

VITAL SPORTSPARKS, THE SOLUTION FOR A MORE ACTIVE ENVIRONMENT FOR THE YOUTH?

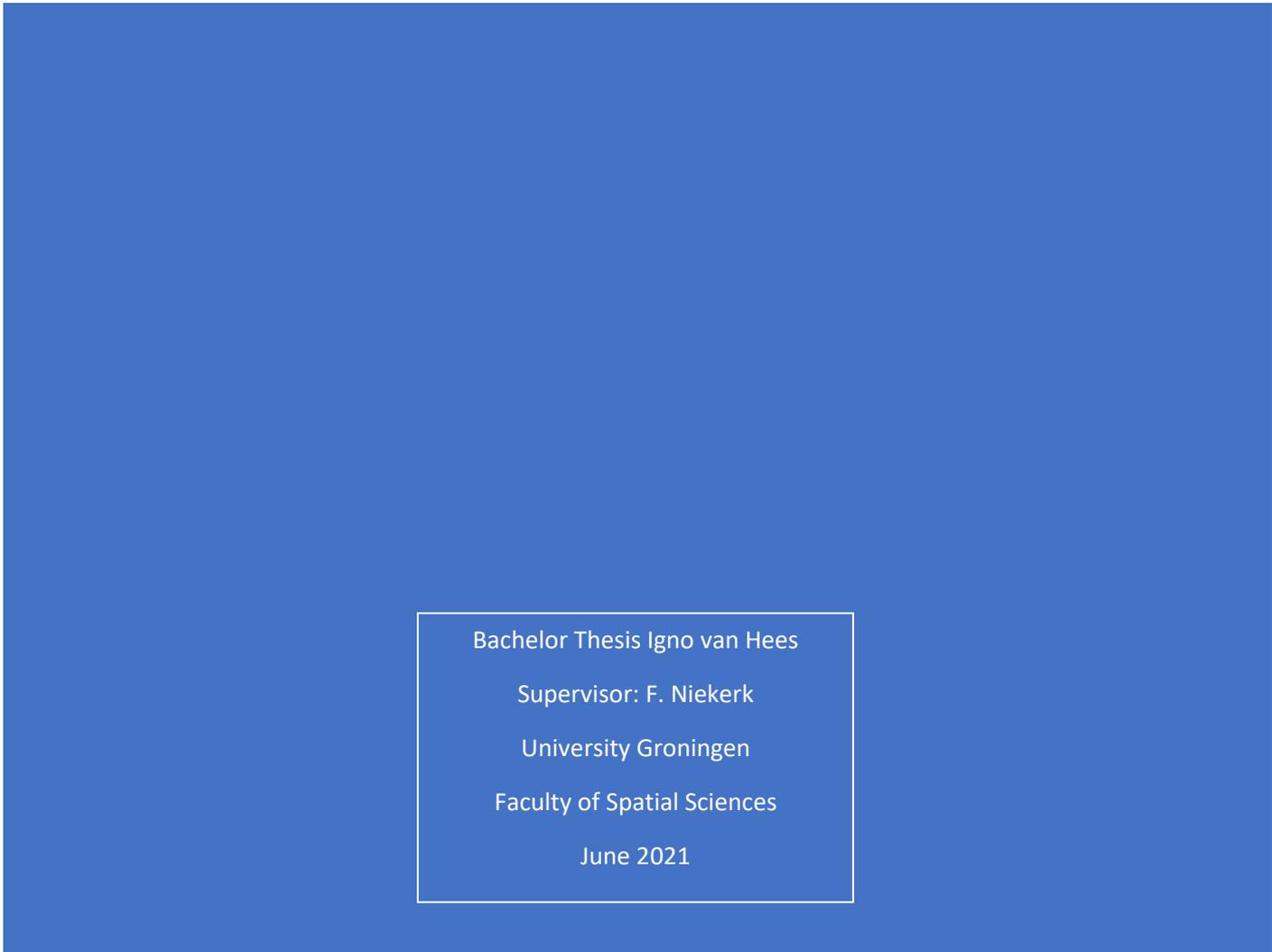
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Summary

This thesis investigates vital sports parks and the role they can play in creating a more active environment for the youth. To improve general health youth needs to be more active. One way to do this is by designing public open space in a way that promotes physical activity, creating a more active environment. This thesis investigates the role sports parks could have in creating a more active environment. An important new development currently happening at sports parks is the creation of so called vital sports parks. At these sports parks the usage of the sports park is improved. This trend is investigated using a framework based on time geography to look at the authority and coupling constraints that are removed from sports parks. A separation is made between a non-spatial approach where new activities are organised on the sports park and a spatial approach where the sports park becomes part of public open space. Through a literature review factors in public open space promoting youth physical activity are identified. Semi structured interviews are used to gain more insight in the new vital sports parks. Based on the results a model is created that describes the process of creating a vital sports park and the role youth physical activity promoting factors in public open space can have on this process in the future.

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Introduction

Background

Physical inactivity has become a global pandemic. Currently it is the fourth leading cause of death worldwide. (Kohl et al. 2012) The lack of physical activity (PA) can already have negative results on health from a young age. For children a lack of PA leads to an increased risk of getting injured. (Bloemers et al. 2012). At the same time increased PA for youth (5-17y) can contribute to improved health indicators for youth (Poitras et al. 2016). One factor that can influence youth PA is the spatial environment. In an Australian study by Veitch et al. (2007), children between the ages of six and twelve mentioned in interviews that factors like urban design, quality of play equipment in public parks and independent mobility all influenced the amount of active playing they did. Looking at more quantitative data on this subject a study by Deelen et al. (2017) has shown that youth with more green areas, water and sports facilities in their neighbourhood have a higher level of sports participation. Wicker et al. (2013) have shown that the location of these sports facilities have a big influence on sport participation in general. Looking at the Netherlands, Deelen et al. (2016) found that neighbourhood liveability and distance to sports facilities influence sports participation. The role of the urban form on youth PA was also researched by Loon and Frank (2011) who found that urban form interventions can have a lasting influence on the behaviour of youth and the amount of PA in their lives.

All these studies look either at the influences of the location of sports facilities or at the influence of urban design on (youth) PA. In the Netherlands there are currently policies from different governmental sectors that are working on this specific topic. The most important change is the new environmental and planning act (omgevingswet) that is currently being implemented by all different levels of Dutch government. This new act combines 26 old environmental laws into one new version. The goal of this act is “to maintain and reach a healthy physical environment and good environmental qualities” (VNG 2021/1). From 2022 onwards all Dutch municipalities need to have an environment and planning plan that describes how they want to use the physical living environment in their municipality to reach the before stated goal (VNG 2021/2). An important concept in this development is the movement friendly environment (beweegvriendelijke omgeving). This concept looks into how physical space can be designed in a way that promotes physical activity (Hoyng and van Eck, 2021). The Mullier Instituut has a database that shows how movement friendly different municipalities are. A trend that is visible in this database is that urban areas are less movement friendly than rural areas (Sportenbewegen cijfers 2021). When looking at factors that influence the movement friendliness of an area the reason for this is quite obvious. Green spaces, walking/cycling routes and playing facilities are mentioned as important factors for a movement friendly environment. Rural areas are often more green which makes them more movement friendly. In the movement friendly environment sports facilities are also mentioned as a factor positively influencing the movement friendliness. A big difference between sports facilities and the other factors is that sports facilities most of the times are not freely accessible in the Netherlands and thus not part of public open space (POS) in the Netherlands. With sports facilities often being green spaces this presents an opportunity.

