



PHYSICAL FUN: EXERCISE, SOCIAL RELATIONS AND LEARNING IN SUPERPARK

Veli Liikanen and Arto Pesola

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PHYSICAL FUN INSIDE SUPERPARK: A SUMMARY

“At SuperPark you move with joy, and exercise comes as a bonus.”

- SuperPark website (superparkunited.com)

SuperParks are indoor activity parks with a mission to deliver experiences of joyful play and entertaining exercise to people across the world. SuperParks originated in Finland, where there are twelve parks across the country in the spring of 2018. SuperParks are now expanding globally, with one park already open in Hong Kong, China, and more underway.

SuperParks offer a diverse set of activities, including trampolines, skate parks, obstacle walls, parkour courses, playtowers and many different games. The activities are aimed to people of all ages and fitness levels. However, the biggest group of visitors are children and young people, who make up a clear majority inside the SuperPark crowd. SuperPark describes the entertaining physical, social and mental activity inside as “sparking”.

SuperPark Ltd, the company behind SuperParks, commissioned this study to investigate the quality of physical activities and social life inside the parks. The research was carried out by researchers from the South-Eastern Finland University of Applied Sciences working in Juvenia and Active Life Lab, units focusing on youth studies and preventive wellbeing, respectively. University of Jyväskylä deserves credit for providing assistance for the research.

This study report consists of two parts. Part 1 focuses on the physiology of sparking and physical data collected from participants at SuperPark Jyväskylä. Part 2 addresses the social life inside SuperPark using survey and interview data collected from young visitors inside SuperPark.

Summary of the main findings and implications:

1. Sparking is of high enough intensity to maintain and improve aerobic and muscular fitness and health in both children and adults. A children's

- typical SuperPark visit fulfilled the WHO recommendation. In long run, sparking can reduce the risk for chronic diseases like type 2 diabetes, and improve functional capacity, which is needed for example to prevent falls.
2. Children had one hour less sitting and one hour more moderate-to-vigorous intensity activity on days when they visited SuperPark as compared to days when they did not visit SuperPark. Visiting SuperPark increased children's physical activity during the whole day.
 3. The versatile, fun and informal nature of sparking is likely to improve motor and cognitive performance and engage both children and adults in a physically active lifestyle. Sparking is a social activity: young people visit parks with their friends, talk about SuperPark outside the park and learn new skills from other young people in park. Fun and learning are the most important goals young people have in visiting SuperPark.
 4. SuperPark can play an important role in promoting equality in sport and reaching out to often-ignored and under-served groups. The young visitors we surveyed and interviewed see SuperPark as a socially open and accessible environment. They very rarely face discrimination and commonly feel that sparking suits for all kinds of people. However, having relatable role models in SuperPark is more common for boys than girls.

In conclusion, this study shows that SuperPark has succeeded in creating an environment for entertaining physical activity and social interaction between teenagers. Active sparking improves health and physical fitness, while simultaneously holding a mindset focusing on fun, learning and development. In SuperPark, some benefits and charms of alternative sport are brought into the mainstream.

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FYYSISTÄ HAUSKAA SUPERPARKISSA: YHTEENVETO

“At SuperPark you move with joy, and exercise comes as a bonus.”

- SuperParkin verkkosivu (superparkunited.com)

SuperParkit ovat sisäaktiiviteettipuistoja, joiden päämääränä on tarjota viihdyttävän liikunnan kokemuksia ihmisille ympäri maailmaa. SuperParkit saivat alkunsa Vuokatista Suomessa, ja keväällä 2018 maassa on kaksitoista erikokoista puistoa. SuperParkit ovat parhaillaan laajentumassa maailmalle. Ensimmäinen puisto Suomen ulkopuolella on avattu Kiinan Hong Kongissa, ja lisää on tulossa.

SuperPark tarjoaa monipuolisen joukon aktiviteetteja, muun muassa trampoliineja, skeittiparkkeja, kiipeilyseiniä, parkour-ratoja ja monia erilaisia pelejä. Aktiviteetit on suunnattu kaikenikäisille ja -kuntoisille. Suurin ja näkyvin vierailijaryhmä ovat kuitenkin lapset ja nuoret. SuperPark käyttää ”sparkkaus” -termiä kuvaamaan puistoissa tapahtuvaa fyysistä, henkistä ja sosiaalista toimintaa.

SuperParkien takana oleva SuperPark Oy tilasi tämän tutkimuksen saadakseen tutkimustietoa fyysisen aktiivisuuden ja sosiaalisen elämän laadusta puistoissa. Tutkimuksen toteuttivat Kaakkois-Suomen ammattikorkeakoulun tutkimusyksiköissä, nuorisolan tutkimus- ja kehittämiskeskus Juveniassa ja tietoon perustuvia hyvinvointipalveluja kehittävässä Active Life Labissa, työskentelevät tutkijat. Jyväskylän yliopisto ansaitsee kiitoksen avusta, jota se tarjosi tutkimusprojektille.

Tämä tutkimusraportti koostuu kahdesta osasta. Osa 1 käsittelee sparkkauksen fysiologiaa ja hyödyntää SuperPark Jyväskylän koehenkilöiltä koottua fyysistä mittaustietoa. Osa 2 kuvaa sosiaalista elämää SuperParkeissa nuorilta SuperPark-vierailijoilta kootun verkkokysely- ja haastatteluaineiston avulla.

Yhteenveto tutkimuksen päätuloksista ja johtopäätöksistä:

1. Sparkkaus on fyysisesti niin tehokasta, että sekä lapset että aikuiset voivat ylläpitää ja kehittää aerobista suorituskykyään ja lihaskuntoaan sen

avulla. Lapsien kohdalla tyypillinen SuperPark-vierailu täytti WHO:n liikuntasuosituksen. Säännöllisesti harjoitettuna sparkkaus voi vähentää kroonisten sairauksien riskiä esimerkiksi kakkostyyppin diabeteksen kohdalla ja parantaa toimintakykyä, jota tarvitaan esimerkiksi kaatumisten välttämiseen.

2. Lapset istuivat tunnin vähemmän ja liikkuivat keskiraskaasti tai raskaasti tunnin enemmän SuperPark-vierailupäivinä verrattuna päiviin, jolloin he eivät vierailleet SuperParkissa. Vierailut kasvattivat lasten fyysistä aktiivisuutta koko päivän tasolla.
3. Sparkkauksen joustavuus, hauskuus ja epämuodollisuus on omiaan kehittämään motoriikkaa ja kognitiivisia kykyjä sekä houkuttelemaan sekä lapsia että aikuisia fyysisesti aktiivisen elämäntavan pariin. Sparkkaus on sosiaalista toimintaa. Nuoret vierailevat SuperParkissa kavereidensa kanssa, keskustelevat SuperParkista puistojen ulkopuolella ja oppivat puistoissa uusia taitoja toisilta nuorilta. Hauskanpito ja oppiminen ovat nuorten tärkeimpiä tavoitteita SuperParkissa.
4. SuperPark voi ottaa merkittävän roolin liikunnan yhdenvertaisuuden edistämisessä ja heikosti palveltujen ryhmien tavoittamisessa. Kyselyyn ja haastatteluihin osallistuneet SuperParkissa harrastavat nuoret näkivät puistot sosiaalisesti avoimina ja saavutettavina ympäristöinä. He näkivät SuperParkin sopivan kaikenlaisille ihmisille ja kertoivat, että syrjintää kohdataan puistoissa hyvin harvoin. Pojilla oli kuitenkin tyttöjä useammin samaistuttavia roolimalleja puistoissa.

Yhteenvedona voidaan todeta, että tämä tutkimus osoittaa SuperParkin onnistuneen viihdyttävää fyysistä aktiivisuutta sekä nuorten sosiaalista kanssakäymistä tukevan ympäristön synnyttämisessä. Aktiivinen sparkkaus parantaa kuntoa ja terveyttä, mutta pitää samalla hauskanpidon sekä oman oppimisen ja kehittymisen toiminnan keskiössä. SuperPark tuo osan vaihtoehtoliikunnan hyödyistä ja koukuista osaksi valtavirtaa.

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PHYSIOLOGY OF SPARKING: PHYSICAL ACTIVITY DURING DIFFERENT SUPERPARK ACTIVITIES AND THEIR EFFECTS ON TOTAL DAILY PHYSICAL ACTIVITY IN CHILDREN AND ADULTS

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ABSTRACT

Background. Less than half of adults and children participate in recommended amounts of physical activities that are required to improve cardiovascular and neuromuscular fitness, motor skills, cognitive performance and decrease the risk of chronic diseases. The aims of this study were to measure the cardiovascular and neuromuscular intensity during different SuperPark activities to estimate if sparking (performing the SuperPark activities) has the potential to improve health and fitness. In addition, the aim was to compare physical activity of when children and adults visited SuperPark to the days without a visit to study if visiting SuperPark during normal daily life increases total daily physical activity, therefore contributing to the WHO recommendations and bringing the health benefits of physical activity.

Methods. The participants were 16 children and 8 adults who were sitting, standing, walking, jogging and playing ten different SuperPark activities: Ice hockey slapshot and radar, Finnish baseball hitting, Finnish baseball catching & throwing, Street game court: floorball 1 on 1, Superpinball, Iwall parkour, Adventure Area, Toddler's track and tumble, Freestyle Hall, Scate and scoot world: scooting, Air Track and Trampoline platform. The SuperPark activities were performed in a randomized order for 3 minutes with 2 minute breaks. Cardiovascular loading was measured with heart rate sensors (Polar A360 with chest strap) and neuromuscular loading was measured with EMG shorts

(MBody, Myontec Ltd) and analyzed as the last minute average of each three-minute task. Moderate and vigorous cardiovascular intensity was analyzed as 64–76 %max and 77–95 %max, respectively, of age-predicted maximum heart rate (220-age). Moderate intensity muscle activity was defined as $\geq 100\%EMG_{\text{walking}}$ (% of muscle activity measured during walking) and vigorous intensity muscle activity as $\geq 200\%EMG_{\text{walking}}$. Daily sitting and physical activity were measured with a thigh-worn 3-axial device (Fibion) during seven days, of which on at least one day the participants were required to visit SuperPark. Within-group statistical difference was analyzed with paired samples t-test having a significance level $P < 0.05$.

