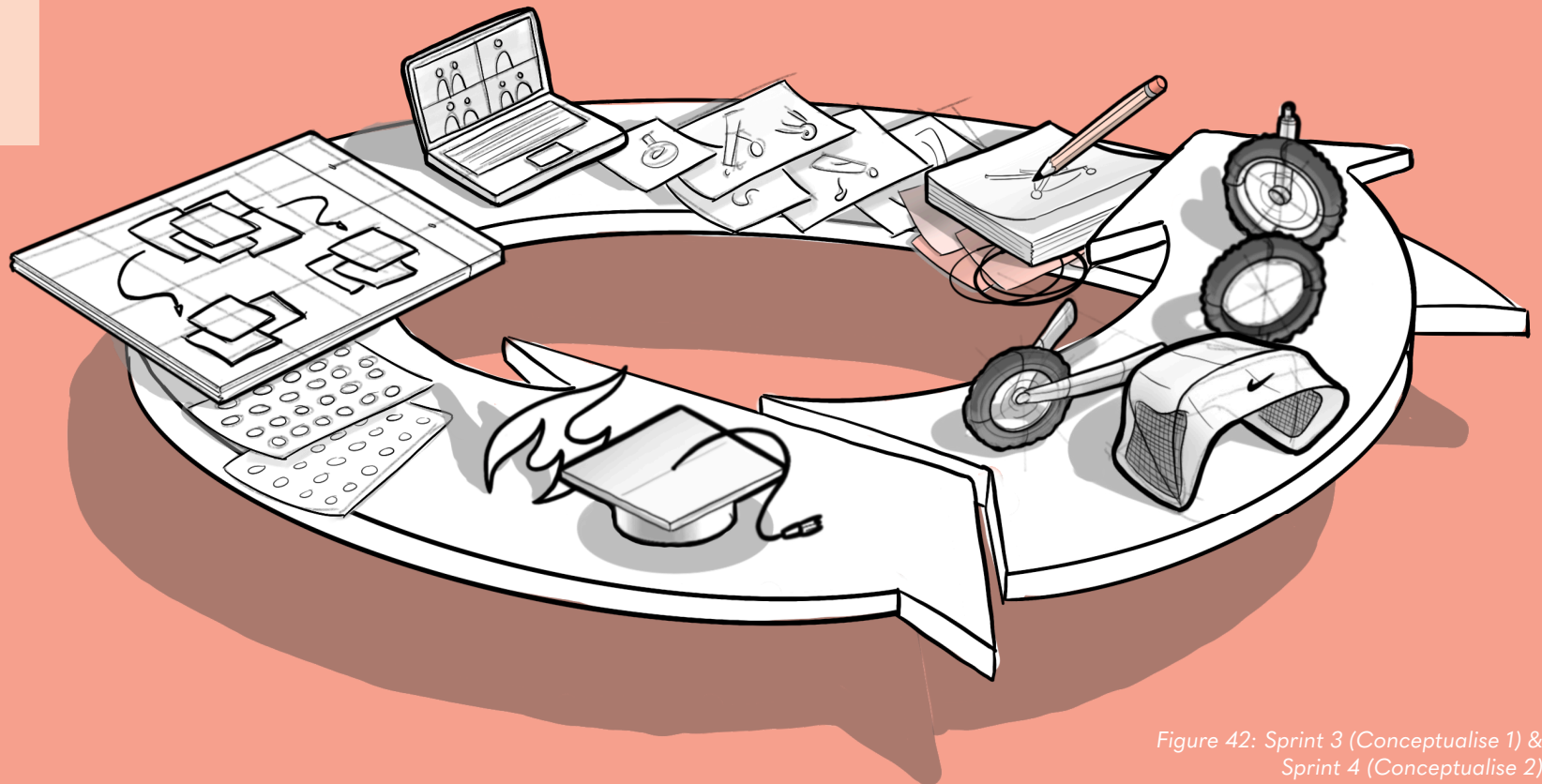
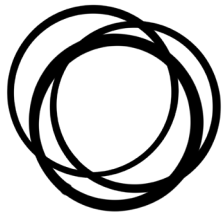


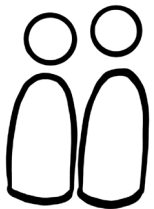
Figure 42: Sprint 3 (Conceptualise 1) & Sprint 4 (Conceptualise 2)

# 4.1 IDEATION APPROACH

Four creative sessions were organised to generate ideas. During the sessions a general program was followed with different methods depending on the session (see figure 43). The specific methods for creative fluency and flexibility during brainstorming & clustering as well as the session duties were derived from the book 'Road Map for Creative Problem Solving Techniques' (Heijne, Katrina & Van Der Meer, Han, 2019). The set-up per session can be found in Appendix F.



The first creative session was organised with four Bugaboo designers: three Product Innovation Leads, the Creative Design Director and a Senior Product Developer (see figure 44 on page 45). The strength of this group is that they are professional designers who are experts in designing strollers. The goal of this session was to gather ideas on 'How to make a runner stroller more compact?' and 'How to sport with your child?' and select the most promising ideas. A set-up was prepared with flip-over sheets, post-its, dot-stickers, and markers.



The second creative session was organised with six Dutch parents (three couples) (See figure 46 on page 47). The first couple has two children (one three-year-old and one that is eight months old), the second one also has two children (one three-year-old and one that is four months old) and the third couple has one child (a two-year-old) and are pregnant with their second child. Couple one and two own a regular stroller and the third couple owns a regular stroller as well as a runner stroller. The strength of this group of parents is that they are part of the target group 'Young Urban Fit Parent' (see sub chapter 3.6). The goal of this session was to find out which type of modular (runner) stroller these parents prefer; replaceable parts, adjustable or not modular at all. This session was held online via Miro and Zoom due the Covid-19 measures.

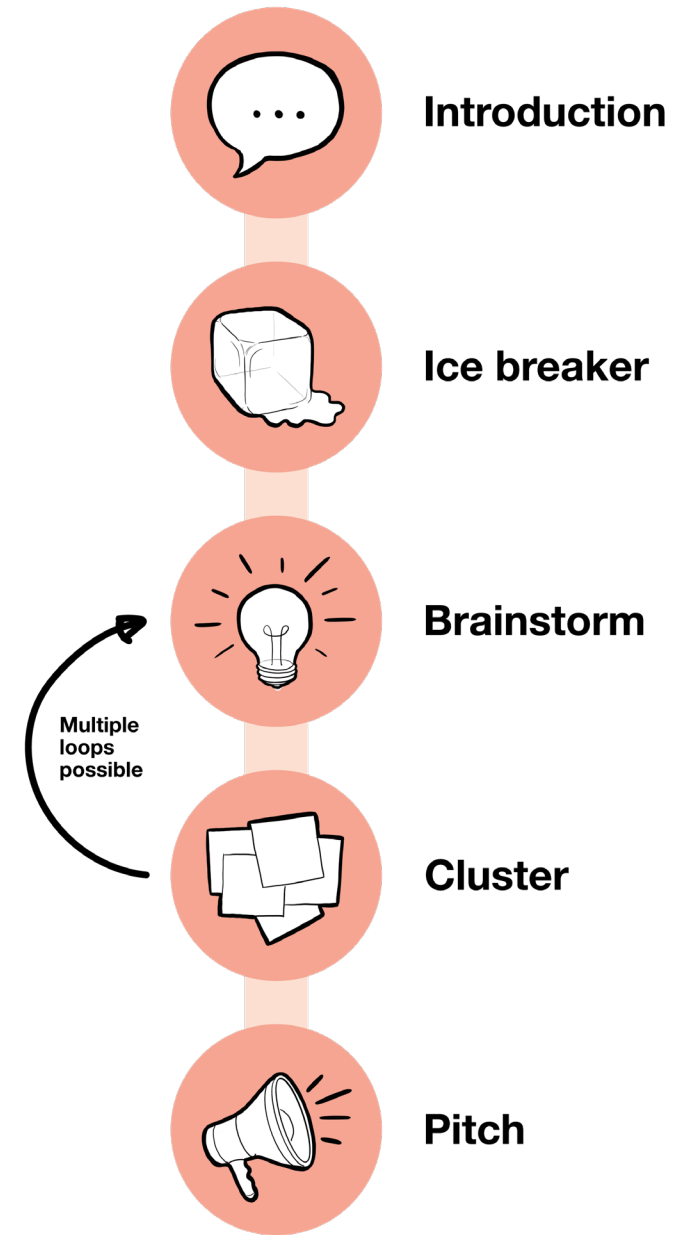


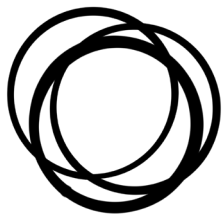
Figure 43: General creative session plan



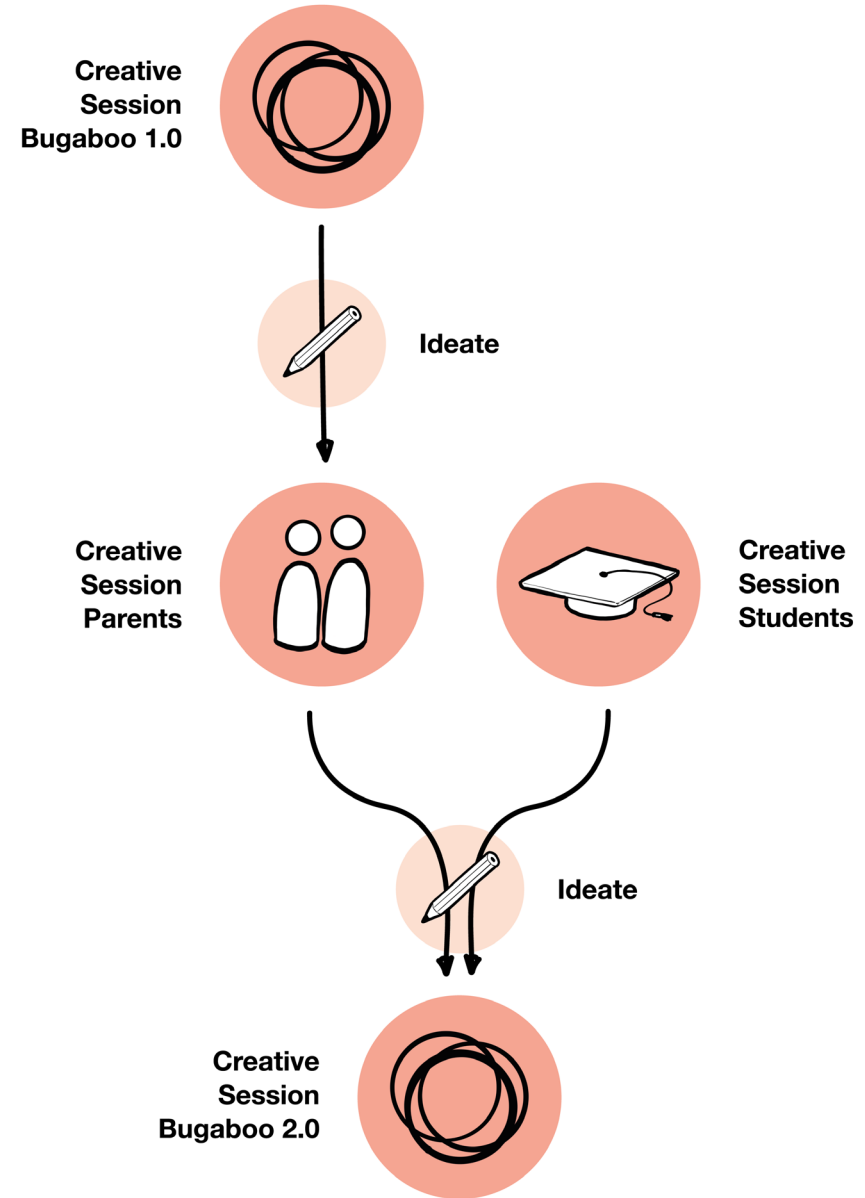
Figure 44: Creative Session Bugaboo 1.0



Five master students were invited for the third two-hour creative session (See figure 47 on page 48). Two of these students study Design for Interaction (user focused), two of them study Strategic Product Design (business focused) and one recently graduated from Integrated Product Design (product focused). The strength of these students is to come up with out of the box ideas since they are all creative minds and are outsiders of this graduation project. The goal of this sessions was to get answers on the questions 'How to make a stroller sporty?' and 'How can you make running with a stroller fun for the child?' and to come up with as many ideas as possible and finding the most promising ones. A set-up was prepared with flip-over sheets, post-its, dot-stickers, and markers.



The fourth session was again organized at Bugaboo. This session was more of a validation session than an actual creative session with a session plan. During this session two Product Innovation Leads, one Senior Product Developer and a Product Designer were present. The strength of this group is that they are design professionals (just like the first session) and the goal of this session was to gather insights about the proposed idea of a regular stroller with the option to make the wheelbase longer & lower the seat.



In figure 45 an overview of the order of the four creative sessions is displayed. In between these four creative sessions I also sketched & brainstormed individually.

Figure 45: Creative session order



Figure 46: Creative Session Parents



Figure 47: Creative Session Students



Figure 48: Creative Session Bugaboo 2.0

# 4.2 IDEAS

Multiple ideas within different directions were created during the creative sessions and while brainstorming. There were multiple ideas regarding the frame of the stroller, such as a different more compact folding mechanism, additions to the frame or different ways of adding more suspension to the stroller. There were also some technological ideas like adding a route tracker to the runner stroller or even adding a projector to the frame which turns your run into a game. This would be fun for the parent as well as for the child. Regarding the child, there were also multiple ideas to add a fun element for them. Like laying in a superman position while your parent is running or even adding some climbing elements in the stroller. The idea of a collaboration with a sports brand like Adidas or Nike was also proposed. All ideas can be found in Appendix F.