Sports facilities being excluded from POS is addressed in another new policy in the Netherlands. In 2018 the ministry of Health, Welfare and Sport together with parties from the sports, welfare and business sector signed the “sports agreement” (sportakkoord). The goal of this agreement is to “futureproof the organisation and finances of sports in the Netherlands” (VWS 2018). The agreement consist of six smaller agreements about more specific subjects. One of these smaller agreements focuses on sustainable sports infrastructure. Among the factors mentioned, needed for sustainable

sports infrastructure, are open sports facilities, making sports facilities part of POS and better usage of sports facilities.

Making sports facilities more open and part of POS offers a lot of opportunities. The Netherlands has a very high density of sports facilities with a good distribution both in urban and rural areas (Van der Poel et al. 2016). Integrating a part of the sports facilities into POS could make areas more movement friendly and improve youth PA. These more open facilities have often been given the name “open sportpark” or “vitaal sportpark” which would translate to open or vital sports park (In this thesis the term “vital sports park” will be used whenever “open/vitaal sportpark” would be mentioned in Dutch). However since this is a new concept there isn’t an established definition of these two terms that is widely used. van Eck & van der Pal (2021) have written an article about the two concepts and how they are used. The common thing about most situations where the concepts are used is that the sports facilities are no longer monofunctional (only used by sports clubs) but are also used as POS or for social/welfare uses.

The development of vital sports parks is a new trend and not yet mentioned in scientific literature. Since vital sports parks represent a big spatial change of the Dutch sports infrastructure, from monofunctional to multifunctional, scientific research into this topic can help to create a framework around this change. A framework that links the change into vital sports parks to existing scientific literature on sports and spatial planning. A clear description of the concept vital sports parks will also help future research into this topic.

Research problem

The use of sports facilities as part of POS and the potential it has to positively influence youth PA is new and information about vital sports parks is scarce. The goal of this thesis is to create an overview of what vital sports parks are and how these vital sports parks can contribute to a movement friendly environment for the youth. The following research question and sub questions will be used to address this:

Research question:

How can closed off sports facilities be integrated into public open space to stimulate youth physical activity?

Sub questions:

Which spatial factors influence youth PA in public open space?

What can be learned from places that already call themselves a vital sports park?

What are possible barriers for the creation of new vital sports parks?

How can the lessons learned from already existing sports parks together with the existing scientific knowledge about youth PA in public space be used to create more vital sports parks that improve youth PA?

Description of structure

This thesis will first establish a theoretical framework that can be used to answer these questions. Since there are some concepts addressed that have not been used a lot before in scientific literature, the definitions used in this thesis will also be addressed in the theoretical framework. A conceptual model will be created as a framework for the rest of the research. From there the methodology for this study will be addressed which includes a literature review and expert interviews. The results from both research methods will be presented and combined to answer the main research question and create an updated conceptual model including the results of the literature study and interviews.

Theoretical framework

Vital sports park

To be able to research vital sports parks a better definition is needed for the so called vital sports parks. The Netherlands has about 25.000 sports facilities (Van der Poel et al. 2016). They vary from tennis courts to sports halls or football fields. For the sports park part of the definition only outdoor sports facilities will be looked at. In the Netherlands this will mainly consist of football and hockey clubs but facilities such as softball fields or athletic tracks are also included. For the vital/open part of the definition it is harder to clearly define what is included. A factsheet published about “open sport sparks” by the Mullier instituut (Schots & Schadenberg, 2020) addresses two ways an open sports facility can be created. Either when facilities become freely accessible or when a sports facility is used for multiple sports and/or economical activities. An article from allesoversport on open and vital sports parks (van Eck & van der Pal, 2021) mentions five characteristics that are needed for an open/vital sports park:

- Mix of functions
The facility is not only used for sports but also for other uses such as a day-care, a library, a physiotherapist or other functions.
- Spatial integration
The sports facility is connected to POS with traffic routes, green and recreational structures. The facility has to become a meeting place or starting location for multiple sports.
- Good usage of the facility
The facility should be used by different target groups (not only sports but also education or welfare). This to create a better usage of the facility.
- Openness
The facility has to be open to everyone. Cycling and walking routes should pass through the facility and the fields should be accessible to everyone.
- Administrative vitality
The offer of activities and volunteers should be well organised.

This definition is way more specific and strict. A third definition that needs to be taken into account is the definition of NOCNSF for an open club (NOC*NSF et al., 2015). According to them an open club is a club where both members and non-members are invited to participate in sports and the club seeks collaboration with parties from other societal sectors to offer new activities. The fourth and last thing that needs to be taken into account is the ‘open clubs and vital sports parks’ initiative from the province of Gelderland. In 2016 the province started subsidising projects to create more open clubs and vital sports parks in the province. Because sports are usually not a domain provinces are involved in the province of Gelderland focused on the societal role sports clubs have in the province (van

Kalmhout et al, 2015). To qualify for a subsidy the initiative needed to come from a sports club or sports facility organisation and the goal had to make the club/facility more futureproof and/or improve the liveability of the surrounding village/neighbourhood. For this they need to collaborate with at least one additional party from the education, culture, recreation, health, welfare or business sector (Reitsma et al. 2019). Even though this isn't a definition of the concept the fact that the province of Gelderland subsidised 25 sports facilities means that this has had a big influence on what is now regarded as a vital sports park.

To make sure all current developments are taken into regard in this study a very wide definition will be used to investigate this new concept. For this research *every sports facility improving the usage of the facility in any way is seen as a possible vital sports park*. This can be making the park more accessible, making it part of POS, but also by facilitating the use of the sports facility by other organisations, possibly from other sectors.

Time Geography

To better contextualise the openness of sports parks, time geography offers a suitable framework. Time geography focuses on individuals everyday activities. It looks at their time use and the possibilities individuals have to use their time. All activities together create one path that forms our days, weeks, years and eventually one path from life to death. The possibilities individuals have to perform different activities are determined by constraints (Hägerstrand 1970). Constraints limit the possibilities we have at different times. Hägerstrand identified 3 different types of constraints. Capability constraints limit us through our biological needs and our capabilities. To stay alive we need to eat and sleep. The second type of constraints are coupling constraints. This are moments where we have to join others or need to be at a specific location to do things. The third type of constraints are authority constraints. This is when a certain group limits the capabilities of others.

Even though the time geography concept is over fifty years old it is currently still used. Ellegård & Vilhelmson (2004) studied the concept more recently with digital communication forms emerging and found that distance, proximity and related constraints are still relevant. Scholten et al. (2012) found that constraints due to spatio-temporal conditions are still a good way to show the affordances people have in everyday life. With modern technologies and software the field of time geography has even expanded now that GIS software gives us new ways to analyse space-time relations (Miller & Bridwell 2009). Time geography has also been used to look at people's recreational sports time use. Qviström et al. (2020) looked at the way people planned their runs and how availability of time influenced the locations where they ran. In this study time geography will be used to look at how constraints limit our use of certain places (sports parks) and how these constraints can be taken away.

With the definition of vital sports parks established the possible constraints surrounding sports parks also become clear. Sports parks being inaccessible for people outside of sports clubs is a clear example of authority constraints. Even for members of sports clubs there are still coupling constraints for when they can use the facilities. People can often only use the facility when they have a training or competition. Creating a more open sports facility can be seen as removing constraints from the use of the space available at a sports facility for as many individuals as possible. This could be done by removing both coupling and authority constraints and making sports parks POS. This way people can use their individual available time slots and make use of the new POS whenever they want. The other option is by giving more groups (possibly from different sectors) access to the sports parks. This creates access for more people within certain coupling constraints. Since it is less flexible it could be less effective. If however existing activities can be moved to sports facilities to include more PA it could still be really effective.