Results. Both children and adults were exercising at a minimum of moderate intensity in all measured activities when assessing both cardiovascular (heart rate) and neuromuscular (muscle activity) physiological loading. The children were exercising at a vigorous cardiovascular intensity in the Trampoline platform and the Air Track and reached a vigorous neuromuscular loading in the Trampoline platform, Toddler's track and tumble and Superpinball. The adults reached a vigorous cardiovascular intensity in seven and a vigorous neuromuscular intensity in eight out of ten SuperPark activities measured. On the days without visiting SuperPark, the children were sitting 6.8 ± 1.1 hours ($52.9 \pm 6.6\%$ of measurement time), had 2.6 ± 0.0 , long (>30min) sitting periods and performed 134.0 ± 45.7 minutes ($17.3 \pm 5.9\%$ of measurement time) moderate-to-vigorous activity, resulting in 2166.7 ± 375.4 kcal daily energy expenditure. As compared to the days without SuperPark visit, the children had 1.0 hours (8.3% of measurement time) less sitting ($P < 0.05$), 1.1 fewer long (>30min) sitting periods ($P < 0.05$), 54.5 min (7.4 percentage points) more moderate-to-vigorous activity time ($P = 0.001$) and 195 kilocalories higher total daily energy expenditure ($P < 0.05$) on the days when they visited SuperPark. There were no differences in the adults' daily activity between the days when they did and did not visit SuperPark.

Conclusion. Sparking is of a sufficient intensity to improve cardiovascular and neuromuscular fitness in both children and adults. Visiting SuperPark significantly contributes towards meeting the WHO physical activity recommendations, therefore having the potential to improve health in the long run.

Summary of the main findings and implications:

- Sparking is of high enough intensity to maintain and improve aerobic and muscular fitness and health in both children and adults.
- Sparking is of high enough intensity to contribute towards meeting the WHO physical activity recommendations in both children and adults.
- Children had one hour less sitting and one hour more moderate-to-vigorous intensity activity on days when they visited SuperPark as compared to days when they did not visit SuperPark. A children’s typical SuperPark visit fulfilled the WHO recommendation.
- Participating in sports training does not necessarily increase total daily physical activity because sitting more outside of the training session can compensate activity. However, visiting SuperPark increased children’s physical activity during the whole day.
- In long run, sparking can reduce the risk for chronic diseases like type 2 diabetes, and improve functional capacity, which is needed for example to prevent falls.
- The versatile, fun and informal nature of sparking is likely to improve motor and cognitive performance and engage both children and adults in a physically active lifestyle.

	Children			Adults		
	Aerobic intensity	Neuro-muscular intensity	Implications ⁹	Aerobic intensity	Neuro-muscular intensity	Implications ⁹
SuperPark activities						
Game Arena						
Ice hockey slapshot and radar	Moderate	Moderate	Improves health, cardiovascular and muscular endurance	Vigorous	Moderate	Improves health, cardiovascular anaerobic endurance and muscular endurance
Finnish baseball hitting	Moderate	Moderate	Improves health, cardiovascular and muscular endurance	Moderate	Vigorous	Improves health, cardiovascular endurance and muscular strength

Finnish baseball catching & throwing	Moderate	Moderate	Improves health, cardiovascular and muscular endurance	Moderate	Moderate	Improves health, cardiovascular and muscular endurance
Street game court: floorball 1 on 1	Moderate	Moderate	Improves health, cardiovascular and muscular endurance	Vigorous	Vigorous	Improves health, cardiovascular anaerobic endurance and muscular strength
Superpinball	Moderate	Vigorous	Improves health, cardiovascular endurance and muscular strength	Vigorous	Vigorous	Improves health, cardiovascular anaerobic endurance and muscular strength
Iwall parkour	Moderate	Moderate	Improves health, cardiovascular and muscular endurance	Vigorous	Vigorous	Improves health, cardiovascular anaerobic endurance and muscular strength
Adventure Area						
Toddler's track and tumble	Moderate	Vigorous	Improves health, cardiovascular endurance and muscular strength	Vigorous	Vigorous	Improves health, cardiovascular anaerobic endurance and muscular strength
Freestyle Hall						
Scate and scoot world: scooting	Moderate	Moderate	Improves health, cardiovascular and muscular endurance	Moderate	Vigorous	Improves health, cardiovascular endurance and muscular strength
Air Track	Vigorous	Moderate	Improves health, cardiovascular and muscular endurance	Vigorous	Vigorous	Improves health, cardiovascular anaerobic endurance and muscular strength
Trampoline platform	Vigorous	Vigorous	Improves health, cardiovascular anaerobic endurance and muscular strength	Vigorous	Vigorous	Improves health, cardiovascular anaerobic endurance and muscular strength

- ^a Moderate intensity refers to the physical activity that is performed at 3.0–5.9 times the intensity of rest. On a scale relative to an individual's personal capacity, moderate-intensity physical activity is usually a 5 or 6 on a scale of 0–10 (World Health Organisation 2010).
- ^b Vigorous intensity refers to physical activity that is performed at 6.0 or more times the intensity of rest. On a scale relative to an individual's personal capacity, vigorous-intensity physical activity is usually a 7 or 8 on a scale of 0–10 (World Health Organisation 2010).
- ^c Improved cardiovascular endurance means that one can perform an activity for a longer period of time without exhaustion
- ^d Improved cardiovascular anaerobic endurance means that one can perform an activity at a high intensity for a longer period of time without exhaustion
- ^e Improved muscular endurance means that one can perform muscle activity for a longer period of time without exhaustion
- ^f Improved muscular strength means that one can perform physical activities that require higher intensity muscle activity
- ^g The true effect depends on the current fitness level.

1. BACKGROUND

An adequate amount of physical activity is necessary for healthy growth and development of children. Physical activity improves cardiovascular and musculoskeletal health and promotes maintaining healthy body weight (US Department of Health and Human Services 2010). Physical activity also promotes learning by positively affecting cognitive processes and memory, and by challenging motor performance (Haapala 2013; Kantomaa et al. 2013; Syväoja et al. 2013). Participating in physical activities improves control over anxiety and promotes self-confidence and social interactions (Biddle & Asare 2011; Dunn et al. 2001). Improved fitness, motor performance, functional capacity and the psychological benefits empower children to maintain a physically active lifestyle also when they reach adulthood (Barnett et al. 2009; Barnett et al. 2008; Stodden et al. 2008). A physically active lifestyle decreases the risk of chronic diseases, provides appealing content for life, and improves quality of life during aging.

To reach these benefits, the World Health Organisation recommends children and youth aged 5-17 years old to accumulate at least 60 minutes of aerobic physical activity of moderate to vigorous intensity every day (World Health Organisation 2010). Examples of moderate to vigorous intensity activities improving aerobic fitness include brisk walking, playing in yard or playing tag. The physical activity exceeding the recommended amount will bring more health benefits. Moreover, the WHO recommends that children should participate in vigorous physical activities that strengthen muscles and bone at least three times a week. Examples of vigorous intensity activities improving neuromuscular fitness include running, playing ball games, or playing skipping rope. For adults, the WHO recommends at least 150 minutes of moderate-to-vigorous or 75 minutes of vigorous intensity physical activity per week, and for additional health benefits to progress towards doubling these amounts. Moreover, adults should incorporate muscle-strengthening activities for large muscle groups at least twice per week (World Health Organisation 2010).

Less than half of the children engage in the recommended amount of moderate-to-vigorous physical activity in their daily lives (Tammelin et al. 2016). The high prevalence of physical inactivity is projected to cause a serious disease burden in their adulthood. Even fewer adults reach the moderate-to-vigorous

activity recommendation (Bennie et al. 2017). Consequently, both children and adults spend the majority of their waking hours in sedentary behaviors (Laukkanen et al. 2015; Pesola et al. 2015; Pesola et al. 2017; Tikkanen et al. 2013). To prevent this scenario, it is important to facilitate participation in the types of physical activities which are appealing and engaging, but which also effect different dimensions of physical activity providing the health benefits for children and adults.

The first purpose of this study was to measure the cardiovascular and neuromuscular loading during different SuperPark activities to estimate if playing in SuperPark is of sufficient intensity and variability to contribute to improved health and development in children and adults. The second purpose of this study was to compare physical activity of the days when children and adults visited SuperPark to the days without a visit. The aim was to find out if visiting SuperPark during normal daily life increases the total of daily physical activity of children and adults, therefore contributing to the WHO recommendations and bringing the health benefits of physical activity.

2. RESEARCH DESIGN AND METHODS

This study consisted of two parts. First, the physical activity of pre-determined SuperPark activities was measured in a convenient sample of 16 children and 8 adults. Performing the SuperPark activities is henceforth referred to as “sparking”. Second, the habitual physical activity of 15 children and 8 adults was measured during seven normal days, of which on a minimum of one day the participants visited SuperPark. The participants were recruited by randomly asking SuperPark visitors to participate. Inclusion criteria were children of 5-12 years of age or adults of 18-65 years of age without any limitations for participating in vigorous physical activities and without regular (more than once per week) systematic vigorous sporting activity (such as playing in a football team or training for marathon). Every interested participant was briefed about the protocol and was given an informed consent. The interested children were required to contact their parents for permission. Those adults that were willing to participate and gave their consent, and those children whose parents gave consent, were scheduled for the first measurements. The study was approved by

the ethics committee of University of Jyväskylä and participants or their parents signed an informed consent prior to the measurements.

2.1. Physical activity of sparking

During the first part, the participants were asked to wear comfortable clothing, which enabled participation in physical activities. The participants arrived to SuperPark in the morning before opening hours in groups of a maximum of four participants. First, the participants were asked to wear EMG shorts, which fit snugly. Heart rate monitors were worn on the chest and accelerometers were worn on the waist and on the thigh in a thigh strap. The monitors were set to record simultaneously and the time was synchronized based on the heart rate monitor time, which served as a master time.