During the creative sessions multiple ideas were selected by the participants using a method called 'Hits & Dots' (Heijne, Katrina & Van Der Meer, Han, 2019). The ideas that the participants liked best & found most promising are marked with a dot-sticker. These ideas are incorporated in the selection together with ideas found during individual brainstorming. Some ideas are more feasible and/or innovative than others and that is why they are mapped on a C-box during the creative sessions and autonomously afterwards (van Boeijen et al., 2020) to determine which ideas have the potential to be turned into a concept (see figure 50). This process is visualized in figure 49. The C-box has two axes: the x-axis shows how innovative an idea is and the y-axis shows if an idea is difficult or easy to implement.

The ideas that are most promising are in the quadrant in the bottom right corner because these ideas are innovative and easy to implement. The six ideas that will be discussed further in the next sub chapter are marked with a red outline in the C-box in figure 50.

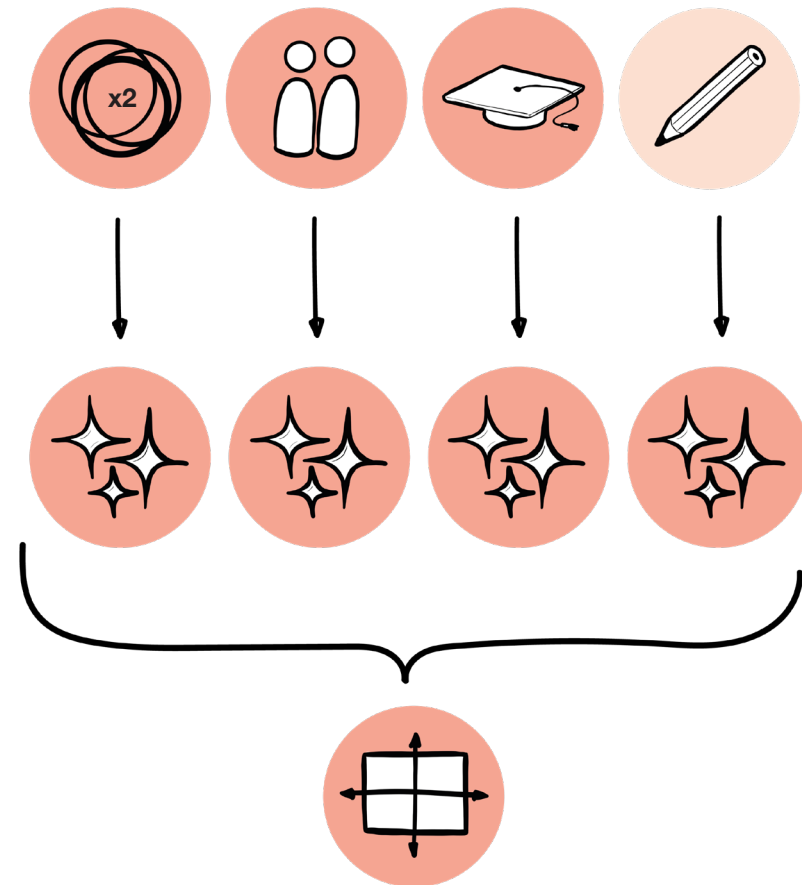


Figure 49: Overview of the ideas mapped in the C-box

Difficult to implement

Not innovative

Very innovative



Easy to implement

Figure 50: C-box with ideas

# 4.3 CONCEPTS

Out of the six ideas that were promising (1. Hammock instead of the seat, 2. Sporty connectors, 3. Extra position of frame, 4. Replace front wheel with one wheel, 5. Expandable frame and 6. All terrain wheels), idea 3, 4, 5 and 6 were considered as concepts. These four concepts are displayed in figure 51-54.

The idea of the hammock chair will not be developed into a concept since the focus of the project is on how to adjust a regular stroller to have the option to run with it and the current seat would also be possible to use while running. The idea to add a more comfortable seating option for the child could be kept in mind.

The idea 'sporty connectors' is covered by concept 3 – replace front wheels with one wheel and 4 – change all wheels to all terrain wheels.

## Concept 1 Extra position of frame



Figure 51: Concept 1

In this concept the frame of the Bugaboo stroller has an extra, lowered, position to put the frame in. This 'sport' position creates a longer wheelbase which makes the stroller more stable to run with. Inside the central pivot point of the Bugaboo stroller, pins click in a certain position to lock the frame in this position. An extra lowered position of the frame will require a new 'lock-point' for all three axes since the geometry of the stroller needs to stay the same.

## Concept 2 Expandable frame



Figure 52: Concept 2

In this concept the front legs of the Bugaboo stroller can be elongated to create a longer wheelbase, which makes the stroller more stable to run with. The front legs can be pulled out by pushing the button in the middle of the front bar and pulling. For safety reasons, it would be a good addition if the front wheels will automatically lock when the frame is elongated. In this concept the rear wheels are 16" all terrain wheels, to make the stroller even more comfortable to run with and to give it a sporty look.

### Concept 3 Replace front wheel with one wheel



Figure 53: Concept 3

In this concept the frontal part of the frame with two swivel wheels can be replaced by a single locked all-terrain wheel. This turns the regular four-wheel stroller into three-wheel runner stroller. By this longer one-wheel part, some length is added to the wheelbase as well. The locked front wheel makes it easy to keep on course and makes it suitable to use for all terrains. The front part of the frame could be removed by clicking a 'memory-button'\* on each side of the frame.

### Concept 4 All terrain wheels



Figure 54: Concept 4

In this concept all four wheels of the stroller would be replaced with larger all terrain wheels. With these wheels it would be easier and more comfortable to run with the stroller, because the large wheels absorb the shocks of the bumpy road. The two new all-terrain front wheels are locked, which makes it easy to keep on course while running.

*\*These memory buttons are already used in the Bugaboo stroller to attach and remove the seat and bassinet. When the user pushes this button on one side, it says 'pushed-in' until you also pushed the button on the other side. Because of this you do not have to push the buttons on both sides at the same time.*

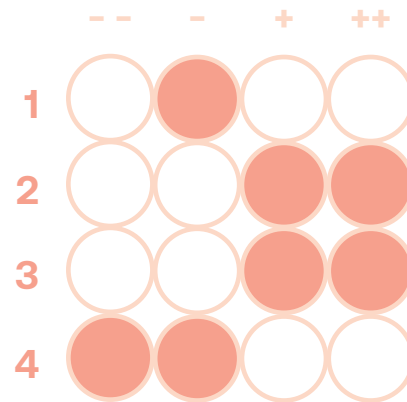
# 4.4 FINAL CONCEPT CHOICE

The four chosen concepts are scored on the requirements described in sub chapter 3.7. This can be seen in the four Harris-profiles (van Boeijen et al., 2020).

The requirements are:

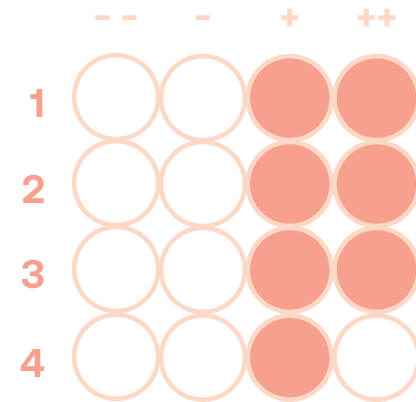
- 1 Improving handling**
- 2 Limit spare parts**
- 3 Easy to use**
- 4 Easy to implement**

## Concept 1 Extra position of frame



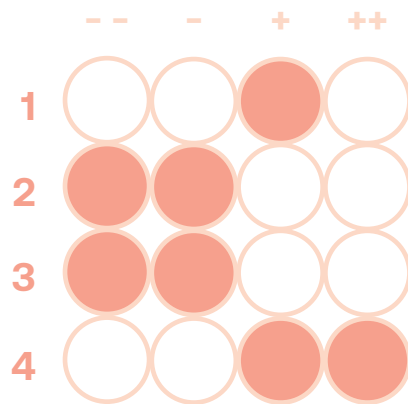
This concept is less feasible, since this position of the frame will change the geometry of the stroller. This calls for a redesign of the whole stroller frame since the weight distribution and centre of gravity need to be calculated precisely. So, this concept will make this concept hard to implement.

## Concept 2 Expandable frame



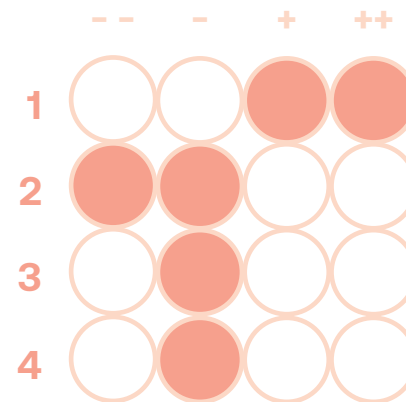
With this concept no extra parts are needed. Elongating the front legs could be a one push action, which makes it easy to use for parents. This concept is also easy to implement, since it contains parts and mechanisms that are already used by Bugaboo.

### Concept 3 Replace front wheel with one wheel



This concept requires a separate part that needs to be attached when the user wants to go for a run. From the creative session with the parents, it was understood that parents would rather not want modular parts/spare parts laying around their house. So, this concept is less preferable than others.

### Concept 4 All terrain wheels



The same counts for this concept as for concept 3. Besides, it is not sure if this will cover the whole solution, because the length of the wheelbase stays the same. This would not solve the unstable feeling of the stroller. So, this concept is less preferable than others.

The second concept of the stroller with expandable frame will be developed further, because it is an easy solution. The fact that the Bugaboo designers already tried out this idea, makes it feasible and possible to implement. The following sub chapter 4.5 will elaborate on the details on this concept. Chapter 5 and 6 will elaborate on the validation and implementation of this concept.

# 4.5 FINAL CONCEPT

## 4.5.1 A regular and runner stroller in one

Like discussed in the previous sub chapter 4.4, the concept that was chosen to continue with is the one to expand the frame of the stroller. An image of the final concept is displayed in figure 55. From now on the final concept will be referred to as the Fox Active.

The Fox Active turns a regular stroller into a runner stroller without any separate parts, which makes it an all-in-one stroller. It combines the benefits of both strollers; it is manoeuvrable and compact, while also being steady and keeping on course while running. Sub chapter 5.3 will elaborate on the characteristics of the stroller.

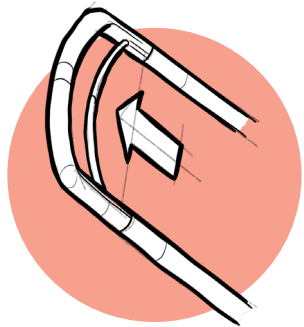
The Fox Active consists of four essential parts: the active brake, the expandable frame, the 16" rear wheels and swivel wheel lock. These parts will be discussed in the following sub chapters.

Besides these four essential parts the Fox Active contains the same features as the current version of the Bugaboo Fox stroller (Bugaboo Fox 3 Bassinet and Seat Stroller Graphite Base, Midnight Black Fabrics, Midnight Black Sun Canopy | Bugaboo NL, n.d.): an adjustable handlebar, a foot brake, a seat which can face both directions, a bassinet\*, an under seat basket, 8.5-inch front swivel wheels and 4-wheel suspension.

*\*The stroller may only be used for a run when the seat is attached and not with the bassinet (When Can You Jog With Baby?, 2020).*



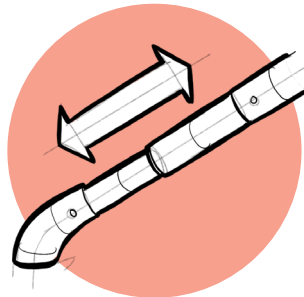
Figure 55: A regular and runner stroller in one



### 4.5.2 Active brake

The active brake adds a feeling of extra safety on while running at high speed. The brake mechanism is based on the Bugaboo Runner, only in this concept the brake pad will be on the rear wheel instead of the front wheel.

The brake handle covers the whole width of the strollers' handlebar, which makes it accessible to use with either of your hands. The brake can be of help when you are running downhill or need to make a sudden stop.



### 4.5.3 Elongated frame

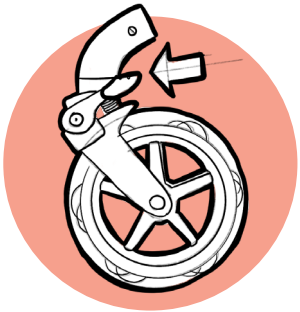
The option to elongate the frame is the most important feature to transform a regular stroller into a runner stroller, because it elongated the wheelbase. A longer wheelbase makes the stroller more stable and helps to keep course while running, just like a car with a long wheelbase. "Cars with longer wheelbase also ensures better and comfortable ride, thanks to the greater time between front and rear wheels hitting bumps. Additionally, a long wheelbase will feel more stable at speeds due to its larger footprint on the road." (Advantages of Longer Wheelbase - CarSpiritPK, 2018).

By pulling out the front part of the frame, an extra 10 cm is added to the wheelbase. The extra length is generated by a sliding tube-in-tube system, just like a vacuum cleaner rod. So, the maximum length of the frame can only be double the original length of the front part of the frame (see icon on the left). In the long position the stroller has a wheelbase of 70 cm, while

it has a wheelbase of 60 cm in the normal position. The length of the wheelbase of the expanded stroller was compared to the Bugaboo Runner, the BOB Gear Ironman stroller\* (BOB Gear Ironman Stroller, n.d.) and the Bugaboo Fox 3 stroller (see figure 56). This figure shows that the elongated wheelbase of this concept only differs 3 cm with the frame of the Bugaboo Runner. An exploration of different configurations of a longer wheelbase in combination with different wheel sizes can be seen in Appendix G.

The frame can be pulled out by pushing a button in the middle of the front frame. By placing the button in the middle of the frame, it will be a one-handed action for the parent to elongate the frame. The working principle of a button like this is already used in the seats of the Bugaboo Fox 3. Appendix B displays this mechanism.