When focusing on youth another form of authority constraints also has to be addressed beforehand. Neutens et al. (2011) describe how not only constraints at a certain location can influence accessibility but also the ways individuals can reach a certain location. Especially for youth the ability to safely get to areas can have a big influence on their use of an area. If the route of an individual child from house to POS/sports park is deemed unsafe by parents the use of that area by youth can drastically decrease (Grow et al. 2008; Veitch et al. 2008), a clear example of an authority constraint.

Spatial factors influencing Youth PA

The third concept that needs to be elaborated on is youth PA. In this study youth PA is used in combination with spatial factors. This study itself will not measure youth PA itself but looks at how spatial factors can influence youth PA levels. When looking at youth sport participation from an environmental perspective the role of the sportscape consisting of built form and supporting infrastructure has to be considered (O'Reilly et al. 2015). Several factors in the built environment and POS all have a certain attractivity according to O'Reilly et al. If new PA endorsing facilities/characteristics in POS are created it is important to know what type of characteristics actually have attractivity and can help improve Youth PA. With vital sports parks possibly becoming part of POS these characteristics can then be implemented at vital sports parks to create a more active environment for the youth. This process is shown in the conceptual model with this approach only being relevant in combination with the spatial approach of creating a vital sports park.

Conceptual model

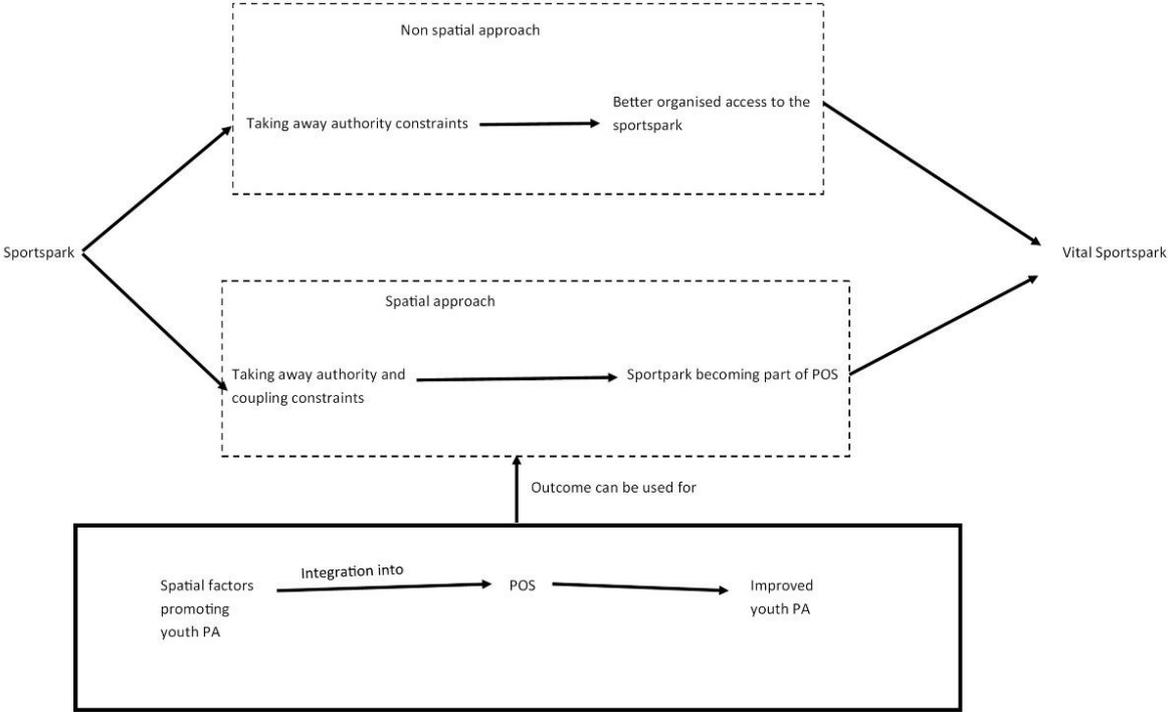


Figure 1, conceptual model

In figure 1 the conceptual model is visualised showing how all the different concepts relate to each other. The starting point is the standard closed of sports park. To get to a vital sports park either authority constraints can be taken away or both authority and coupling constraints. When you only take away authority constraints organised access for more groups will be the outcome leading to the needed better usage of the sports park necessary for a vital sports park. This method will be regarded as the non-spatial approach that focuses on improving the usage without making spatial changes. When you take away both authority constraints and coupling constraints the sports park will become accessible for individuals who are not member of a sports club whenever they want and so the sports park becomes part of POS. This should lead to improved usage of the sports park and create a vital sports park. The opening of a sports park to the public is a spatial change and this approach is therefore called the spatial approach. Both approaches are not mutually exclusive and can both be used at the same sports park.

The spatial factors promoting youth PA are relevant for whenever the spatial approach is used. Since the spatial approach integrates a sports park into POS spatial factors that contribute to an increase in youth PA can be integrated in a vital sports park. Whether this link is will have to be reflected on based on the results of this study.

Expectations

When sports facilities become more open and part of public open space it can be expected that it will positively effect youth PA. What factors in POS will positively influence youth PA is unknown before the literature study. The most beneficial outcome would be if sports facilities in POS positively influence youth PA since they are already available at sports parks. However there will probably be more factors that positively influence youth PA.

What can be learned from current vital sports parks and possible barriers for the creation of vital sports parks are also unknown. Currently the best sources on information on existing projects is a report on projects in the province of Gelderland. However that report is focussed on evaluating how the subsidies from the province are used and therefore limited by the requirements that the province uses for open clubs and vital sports parks (Provincie Gelderland 2019).

Methodology

When addressing the main research question “How can closed off sports facilities be integrated into public open space to stimulate youth physical activity?” certain concepts need to be researched to answer the question. The sub question: “What spatial factors influence youth PA in public open space?” aims at the factors in POS that stimulate youth PA as can be seen on the bottom of the conceptual model. The influence of POS on youth PA is an already know scientific topic that has been addressed in a plethora of articles. Because of that this sub question will be addressed through a literature review.

The sub questions “What can be learned from places that already call themselves a vital sports park?” and “What are possible barriers for the creation of new vital sports parks?” go into what vital sports parks are, what can be learned from them and what barriers exist for the creation of more vital sports parks. In regards to the conceptual model these sub questions go into the top part of the conceptual model, looking at the process from sports parks to vital sports parks through either the spatial or non-spatial approach. Since ‘vital sports park’ is a new concept no previous research has been done on this specific topic. Thus a method is needed to generate data on this concept. This will be done using semi structured interviews of which the data will be analysed with an inductive approach to create a description of this new concept.

The last sub question, “How can the lessons learned from already existing sports parks together with the existing scientific knowledge about youth PA in public space be used to create more vital sports parks that improve youth PA?” combines the findings from the literature study looking at youth PA and POS with the finding about vital sports parks. It will go into how these two topics currently interact and what the opportunities are for future interactions.

Method literature study youth PA

To find the spatial factors that influence youth PA literature research will be used. Literature about spatial influences on youth PA will be collected and analysed. The method will be based on Healey and Healey (2016).