The measurements started with the habitual activities of 1) sitting still, 2) standing still with weights on both legs, 3) walking with a self-selected speed, and 4) jogging with a self-selected speed on a pre-determined path inside SuperPark. The participants were instructed to walk and jog as they would normally, and to maintain the same speed. Each task was continued for three minutes. These measurements provided baseline (sitting) and normalization (walking) signals for EMG data.

Ten different SuperPark activities that were assumed to represent typical physical activities performed in SuperPark environment, were selected for measurements. The activities studied are described below, and further description of all SuperPark activities can be found at <https://superpark.fi/en/activities/> (referred 18.2.2018). The participants were asked to perform the activities in a self-selected style and intensity according to their own skill level. SuperPark activities were performed in a randomized order. Each activity was performed for three minutes, during which the participants were expected to reach a steady state in aerobic energy expenditure. There was a minimum of a two-minute break between activities, or a longer break after which the heart rate dropped below 100 beats per minute. The researcher checked the heart rate from a heart rate monitor before each activity.

2.2 Description of SuperPark activities

Game Arena

Ice hockey slapshot and radar. The participants were asked to choose gloves and a stick suitable for them. The pucks were collected next to a shooting plate and the participants were asked to hit the pucks at a self-selected pace in a goal located about five meters in front of them. After each shot the puck's speed was shown in a screen next to the goal.

Finnish baseball hitting. The participants were given either a junior (children) or a senior (adults and taller children) bat. The researcher collected the balls next to a rink. The researcher threw the balls upright while the participants tried to hit the ball with the bat. After each hit, the ball's speed was shown on a screen at the end of the hitting net.

Finnish baseball catching & throwing. The participants were asked to choose either a left or a right handed mitt suitable for them. A pair of the participants were throwing and catching a Finnish baseball while standing about 4-8 meters apart. In case of not having a pair, the researcher served as a pair. If one did not catch the ball, he/she was instructed to get it back and continue normally.

Street game court: floorball 1 on 1. The participants chose a floorball stick suitable for them. The participants were playing a one on one game in a field with a goal on each side of the field. The players were matched to have a similarly sized opponent. In case no pair was available, the researcher was playing.

Superpinball. The aim of Superpinball is to hit different targets by kicking a football, and to collect as many points as possible during the one-minute game time. The game area includes different physical targets, which provide points when the ball hits the target. The smaller and upper targets provide more points as compared to closer and larger ones. The game area is inclined so that the balls return to the player. The player is standing in the lower end of the game area on a level ground. In the beginning the player has four footballs next to him/her. During the game, there is background music and a sound is heard when the ball hits a target. The accumulated points are shown in a screen at the end of the game area. Each participant was instructed about the game and performed three consecutive games, so that the total game time was three minutes.

Iwall parkour. Iwall is a digital game, where the player is standing one meter away from a screen. A motion detection system above the screen tracks the player's movements. The aim of the game is to move a digital character in different games with the player's physical movements. The game studied was Iwall parkour, in which running in place moves the character forward, jumping makes the character to jump over obstacles, squatting makes the character to crawl under obstacles, and raising hands makes the character to raise his hands to grab a cable slide. The participants were given instructions for the game and they were allowed to test the game for a short time, after which the game was played for three minutes.

Adventure Area

Toddler's track and tumble is a circular track including obstacles, fences, car tires and a tube, and is suitable for children and adults. The participants were asked to go through the track in a self-selected pace for three minutes.

Freestyle Hall

Skate and scoot world: scooting. The participants were asked to select a suitable scoot and a helmet. The scooting area included different ramps, jumps, rails and a free level area. The participants were asked to scoot according to their skill level and to go around the scooting area as they wished for three minutes. The majority of participants were scooting on the ground level and reached the small ramps only occasionally, while some more advanced participants were also reaching the higher rails and doing jumps.

Air Track is a bouncy mattress. The participants were asked to perform any self-selected activities on Air Track for three minutes. Some participants were walking and running, while others were also jumping, doing volts, or cartwheels.

Trampoline platform has a large highly bouncy surface. The participants were asked to jump, as they would do normally according to their skill level, for three minutes. Most participants were only jumping in place, whereas the more advanced participants were doing volts or other tricks.

Taking the measurements lasted for approximately two hours, including wearing and taking off the monitors. After the measurements, the participants were given questionnaires to complete at home and a time for laboratory measurements was scheduled.

2.3. Laboratory measurements and measurements of physical activity during normal daily life

On a separate morning, the participants arrived to the University of Jyväskylä research laboratory having fasted overnight. After measuring the weight and height, the participants' lean and body mass were measured with the InBody device (InBody 720, Biospace Ltd, Seoul, Korea). After taking the measurements, the participants were given a breakfast package. Two accelerometers (one on the waist and one on a thigh strap) for the seven-day period were either worn right away, or were given to be worn at an appropriate time at home. Instructions for the measurements and for keeping an activity diary were given.

During the seven-day period the participants were asked to continue their normal daily lives while wearing the accelerometers and filling in the diary. Bedtimes, wake-up times, school or work time, any physical activity start and end time, including SuperPark time, bathing time or other times when the monitors were detached, and any abnormal days or behaviors, were to be filled in the diary. The participants were instructed to detach the monitors at night and for bathing and for any water-based activities and to wear them again initially after these occasions. The participants were instructed to visit SuperPark during a minimum of one and on a maximum of four days during the seven-day period.

2.4. Measurements and analyses

Heart rate

Heart rate was measured with Polar A360 (Polar Electro Ltd., Kempele, Finland) device using a chest strap. The data were collected to wrist-worn watches and downloaded to the Polar Flow web service, and exported for further analysis into Microsoft Excel. The data format was number of beats per minute in one-second intervals and was presented as beats per minute as an average from the last minute of the three-minute activity period. The maximum heart rate was estimated based on equation $220 - \text{age}$ (Karvonen & Vuorimaa 1988).

Heart rate intensity was analyzed as an absolute heart rate (HR) and percentage of age-estimated maximum heart rate (%HRmax) (Karvonen & Vuorimaa 1988).

Moderate-intensity activity was defined as 64–76%max and vigorous activity as 77–95%_{max} (Garber et al. 2011). In children, a widely accepted moderate-to-vigorous intensity activity threshold is ≥ 140 beats per minute (Simons-Morton et al. 1988). In a 10-year-old child, this corresponds to $67\%HR_{max}$. The adult MVPA threshold corresponds to 134 bpm and the vigorous activity threshold to 162 bpm. Therefore, since the heart rate was expressed in relation to age-estimated maximum, similar relative moderate- and vigorous activity thresholds were used for adults and the children.

Muscle activity

Muscle activity was measured from the quadriceps and hamstring muscles with EMG shorts (Myontec Ltd, Kuopio and Suunto Ltd, Vantaa, Finland), which have been validated against bipolar electrodes and have been used in similar research-setups (Finni et al. 2007; Pesola et al. 2014; Tikkanen et al. 2013, 2014).

Muscle activity was normalized to the last minute average of muscle activity measured during the 3-minute walking period and is presented as $\%EMG_{walking}$. Moderate intensity muscle activity was defined as $\geq 100\%EMG_{walking}$, and vigorous intensity muscle activity as $\geq 200\%EMG_{walking}$ based on previous research (Pesola et al. 2014).

Physical activity of sparking assessed with accelerometer

Acceleration during SuperPark activities was measured with a tri-axial waist-worn device (X6-1a, Gulf Coast Data Concepts Inc, USA) sampling at 40 Hz at a 16 bit dynamic range. Accelerometer counts (counts per minute, cpm) represent the magnitude of impacts during physical activities and increase with increasing physical activity intensity. All analyses were performed with a one-minute epoch time. Different absolute thresholds have been published to classify count intensities for children and adults. Thresholds by Evenson et al. (2008) have been widely used for children and are: sedentary ≤ 100 cpm, moderate 2296–4011 cpm, vigorous ≥ 4012 cpm (Evenson et al. 2008). Thresholds by Freedson et al. (2001) have been widely used for adults and are: 100 cpm, moderate 1952–5725 cpm, vigorous ≥ 5725 cpm (Freedson et al. 2011).

Physical activity and sitting during daily life

Daily sitting and physical activity were measured with a thigh-worn 3-axial lightweight device (20g, L•W•T = 30•32•10mm; Fibion Inc, Jyväskylä, Finland), which has no buttons or display and can operate around 30 days fully charged. The Fibion device was worn in an elastic thigh strap, which fit snugly on the participant's right thigh with a Velcro attachment.

Data were uploaded from the devices to the manufacturer's web-browser-based online service (www.fibion.com/upload) and the participant's weight, height, age and sex were submitted to the service. The service analysed the data and provided the report including day-by-day results for sitting, long sitting periods, standing, light and moderate walking, cycling, vigorous activity, as well as light, moderate and vigorous activity times. For research purposes, Fibion provided access to the Fibion RT-tool, which provided daily results in a spreadsheet format, which was used for further analysis in Microsoft Excel.

Questionnaires

The short-form international physical activity questionnaire was used to assess the duration of sitting, walking, moderate and vigorous physical activity. Parents estimated the children's physical activity. The number of times per week and the duration per each session of physical activities were asked in the questionnaire. The resulting volume of physical activity was divided by seven days to yield an average duration of physical activity per day in a week.

2.5. Statistical analysis

Comparisons were made between boys and girls and between children (boys and girls combined) and adults. Within-group comparisons were made with paired-samples t-tests and between-group comparisons with independent-samples t-test. Statistically significant differences were considered at $P < 0.05$.

3. RESULTS

3.1. Background variables

The background variables in girls, boys and adults are shown in Table 1. The participants were healthy, of normal weight and self-reportedly physically active. No statistically significant differences between girls and boys were observed. As expected, the differences between children and adults were their height and weight.

TABLE 1. Background variables of study participants.