*\*This stroller was used for comparison, since this model was present at the Bugaboo Office in Amsterdam.*



#### 4.5.4 Swivel wheels lock

The front wheels must be locked while running to prevent the swivel wheels from wobbling or blocking perpendicular and causing a sudden turn or accident (Difference; Fixed Front Wheel vs. Swivel Front Wheel Running Buggy?, n.d.). This feature must be present in a runner stroller since it is required by the Bugaboo Compliance department. The mechanism to

do this is already used on the current Bugaboo Fox model and will be implemented in this concept as well. The front wheels can be locked by pushing the white the buttons near each front wheel down. They can be unlocked again by pushing the buttons up.



#### 4.5.5 16-inch rear wheels

The regular 12-inch rear wheels are replaced with 16-inch rear wheels to provide a comfortable, bump-free ride and to compensate the extra height added by the elongated frame. The large wheels absorb shocks and provide more contact with the road, which results in better handling and more control just like bigger tires on a car (Pros and Cons of Bigger Wheels in Car, 2018).

The tires are made from solid rubber, just like the regular 12-inch wheels. Solid rubber tires were chosen instead of air-filled tires, since need less maintainance and cannot be punctured.

The styling of the Fox Active and positioning in the portfolio of Bugaboo will be discussed in sub chapter 6.2. Sub chapter 6.4 will discuss a use scenario of the concept.



Figure 56: Comparison of wheelbase lengths



# 5 VALIDATION

In this chapter, the fifth sprint of the design process will be discussed. In the fifth sprint - 'Validation' a prototype of the Fox Active was made and validated.

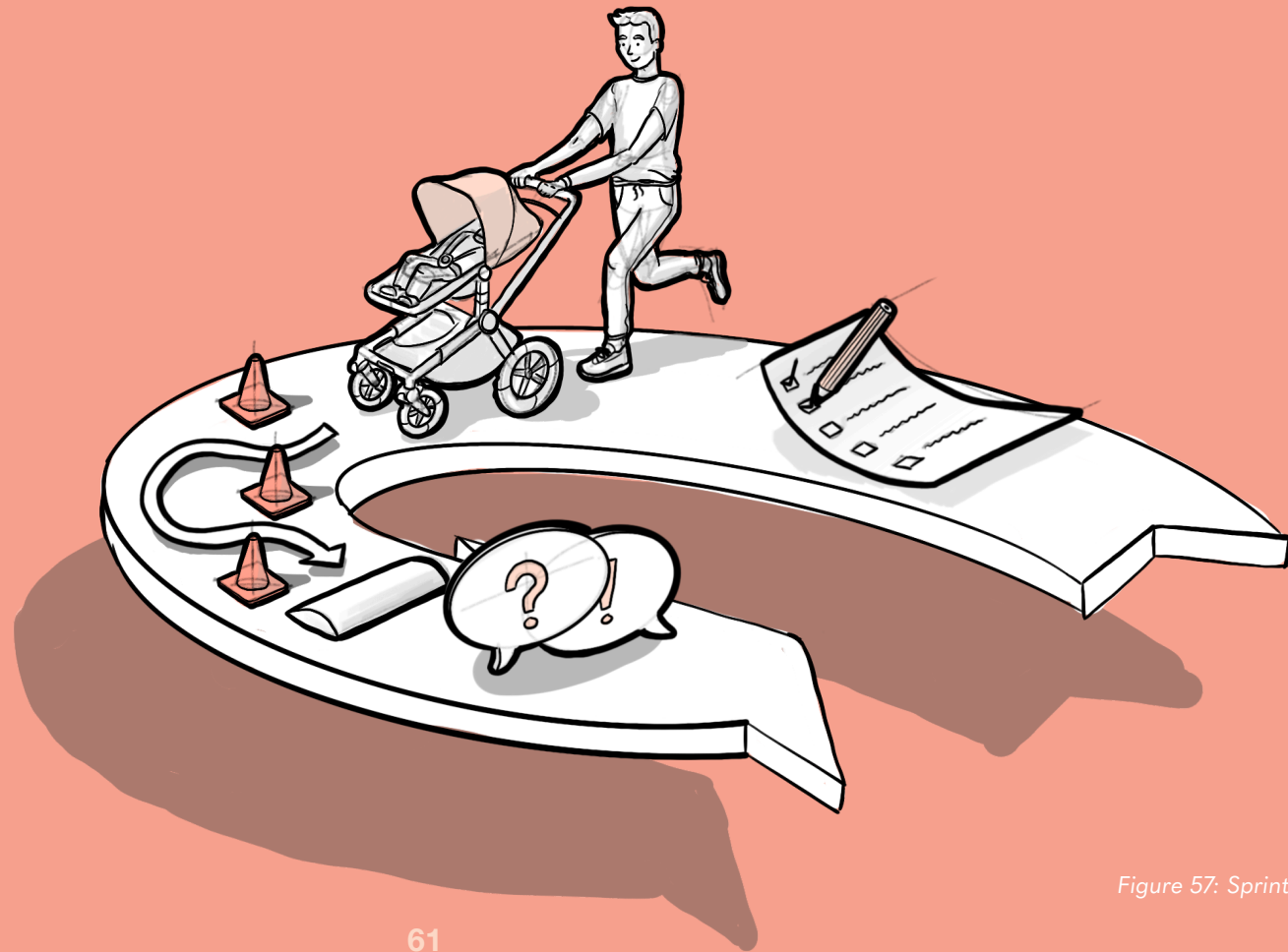


Figure 57: Sprint 5 (Validation)

# 5.1 VALIDATION APPROACH

To validate the Fox Active multiple steps were taken. First, the model of the Fox Active\* and the button mechanism were researched. To complete the Fox Active, large 16-inch wheels were added. This is described in sub chapter 5.2.

Second, a run test was performed to test the handling, stability, and controllability of the Fox Active regarding the different features. This is described in sub chapter 5.3.

Lastly, multiple interviews were conducted with parents to hear their opinions about the Fox Active. This is described in sub chapter 5.4.

*\*The basis of the prototype is an expandable frame that was already prototyped at Bugaboo for a tandem stroller.*



Figure 58: Prototype of the final concept

# 5.2 PROTOTYPE

The designers at Bugaboo already made a prototype of a stroller with an expandable wheelbase. Like explained before, this prototype was made for another purpose, namely a sibling tandem stroller. This expandable wheelbase was used for the prototype and is based on a new version of the Bugaboo Fox stroller.

When the front legs are expanded, the wheelbase is 10 cm longer than the original wheelbase. In this prototype the front part of the frame is locked with a clip on both sides of the frame (see nr. 1 in figure 59). These clips must both be opened before the front part can be pulled out. These clips can be seen in figure 59 which shows a side view of the prototype. In the final design these clips would be replaced by a mechanism with a button in the front part of the frame, like explained in sub chapter 4.5.

For this prototype the 16-inch rear wheels of the original Bugaboo Runner were modified with a lathe to fit on the stroller. The two front wheels can be locked pushing the two buttons near the front swivel wheels (see nr. 2 in figure 59).

A photo of the recommendation session/discussion about the Fox Active at Bugaboo is displayed in figure 60 and figure 61 on the page 64 shows a picture of a Bugaboo employee running with the prototype in the office.



Figure 59: Side view of prototype



Figure 60: Discussion about prototype at Bugaboo



Figure 61: Running with the prototype at the Bugaboo office

# 5.3 TEST

## 5.3.1 Test approach

To validate the Fox Active, two run tests have been performed. The first test was a run test with parents to be. The goal of this test was to find out if parents would like the feeling of both running and walking with this stroller. This test was done by two parents to be who each, both walked and went running on the same route. There was no weight in the stroller during this test.

The second test was performed to determine the effect of each different feature of the Fox Active, namely the expandable frame, size of the rear wheels and option to lock the front wheels (see sub chapter 4.5 for the explanation of each feature). During this test, these three features of the stroller were scored on manoeuvrability, bump absorption, course, and controllability, where 0 is not at all and 5 is very much\*. These four variables were chosen since a regular and runner stroller perform different on these variables (see sub chapter 3.2), which makes it possible to see if the Fox Active contains both characteristics.

This test was done by a product designer and me, which means that each feature was scored twice. The mean of these scores was taken. We both walked and went running on the same route. This route contained long turns, short turns, bumps, and different types of terrain and a part of the route was executed with one hand. There was a weight of 3,6 kg in the stroller during this test.

The start configuration of the test was the regular position of the stroller with 12-inch rear wheels, swivel front wheels and a normal frame length. Each round of the route one feature was added, changed, or isolated.

*\*The scores are subjective and are used to compare the different features to each other.*



Figure 62: Product designer performing the feature test

### 5.3.2 Test results

The result of the first run test was that both parents to be felt a difference between running with a normal frame and a long frame. 'It feels like the stroller is on a track' mentioned one participant after running with the stroller with the elongated frame, locked front wheels and 16-inch rear wheels.

During run test two, two important questions to answer were: 'is it more comfortable to run with the elongated frame compared to the normal frame of the stroller?' and 'Do the 16-inch rear wheels add something compared to the 12-inch rear wheels while running?'. Both answers to these questions can be found in figure 63 and were tested with locked front wheels. The grey range represents the ideal running situation, based on the characteristics explained in sub chapter 3.2.

The **red** line represents the configuration of 'running with the normal frame'; 12-inch rear wheels and the normal frame. The **dark blue** line represents running with the elongated frame, but still with the 12-inch rear wheels. These two configurations score different on all four axes.

The long frame **decreases** the manoeuvrability, but **increases** the bump absorption, course, and controllability. When adding 16-inch rear wheels to the elongated frame, like represented by the **pink** line, the manoeuvrability increases again. These changes in characteristics make the prototype feel close to an ideal runner stroller. The 16-inch rear wheels compensate the decreased manoeuvrability of the elongated frame.

Two other important questions during run test two were: 'Does walking also feel comfortable with 16-inch rear wheels?' and 'Could the elongated frame also be of benefit while walking?'. Both answers to these questions can be found in figure 64 and were tested with swivel front wheels. The grey range represents the ideal walking situation, which is based on the scores from the 'original' 12-inch rear wheel, normal frame configuration.

The **yellow** line represents the configuration of walking with the normal frame and 16-inch rear wheels. The **pink** line represents walking with the elongated frame, but still with the 16-inch rear wheels.

The 16-inch rear wheels **decrease** the manoeuvrability a bit, but **increase** the bump absorption, course, and controllability slightly compared to the ideal walking scores. When the frame is elongated, the bump absorption and controllability **increase** even more, but the manoeuvrability **decreases** slightly. Although both options are close to the ideal walking characteristics, the configuration with 16-inch rear wheels and normal frame is the closest to ideal and is thus sufficient.

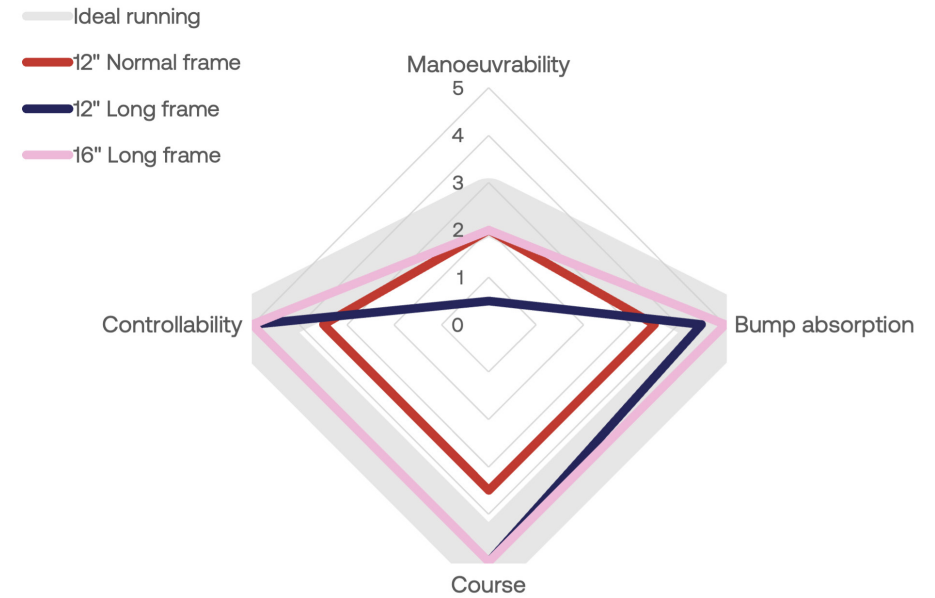


Figure 63: Running graph; locked front wheels



Figure 64: Walking graph; swivel front wheels

# 5.4 VALIDATION WITH PARENTS

To validate the final concept with the target group, two interviews with parents have been conducted. The first couple has a 2-year-old and are 26 weeks pregnant with their second child. The second couple is 29 weeks pregnant with their first child. Both couples can be identified as the Young Urban Fit Parent persona (see sub chapter 3.6).

During the interview three options were showed to the participants: option 1 - a regular stroller, option 2 - a regular stroller and runner stroller and option 3 - a regular stroller with sport function. Appendix H displays the visuals that were used during the interviews.

The participants were asked what option suits them best and why. Couple one's first choice would still be the regular stroller. However, they would consider the regular with sport function if it does not cost too much extra and if it is clear what the benefits over the regular version are. The second couple would also consider the option of the regular stroller with sport function if it would not cost too much extra. The combination of regular and runner stroller was not an option for both parents since they do not feel the need to have separate stroller for running especially.

Both couples mentioned that it should be clear that regular stroller with sport function is comfortable for both running and walking and performs just as good as the regular stroller when walking. Also, both couples think that many people would want to buy the regular stroller with sport function.

Both couples mentioned the fact that the styling of the stroller is important. They would like the colour of the regular stroller with sport function to be neutral or black, with small sporty accents. Sub chapter 6.2 will elaborate on this.



Figure 65: Parent to be testing prototype

# 5.5

## INSIGHTS



### 5.5.1 Test

The first test proves that parents feel the difference between running with a normal frame and the elongated long frame.