To find relevant literature “Web of Science” will be used. Since the relation between youth physical activity and spatial influences is investigated, search terms are split up between these two categories and will be combined to come up with the actual combinations used in the search engine. The search terms that are used are split up into two groups, key search terms and narrower search terms (appendix 1). The search terms “public open space” and youth physical activity will be the main focus

of the literature review. Additionally narrower search terms will be used to find articles that look into more specific parts of the area of interest (children instead of youth for example).

The results from Web of Science will be judged on relevance and relevant articles will be collected. The relevance is determined first by checking the title. If the title seems relevant the abstract will be checked. If the abstract also seems relevant the full article will be scanned and if relevant be used for the literature review. For all the search terms the amount of search results, relevant abstracts and articles used will be documented.

Relevant literature consists of articles describing spatial factors that influence PA of youth between 6 and 18. Since the search terms youth, child and adolescents are used some literature will be on specific age groups in the allowed range. In the analysis of the literature this will be taken into account since it is logical that the needs of six and sixteen years old will be different.

The goal of the literature search is to find all relevant literature related to the search terms. Depending on the amount of articles this results in it might be brought further down to an amount of +/-20 based on their relevance for this research.

For the analysis the most important factors from the articles will be combined to create an overview of what factors can positively influence youth PA. Because of the wide age range the results will be split up into the categories children (6-12y old), adolescents (12-18y old) and general (all ages). Additionally, if gender is mentioned by many articles this will also be used as a category.

Method interviews open/vital sports parks

The sub questions “What can be learned from places that already call themselves open sports parks?” and “What are possible barriers for the creation of new open sports parks?” will primarily studied through interviews. Since no scientific research has been done into vital sports parks previously a method is needed to describe this new concept. An inductive approach analysing raw data is a tool that can be used to describe themes or concepts based on raw data. At this moment there are policy documents mentioning vital sports parks but there is no existing raw data yet on vital sports parks. Interviews with stakeholders at existing vital sports parks and experts in sports/spatial policy who have worked with the vital sports parks concept are the best way of getting raw data about sports parks that can be used to describe this new concept.

Through internet searches, reading policy documents, looking into reports on vital sports parks and contacting research institutes and government organisations these experts were identified. The people that were found were:

- Sport policymakers/researchers who are working on the development of the ‘vital sports park’ concept.
- Provincial employees/‘sports park coordinators’ or people in similar roles who have been involved in the creation of a vital sports park.
- Experts from advisory firms.

Eight people agreed to the interview proposal. The background of the people interviewed varied from people with a spatial sciences background, sports background, and people with a background in welfare. That way the issue will be addressed from more than only a spatial point of view which the author of this thesis has. An overview of the different people and their roles can be found in Figure 2.

Interview	Role interviewee	Organisation	Experience with vital sports parks
1	employee Gelderse sport federatie	Gelderse Sport Federatie	Worked on the creation of vital sportsparks in the province of Gelderland
2	researcher/teacher at Hogeschool Arnhem Nijmegen	Hogeschool Arnhem Nijmegen	Researched open clubs and vital sports parks
3	Sportpark manager @sportpark Galecop Nieuwegein	Sport ID Nieuwegein	Works as a sportpark manager
4	Project leader Gelderland Sport!	Provincie Gelderland	Works on the open club and vital sports park program of the provincie Gelderland
5	Former sportpark manager @sportpark de Marslanden Zwolle and vital sports park advisor	Vitaal Sportpark	Has worked as sportpark manager and owns an advisory firm specifically advising on vital sports parks
6	Researcher Mullier instituut	Mullier instituut	Worked on the factsheet 'open sportparken' and is an expert on sports facilities in the Netherlands
7	Partner @sport & Ruimte advisory firm	Sport en Ruimte	Partner at the advisory firm that has the most experience with the spatial approach of creating vital sports parks
8	Expert vital sports parks with experience at Kenniscentrum Sport and bewegen who currently works for Kragten	Kragten (previously Kenniscentrum sport en bewegen)	Specialist movement friendly environment and sports infrastructure with an interest in vital sports parks

Figure 2, overview of interviews

The interviews with the policy makers/researchers will focus on the theoretical development of the vital sports park concept and the policy side behind the development of the vital sports parks. The interviews with the municipal workers/sports park managers and local stakeholders will additionally focus on the specific case they are involved with. For experts from advisory firms it will depend on their experience with the topic what the focus of the interview will be.

The interview method will be developed based on 'Longhurst, (2016) . A semi structured interview with some pre-set themes that have to be addressed in the interview will be used (appendix 2). This gives the person interviewed the chance to speak freely about their experiences and thoughts whilst also being able to address all subjects which are relevant for this research. This is particularly important since not much is known yet about the topic on which the questions of the interview guide can be based. Since the researcher got to know the topic better after every interview knowledge acquired in the first interviews was used to ask more specific questions if applicable. The interviews were conducted digitally because of the COVID.

Coding

The interviews were analysed using coding. A general inductive coding method was used. Inductive coding is used because it looks at a set of data to derive concepts, themes or a model from the data (Thomas, 2006). "The inductive approach is relevant when doing an exploratory study or when no theoretical concepts are immediately available to help you grasp the phenomenon being studied" (Skjott Linneberg & Korsgaard 2019, p.12). Since the concept/theme of open sports parks as they are created now have not yet been documented in scientific research this method is best suited here.

Grounded theory has also been looked at as an option however since the concepts studied haven't been described yet, forming a clear description of the concept with related themes is needed before theories can be developed through grounded theory research.

The article mentioned before by Thomas (2006) will be used as a guideline for the coding process. The objective of the coding will be finding structures in the raw data that can help towards answering the research questions. The use of the interview guide in the interviews will generate data that can be used to form a description on the open sports parks. However since the findings in inductive coding arise directly from the raw data a priori expectations are not necessarily met.

The primary mode of analysis will be the development of categories from the raw data that will be turned into a model or framework containing all the identified key themes. The coding will be done using ATLAS.TI. Coding will be done in Dutch to make sure no misinterpretation happens in the coding process. The coding categories are being translated to English afterwards. The outcome of the coding will be descriptive and should create a clear image of the vital sports park concept and how youth PA is regarded in the planning of the sports park.

Results

Results literature review

General beneficial factors to youth PA

Looking at the 19 articles, 15 different spatial factors were mentioned that could positively influence PA in POS. The spatial factors mentioned most often were availability of green areas in POS (9 mentions) and accessibility (8 times). For the accessibility both proximity of POS and the possibility of active transport were mentioned as ways to improve accessibility. Other factors that were mentioned at least 4 times were the maintenance of the facilities in POS (5 times), the availability of sports fields or courts in POS (6 times), perceived safety (4 times). The availability of POS in general (4 times) and challenging, age appropriate playing facilities/equipment (4 times). A full overview with all 15 factors and where they are mentioned can be found in Appendix 3.

Factors beneficial for children

Six articles looked at children between the ages of six and twelve. In these articles the availability of playgrounds and accessibility were both mentioned in three of the articles. Additionally green spaces and availability of sports fields/courts, parental consent, general availability of POS and challenging age appropriate facilities/equipment were mentioned twice for this age category. The factors feeling of ownership and maintenance of facilities were mentioned once.

For children the availability of playgrounds stands out. This factor was only found in studies looking at children. In situations where only children's PA needs to be improved creating new playgrounds would be the solution.