	Girls (n = 8)	Boys (n = 8)	Girls-boys P-value	Children (n = 16)	Adults (n = 8)	Children- adults P-value
Number of girls/ women	8	0		8	2	
Height (cm)	141.3 ± 14.1	148.9 ± 7.7	0.204	145.1 ± 11.7	172.3 ± 8.5	<0.001
Weight (kg)	39.7 ± 14.0	40.2 ± 8.4	0.942	40.0 ± 11.2	67.8 ± 13.5	<0.001
BMI (kg/m ²)	19.3 ± 3.6	19.4 ± 2.4	0.966	19.3 ± 3.0	22.7 ± 2.9	0.018
Body fat (%)	21.0 ± 7.4	21.1 ± 9.3	0.970	21 ± 8.0	17.7 ± 10.2	0.400
Self-reported sitting time (h/d)	6.4 ± 1.7	4.5 ± 2.0	0.098	5.7 ± 2.0	7.8 ± 3.2	0.095
Self-reported walking time (h/d)	1.5 ± 1.1	0.6 ± 0.6	0.151	1.2 ± 1.0	0.4 ± 0.3	0.117
Self-reported moderate activity time (h/d)	0.7 ± 0.4	1.8 ± 2.1	0.143	1.2 ± 1.5	0.7 ± 0.5	0.447
Self-reported vigorous activity time (h/d)	0.3 ± 0.4	0.2 ± 0.3	0.575	0.3 ± 0.3	0.4 ± 0.7	0.801
Meets PA recom- mendations (%)	100 %	80 %		92.3 %	100 %	

3.2. Heart rate during sparking

Heart rate as beats per minute (HR) and as a percentage of estimated maximum heart rate (%HR_{max}) are presented in Tables 2 and 3, respectively. The only statistically significant difference between girls and boys was a higher HR in Iwall parkour in girls than boys (P=0.001, Tables 2 and 3). The children had a

higher HR and %HR_{max} during standing and walking, and a higher HR during sitting than the adults (P<0.05, Tables 2 and 3). In Game Arena the children had a higher HR during Finnish baseball catching & throwing than the adults (P<0.05, Table 2). When expressed as %HR_{max}, the children had a lower heart rate in Ice hockey slapshot and radar, Finnish baseball hitting and Street game court: floorball 1 on 1 than the adults (P<0.05, Table 3). In exergames, the children had a similar HR but lower %HR_{max} during both Superpinball and Iwall parkour (P<0.01, Table 3). Moreover, the children had a higher HR during Scate and scoot world: scooting (P<0.05, Table 2).

TABLE 2. Heart rate as beats per minute during sparking.

	Heart rate (beats per minute)					
	Girls (n = 8)	Boys (n = 8)	Girls-boys P-value	Children (n = 16)	Adults (n = 8)	Children- adults P-value
Habitual activities						
Sitting	85.5 ± 5.1	83.2 ± 12.5	0.666	84.5 ± 8.9	68.4 ± 11.8	0.004
Standing	100.8 ± 5.3	95.1 ± 8.8	0.179	98.1 ± 7.4	76.3 ± 11.0	<0.001
Walking	113.8 ± 8.7	107.9 ± 14.9	0.394	111.1 ± 11.8	85.8 ± 12.3	0.001
Jogging	151.7 ± 7.3	161.2 ± 11.5	0.100	156.1 ± 10.3	123.9 ± 15.5	<0.001
SuperPark activities						
Game Arena						
Ice hockey slapshot and radar	140.7 ± 8.3	131.7 ± 12.1	0.127	136.2 ± 11.0	141.0 ± 13.2	0.407
Finnish base- ball hitting	139.0 ± 6.3	138.4 ± 13.8	0.910	138.7 ± 10.3	135.5 ± 18.6	0.624
Finnish base- ball catching & throwing	137.5 ± 9.9	136.0 ± 17.0	0.836	136.8 ± 13.4	121.3 ± 11.0	0.024
Street game court: floorball 1 on 1	156.0 ± 15.1	151.2 ± 25.5	0.677	153.6 ± 20.3	160.4 ± 22.2	0.511
Superpinball	151.4 ± 9.2	153.7 ± 15.9	0.747	152.5 ± 12.5	160.0 ± 22.3	0.345
Iwall parkour	159.8 ± 9.8	135.9 ± 11.8	0.001	147.9 ± 16.2	154.9 ± 14.1	0.370
Adventure Area						
Toddler's track and tumble	162.1 ± 17.9	151.0 ± 24.9	0.358	156.6 ± 21.6	153.2 ± 20.9	0.752
Freestyle Hall						
Scate and scoot world: scooting	147.8 ± 13	155.6 ± 13.6	0.315	151.4 ± 13.4	132.1 ± 19.3	0.021
Air Track	163 ± 11.2	156.9 ± 19.9	0.491	159.9 ± 15.8	152.2 ± 22.6	0.391
Trampoline platform	168.2 ± 8.1	170.9 ± 13.6	0.657	169.5 ± 10.9	158.5 ± 19.0	0.114

TABLE 3. Heart rate as %HRmax during sparking.

	Heart rate (%HRmax)					
	Girls (n = 8)	Boys (n = 8)	Girls- boys P-value	Children (n = 16)	Adults (n = 8)	Children- adults P-value
Habitual activities						
Sitting	40.7 ± 2.5	39.8 ± 5.8	0.697	40.3 ± 4.2	37.6 ± 5.0	0.237
Standing	48.0 ± 2.8	45.4 ± 4.3	0.218	46.8 ± 3.6	42.0 ± 4.7	0.026
Walking	54.2 ± 4.0	51.5 ± 6.8	0.403	53.0 ± 5.4	47.2 ± 5.1	0.043
Jogging	72.3 ± 3.9	77.0 ± 4.8	0.078	74.4 ± 4.8	68.8 ± 9.1	0.102
SuperPark activities						
Game Arena						
Ice hockey slapshot and radar	67.0 ± 4.0	62.9 ± 5.8	0.152	65.0 ± 5.3	77.9 ± 7.3	<0.001
Finnish base- ball hitting	66.2 ± 2.8	66.1 ± 7.0	0.985	66.2 ± 5.1	75.0 ± 11.4	0.025
Finnish base- ball catching & throwing	65.5 ± 4.7	65.0 ± 8.0	0.882	65.2 ± 6.3	67.0 ± 6.2	0.563
Street game court: floorball 1 on 1	74.3 ± 7.4	72.2 ± 11.7	0.695	73.2 ± 9.4	89.1 ± 16.1	0.012
Superpinball	72.1 ± 4.5	73.4 ± 7.0	0.689	72.7 ± 5.7	88.7 ± 14.4	0.002
Iwall parkour	76.1 ± 4.6	64.9 ± 5.3	0.001	70.5 ± 7.5	85.7 ± 8.7	0.001
Adventure Area						
Toddler's track and tumble	77.2 ± 8.9	72.1 ± 11.2	0.361	74.6 ± 10.1	84.2 ± 7.6	0.053
Freestyle Hall						
Scate and scoot world: scooting	70.4 ± 6.2	74.6 ± 6.9	0.274	72.3 ± 6.6	72.9 ± 9.9	0.873
Air Track	77.6 ± 5.7	74.9 ± 8.9	0.506	76.3 ± 7.3	84.3 ± 13.7	0.101
Trampoline platform	80.1 ± 4.5	81.7 ± 6.7	0.615	80.9 ± 5.5	87.5 ± 10.1	0.070

Figure 1 shows activity intensities as a percentage of age-predicted maximum (%HR_{max}) in relation to moderate and vigorous activity thresholds in adults and children. Sparking was at least of moderate intensity in all SuperPark activities. In the children, Trampoline platform jumping and Air Track were at a vigorous

intensity level. In the adults, Trampoline platform jumping, Air Track, Toddler's track and tumble, Iwall parkour, Superpinball, Street game court: floorball 1 on 1 and Ice hockey slapshot and radar were at a vigorous intensity level.

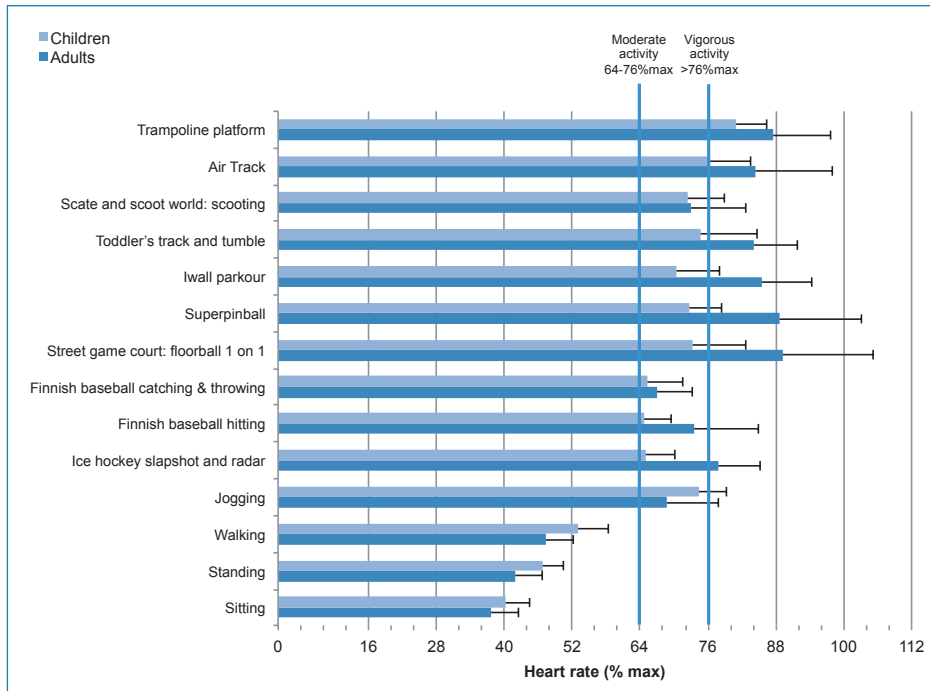


FIGURE 1. Heart rate intensity (% of estimated max) in relation to moderate and vigorous intensity thresholds in children and adults.