The second test proved that the configuration of the Fox Active with 16-inch rear wheels and the elongated frame is close to the ideal running situation and performs better than running with the normal frame and/or 12-inch rear wheels.

The second test also proved that walking with 16-inch rear wheels and the normal frame is sufficient and preferred over walking with the elongated frame.



### 5.5.2 Validation with parents

All participants of the validation session with parents would consider the regular stroller with sport function if it does not cost too much extra and if it is clear what the benefits over the regular version are.

The combination of regular and runner stroller was not an option for all parents since they do not feel the need to have separate stroller for running especially.



Figure 66: Parent to be testing prototype



# 6 IMPLEMENTATION

In this chapter, the sixth and final sprint of the design process will be discussed. In the sixth sprint - 'Implement' the positioning of the Fox Active within the portfolio, the styling and costs are determined. Also, the user scenario of the Fox Active is explained.

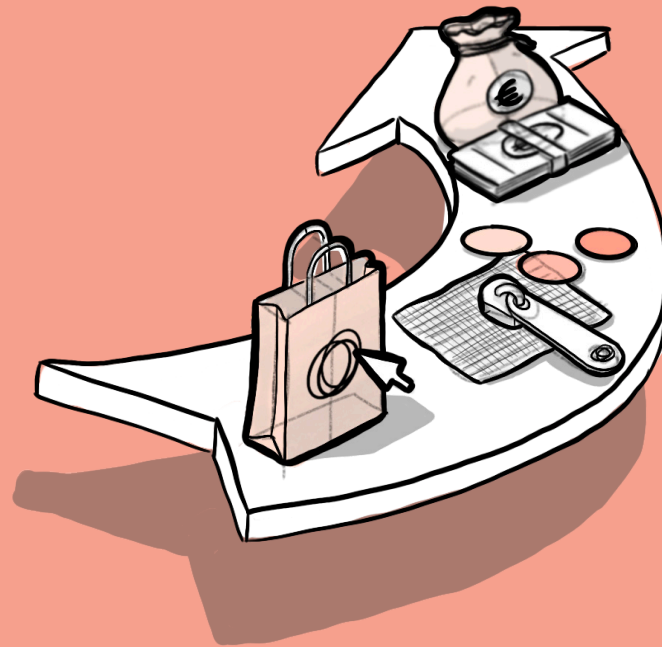


Figure 67: Sprint 6 (Implementation)

# 6.1 FIT IN BUGABOO PORTFOLIO

This sub chapter is described in Appendix B, because it contains confidential client information. Figure 68 shows the current portfolio of Bugaboo on their website.

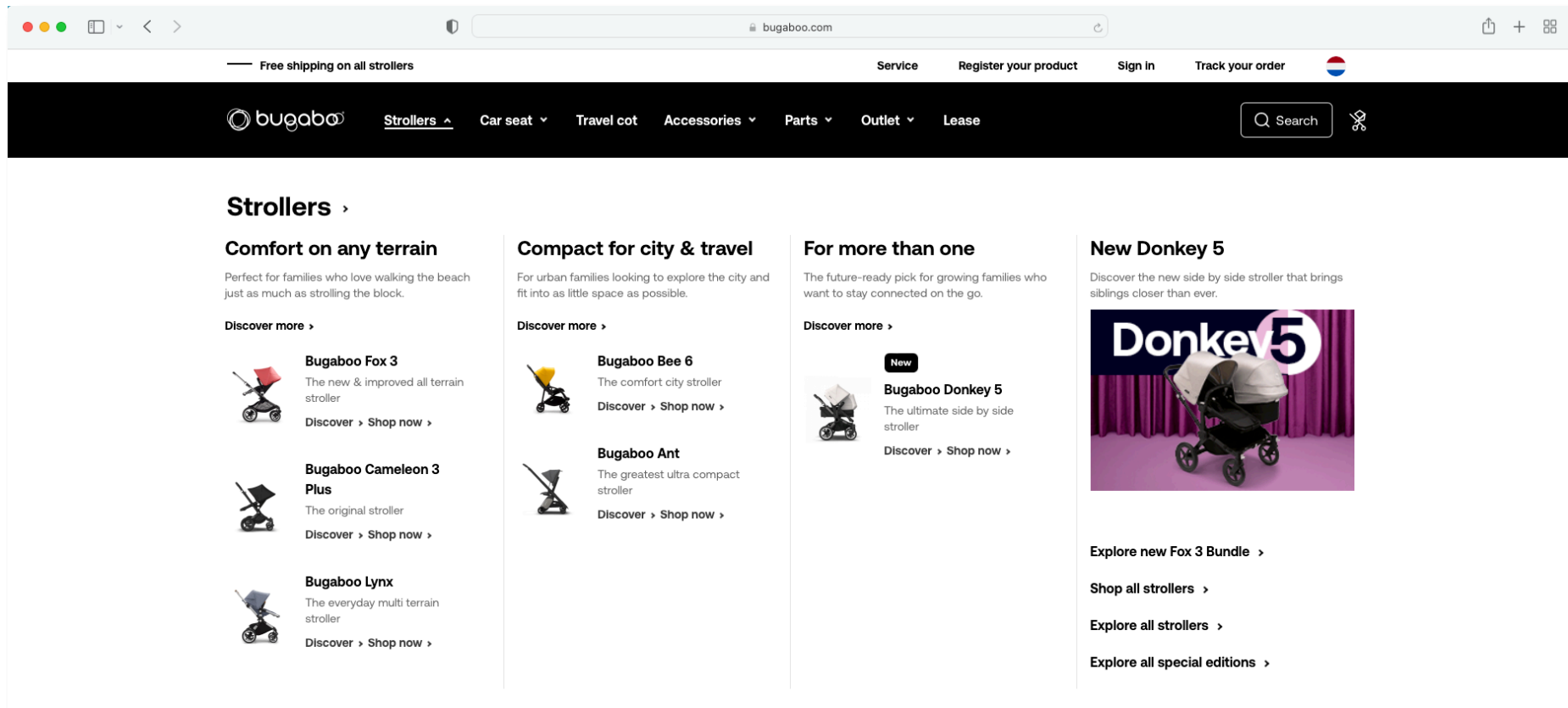


Figure 68: Current stroller portfolio of Bugaboo

# 6.2 STYLING

To determine the styling of the Fox Active, a meeting with the Senior Product Designer who is responsible for styling at Bugaboo was organised. She advised to keep the styling classy with sporty accents.

Figure 70 displays a collage of inspirational photos for the styling of the Fox Active. The base colour of the styling is black, with bright orange accents. Figure 69 displays an image of the Fox Active with this styling. These accents are inspired on sport brands like Nike, the North Face and Adidas. Within the stroller different types of fabrics will be used. The canopy will be made of a smooth black rainproof fabric, to repel rain while running and the canopy will have sporty silicone zips. The seat will be covered with a black mesh fabric that breathes; this will regulate the temperature of the child. The stitching on the canopy and handlebar will be done with bright orange thread, to create a popping accent.

The 'sport buttons' (the buttons to lock the swivel wheels, active brake bar and button to elongate the frame) will be coloured bright orange as well, to make clear that these buttons have a special function.

The wheel covers could be coated with a reflective material to provide extra visibility while running in the evening. An accessory for this stroller could be a small light that the user can easily pop on the front part of the frame to create extra visibility in the evening as well. Figure 71 displays an image of the details of styling of the Fox Active.



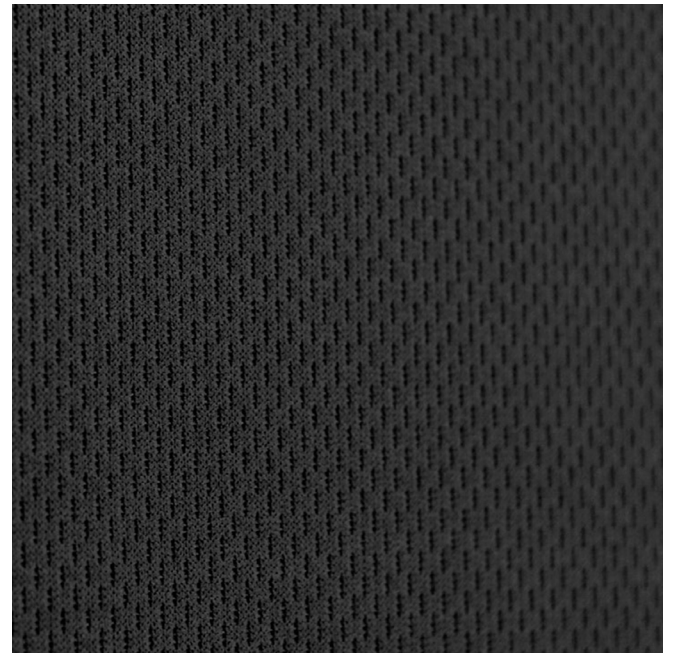


Figure 70: Styling inspiration collage



**Colored brake bar**



**Colored stitching  
& silicone zipper**



**Mesh seat fabric**



**Colored sport buttons**

*Figure 71: Styling details of the final concept*

# 6.3

## COSTS

In this sub chapter an indication of the retail price of the Fox Active will be given. To determine what this stroller is going to cost for parents, the prices of multiple other strollers are compared.

The Bugaboo Fox 3 is used for comparison, because the Fox Active is based on the Fox model. The combination of Fox 3 and runner stroller is used, because the Fox Active combines the characteristics of both strollers and the Donkey 5 Mono is used, because this stroller also has an expandable frame (sideways in this case) and also comes with a seat and bassinet.

The price of the Bugaboo Fox 3 stroller is €1199 (Bugaboo Fox 3 Bassinet and Seat Stroller Graphite Base, Midnight Black Fabrics, Midnight Black Sun Canopy | Bugaboo NL, n.d., p. 3), The price of the Bugaboo Fox 3 + Thule Urban Glide 2 strollers is €1999 (Thule Urban Glide 2 | Thule, n.d.) and the price of the Bugaboo Donkey 5 Mono is €1379 (Bugaboo Donkey 5

Mono Bassinet and Seat Stroller Graphite Base, Midnight Black Fabrics, Midnight Black Sun Canopy | Bugaboo NL, n.d.). The images and prices of all these strollers can be seen in figure 73.

The Fox Active should cost more than the Bugaboo Fox 3, because it has more features. However, it should cost less than the Bugaboo Fox 3 and a runner stroller together, otherwise parents will be tempted to buy two strollers for the same price as the Fox Active. It should cost about the same as the Donkey 5, because the frame has similar technical details.

Based on the comparison of these prices, the estimated retail price for the Fox Active is €1299-€1499 (see figure 72). The Fox Active will also come with a bassinet for regular use. This meets the expectations of parents since they suggested that this stroller should cost €100-300 compared to a regular stroller, during the parent validation sessions.



Figure 72: Proposed retail price of Fox Active

Fox 3



€1.199

Fox 3 + runner



€1.999

Donkey 5



€1.379

Figure 73: Retail prices of different strollers

# 6.4 USE SCENARIO

The Fox Active can be used with the normal frame position and swivel wheels while walking. In this position the stroller is easy to manoeuvre. The user can run with the Fox Active when they elongate the frame & lock the front wheels. In this position the stroller keeps on course & is stable. These two use cases are displayed in figure 75.

The user can change between these two modes by pushing the button on the front bar of the frame. Pull the frame while pushing the button to extend the frame. Figure 74 displays these actions. The frame can be shortened again by pushing the button on the front bar pushing the frame back in.



1. Push the button on the front bar



2. Pull the bar to elongate the frame

Figure 74: Use scenario

# The Fox Active

Take your little one wherever you go.



**BE PRODUCTIVE**

**BE ACTIVE**

Figure 75: Fox Active poster

# 6.5 INSIGHTS



## 6.5.1 Fit in Bugaboo Portfolio

The Fox Active could be launched as a special collection of an upcoming stroller release. See Appendix B for the details.



## 6.5.2 Styling

The base colour of the styling is black, with bright orange accents. The canopy will be made of a smooth black rainproof fabric and will have sporty silicone zips. The seat will be covered with a black mesh fabric that breathes. The stitching on the canopy and handlebar will be done with bright orange thread, to create a popping accent.

The 'sport buttons' (the buttons to lock the swivel wheels, active brake bar and button to elongate the frame) will be coloured bright orange as well, to make clear that these buttons have a special function.



## 6.5.3 Costs

Based on the comparison of the prices of the Bugaboo Fox 3, the price of a Bugaboo Fox 3 and a runner stroller together and the price of the Bugaboo Donkey 5, the estimated retail price for the Fox Active is €1299-€1499. The Fox Active will also come with a bassinet for regular use. This meets the expectations of parents since they suggested that this stroller should cost €100-300 compared to a regular stroller, during the parent validation sessions.





# FINALISATION

This chapter will discuss the finalisation of this graduation project. The finalisation consists of the conclusion, recommendations, a discussion & a personal reflection.