Factors beneficial for adolescents

Six articles looked specifically at the adolescents with most research focusing on the twelve to sixteen years old age group. The factor maintenance level of facilities, sports fields/courts and greenness of POS were mentioned in half the articles making them the most found spatial factors beneficial for adolescents PA. Perceived safety and the accessibility/possibility to get there easily on foot/by bike, challenging playing facilities and places to sit or where you can socialize were all found as relevant factors in two studies. The factor places to sit and socialize was only found among adolescents and not in other age groups meaning that this is a factor that can be used specifically to get more adolescents active in POS. The same thing goes for the factor lighting around sports courts and equipment. van Hecke et al. (2018/2) only found a general positive influence of POS youth physical activity and a gender difference in the use of POS among adolescents with girls being less likely to use POS.

Gender dependant factors

Three different articles also mentioned differences between genders when looking at PA in POS. van Hecke et al. (2018/2) found that in general adolescent boys used POS more for PA than girls. Veitch et al. (2016) found that for adolescent girls lack of safety and accessibility where the most influential barriers for more PA in POS whereas for boys the lack of green spaces was the main barrier. Mitchell et al. (2016) looked at the influence of POS availability in the neighbourhood on PA for kids between 9 and 14 and found that for boys POS within 800 meters of their home positively influenced PA whereas for girls this was only the case for an area within 500 meters of their homes.

Possibilities

The results of the literature study present several possibilities for improving youth PA. Sports parks offer green spaces and sports facilities, if sports parks would become part of POS this would automatically offer extra opportunities for the youth to be active. If sports parks are situated in

locations that lack POS this becomes even more important since it would also improve the accessibility of POS for the youth which also improves youth PA. If possible opened sports parks could also be improved to increase youth PA even further by looking at other spatial factors which were found. Examples could be creating a playground on a sports park to improve children's PA or creating places to sit and socialize to specifically improve adolescents PA. The differences between genders are also important to take into account. Improving female youth PA has shown to be a bigger challenge. Making sure the sports park is safe and the accessibility is good seem to be the most important factors to specifically help female youth PA. More research into the gender differences in PA level in relation with POS would be needed in the future to better address this issue. Only one article was found focused on the differences between genders and two more found gender as a relevant factor in their research.

Results interviews

Six out of the eighth interviews were transcribed and coded (data from two interviews was lost because of technical problems, a small written report was made of these two interviews). About forty codes were created in the first round of coding, afterwards 8 more categorical codes were created (Appendix 4). The interviews showed that there is not yet a general way to create a vital sports park and that different parties involved had different goals for vital sports parks. The results will be presented based on different themes that were mentioned in the interviews.

Involved parties

Looking at the vital sports parks and parties that are involved with creating them the two most important parties are sports clubs and municipalities. Municipalities are most of the times the owners of the sports facilities and therefore their involvement is almost always needed (interview 6). Sports clubs are traditionally the main users of the sports facilities, are essential for the sports offer and also important for the social fabric of the Netherlands. Initiatives to create vital sports park in most cases came from the municipalities or sports clubs. When municipalities came with the initiative the reasons to do something with the concept ranged from seeing it as a way to save money (Interview 5), seeing it as a way to generate money (interview 3 and 5) or someone in the municipality wanting to try it after having heard of it (interview 5). If the initiative came from sports clubs the clubs often saw it as a way to solve problems that were hard to solve as a club on their own. An example of this is on sportpark De Marslanden in Zwolle where clubs got together to solve a parking problem which eventually led to more collaboration between the clubs and the creation of a vital sports park (interview 5). Another important party to mention is the province of Gelderland that through subsidies financed fifty projects to help with the development of open clubs and vital sports parks. The availability of subsidies for projects has proven to be a good way to create vital sports parks (Interview 1, 4 and 8).

Next to sports clubs, municipalities and provinces several other parties were also involved in the creation of vital sports parks. In many projects external parties from the welfare, business or education sector were involved. In certain projects a sports park manager was appointed to guide the process and in some cases stay on permanently to generate more income and create new collaborations with parties outside of the sports sector (interview 3 and 5). Neighbourhood sports coaches (buurtsportcoaches) were also mentioned as people who could help by creating a sports offer for new target audiences who before wouldn't use the sports park (interview 5).

Users of sports facilities

Looking at users of vital sports parks, sports clubs remain the main users of the sports facilities (interview 6). At many vital sports parks one of the main goals is to find more users of the sports facilities. Schools have always been a party that made use of sports parks, at vital sports parks the collaboration between schools and the sports sector is sometimes extended to learning-working tracks in which students help the volunteers of the sports clubs (interview 1). The use of the facilities of a sports park by other parties is also a way in which businesses or parties from the welfare/social sector can become users of the sports facilities. In Nieuwegein at sportspark Galecop businesses and the local hospital make use of the sports clubs buildings for meetings and Vluchtelingenwerk (refugee help organisation) uses the buildings and fields for lessons (Interview 3). In Zwolle and several projects in Gelderland the canteens of sports clubs are used as meeting places for elderly or people from the local community to drink coffee together (Interview 2 and 5). The last group of new sports park users is individual sporters. These so called unbound sporters (ongebonden sporters) can use the sports facilities on their own or together with others without being a member of a sports club.

Trends

Looking at all the different ways of developing vital sports parks some general trends can be identified. In all projects in some way the goal was to get more people to use the sports facility, preferably target groups that didn't participate in physical activity before. Everyone wanted to end the monofunctional function of the sports facility where only sports clubs have their traditional offer for their members. Another similarity was that at all vital sports parks the local needs were important in some form for the way the sports park was developed. Whether this was a problem the sports clubs had (interview 3 and 5), the need for a new location for a community centre (interview 1) or a way to get people in a neighbourhood more active (interview 8). Other trends in general could be split up between a more spatial approach with physical changes to the sports park and a non-spatial approach, focusing on getting a better usage of the existing facilities and getting new parties from other sectors involved at the sports park.

Non spatial approach

The non-spatial approach is the most prominent development when looking at vital sports parks. It takes the existing sports facilities and buildings and tries to change it from a facility with monofunctional use to a facility that is used for several functions. The benefit of this approach is that it doesn't take much of a financial investment to start with. It can be as easy as renting out the fields during the day to a physiotherapist. However at locations where the term vital sports park is used the changes are often bigger. In most situations the extra functions are developed together with sports clubs. This can be by a sports club renting out their building but also by a sports club offering sports to new target audiences. An example of this could be creating a coffee and sports hour for elderly which was done in Zwolle (interview 5). This approach involving sports clubs was used at Sportpark de Marslanden (interview 5) and Sportpark Galecop (interview 3).

On several sports parks a sports park manager is used to create a vital sports park. This requires an investment from other stakeholders like municipalities, provinces or sports clubs. This can potentially be profitable if the sports park manager can create new streams of revenue for the sports park by creating a better utilisation of the sports park (Interview 3). Examples of ways a sports park manager can become profitable is by finding parties from other sectors that are interested in using the space and facilities available at the sports park or by connecting sports clubs to other parties they can collaborate with.

A tool not often used yet for outdoor sports accommodations is a flexible exploitation model. At the moment most sports clubs pay a single sum of money as rent for a whole year/season. In a flexible model users pay rent per hour they use the sports facility. This flexible model is already used for indoor sports accommodations and the usage of those accommodations is higher (interview 6).