3.3. Muscle activity during sparking

Muscle activity as a percentage of walking muscle activity ($\%EMG_{walking}$) is shown in Table 4. The girls and the boys had similar $\%EMG_{walking}$ in all activities. The adults had a higher $\%EMG_{walking}$ during standing, Ice hockey slapshot and radar, Finnish baseball hitting, Street game court: floorball 1 on 1, Superpinball, Iwall parkour, Toddler's track and tumble and Air Track than the children ($P < 0.05$, Table 4).

TABLE 4. Muscle activity (percentage of muscle activity during walking) during sparking.

	Heart rate (beats per minute)					
	Girls (n = 8)	Boys (n = 8)	Girls-boys P-value	Children (n = 16)	Adults (n = 8)	Children- adults P-value
Habitual activities						
Sitting	11.9 ± 5.1	12.4 ± 6.2	0.874	12.1 ± 5.4	13.8 ± 3.8	0.490
Standing	23.7 ± 8.1	30.4 ± 13.2	0.257	26.8 ± 10.9	40.3 ± 18.8	0.044
Walking	100 ± 0	100 ± 0	NA	100 ± 0	100 ± 0	NA
Jogging	245.9 ± 41.1	244.0 ± 67.4	0.949	245.0 ± 52.8	257.5 ± 74.1	0.653
SuperPark activities						
Game Arena						
Ice hockey slap-shot and radar	112.8 ± 32.9	135.7 ± 26.0	0.163	123.5 ± 31.2	190.5 ± 54.2	0.001
Finnish baseball hitting	96.9 ± 21.6	138.9 ± 70.5	0.132	116.5 ± 53.3	220.1 ± 69.4	0.001
Finnish baseball catching & throwing	125.0 ± 31.2	151.4 ± 79.9	0.402	137.3 ± 58.4	151.2 ± 65.9	0.623
Street game court: floorball 1 on 1	150.9 ± 47.2	197 ± 77.2	0.180	172.4 ± 65.1	337.6 ± 118.9	<0.001
Superpinball	194.6 ± 49.3	233.4 ± 54.7	0.172	212.7 ± 53.8	363.6 ± 148.5	0.002
Iwall parkour	186.7 ± 34.6	156.1 ± 67.2	0.278	172.4 ± 52.8	329.5 ± 128.5	0.001
Adventure Area						
Toddler's track and tumble	229.4 ± 62.5	198.9 ± 68.4	0.383	215.2 ± 64.8	301.0 ± 122.0	0.041
Freestyle Hall						
Scate and scoot world: scooting	135.5 ± 42.2	193.4 ± 90	0.132	160.3 ± 70.4	225.4 ± 69.5	0.059
Air Track	158.5 ± 31.9	181.2 ± 53.5	0.329	169.1 ± 43.3	270.2 ± 110.6	0.005
Trampoline platform	196.3 ± 58.1	219.8 ± 78.3	0.517	207.3 ± 66.8	276.4 ± 101.8	0.070

Figure 2 shows muscle activity intensities as %EMG_{walking} in relation to moderate and vigorous intensity thresholds in children and adults. Sparking was at least moderate intensity in all SuperPark activities. The children's muscle activity reached a vigorous intensity during Trampoline platform jumping, Toddler's track and tumble and Superpinball. The adults' muscles were active above the vigorous intensity threshold in all other activities except for Finnish baseball

catching & throwing and Ice hockey slapshot and radar.

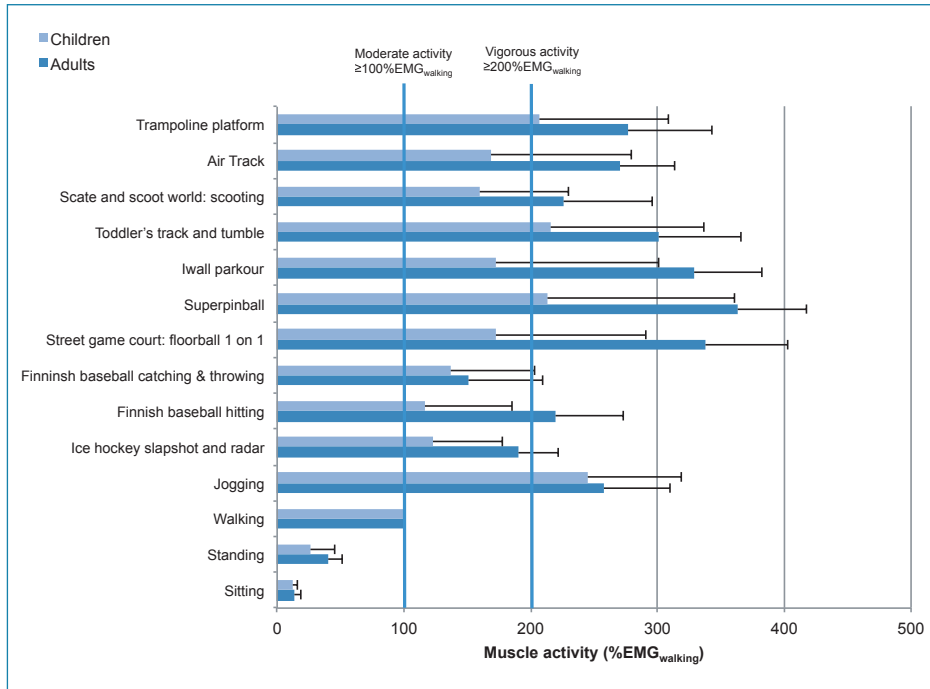


FIGURE 2. Muscle activity intensity in relation to moderate and vigorous intensity thresholds.

3.4. Physical activity during sparking assessed with accelerometer

The accelerometer-derived counts per minute are shown in Table 5. The only differences between the groups were higher counts per minute in the adults than the children in Iwall parkour as well as Air Track ($P < 0.05$, Table 5).

Figure 3 shows the accelerometer counts in relation to moderate and vigorous activity thresholds. In the children, Iwall parkour, Toddler's track and tumble, Air Track and reached the moderate activity thresholds, and Trampoline reached the vigorous activity threshold. The adults' results in Figure 4 show that Street game court: floorball 1 on 1, Superpinball, Iwall parkour, Toddler's track and tumble and Air Track were vigorous activities, and Trampoline platform was a vigorous activity.

TABLE 5. Accelerometer-derived counts per minute during sparking.

	Acceleration (counts per minute)					
	Girls (n = 8)	Boys (n = 8)	Girls- boys P-value	Children (n = 16)	Adults (n = 8)	Children- adults P-value
Habitual activities						
Sitting	1.0 ± 2.4	2.8 ± 6.0	0.466	1.9 ± 4.4	0.0 ± 0.0	0.420
Standing	1.5 ± 3.1	9.1 ± 12.1	0.107	5.1 ± 9.1	0.0 ± 0.0	0.290
Walking	1423 ± 933	1772 ± 846	0.472	1590 ± 879	1722 ± 818	0.790
Jogging	4865 ± 3038	5060 ± 2127	0.889	4956 ± 2562	7044 ± 2200	0.156
SuperPark activities						
Game Arena						
Ice hockey slapshot and radar	684 ± 539	753 ± 457	0.795	716 ± 486	917 ± 599	0.491
Finnish baseball hitting	555 ± 386	811 ± 543	0.307	675 ± 467	1463 ± 1716	0.112
Finnish baseball catching & throwing	984 ± 697	1284 ± 974	0.499	1124 ± 820	612 ± 186	0.241
Street game court: floor- ball 1 on 1	1926 ± 1217	2635 ± 1427	0.318	2257 ± 1322	2887 ± 1849	0.444
Super pinball	1884 ± 1244	2642 ± 1226	0.258	2238 ± 1253	2990 ± 1830	0.344
Iwall parkour	2771 ± 1934	2449 ± 1498	0.727	2621 ± 1691	4912 ± 2208	0.036
Adventure Area						
Toddler's track and tumble	2255 ± 1198	2477 ± 1828	0.782	2358 ± 1470	2898 ± 2333	0.570
Freestyle Hall						
Scate and scoot world: scooting	1086 ± 817	1603 ± 708	0.239	1307 ± 789	1491 ± 1697	0.756
Air Track	2812 ± 1857	3638 ± 2695	0.497	3197 ± 2239	8031 ± 5721	0.014
Trampoline platform	6918 ± 4422	10483 ± 4608	0.151	8581 ± 4718	11320 ± 5379	0.329

Figure 3 shows the accelerometer counts in relation to moderate and vigorous intensity thresholds in children.

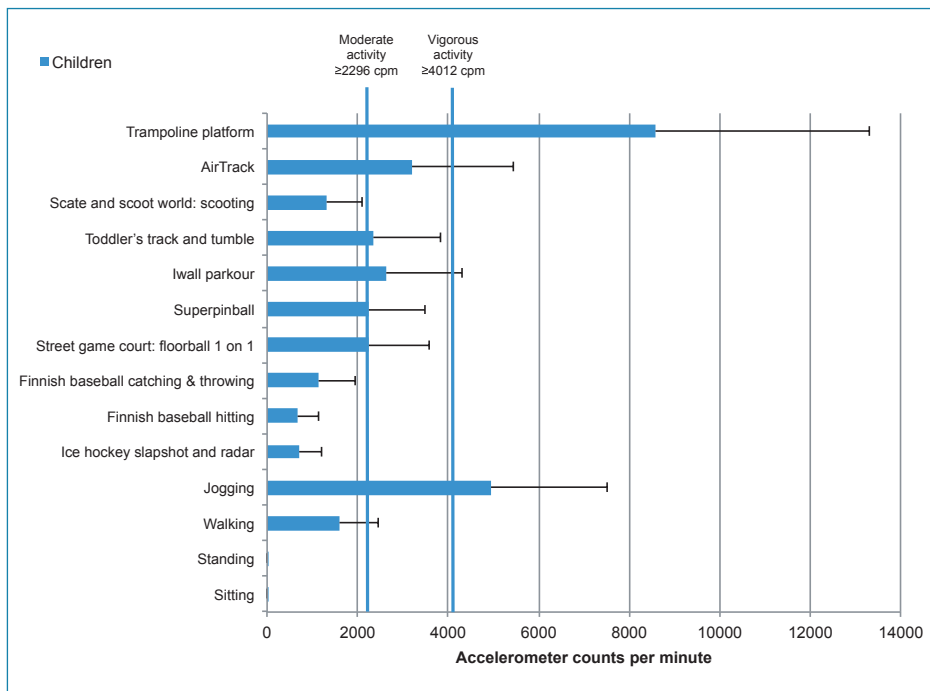


FIGURE 3. The accelerometer counts in relation to moderate and vigorous intensity thresholds in children.