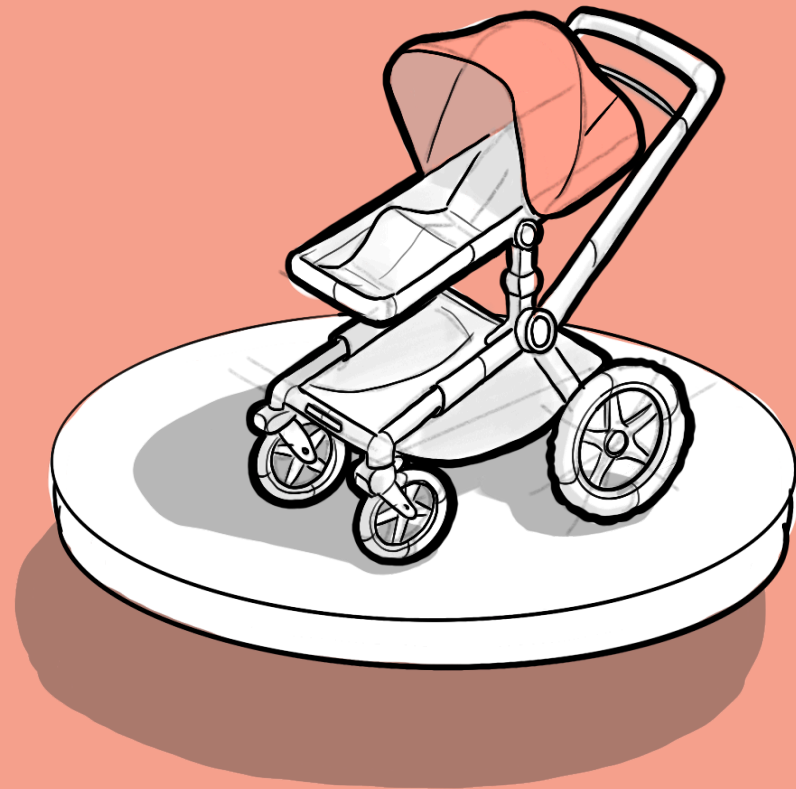


Figure 76: End result

# 7.1 CONCLUSION

So, the final concept of this graduation project is the Fox Active. It is a stroller that can be transformed from regular stroller into runner stroller and back. This can be done by elongating the frame with one hand & locking the front wheels. This version of the Bugaboo Fox comes with a bassinet, 16-inch rear wheels and an active brake. The stroller can only be used for running when the child is older than six months, is sitting in the seat and the front wheels are locked.

A four-wheel stroller like this does not exist yet. Bugaboo could enter a new part of the market with this product. It facilitates a new type of adventurous living in the city. Everything can be done with just one stroller. Also, this stroller might be bought by consumers, who would not consider running with a stroller before. The Fox Active fits in Bugaboo's future product portfolio and is broadening their possible consumers.

Second, it was checked if the Fox Active is feasible, desirable, and viable. The Fox Active is feasible, because it is based on an existing Bugaboo stroller and the new components consist of existing technologies. The product is also viable, because this is the first two-in-one regular/runner stroller. It can also be implemented within the coming years. The Fox Active is also desirable, because it is validated by parents that there is a need for a product like this. Figure 77 shows the Fox Active.



Figure 77: The Fox Active

# 7.2

## DISCUSSION

Within this project it was important to find a balance between this product being a regular stroller and a runner stroller. Currently the stroller looks more like a regular stroller than a runner stroller, but it does function as both. However, the assumption for now is that it does not perform as well as a high-performance runner. It should be good enough to go for a run in the park and is not good enough to run a marathon with. This is because this concept is designed for the target group of Young Urban Fit Parents who are not willing to buy a separate runner stroller. If it would be possible to run a marathon with this concept, this would of course be a nice side effect.

The design during this project was user centered. This is important because the users, in this case the parents, decide to buy this product or not. However, the child was not always considered during this project which could have a negative effect on the design.

In the design of the final concept, most parts of the stroller are existing parts of Bugaboo. By doing this, it is easy to implement this concept into the portfolio of Bugaboo. It also gives benefits regarding sustainability since existing parts can be used in new ways and no new production facilities have to be created.

In the final design, 16-inch wheels are incorporated. Sub chapter 5.3 proves that these wheels improve the performance of the stroller. However, the downside of adding large rear wheels is that the folding package of this stroller will become larger than the original folding package.

# 7.3

## RECOMMENDATIONS

This sub chapter discusses the recommendations given by the Bugaboo designers during a recommendation session at the Bugaboo office.

First, there is no extra suspension in the Fox Active, because this adds extra weight to the stroller. However, this could be something to consider when developing this concept further since extra suspension will probably improve the performance of the stroller. An option to add extra suspension is to add a spring system in the tube-in-tube system which is used to elongate the frame.

Second, the central joint of the stroller needs to be tested. Currently this joint is only tested for walking, so it might be possible that this joint does not resist the forces of running with the stroller. It should also be tested if the stroller is not too heavy to comfortably run with. Besides this, the length of the handlebar was not tested during this project. It should be tested if it is long enough to run with.

Third, the sizes of the wheels are still up for debate. The designers at Bugaboo were discussing if the 16-inch rear wheels should be added or not. They also discussed the option to add larger front wheels. This is something that needs to be researched when this concept will be developed further.

Lastly, some other ideas could be explored to add to this concept in the future as well. Like a virtual reality/augmented reality projector to turn your run into a game, add a lightweight hammock seat so the child is extra comfortable or a collaboration with a sport brand to make the stroller a must-have statement piece. All these ideas were generated during the creative sessions (see sub chapter 4.2).

# 7.4 PERSONAL REFLECTION

I really enjoyed this project. I enjoyed the freedom of choosing my own direction, but this is also something I found difficult from time to time. Sometimes I felt insecure about the work I have done and if I had done enough work at all. My supervisors helped me to put these thoughts into perspective, however this is something I still need to develop further.

During this project I had two personal ambitions, which are described in my project brief in Appendix A. The first one was to strengthen my visualisation skills. At the start of this project, I was already quite experienced with visualizing, but it was still something I wanted to grow in. And I can conclude: I visualized a lot during this project! This is my happy place and I decided that I want to pursue a career in this direction. However, my pitfall is that I want to make a drawing too perfect and because of this I experience quite some pressure before I start. I did not manage to overcome this fully during the project. This is something I still need to work on. When I look back on the project, I could have made more sketches on paper. Now most drawings were digital drawings made on my iPad. Figure 78 displays a picture of me visualizing the sprint visual of this project.

The second personal ambition that I had was to strengthen my validation skills. In previous projects I experienced some insecure feelings when it came to validation. I always was a bit nervous to contact test participants. During this project I started with 'validation' early in the process. I did many user interviews, and this helped me to overcome the nervous feelings I had before. I feel more confident about this now. I'm also glad that I performed the final run test, since I feel that this proves the strength of my final concept.

During this project I also organised and facilitated a few creative sessions. I really enjoyed this, and it helped me overcome the hurdle of starting with ideation by myself. Preparing these sessions helped to determine in which direction I wanted to gather ideas and how I would get there.



INTRO

Figure 78: Me working on this project in the IDE Hall

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# APPENDIX

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# PROJECT BRIEF

# 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 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 Husen  
 initials A.I. given name Avelien  
 student number 4432436  
 street & no. \_\_\_\_\_  
 zipcode & city \_\_\_\_\_  
 country \_\_\_\_\_  
 phone \_\_\_\_\_  
 email \_\_\_\_\_

Your master programme (only select the options that apply to you):  
 IDE master(s):  IPD  Dfi  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 Sylvia Mooij dept. / section: DOS/MCR  
 \*\* mentor Susie Brand-de Groot dept. / section: HCD/HICD  
 2<sup>nd</sup> mentor Aernout Dijkstra-Hellinga  
 organisation: Bugaboo  
 city: Amsterdam country: The Netherlands

comments (optional)  
 :  
 :  
 :

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.

**Procedural Checks - IDE Master Graduation**

**APPROVAL PROJECT BRIEF**

To be filled in by the chair of the supervisory team.

chair Sylvia Mooij date 13 - 09 - 2021 signature Sylvia Mooij  
 Digitally signed by Sylvia Mooij - IO Date: 2021.09.16 16:33:09 +02'00'

**CHECK STUDY PROGRESS**

To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: 24 EC  
 Of which, taking the conditional requirements into account, can be part of the exam programme 24 EC  
 List of electives obtained before the third semester without approval of the BoE

YES all 1<sup>st</sup> year master courses passed

NO missing 1<sup>st</sup> year master courses are:

\_\_\_\_\_

\_\_\_\_\_

name C. van der Bunt date 20 - 09 - 2021 signature C. van der Bunt  
 Digitally signed by C. van der Bunt Date: 2021.09.20 13:58:19 +02'00'

**FORMAL APPROVAL GRADUATION PROJECT**

To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked \*\*. Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks?
- Does the composition of the supervisory team comply with the regulations and fit the assignment?

Content:  APPROVED  NOT APPROVED

Procedure:  APPROVED  NOT APPROVED

\_\_\_\_\_ comments

name Monique von Morgen date 28 - 09 - 2021 signature \_\_\_\_\_

The design of a modular runner/exercise stroller \_\_\_\_\_ 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 06 - 09 - 2021 \_\_\_\_\_ end date 11 - 03 - 2022 \_\_\_\_\_

**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, ...).

Bugaboo is childcare company, which is mostly known for their high-end Dutch design strollers. The company was founded in 1999 and their first product was a modular stroller which could be used to both have a stroll and to put behind your bike. After this they launched multiple high-end modular strollers, a car seat, a travel bed and multiple accessories. Bugaboo products are mostly used by higher educated consumers, who value freedom, adventure, and high-quality products. Their current brand focus is to improve the development of the child. The Bugaboo stroller are designed with sustainability in mind, since most parts are replaceable and/or washable (Bugaboo, 2021).

With this project they want to enter an existing market with a product that meets the Bugaboo standards and to make it more attractive for parents to have a work-out together with their (young) child(ren).

The context of this project is where Bugaboo currently sells their products, which is in Europe, The United States and Asia. The research will be performed within Europe.

The most important stakeholders are Bugaboo and their consumers. Besides this, the government is an important stakeholder since they determine the rules and regulations regarding strollers and childcare products.

Bugaboo. (2021). Bugaboo.com; Bugaboo.  
<https://www.bugaboo.com/nl-nl/about-us-new-brand-1stjune-1stjune/folder-about.html>

space available for images / figures on next page

introduction (continued): space for images



image / figure 1: Old Bugaboo runner stroller - on the market in 2015. (currently not on the market)

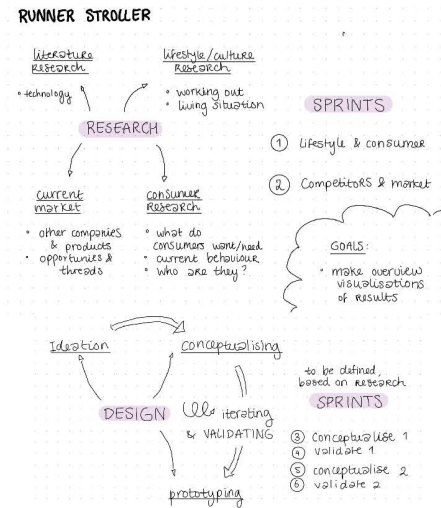


image / figure 2: Sprint ideation

**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.

Currently the consumers of Bugaboo are not able to take a run or exercise with their child using a Bugaboo product. Earlier Bugaboo already saw a market for jogging strollers and tried to enter this market. Unfortunately, this did not work since the chassis of the designed stroller was too expensive and the product could not be used for regular things, like buying groceries or walking in the city. Bugaboo still sees a need for a runner/exercise stroller product by their consumers. This need will be further researched during this graduation project since it is not based on elaborate research yet.

**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.

During this project I will design a concept design of a modular runner/work-out stroller. A product like this will be an addition to the Bugaboo portfolio since they do not have a product which makes this possible yet. The goal is to make working-out possible for parent(s) while taking their child with them.

The aim of the result of this project will be an advanced concept, based on new research, which can be tested with consumers, and which could be further developed/detailed into a product/parts/accessories. Besides this, requirements will be composed based on the needs of consumers and regulations from the government. The project will take the needs and wishes of all stakeholders into account and should be feasible, viable and desirable. The final concept should be in line with Bugaboo's core principles. During the project I will go through the stages of designing, prototyping and testing multiple times, to make sure the process is as iterative as possible.

**PLANNING AND APPROACH \*\***

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 6 - 9 - 2021 end date 11 - 3 - 2022

Calendar week	Part-time (4 days a week)										Full-time																
	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	1	2	3	4	5	6	7	8	9	10
Project week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
Main events																											
Bugaboo meeting																											
Deadlines																											
RESEARCH																											
Sprint 1 - Competitors & market																											
Sprint 2 - Lifestyle & consumer																											
DESIGN & VALIDATE																											
Sprint 3 - Conceptualise 1																											
Sprint 4 - Validate 1																											
Sprint 5 - Conceptualise 2																											
Sprint 6 - Validate 2																											
Sprint 7 - Conceptualise 3																											
Sprint 8 - Validate 3																											
Sprint 9 - Finalise																											
Document																											

I'm planning to work on my graduation for four days a week during most parts of the graduation project. I will work full-time on the project during the last four weeks. Because of this my project runs for 24 weeks. In this planning you can see the kick-off (KO) meeting on day 1, the midterm (MT) meeting on day 40, the green light (GL) meeting on day 80 and the final presentation on day 100. During my project I planned three breaks; one in November after my midterm meeting, one in December during Christmas and one in February to go skiing. I already set some deadlines for myself to hand-in my midterm report (day 36), my green light report (day 76) and my final report (day 95).

I will go through multiple sprints during the project which last around 2 weeks. I'd like to work in sprints, because this gives me the ability to focus on a specific topic or part and close this off, before continuing to the next topic. The sprints are categorized within a Research and a Design & Validate category. I will go through multiple conceptualize and validation sprints to make my design process as iterative as possible. I will ideate and be open to ideas throughout the whole graduation project.

To determine the context and scope of the project the consumers, lifestyle of these consumers, current market and competitors need to be researched. Besides this, (literature) research will be performed in the field of exercising with a child. If needed, an extra research sprint can be incorporated in the planning. After performing research, the ideation, conceptualization, and prototyping will start, based on the outcomes of the research. Each concept will be validated, before developing it further.

### MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... Stick to no more than five ambitions.

I set up this project, because I want to strengthen my product design skills and because I have affinity with design for childcare. During the IPD curriculum in the ACD course, I already designed an accessory for Bugaboo and this project gave me a lot of energy and I learned a lot. The focus of this project was the design of an accessory to strengthen the bond between the parents and their child. The result was a baby carrier that was integrated in the bassinet of the Fox stroller. With this product parents can switch between carrying and strolling easily, without having to remember to take a baby carrier with them. I can relate to the Bugaboo brand principles and like the atmosphere of the company.