All the methods in the non-spatial approach create opportunities for new individuals to make use of the sports park and increase utilisation of the sports park. However these new opportunities are limited by what is organised. Individuals are still limited by coupling constraints forcing them to make use of the facilities at a specific moment in a specific way organised by another party such as a sports club, business or school.

Spatial approach

The spatial approach is an approach that isn't yet used as much. In this approach the sports park is regarded as valuable space that can be used for more than only sports. Sports parks are big monofunctionally used areas often in valuable locations. Using them only parts of the day for one specific use doesn't make sense (interview 7). Sports parks are often green spaces with facilities that could be used for multiple things. Most of them are closed off with fences and only accessible at certain parts of the day for only specific groups. In places where the spatial approach is used local spatial and societal needs are seen as needs that could potentially be fulfilled at the sports park. This can be in the form of integrating the sports park into POS to create more publicly available open space (interview 8). Artificial grass pitches can be used to store water under by creating water storage under the fields (interview 7). Sports parks can be opened up to unbound sporters so that they can use the sports facilities during the day and additional sports facilities can be developed at sports parks to cater to the needs of unbound sporters. Examples of new sports facilities for unbound sporters are calisthenics equipment, mountain bike routes or running routes on the sports park (interview 7 and 8).

Important for the spatial approach is the integration of the sports park into the surrounding area. Creating connections for people to access the sports park easily helps improve the accessibility of the sports park and helps attract new people to it. This can be done by creating better cycling/walking routes to the sports park (Interview 4). Even more effective is creating cycling routes through the sports park, that way the sports park is not only a destination but also a space people can travel through (interview 7).

The benefit of the spatial approach is that both coupling and authority constraints are taken away. When the sports park becomes publicly accessible authority constraints previously limiting access have been taken away. Individuals can make use of the facilities of the sports park without being limited by other parties on when they can use the facilities, thereby also taking away the coupling constraints.

Resistance and barriers in the creation of vital sports parks

Resistance against opening up sports parks comes from different parties. Sports clubs are often sceptical about opening up the facilities to people outside of their club. Especially in instances where physical barriers between the sports park and it's environment are removed sports clubs are afraid of vandalism. Many clubs have already experienced vandalism with barriers still in place and are afraid of that becoming more frequent (Interview 4, 5 and 8). Locals can also be opposed to the idea of opening up sports parks. They see it as a threat to the peace they are used to and don't want more users at the sports park. Locals are sometimes also opposed to changes if they influence already existing POS. They are afraid parts of their existing green spaces get lost to sports facilities (interview 8).

National sports federations also make the creation vital sports parks harder. These associations often have strict requirements for the facilities or fields that make multifunctional use of fields harder. Administratively they make it harder for clubs to work together. Every sports federation uses different administrative systems and has different requirements of its members. This lack of flexibility makes collaborations between clubs and new membership types for sports clubs harder (interview 3 and 5)

Money and cost of creating a vital sports park is another barrier. Even though it doesn't need to be expensive, spatial changes do cost money (interview 7). Many municipalities have a fixed budget for the upkeep of sports facilities and opening up a sports park often requires more or different investments. In Zwolle several clubs together with other local parties wanted to invest in new facilities but the municipality didn't want to invest because of their investment schedule (interview 5).

Another barrier often mentioned was finding people at the sports clubs to help with the projects. Dutch sports clubs are most of the times ran by volunteers. With collaborations and new groups coming to the sports parks/clubs more work needs to be done by these volunteers. Clubs already have a hard time finding volunteers and this also makes the creation of vital sports parks harder (interview 1 and 4).

The last barrier that came forward in three of the interviews was parking (interview 5, 7 and 8). Sports parks have big parking areas that are only fully needed during the peak hours in the weekend. During the week the parking areas are often empty and are regarded as unsafe spaces (interview 7). The solution proposed by two of the people interviewed (interview 7 and 8) was to get people to cycle to the sports park thereby reducing the need for parking spaces at times of peak demand. Another interesting approach regarding cycling was used at Sportpark Galecop in Nieuwegein. There the parking spaces were rented out to companies at a local business park who needed more parking spaces (Interview 3). Another example of how local needs can be fulfilled with the facilities at a sports park.

These forms of resistance make it harder to take away the constraints that stop people from using the sports park. Most of the barriers influence the ease of taking away authority constraints since they influence who is allowed to use the sports park. An exemption to this is the resistance from national sports federations. This also clearly influences the coupling constraints since federations want people to sport but require people to do it in an organised way as members of their federation or a club part of their federation.

Key for success

Looking at the different interviews a lot of different approaches to vital sports parks were taken and were successful. From initiatives in smaller villages where the community centre couldn't stay open and the buildings at the sports park could be used (interview 2), to examples where sports park managers played an important role in creating more activities at a sports park (interview 1, 3 and 5) and sports parks where through spatial changes the sports park became more accessible and part of the surrounding area (interview 7 and 8). One similarity in all these different approaches is that in some way the sports park and its facilities fulfil some local need. Whether that is from the social domain, local businesses, climate demands or a lack of public open space. The ideal vital sports parks will therefore be something different depending on the location and the local context and needs.

Another thing mentioned by several people that were interviewed was setting off with a clear goal and structure. With the vital sports park concept being used in so many different ways it becomes important to know what you want to achieve with the vital sports park from the start (interview 8). Every sports park is different and what counts as a success in one place isn't necessarily a success at other sports parks. With the goal set it is important that all parties involved know what their role is and feel ownership over the project. In places where this was successful this was organised in a way that benefitted all parties involved. If parties showed involvement and put energy into the project they profited from the results (Interview 3, 5 and 8).

In locations where the non-spatial approach is used it is important that the vital sports park is organised sustainably. Spatial changes are more permanent and won't suddenly disappear. If the changes are non-spatial sustainability of the changes becomes harder. Often new projects depend on subsidies, a paid sports park manager or an enthusiastic volunteer. If the money or people leading the project disappear it can mean the end of the project. Embedding the changes into existing organisations, (sports clubs, schools, businesses, municipalities) is needed to make sure changes last (interview 4).

For the success of vital sports parks it is also important to change the way people look at sports parks. Most of the times sports parks are still regarded as a location that is used for sports related activities and maybe other ways to use the building. This whilst sports parks are often also beautiful green areas with a lot of potential for other domains. Sports parks can be used as additional public open space, cool spots or water retention areas to adapt to climate challenges and can help solve many other especially urban issues. A quote from interview 7 perfectly illustrates this: "These spatial developments are often not taken into account since people have no understanding of them". To optimize the way we use sports parks you need to make sure the sports park is seen as an asset for the area around, not only as a place for sports.

Updated model with the results

These elements that are key for success together with the other results lead to the creation of an updated conceptual model with some additional steps added to the transformation of a sports park to a vital sports park. The local needs and goals which are created based on the local needs play such an important role in the process that this has been added as an additional step. The resistance from several parties has also been added to the model to show how they make taking away constraints harder. In the non spatial approach embedding the changes into existing organisations has been added because of its importance to a vital sports parks longevity. Based on the literature study the 15 factors that can improve youth PA in POS have also been added, the link between the factors in POS that improve youth PA and the rest of the model has changed. It is now a conditional link only applicable if improved youth PA is a local need and goal for the vital sports park.