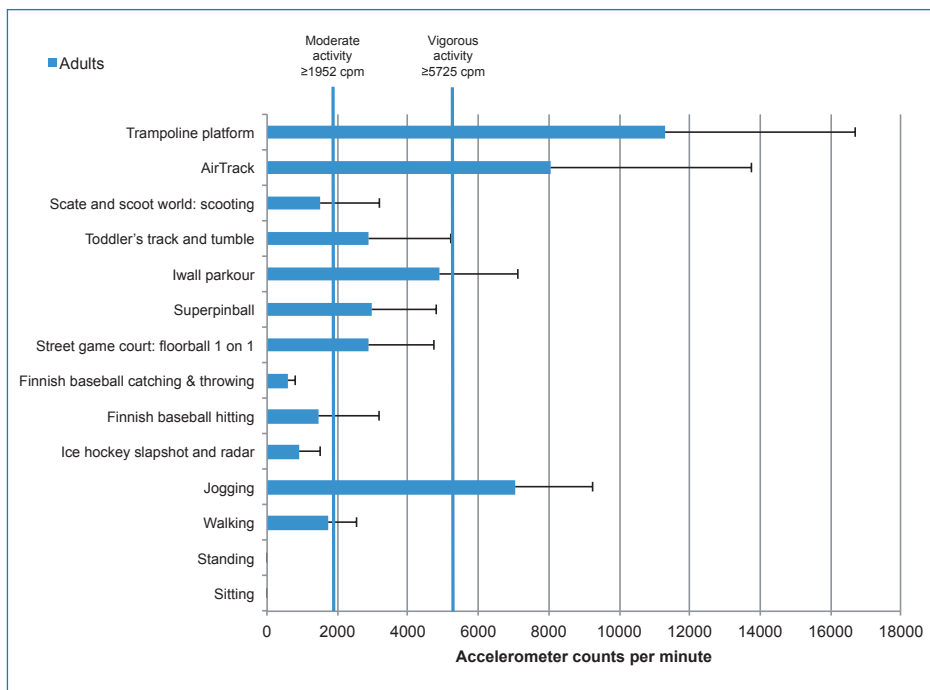


FIGURE 4. The accelerometer counts in relation to moderate and vigorous intensity thresholds in adults.

3.5. Physical activity and sitting during daily life

Daily sitting and physical activity with and without SuperPark visits are presented in Table 6 for the girls and the boys and in Table 7 for the children and the adults. On average, the girls visited SuperPark on 1.5 ± 0.5 days, of which 0.8 ± 0.4 visits were on weekdays and 0.7 ± 0.5 on weekends (Table 6). The duration of one visit was on average 2.4 ± 0.6 hours. On average, the boys visited SuperPark on 0.2 ± 0.4 weekdays and on 1.4 ± 0.5 weekend days, totaling 1.6 ± 0.5 days on the measurement week. The boys' one visit lasted on average 3.2 ± 2.0 hours.

The boys were sitting 10.8 pp (percentage points, $P < 0.001$) less and had 1.4 fewer long (≥ 30 min, $P < 0.05$) sitting periods on SuperPark days than on the days without SuperPark (Table 6). The girls had less (0.9h; $P < 0.05$) and the boys had more (0.8h; 4.4%, $P < 0.05$) light activity time on SuperPark days as compared to the days without SuperPark. However, the girls had more moderate (45.7 min; 7.0%; $P < 0.05$) and vigorous (25.8 min; 3.8 pp; $P < 0.05$) activity time on SuperPark days than on the days without SuperPark. The total increase in moderate-to-vigorous activity time in the girls was 71.6 min or 10.8pp ($P < 0.05$).

TABLE 6. Sitting and physical activity during the days with and without SuperPark visits in the girls and the boys measured with the Fibion device.

		No Super-Park-day	Super-Park-day	P-Value	Girls-boys P-value SuperPark day
Number of days	Girls	5.2 ± 0.8	1.5 ± 0.5	<0.001	0.770
	Boys	4.0 ± 1.9	1.6 ± 0.5	0.090	
Number of weekdays	Girls	4.2 ± 0.4	0.8 ± 0.4	<0.001	0.036
	Boys	3.6 ± 1.3	0.2 ± 0.4	0.007	
Number of weekend days	Girls	1.0 ± 0.6	0.7 ± 0.5	0.363	0.048
	Boys	0.4 ± 0.5	1.4 ± 0.5	0.089	
Time spent at Super-Park (h)	Girls	0.0 ± 0.0	2.4 ± 0.6		0.401
	Boys	0.0 ± 0.0	3.2 ± 2.0		
Recording time (h)	Girls	13.4 ± 1.0	12.6 ± 0.5	0.113	0.277
	Boys	12.3 ± 1.4	13.7 ± 2.2	0.134	
Off-time	Girls	10.6 ± 1.0	11.4 ± 0.5	0.113	0.277
	Boys	11.2 ± 2.3	10.3 ± 2.2	0.234	
Sitting time (h)	Girls	7.4 ± 0.8	6.2 ± 0.7	0.073	0.095
	Boys	6.2 ± 1.2	5.4 ± 0.7	0.102	
Sitting time (%)	Girls	55.4 ± 5.1	49.1 ± 5.7	0.165	0.044
	Boys	50.0 ± 7.5	39.2 ± 8.3	<0.001	
Long (>30min) sitting period number	Girls	2.7 ± 0.6	1.9 ± 1.1	0.237	0.147
	Boys	2.4 ± 0.8	1.0 ± 0.7	0.010	
Long (>30min) sitting period duration (h)	Girls	2.0 ± 0.6	1.3 ± 1.0	0.316	0.346
	Boys	1.7 ± 0.7	0.8 ± 0.7	0.068	
Light activity time (h)	Girls	3.9 ± 0.8	3.0 ± 0.8	0.042	0.102
	Boys	3.4 ± 1.0	4.2 ± 1.4	0.022	
Light activity time (%)	Girls	29.3 ± 6.3	23.7 ± 5.0	0.059	0.067
	Boys	27.6 ± 7.8	32.0 ± 8.1	0.016	
Moderate activity time (min)	Girls	84.6 ± 22.7	130.3 ± 47.4	0.027	0.594
	Boys	109.6 ± 25.2	143.8 ± 28.6	0.220	
Moderate activity time (%)	Girls	10.4 ± 2.3	17.4 ± 6.6	0.022	0.814
	Boys	14.9 ± 2.4	18.3 ± 4.7	0.306	
Vigorous activity time (min)	Girls	28.1 ± 16.1	53.9 ± 25.9	0.047	0.778
	Boys	50.1 ± 22.2	50.1 ± 15.7	0.995	
Vigorous activity time (%)	Girls	3.4 ± 1.8	7.2 ± 3.6	0.035	0.698
	Boys	6.6 ± 3.1	6.4 ± 2.4	0.704	
Moderate-to-vigorous activity time (min)	Girls	112.6 ± 37.5	184.2 ± 70.9	0.025	0.778
	Boys	159.7 ± 44.1	193.8 ± 21.0	0.259	
Moderate-to-vigorous activity time (%)	Girls	13.8 ± 3.9	24.6 ± 9.9	0.020	0.984
	Boys	21.5 ± 5.2	24.7 ± 5.5	0.364	
Total energy expenditure (kcal)	Girls	1971.8 ± 302.0	2214.1 ± 485.5	0.071	0.197
	Boys	2400.6 ± 336.1	2539.0 ± 198.6	0.307	

The children visited SuperPark on 0.5 ± 0.5 weekdays and 1.0 ± 0.6 weekend days, totaling 1.5 ± 0.5 days on the measurement week (Table 7). The children spent on average 2.7 ± 1.4 hours in SuperPark during a visit. The adults went to SuperPark on a total of 1.4 ± 1.1 days, of which 1.0 ± 1.0 were weekdays and 0.4 ± 0.5 weekends. On average, the adults spent 1.7 ± 0.5 hours in SuperPark.

As compared to the days without SuperPark visits, the children had 1,0 hours or 8.3% less sitting and 1.1 fewer long (>30min) sitting periods on the days when they visited SuperPark ($P < 0.05$, Table 7). Moreover, the children had 40.5 min or 5.3 pp more moderate activity time during SuperPark days than on the days without visiting SuperPark ($P = 0.001$). The children's moderate-to-vigorous activity time was 54.5 min or 7.4 pp higher ($P = 0.001$) and their total energy expenditure 195 kilocalories higher ($P < 0.05$) on SuperPark days as compared to the days without SuperPark visits.

TABLE 7. Sitting and physical activity during the days with and without SuperPark visits in the children and the adults.