For this project I have two main personal goals. The first one is that I want to strengthen my visualization skills. I'm already quite experienced in this field, but would like to learn and apply it even more, since this might be a branch, I would like to pursue a career in. During this project I would like to focus on making vision/strategic visuals. I plan to strengthen my skills by making a visual overview as a result of each sprint and to make my report as visual as possible.

The second goal is to strengthen my validation skills. During my masters I already performed some validation tests, but I still feel insecure when I perform these. This step is quite important for the design process since this determines if the designed product is perceived well by the consumers. I plan to do this by going through multiple validation sprints during several stages in the design process.

### FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.





# COMPETITOR COMPARISON

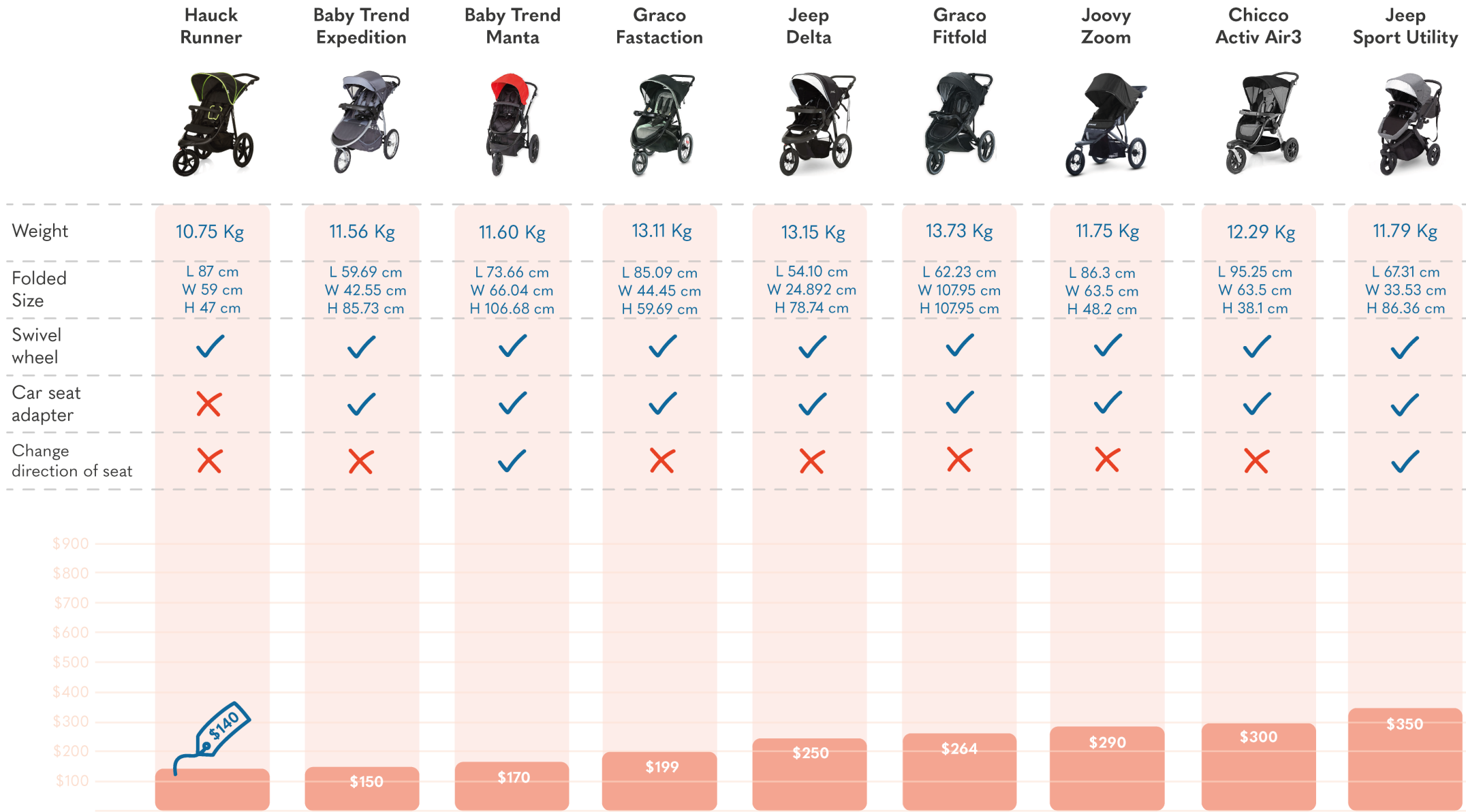


Figure C1: Runner comparison (see References for the links to all strollers)

Baby Jogger Summit 3

Bob Gear Revolution Flex

Thule Glide 2

Cyber Avi

UPPAbaby Ridge

Thule Urban Glide 2

Bob Gear Allterrain Pro

Cyber Zeno



12.90 Kg

11.39 Kg

11.07 Kg

10.60 Kg

13.24 Kg

11.07 Kg

14.51 Kg

12.50 Kg

Weight

L 80 cm  
W 63 cm  
H 38 cm

L 64 cm  
W 34.3 cm  
H 98 cm

L 89 cm  
W 58.5 cm  
H 25 cm

L 69 cm  
W 52 cm  
H 93 cm

L 46.99 cm  
W 66.04 cm  
H 92.71 cm

L 69 cm  
W 39.4 cm  
H 98 cm

L 99.70 cm  
W 64.77 cm  
H 43.18 cm

L 99.5 cm  
W 58.0 cm  
H 35.0 cm

Folded Size



Swivel wheel



Car seat adapter



Change direction of seat

\$430

\$550

\$550

\$580

\$600

\$600

\$680

\$900

\$800

\$700

\$600

\$500

\$400

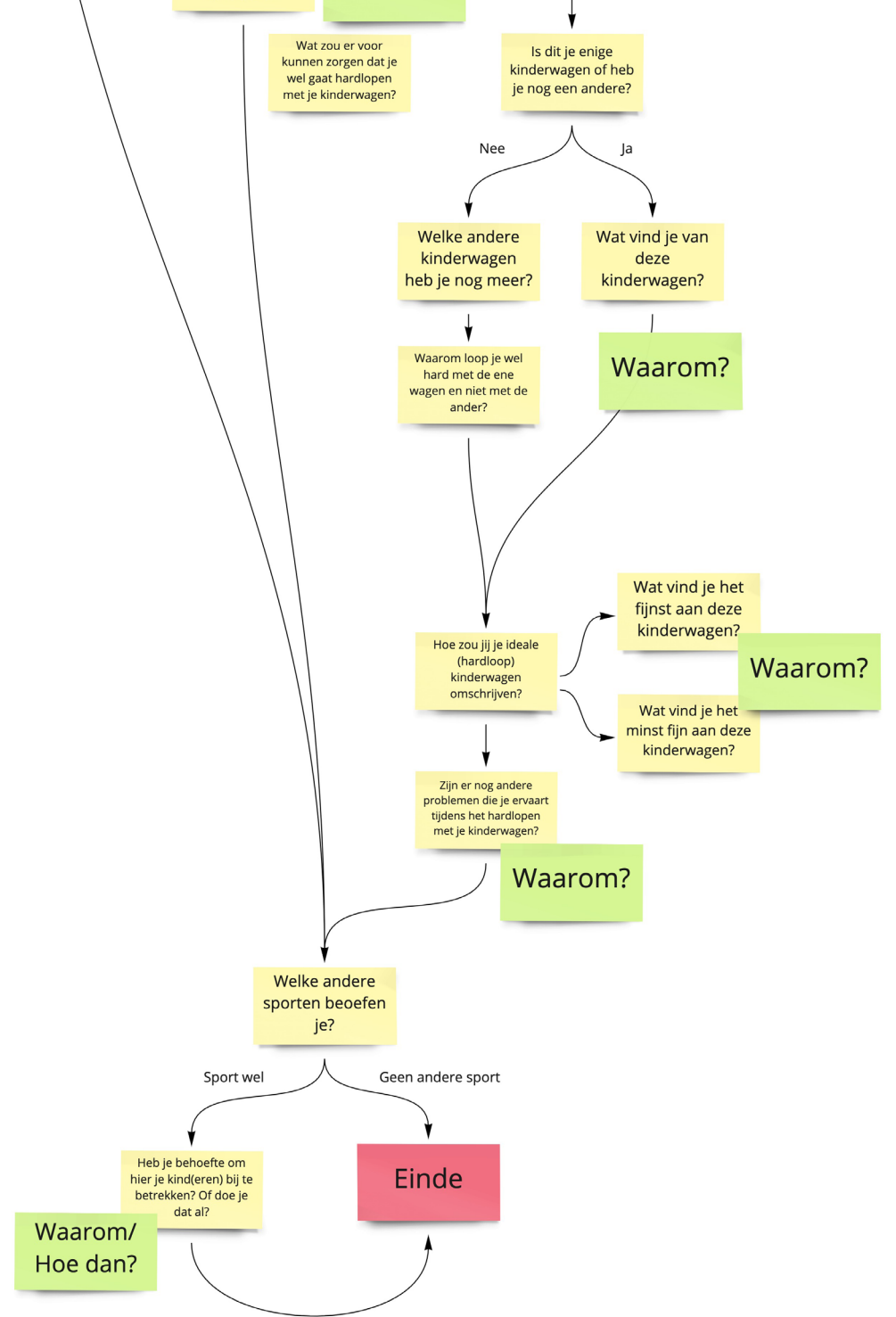
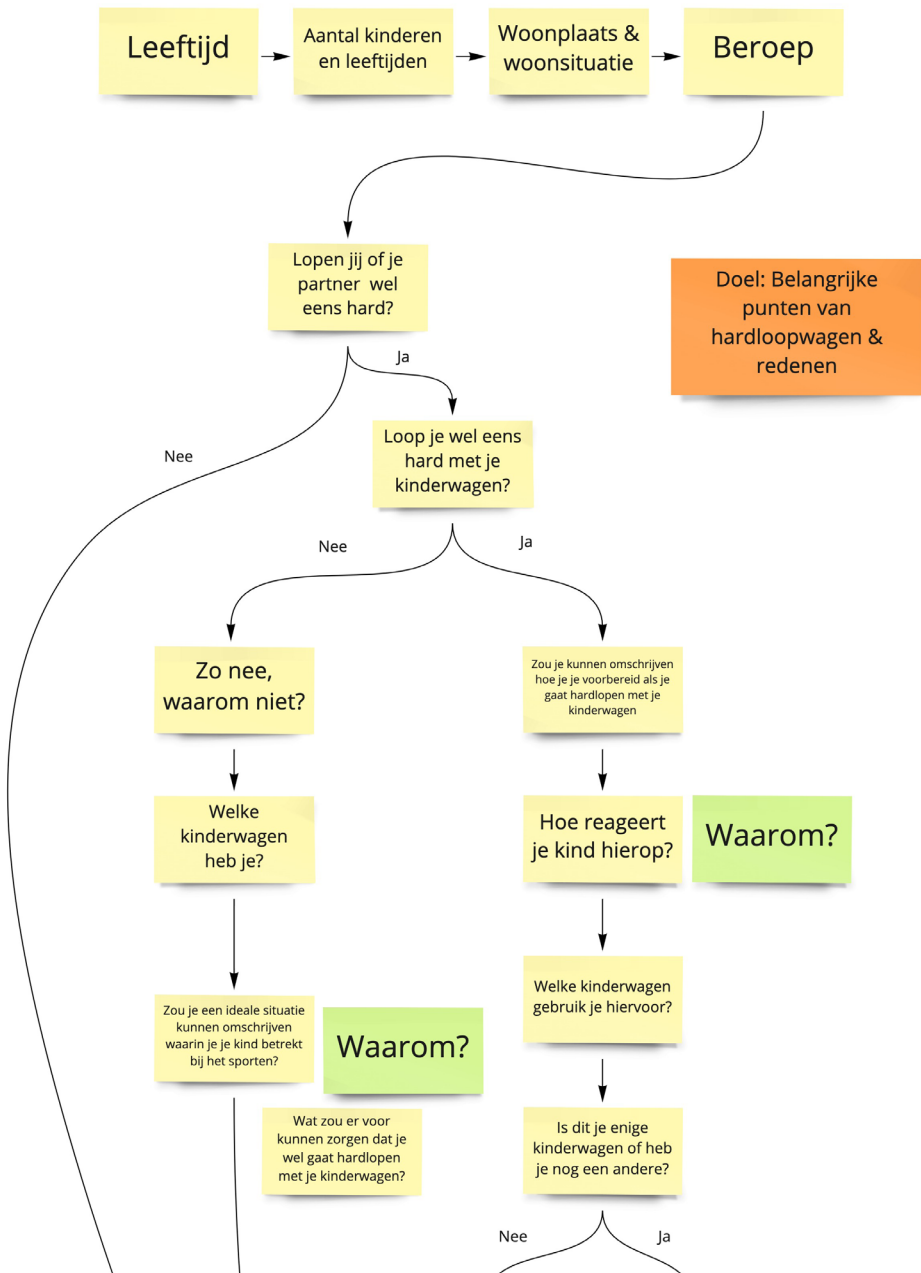
\$300

\$200

\$100



# D CONSUMERS



# The Young Urban Professionals

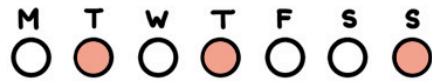
Living in

Rotterdam, The Netherlands

Sports

Hockey, Tennis, Running

Sport frequency



Brands they like



HAY

SUSAN BIJL



in an **apartment**

'I want a **safe & practical** stroller'

works as a doctor



**pregnant** with first child



31 years  
33 years  
**EMMA FRANK**

'I want the stroller to have a **cool design**'

WORKS as a front-end designer



Figure D2: Persona Young Urban Professional parents

# The Fit parents

in a family home

Living in

Berlin, Germany

Sports

Running & triathlons

Sport frequency

M T W T F S S  
● ● ● ● ○ ● ●

Brands they like



GYMSHARK



UNDER ARMOUR



NIKE

2 children

girl  
3 years

boy  
6 monts

32 years

VERA

'I want a stroller I can comfortably run with'

works as a personal trainer



34 years

MICHAEL

'I want a stroller I can train with'



works as an IT consultant



Figure D3: Persona Fit parents



# BUGABOO NEWSLETTER QUESTIONNAIRE

## 1. Where are you from?

5 Responses

ID ↑	Name	Language	Responses
1	anonymous	English (United States)	Sweden
2	anonymous	English (United States)	Sweden
3	anonymous	English (United States)	Scotland
4	anonymous	Español (España, alfabetización internacional)	Zaragoza, España
5	anonymous	English (United States)	Norway

## 2. In which configuration did you buy the Bugaboo Runner?

[More Details](#)

- As a complete stroller includin... 1
- As an accessory to put my Bu... 4



## 2. In which configuration did you buy the Bugaboo Runner?

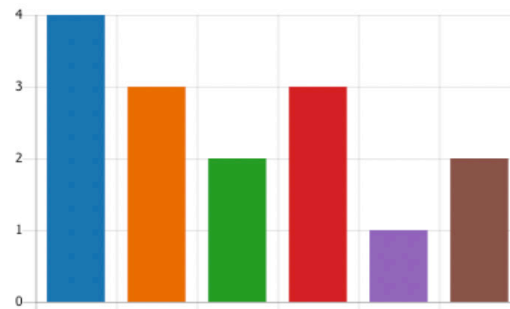
5 Responses

ID ↑	Name	Language	Responses
1	anonymous	English (United States)	As a complete stroller including the seat.
2	anonymous	English (United States)	As an accessory to put my Bugaboo stroller seat on with adapters.
3	anonymous	English (United States)	As an accessory to put my Bugaboo stroller seat on with adapters.
4	anonymous	Español (España, alfabetización internacional)	As an accessory to put my Bugaboo stroller seat on with adapters.
5	anonymous	English (United States)	As an accessory to put my Bugaboo stroller seat on with adapters.