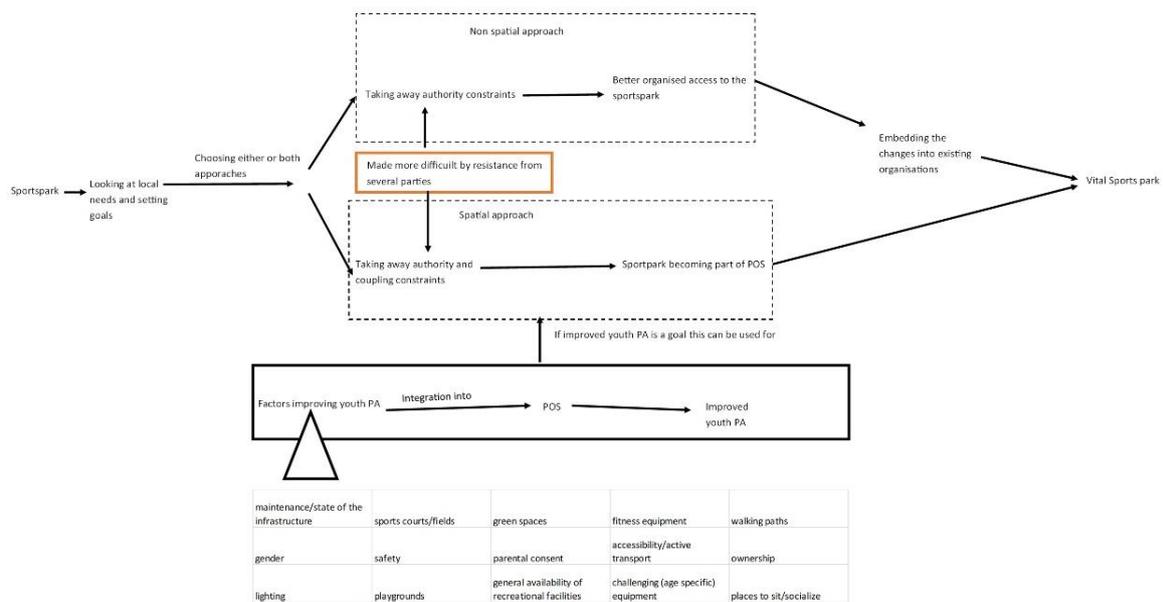


Figure 3, model with the results

Based on the results we can now also answer the sub questions. Based on the literature study 15 factors have been found that influence youth PA that can now also be found in the updated model with the results. Looking at places that already call themselves a vital sports park, a lot of lessons can be learned. There is not one way to create a vital sports park and there is no one size fits all way of creating an open sports park. Key for success in general is looking at the local needs, regarding more than only the traditional functions of the sports park. The sports park with its buildings, facilities and fields offers a lot of opportunities to improve its surrounding area. Depending on the local needs specific constraints can be taken away using either or both the spatial and non-spatial approach.

Looking at the possible barriers, several barriers for taking away the constraints have been found, examples are lack of funding, unwillingness of the municipality or sports clubs, parking problems, lack of volunteers and/or the structure of sports federations. This leads us to the last sub question: "How can the lessons learned from already existing vital sports parks together with the existing scientific knowledge about youth PA in public space be used to create more vital sports parks that improve youth PA?". At the moment improving youth PA is not yet something that is taken into account in the creation of vital sports parks. To improve this in the future the need for improved youth PA would need to become a local need that is on the agenda of policy makers. When that happens the spatial factors found in the literature review can be implemented at sports parks when using the spatial approach to create a more active environment for the youth to help improve youth PA.

Conclusion

This study investigated what vital sports parks are and how they can help improve youth PA. A model was created to show how improvements to POS to stimulate youth PA can be linked to the creation of vital sports parks. It has provided an overview of the different ways vital sports parks are created and what can be learned from them, using time geography and constraints as a framework. Different ways of taking away constraints, separated into a spatial and a non-spatial approach have been presented. Barriers to take away these constraints were found and integrated into the model. With the vital sports park concept being very new and no previous scientific research being available on this topic the findings and model from this study can be used for future research into this topic. The findings from this study can also be used in the development of future vital sports parks with this study giving an overview of the wide range of options vital sports parks offer for multifunctional use of the sports park. Since youth PA is currently never mentioned as a clear goal of a vital sports park this study provides a clear method of how youth PA can be improved through the creation of a vital sports park.

Within the Dutch context the multifunctional use of sports parks will become more relevant starting next year with the implementation of the environment and planning law. At the moment sports parks are often still only looked at for their sports use. This study illustrates how sports parks can be used as a solution for a wider range of spatial challenges such as a lack of green space or climate adaptation.

More research is needed into vital sports parks in the future. In this study the wide variety of vital sports parks was brought together into a single model. Further research in how the different approaches are implemented and the effects of the implementation of vital sports parks on (youth) PA has to be done to find out whether vital sports parks are an effective way to improve (youth) PA levels.

A limitation to this study was the interpretation of the data by the researcher. Interpretation of interviews is always a limitation of this type of research. However for this study it has to be taken into account that this research was done by someone with a spatial sciences background. A researcher with a management or sports background would probably look at vital sports parks in a different way and come to different conclusions. Collaboration/discussion between researchers/experts from different fields would be beneficial for the further development of knowledge on vital sports parks. This limitation is also important in the field when vital sports parks are developed. With the wide range of opportunities in the development of a vital sports park knowledge from the different sectors that can profit from a vital sports park is needed.

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Appendices

Appendix 1: literature review search terms

key search terms	Narrower/ search terms
Public open space	Green areas
	Park design
	Adolescents physical activity
Youth physical activity	Children physical activity

Appendix 2, Interview guides:

The interviews will be conducted in a semi-structured way. The questions are there to guide the conversation past some topics important for the research. The order is just a suggestion. If the conversation flows in a different way or if the interviewee starts talking about the other topics themselves the order can be changed. For all interviews the researcher will try to position himself in a position of understanding the position of the interviewee. The background of the interviewer as chairman of a sports club in the past and as policy worker for a sports association/student spatial planning can be used for sports clubs on the one hand and experts, municipal workers and sportpark coordinators on the other hand. All interviews will start with asking for consent for the interview,

recording the interview and using the data from the interview. This will be followed by an explanation of the research (Identifying how the open sportpark works and how it can stimulate youth PA). No specified script will be used for this part of the interview to create an easy going atmosphere. Once both parties are comfortable talking to each other the script for the semi structured interview will be used as described below.

Hoe zouden jullie het open sportpark concept omschrijven?

Op welke manier zijn jullie betrokken bij open sportparken?

Hoe zijn jullie erbij betrokken geraakt?

Zijn jullie betrokken geweest bij de creatie en zo ja op welke manier?

Wat zijn volgens jullie de grootste voordelen van een open sportpark?

Wat zijn volgens jullie de grootste nadelen van een open sportpark?

Wat voor een ruimtelijke aanpassingen worden er aan een sportpark gedaan om het een open sportpark te maken?

Met welke partijen wordt er rekening gehouden bij de ontwikkeling van open sportparken?

Hoe bekend is het concept nationaal al/wordt het veel toegepast?

In hoeverre wordt er in de ontwikkeling van de parken rekening gehouden met de jeugd?

Op welke manieren zijn open sportparken al in beleid verwerkt?

Hardware vs. Software discussion?