		No Super-Park-day	Super-Park-day	P-Value	Girls-boys P-value SuperPark da
Number of days	Children	4.6 ± 1.4	1.5 ± 0.5	<0.001	0.769
	Adults	4.9 ± 1.7	1.4 ± 1.1	0.010	
Number of weekdays	Children	3.9 ± 0.9	0.5 ± 0.5	<0.001	0.221
	Adults	3.4 ± 1.4	1.0 ± 1.0	0.015	
Number of weekend days	Children	0.7 ± 0.6	1.0 ± 0.6	0.432	0.065
	Adults	1.4 ± 0.5	0.4 ± 0.5	0.038	
Time spent at SuperPark (h)	Children		2.7 ± 1.4		0.082
	Adults		1.7 ± 0.5		
Recording time (h)	Children	12.9 ± 1.2	13.1 ± 1.6	0.742	0.110
	Adults	15.0 ± 4.5	15.0 ± 3.2	0.984	
Off-time	Children	10.9 ± 1.6	10.9 ± 1.6	0.949	0.020
	Adults	9.0 ± 4.5	7.0 ± 4.6	0.285	
Sitting time (h)	Children	6.8 ± 1.1	5.8 ± 0.8	0.007	0.166
	Adults	7.6 ± 1.8	7.5 ± 3.8	0.944	
Sitting time (%)	Children	52.9 ± 6.6	44.6 ± 8.4	0.003	0.466
	Adults	53 ± 14.3	49.8 ± 20.7	0.477	
Long (>30min) sitting period number	Children	2.6 ± 0.7	1.5 ± 1.0	0.011	0.064
	Adults	3.2 ± 2.1	3.1 ± 2.4	0.580	
Long (>30min) sitting period duration (h)	Children	1.8 ± 0.7	1.1 ± 0.9	0.051	0.042
	Adults	2.9 ± 2.1	3.4 ± 3.2	0.536	
Light activity time (h)	Children	3.6 ± 0.9	3.5 ± 1.2	0.763	0.638
	Adults	4.5 ± 1.0	3.9 ± 1.7	0.431	
Light activity time (%)	Children	28.5 ± 6.7	27.4 ± 7.6	0.609	0.835
	Adults	31 ± 8.9	28.7 ± 17.0	0.594	
Moderate activity time (min)	Children	95.9 ± 26.2	136.4 ± 38.7	0.010	0.001
	Adults	46.1 ± 12.7	70.9 ± 22.2	0.065	
Moderate activity time (%)	Children	12.5 ± 3.2	17.8 ± 5.6	0.012	0.001
	Adults	5.2 ± 1.6	8.5 ± 4.0	0.077	
Vigorous activity time (min)	Children	38.1 ± 21.4	52.2 ± 20.9	0.066	0.018
	Adults	29.4 ± 28.2	27.9 ± 15.5	0.901	
Vigorous activity time (%)	Children	4.9 ± 2.9	6.9 ± 3.0	0.064	0.011
	Adults	3.6 ± 3.1	3.3 ± 1.8	0.802	
Moderate-to-vigorous activity time (min)	Children	134.0 ± 45.7	188.6 ± 52.1	0.010	0.001
	Adults	75.5 ± 34.1	98.8 ± 31.0	0.269	
Moderate-to-vigorous activity time (%)	Children	17.3 ± 5.9	24.7 ± 7.8	0.013	0.001
	Adults	8.8 ± 4.2	11.7 ± 5.2	0.188	
Total energy expenditure (kcal)	Children	2166.7 ± 375.4	2361.8 ± 403.0	0.029	0.375
	Adults	2507.6 ± 605.0	2541.8 ± 417.3	0.835	

4. DISCUSSION

The aims of this study were to measure cardiovascular and neuromuscular loading during sparking and to assess whether visiting SuperPark increases daily physical activity in children and adults. The main findings of this study were that both the children and the adults were exercising at a minimum of moderate intensity in all the measured activities when assessing physiological loading from both cardiovascular (heart rate) and neuromuscular (muscle activity) perspectives. The children were exercising at a vigorous cardiovascular intensity in Trampoline platform and Air Track and reached a vigorous neuromuscular loading in Trampoline platform, Toddler's track and tumble and Superpinball. The adults reached a vigorous cardiovascular intensity in seven and a vigorous neuromuscular intensity in eight out of ten SuperPark activities measured. The children had one hour less sitting, fewer long sitting periods, almost one hour more moderate-to-vigorous activity and a 200 kilocalories higher total daily energy expenditure on the days when they visited SuperPark as compared to the days without a visit. Taken together, these findings show that sparking is very intensive from both cardiovascular and neuromuscular perspectives. Sparking has the potential to improve fitness, motor skills and learning through increased intensity and variability of physiological loading. Moreover, visiting SuperPark reduces daily sitting time and increases physical activity time in children, therefore promoting a physically active lifestyle.

Both cardiovascular and neuromuscular loading(s) are beneficial for health. Cardiovascular loading is characterized by repetitive prolonged activity, which increases the heart rate and gets one out of breath. A typical example is jogging or running for several minutes. Cardiovascular loading stresses the cardiovascular system by increasing the energy demand, cardiac output and blood flow. Cardiovascular loading of moderate intensity increases the body's ability to produce energy through aerobic metabolism, improves blood delivery capacity, and increases energy stores and their oxidation capacity within the muscle cells. An increase in cardiovascular fitness means practically that one can perform an activity for a longer period of time without exhaustion. An increase in cardiovascular fitness is associated with numerous health benefits, such as the decreased risk for metabolic disorders, type 2 diabetes, cardiovascular diseases, some forms of cancer as well as premature mortality (Blair, Cheng, & Holder 2001). Moreover, an increase in aerobic fitness makes the execution of daily tasks easier because one has to use a lower proportion of the full aerobic capacity

for the tasks. Neuromuscular loading means stress on neuronal and muscular systems and is characterized by intensive short work periods. A typical example of neuromuscular loading is strength training, but also other forms of activity that stress similar systems may improve neuromuscular fitness. When performed at a sufficient intensity and/or speed, neuromuscular loading increases power output, strength, muscle mass and coordination. These forms of neuromuscular fitness are needed in the daily life to carry groceries, to prevent falls and to maintain functional capacity at a later age, for example.

In many physical activities both cardiovascular and neuromuscular loading increase to a similar extent. For example, vigorous running requires a high level of muscle activity while increasing the heart rate significantly. However, some forms of physical activity may stress these systems differently, thereby producing differing benefits for these physiological systems. In this study, both cardiovascular and neuromuscular loading were measured to distinguish the unique characteristics and benefits of different SuperPark activities. We found that while all SuperPark activities were able to significantly stress both the cardiovascular and neuromuscular systems, there were some differences in cardiovascular and neuromuscular loading between some forms of activities. For example, jumping (Trampoline platform and Air Track), exergame activities (Iwall parkour and Superpinball) and Street game court: floorball 1 on 1 were able to increase cardiovascular loading above the vigorous activity threshold to a similar extent in the adults. However, Superpinball was the most vigorous activity from the neuromuscular perspective followed by Street game court: floorball 1 on 1 and Iwall parkour in the adults. The reasons for these differences may include that Superpinball and Iwall parkour are played in a rather limited area, therefore requiring a stabile posture and quick responses in a limited space and time, thus placing higher demands specifically on the neuromuscular system. Similarly, Street game court: floorball 1 on 1 is played on a small pitch, therefore requiring quick turns and reactions to the opponent's moves.

It was notable that although Ice hockey slapshot and radar, Finnish baseball hitting and Finnish baseball catching & throwing are performed basically while standing with little movement, both cardiovascular and neuromuscular loading reached the moderate activity threshold both in the children and the adults. This was clearly illustrated by the fact that the accelerometer counts did not reach the moderate activity threshold despite the responses in the heart rate and muscle activity did. Accelerometers are the current gold standard to monitor physical activity intensity objectively. Well acknowledged limitations of the

accelerometers include incapability of measuring activities with limited vertical acceleration, such as when catching & throwing a baseball (Chen & Bassett, 2005; Marshall & Merchant, 2013). The accelerometer measures the sensor impacts, and does not reflect the physiological loading of the performed activity if the sensor remains still. Similarly, conventional thinking holds that if children and adults are only standing still during these types of activities, the resulting physiological loading should be insignificant. However, the heart rate and muscle activity measurements showed that even these activities are of moderate intensity. This may be due to the fact that even though the accelerometer sensor remained relatively stable on the waist, there were significant amounts of upper body movement and static activity in the legs. The magnitude of both cardiovascular and neuromuscular loading measured in nearly all of the SuperPark activities is enough to maintain or improve both cardiovascular and neuromuscular fitness.

In addition to the cardiovascular and neuromuscular benefits, versatile and informally playful physical activity provides neuromuscular and cognitive variability for children. This kind of versatile physical activity has been suggested to improve learning and provide a foundation for motor development during childhood (Laukkanen et al. 2014; Stodden et al. 2008). Improved motor performance is associated with active physical activity participation both in childhood and later in adolescence, which highlights that facilitating these kinds of activities already in the early childhood is of high importance (Stodden et al. 2008). Moreover, physical activity which improves motor performance is associated with better academic achievements in adolescence (Kantomaa et al. 2013). The results of this study illustrate that the nature of sparking promotes physical activity, which is of high intensity and variability, and can therefore be assumed to improve motor performance. Even though not measured in this study, many of the measured SuperPark activities challenge also cognitive performance, like reacting to different obstacles with different body postures in Iwall parkour, and motor performance, such as proceeding through variable barriers in Toddler's track and tumble. The playful, informal and fun nature of sparking goes hand in hand with the benefits in cognitive, motor and physiological performance. The more fun and versatile the activities are, the longer and the more vigorously children and adults are willing to engage in these activities, and the more these activities promote the very aspects that are required for cognitive and motor development.

Increasing daily physical activity in children and adults is a public health priority. Participating in sports training has been a traditional means to increase physical activity, but this does not necessarily result in increased total daily physical activity time. Reasons for this include that sports training do not necessarily decrease sedentary time and increase physical activity outside of the training session (Gomersall et al. 2013; Marques et al. 2016; Rantalainen et al. 2017; Ridgers et al. 2014). Children and adults may compensate for the increased physical activity by resting more outside the training session because of fatigue or by allowing themselves more sedentary routines after having exercised. Therefore, the finding of this study related to the children decreasing their sedentary time in addition to increasing their moderate-to-vigorous activity time is promising, and suggests that the form of activity performed in SuperPark does not result in the compensation of daily total physical activity. Instead, magnitude of increase in daily physical activity and decrease in sedentary time in the children were notable, suggesting that visiting SuperPark is an effective strategy to both decrease children's sedentary time and to increase their moderate-to-vigorous activity time during the whole day.