## 3. What did you use the Bugaboo runner for?

[More Details](#)

- Running in the city 4
- Running in the woods 3
- Walking in the city 2
- Walking in the woods 3
- Shopping 1
- Other 2



#### 4. To what extent did it fulfill your expectations?

[More Details](#)

Promoters	4
Passives	1
Detractors	0



#### 4. To what extent did it fulfill your expectations?

##### 5 Responses

ID ↑	Name	Language	Score	Category
1	anonymous	English (United States)	9	Promoters
2	anonymous	English (United States)	7	Passives
3	anonymous	English (United States)	10	Promoters
4	anonymous	Español (España, alfabetización internacional)	10	Promoters
5	anonymous	English (United States)	10	Promoters

#### ID ↑ Name Language Responses

ID ↑	Name	Language	Responses
1	anonymous	English (United States)	Nice big air wheels. Great with the break when walking downhill, especially when it's ice. A bit heavy to move around/change directions when you are used with the smooth wheels at other Bugaboo strollers. Love that you can have the kid face towards you, that is otherwise rare at other runner strollers from other brands.
2	anonymous	English (United States)	I absolutely LOVE my bugaboo runner and so does my son. We have averaged nearly 1000 miles with it mostly running. The best bit is the choice to front or parent face as we actually preferred the parent facing option up until my son turned 3 so we could see each other, chat, sing, interact. The storage basket underneath is a blessing and I miss not having it when I run solo. The size of the wheels are excellent and the tyres are of excellent quality too. I wouldn't change a thing about it.
3	anonymous	English (United States)	Get me where I want regardless of terrain.



# CREATIVE SESSIONS

# F.1

## CREATIVE SESSION BUGABOO 1.0

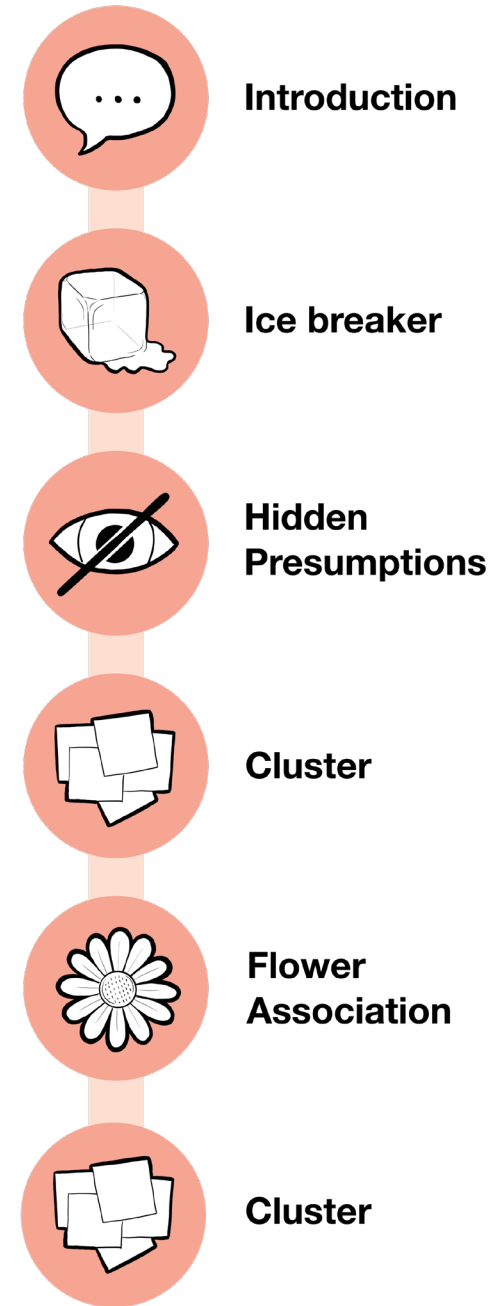


Figure F1: Creative session Bugaboo 1.0 plan



Figure F2: Creative Session Bugaboo 1.0



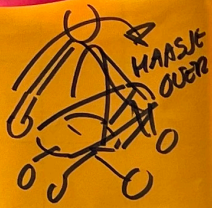
Rest

Child as weight

Same method  
eraren



raebak fiets

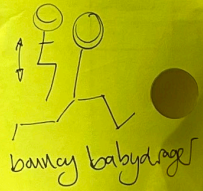


SQUADTWINS



KIND GEWICHT

KIND TUSSEN  
JE INO TEEKING



bouncer babydage

Sport  
fester  
organiseren



KINDEN KIND OP DE RUG

Kind als  
gewicht  
gebruken

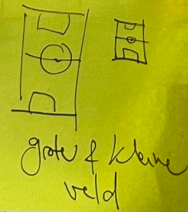
Parking the  
child

1 team is  
de baby  
ppas

POP UP TENT  
MAKST UP-OP

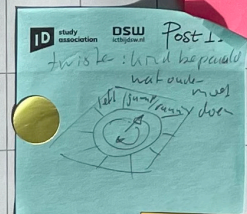


COPY  
SCALE  
PASTE



gaten & kleine  
veld

Together



Post ID  
Make it a game  
→ laser game  
= running/diving  
etc

Spel van  
maken



BAL SPORT

Same  
Lukken

Figure F4: Creative Session Bugaboo 1.0 - Outcomes 'How to sport with your child?'

# F.2

## CREATIVE SESSION PARENTS

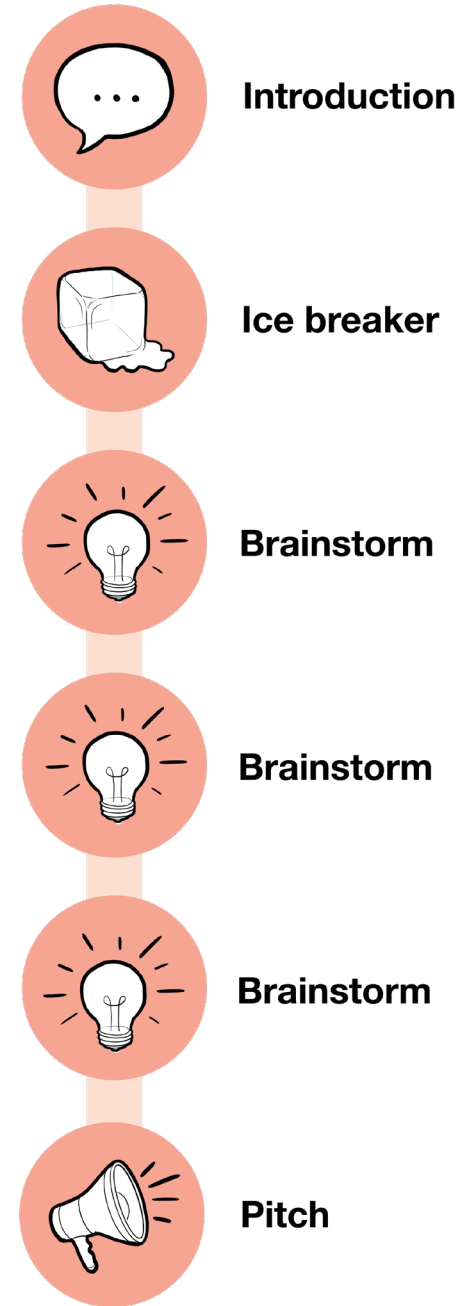

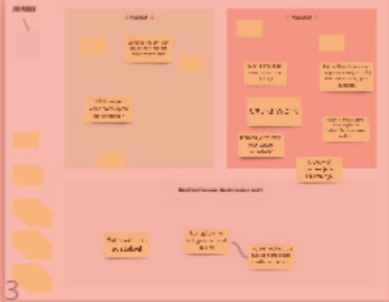


Figure F5: Creative session Parents plan


### Concept 1




2



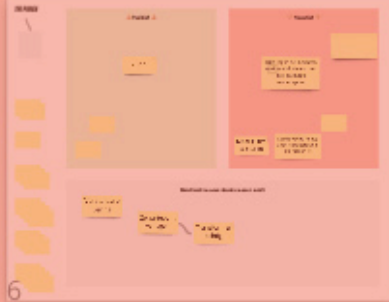
3




### Concept 2




5



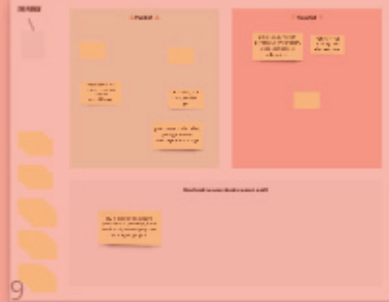
6




### Concept 3




8




9




Rules




Rules




Copy of Rules




Copy of Rules




Copy of Rules




Copy of Rules




Copy of Rules




Copy of Rules




### Break



#### Pitch Team A



#### Pitch Team B



#### Pitch Team C




Figure F6: Miro board creative session parents

# F.3

## CREATIVE SESSION STUDENTS

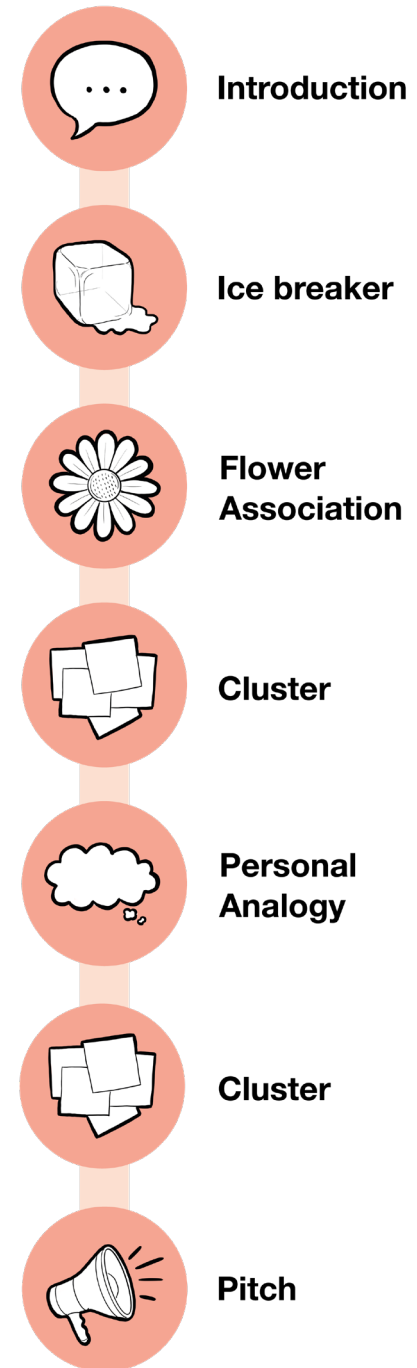


Figure F7: Creative session Students plan



**RULES**

- ENGAGEMENT
- QUANTITY BREEDS QUALITY
- FREE WHEEL
- ENGAGE IN THE SESSION
- ACKNOWLEDGE THE TEAM EFFORT
- OPEN INSIDE, CLOSED OUTSIDE
- HAVE FUN!