Appendix 3: Overview literature review

Title	Age group	author	category	Spatial factors:	maintenance/state of the infrastructure	sports courts/fields	green spaces	fitness equipment	walking paths	lighting	gender	safety	parental consent	accessibility/active transport	ownership	playgrounds	general availability of recreational facilities	challenging/age specific equipment	places to sit/socialize
Differences in park characteristic preferences for recreation and physical activity among adolescents: A study of park characteristics influencing adolescents' use and physical activity: A systematic review of quantitative and qualitative studies	12-16 age	Becken et al. 2019	adolescents		1	1	1	1	1			1							
Factors related with public open space use among adolescents: a study using GIS and accelerometers	12-16 age	van Hecke et al. 2018 [1]	adolescents		1	1	1	1	1			1							1
Associations between park features and adolescent park use for physical activity	12-16 age	van Hecke et al. 2018 [2]	adolescents				1	1			1								1
Investigating the factors predicting adolescents' use of physical activities in urban green spaces	13-18 age	Alparaz 2020	adolescents				1						1						
Adolescents' ratings of features of parks that encourage park visitation and physical activity	12-14 age	Verch et al. 2016	adolescents		1														1
When Are Youth Active? Roles of Proximity, Active Transport, and Built Environment	5-11 age	Grove et al. 2008	both																
The effect of local neighborhood park redevelopment on park visitation and user physical activity levels: a pre-post evaluation	all ages	Duncan et al. 2021	both													1			
Physical activity and social connections in the built environment among children and youth: a rapid review	19 and younger age	Wray et al. 2020	both													1			
Built Environment Influences of Children's Physical Activity: Examining Differences by Neighborhood Size and Sex	9-11 age	Mitchell et al. 2015	both						1										
Promoting Youth's Physical Activity Through Park Design: Linking Theory and Practice on a Public Health Perspective	9-21 age	Geoghegan et al. 2014	both		1	1	1	1	1				1						
Neighborhood physical activity opportunities for inner-city children and youth	11-14 age	Hot et al. 2009	both										1						
Environmental influence on physical activity levels in youth	11-13 age	Tucker et al. 2009	both																1
Will the children use it?—A RE-AIM evaluation of a local public open space intervention involving children from a deprived neighbourhood	10-11 age	Peworski 2019	child													1			
Exploring Children's Views on Important Park Features: A Qualitative Study Using Walk-Along Interviews	8-12 age	Verch et al. 2020	child													1			
Children's Independence and Affordances Experienced in the context of public open spaces: a study of children's perceptions of urban neighbourhoods in Auckland, New Zealand	9-13 age	Chaudhury et al. 2019	child																1
Using the Built Open Space Attributable Index tool to assess children's public open space use and access by independent mobility	9-11 age	Chaudhury et al. 2017	child																1
Objective Measures of the Built Environment and Physical Activity in Children: From Walkability to Accessibility	2-9 age	Bull et al. 2014	child																1
Determinants of family-friendly neighbourhoods for children: Results from the SPACE study	6-11 age	de Vries et al. 2007	child				1	1	1										1
Sum					5	6	9	2	3	1	1	3	4	3	8	2	3	4	4

Appendix 4: Codes used

Standard codes in white, categorical codes in yellow

Code	Comment	amount of times used
Sports clubs (verenigingen)	Sports clubs are mentioned as a party/stakeholder	68
Money (geld)	Code used for whenever money is mentioned (both costs and benefits)	46
Social (maatschappelijk)	A situation in which social needs/a social collaboration approach is used. Broad category	44
New collaborations (nieuwe samenwerkingen)	Whenever new collaborations between parties are mentioned. Can be between sports clubs and external parties but also only between sports clubs.	41
Initiative (initiatief)	Whenever the interview is about the initiative for creating a open/vital sportspark	39
Multifunctional use (multifunctioneel gebruik)	Multifunctional use of the sportspark facilities (more than only sports) is mentioned	36
Spatial (ruimtelijk)	A situation in which the spatial approach is used/mentioned. Broad category	34
Municipality (gemeente)	Code used when the municipality and their role is mentioned	31
New target audiences (nieuwe doelgroepen)	Mentions of situations where new target audiences are mentioned who can/do make use of a sportspark	31
External parties (externe partijen)	This code is used when external parties are mentioned as possible parties to also start making use of the sportspark.	26
key for succes	Used for sections where the interviewee mentions things that they think are essential for the succes of a vital sportspark	26
Local needs (lokale behoefte)	The interviewee mentions a situation in which local needs are taken into account in a project.	23
sportpark manager	The sportpark manager and/or their role is mentioned	23
Income (inkomsten)	Code used when the (possible) extra income generated by a sportpark is mentioned	22
Resistance (verzet)	Any form of resistance against vital sportsparks is mentioned	22
Costs (kosten)	The role of the costs of a project are mentioned	21
New sports facilities (nieuwe sportvoorzieningen)	A mention of new sports facilities being built/created at a sportspark)	18
Connection to its surroundings (verbinding omgeving)	The connection between the sportspark and its surroundings is mentioned (spatially)	18
Unbound sports (ongebonden sport)	Unbound sports (people sporting without being a sports club member) or sporters are mentioned as a party taken into account	17
Definition	A definition of one of the key concepts is mentioned by the interviewee	15
Buildings (gebouwen)	The buildings on the sportspark are mentioned	15
Youth (jeugd)	When youth are mentioned in relation to sports facilities	14
Giving it a push (slinger geven)	Giving it an extra push to get it started, a situation is described where something/something gives an extra push to get things started	14
Accessibility (toegankelijkheid)	The factor accessibility (spatial sense) is mentioned	14
Green environment (groene omgeving)	Used whenever green spaces and their importance are mentioned	13
Province (provincie)	The province is mentioned as a stakeholder	13
Better usage (beter benutten)	Better usage, for mentions of a better usage of a sports facility	12
Movement friendly environment (BVO)	BVO is mentioned or the importance of an active environment is mentioned	12
Social function (sociale functie)	The social function of sports/the sportspark is mentioned.	12
Vandalism (vandalisme)	Vandalism at the sportpark is mentioned	11
Climate (klimaat)	Climate related issues are mentioned (heat island, water retention)	10
spatial pressure (druk op ruimte)	Spatial pressure, the lack of space in certain areas in the Netherlands, is mentioned.	9
Exploitation model (exploitatiemodel)	The exploitation model of the sports facilities is mentioned. Either about the current model or about future needs.	9
Sports club membership (lidmaatschap)	Membership of a sports club is mentioned as a factor	9
Local involvement) lokale betrokkenheid	Local involvement is mentioned as a factor	9
Education (onderwijs)	Education is mentioned as an external party	9
Taking away the fences (hekken weg)	Whenever a situation is mentioned where they do/want to take the fences/other physical barriers away that separate the sportpark from its surroundings.	8
Environment and planning act (omgevingswet)	The new environment and planning act is mentioned	8
Parking (parkeren)	Parking is mentioned as a topic	8
Volunteer with too much time (gekke henkie)	Used for when the role of key volunteers of clubs are mentioned and their importance.	7
open club	The open club concept is mentioned	7
National sports associations (sportbonden)	National sports associations are mentioned as an involved party	7
Commotion (reuring)	Commotion/having people/activities at the sports park is mentioned as a succes factor	6
Neighbourhood sports coaches (buurtsportcoach)	Buurtsportcoaches (neighbourhood sports coaches) are mentioned	5
National sports agreement(sportakkoord)	The National sports agreement is mentioned	4
Starting location (startpunt)	The sportpark is mentioned as a starting point for new (sports) activities	3
Prevention agreement (preventie akkoord)	A prevention agreement is mentioned	2
spending time at the sportspark (verblijfsfunctie)	The sportspark is mentioned as a location people want to spend time	2
making agreements (afspraken maken)	A mention of the importance of making clear agreements with involved parties	1