**CODE OF CONDUCT**

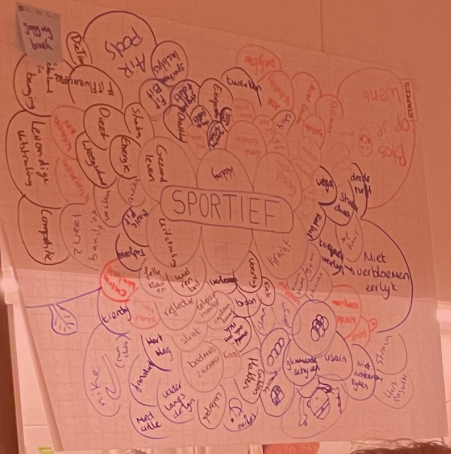
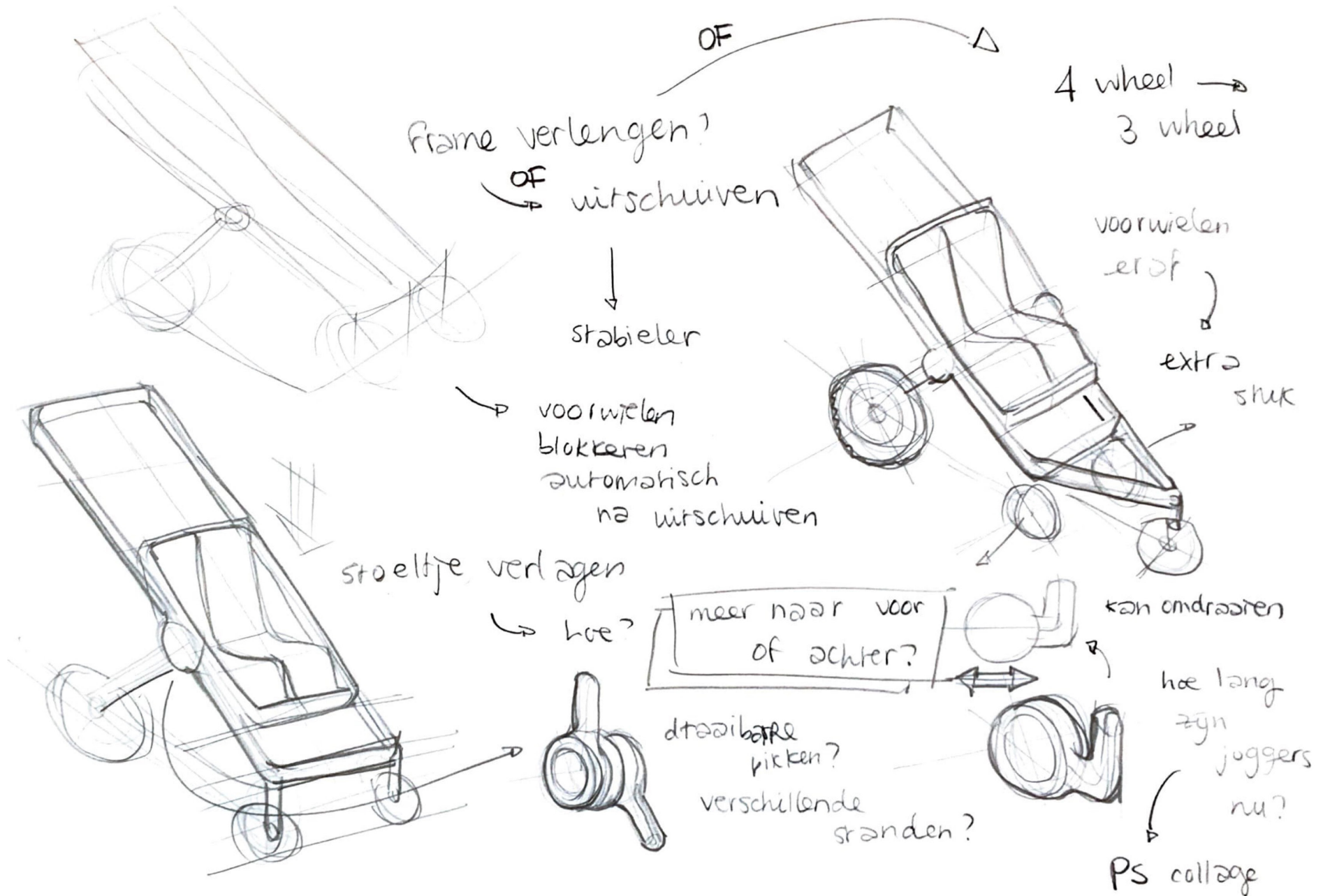


Figure F8: Creative Session Students

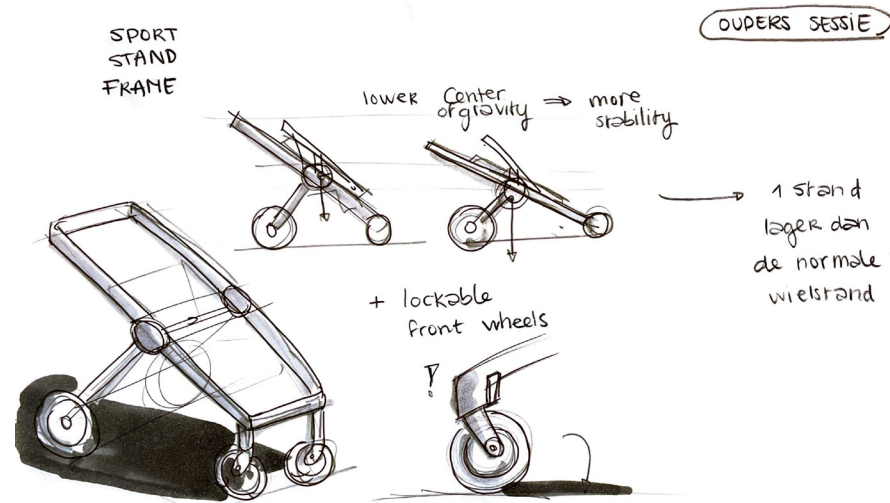


Figure F9: Creative Session Parents - Outcomes 'how to make a stroller sporty?'



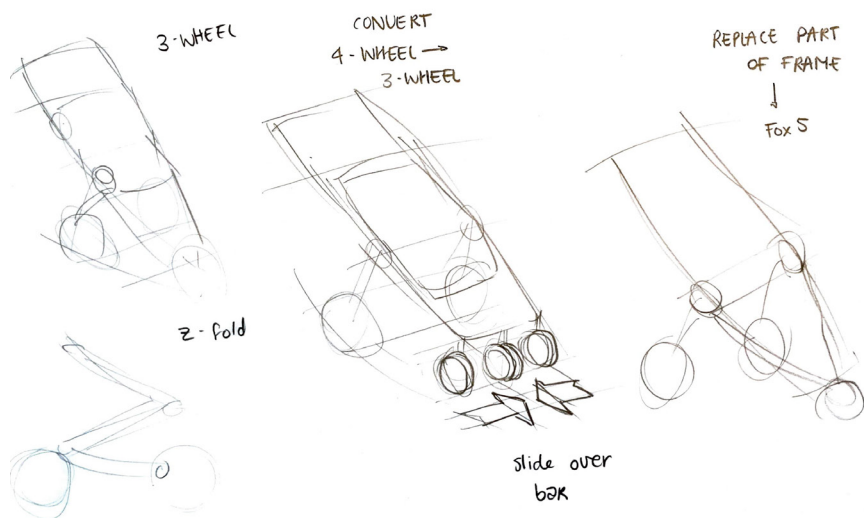


# F.4 IDEA SKETCHES



OUDEKS SESSIE

hierdoor is hij stabielier & kan je ermee rennen  
sport 'versie' van normale wagen

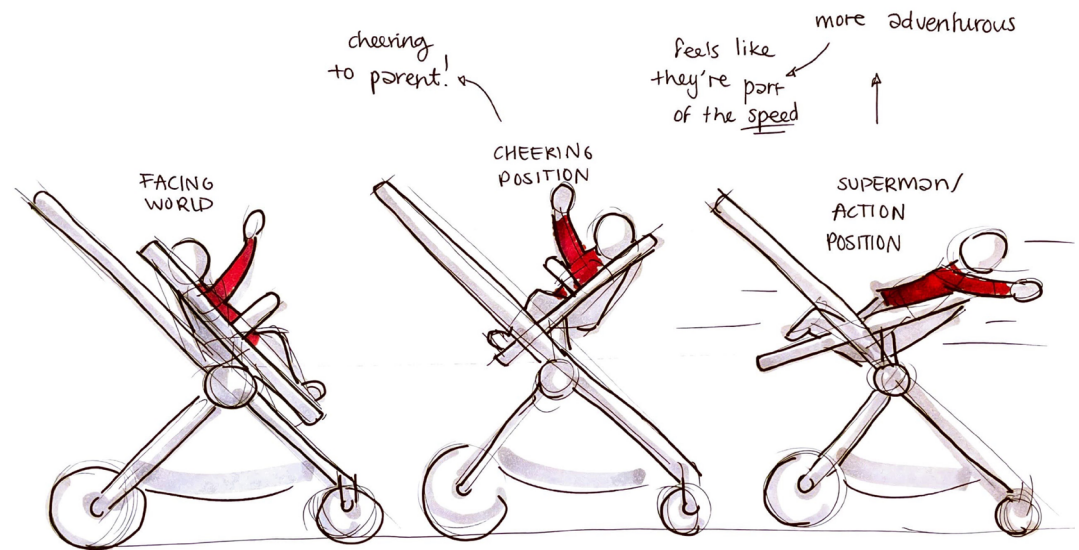
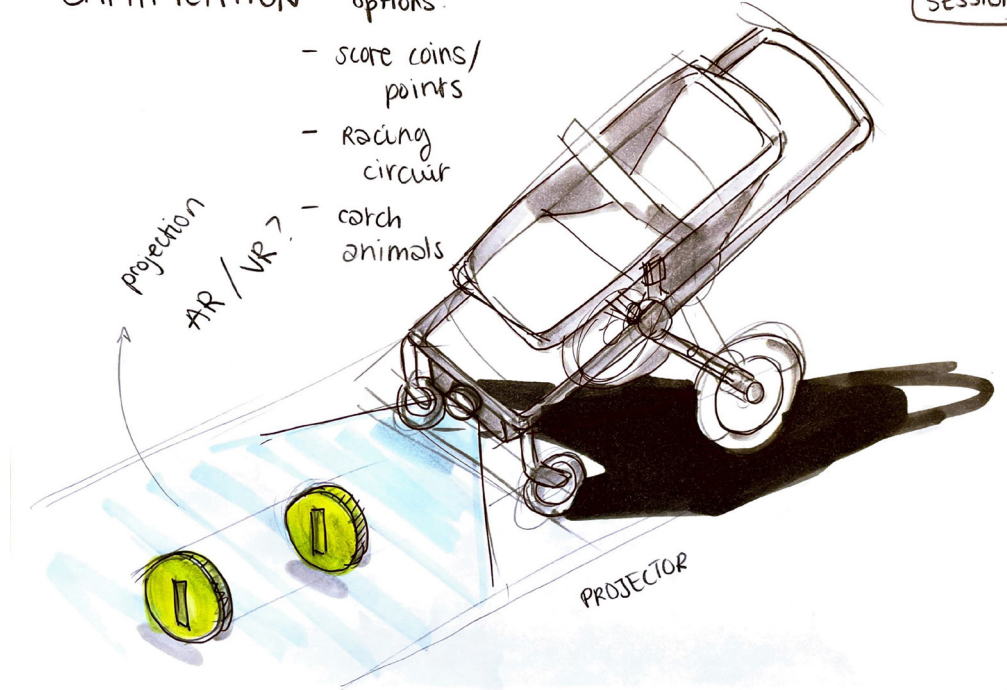


## GAMIFICATION

options:

- score coins/points
- racing circuit
- catch animals

STUDENT SESSION



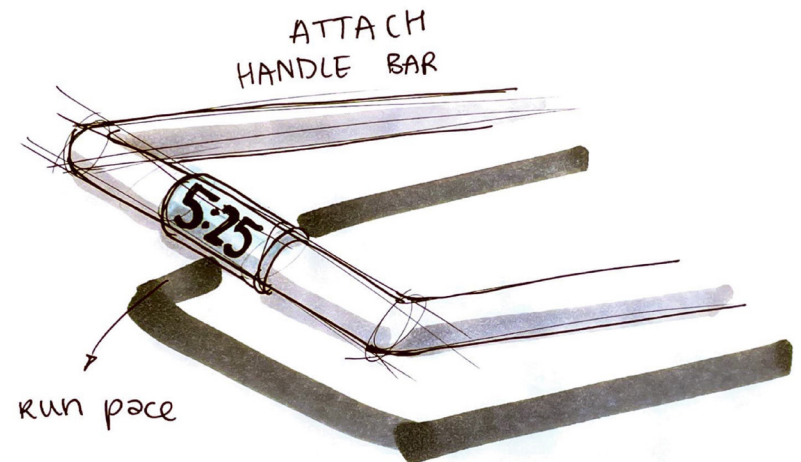
EXTRA SEATING POSITION



TRACKING  
ACCESSORY



- SPORTY LOOK
- DRY FIT FABRICS
- REFLECTIVE FRAME
- SPECIAL BASKET
- FRONT LIGHT
- LOCKABLE ALL TERRAIN WHEELS





# EXPLORATION OF CONFIGURATIONS

Elongated  
frame  
(with angle change)



Bugaboo Fox 3

Elongated front leg  
& swivel wheel

Elongated front leg  
& large front wheel

Elongated front leg & large  
front wheel + lowered seat

Elongated  
frame  
(same angle)



Elongated front leg (angle  
stays the same) & swivel wheel,  
lowered seat

Elongated front leg (angle  
stays the same) & swivel wheel,  
seat placed forward

Elongated front leg (angle  
stays the same) & swivel wheel,  
seat placed forward

Figure G1: Different configuration of longer wheelbases and different positions of the seat

# VALIDATION WITH PARENTS



Figure H1: Different option proposed during parent validation sessions

Optie 1

## Normale kinderwagen



- Wiegje & stoeltje
- Zonnekap
- 8,5" voorwielen
- 12" achterwielen

€1.199

Figure H2: Details of option 1

## Optie 2

# Normale kinderwagen & Hardloop kinderwagen



€1.999

### Normale kinderwagen

- Wiege & stoeltje
- Zonnekap
- 8,5" voorwielen
- 12" achterwielen

### Hardloop kinderwagen

- Stoeltje
- Zonnekap
- 10" voorwielen
- 16" achterwielen

Figure H3: Details of option 2

### Optie 3

## Normale kinderwagen met sport functie



€1.299-€1.599

- Wiegje & stoeltje
- Zonnekap
- 8,5" voorwielen
- 16" achterwielen
- Optie om frame langer te maken
- Rem
- Sportieve look

Figure H4: Details of option 3

MASTER

THESIS

by **Avelien Husen**