However, the increase in daily moderate-to-vigorous activity time of the adults did not reach statistical significance. This may be due to the shorter time the adults spent in SuperPark (1,7 hours as compared to 2,7 hours in children) or because the activity compensation may be more marked in adults than in children (Craft et al. 2012; Finni et al. 2014; Marques et al. 2016). Because we could not specifically separate the activities performed during the free SuperPark visits, it is unclear how active the adults were during their visits. It may be that during their free visits, the adults were sparkling with a lower intensity than during the formal measurements, and the true increase in moderate-to-vigorous activity was lower than expected. Even though we recruited participants who self-reportedly did not systematically participate in vigorous activities, they reported high levels of physical activity during daily lives. Thus, the total physical activity time in the adults might have been too high to show any additional increments in physical activity by visiting SuperPark. The results could be more marked in inactive and sedentary populations. However, the child participants were self-reportedly (reported by their parents) even more active than the adults, which adds significance to the discovered increase in the children's total physical activity time on days when they visited SuperPark.

The World Health Organisation recommends that children and youth aged 5-17 years of age to accumulate at least 60 minutes of aerobic moderate-to-

vigorous intensity physical activity every day, and adults to accumulate at least 150 minutes of moderate-to-vigorous or 75 minutes of vigorous intensity physical activity per week (World Health Organisation 2010). Moreover, adults should incorporate muscle-strengthening activities for large muscle groups at least twice per week (World Health Organisation 2010). The results of this study showed that by visiting SuperPark, both the children and the adults could meet the WHO physical activity recommendations. First, the intensity in all measured SuperPark activities met the WHO recommendation for both the children and the adults. Second, the increase in the children's daily moderate-to-vigorous intensity physical activity during SuperPark days was almost one hour, which by itself is enough to fulfill the WHO recommendation. In the adults, vigorous neuromuscular loading was measured from large muscle groups in seven out of ten SuperPark activities, meaning that adults can meet the WHO recommendation by visiting SuperPark. Although not statistically significant, the average moderate-to-vigorous activity time increased by 23 minutes in the adults. When distributing the recommended weekly 150 minutes to seven weekdays, 21 minutes of moderate-to-vigorous physical activity daily is enough to fulfill the WHO recommendation. Therefore, visiting SuperPark can be a means to increase daily physical activity to the amounts recommended by the WHO in both children and adults.

In conclusion, this study showed that all SuperPark activities are typically performed at least with moderate intensity when measured with both cardiovascular and neuromuscular methods, and many of the activities reached vigorous intensity especially in the adults. As compared to the days without visiting SuperPark, on the SuperPark days the children had one hour less sitting, which was reallocated to almost one hour of moderate-to-vigorous physical activity resulting in 200 kilocalories higher total daily energy expenditure. Taken together these results show that sparking can promote cardiovascular and neuromuscular performance both in children and adults. The versatile, fun and informal nature of sparking is likely to promote motor and cognitive performance both in children and adults. In long term, the observed effects can reduce the risk for chronic diseases, maintain and improve functional capacity, and engage both children and adults in a physically active lifestyle.

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ACTIVE FRIENDSHIPS: SUPERPARK FROM A SOCIAL PERSPECTIVE

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1. INTRODUCTION

The public discussion on children and young people's physical activity in Finland has long focused on risks and concern. The observations about the lack of activity and decreasing physical skills among young people, compared to national recommendations, are now a regular subject of national attention.

In this public debate, the views of young people themselves are seldom heard. Missing from this image of physical doom and gloom are many new and innovative forms of exercise, rising in popularity. There are new trendy forms of organized sports. There are mobility and exercise induced by digital apps making use of motion sensors, location services, augmented reality and entertainment brands. There are alternative sports, without memberships or adult supervision, using streets and parks as arenas. There is SuperPark; commercial indoor activity parks utilizing these new trends, and aiming to offer "exercise for the mobile game generation" (SuperPark 2018).

The perceived lack of youth exercise cannot be explained by a lack of volume or quality of sport services. Today, there are more sports facilities than ever before. Physical education and training have become more professional; there are more professional coaches with a salary and an education. In some fashion, this might even be a part of the problem. Some researchers have noted that the culture of organized sports is now more adult-oriented and less light-hearted than in the past. In 2005, Finnish sports sociologists asked (Koski & Tähtinen 2005, translation by author): "Has the pedagogical seriousness of our sports system disrupted sports' connection to play?"

Many new and uprising forms of exercise break the molds of traditional organized sports and their seriousness. A young person does not have to be an athlete in a sports club to be physically active. They can lead an active life via

everyday physical mobility, by playing games, climbing stairs and hanging out with friends. Often young people do not consider their physically active hobbies to be sports or exercise at all.

When it comes to sports, the traditional options are complemented by newer alternatives such as skateboarding and parkour, often described by the term life-style sports in current sports research (Wheaton 2013, 25–36). *Life-style sports* typically emphasize style, creativity, exciting experiences, innovative use of space, and employing new technology and equipment. Life-style sports are usually practiced without adult supervision and spread among young people in organic fashion. Their communities often reject traditional competition and focus on individual development instead. This is supported by a culture of peer teaching and learning (Rannikko et al. 2014).

From a sociological point of view, the rise of life-style sports reflects general social trends: Individualization and the fragmentation of an overarching nationalist culture. We now live a life of many distinct cultures and competing and contrasting identities (Kotro & Pantzar 2005, translation by author): “...in post-modern sports and exercise, the most important things are the experiences and challenges that sports provide, and the ability to share these with other like-minded people.” This emphasizes the social nature of sports. Sports and exercise are not only about sweat and effort, they are also about company and compassion. If we want to understand why people practice sports, we have to find out what meaning it holds for them and what social relations are connected to it.

As the world around changes and new opportunities arise, young people vote with their feet. As children grow into teenagers, more and more of them drop out of sports clubs and leave the often-rigid structures of organized sports (Tiirikainen & Konu 2013). If we want to keep young people active, we must provide them options that are more diverse and make physical activity easier, more attractive or more fun. Or all of that at the same time.

Here is where SuperPark comes in. As a new type of arena for physical activity, SuperPark could play an important part in offering new exercise opportunities for young people. As exercise is a social activity, SuperPark’s effectiveness in this depends heavily on the kind of communities and youth cultures that are being created in the parks. This social aspect is recognized in the term “sparking”, which SuperPark uses to describe the entirety of physical, social and mental activity inside the parks. Many SuperPark activities are or resemble life-style

sports. However, as the parks are commercial venues aimed at large crowds, it is not immediately obvious how similar the parks' communities are to life-style sports cultures, and whether SuperParks can create the same positive effects.

In this study, we seek to answer the following questions:

Who are the young people for whom SuperPark provides an attractive environment for exercise? What is their background and what is their attitude towards sports and exercise?

What kind of communities are formed in SuperParks? What kind of youth sports culture do they produce? What meaning does SuperPark hold for its young visitors?

In the following analysis, these main research questions are elaborated and answered using research material collected from SuperPark's young visitors during the autumn of 2017.

2. METHODOLOGY

We collected data on the social aspects of SuperPark with two methods. First, we conducted interviews with young SuperPark visitors in order to gather qualitative narratives and discourses on the views and experiences regarding SuperParks. Secondly, we collected quantitative data from a large number of SuperPark visitors via an online survey targeting young people who follow SuperPark through social media or mailing lists.

The research interviews were conducted in SuperPark Vantaa on 7 October and 6 November 2017. Young visitors in SuperPark were approached by the researcher and interviewed with their informed consent in groups of two to four persons at a time. The interviewees were presented with a short information leaflet about the study, privacy and data collection methods. Children under the age of 14 were asked to get their guardian's approval for the interview. This was usually obtained by relaying the study information and getting confirmation from the guardian via online messages. The interviews used a semi-structured thematic outline and were recorded and later transcribed for thematic analysis. Altogether, there were 11 interviews and 27 interviewees, 13 females and 14

males. The interviewees' age ranged from 9 to 16 years, with 25 interviewees aged between 12 to 16 and only two younger children, who were interviewed together.

The online survey was conducted between 29 November and 19 December 2017 using Google Forms online survey tools. SuperPark was responsible for the dissemination of the survey: the survey call was posted first on SuperPark's Instagram account, and then it was posted also on their Facebook pages and emailed via the company's customer email list. To encourage responses, SuperPark offered the respondents an opportunity to enter a lottery for free tickets and passes to the parks. The sampling method can be characterized as convenience sampling. Considering the nature of the target population and the lack of an accurate record of SuperPark visitors, this was deemed the only feasible method for survey data collection. The survey was very popular: 575 responses were recorded during the 21-day survey period.

Table 1.

Age	Number of respondents
under 12 years	124
12-14 years	331
15-19 years	6
20-24 years	11
25-29 years	16
over 29 years	26
Total	575

As table 1 shows, the majority of the respondents (425) were of the targeted age group, 12–29-year-olds, but there were also 124 answers from children younger than 12 years of age. The survey call required the younger children to respond with their guardian present. However, due to reliability concerns, the following analysis restricts itself exclusively to the 12–29-year-old respondents. Due to the low numbers of over 19-year-old respondents, detailed results are analysed only for two age groups: young teenagers (12–14-year-olds) and older teenagers (15–19-year-olds).

Among 12–29-year-olds, the Instagram call received 304 responses from a total follower population of 37,200 (26.1.2018). 117 responses were collected from 38,803 followers (29.1.2018) on SuperPark’s nine Finnish Facebook pages, and the email call received 154 responses. One-third of the respondents were female and two-thirds were male. A third gender option, ”other”, was provided, but no respondents selected it. More background details of the sample are presented in figure 1. Based on the researcher’s observations and prior knowledge, these characteristics of the sample appear to reflect the composition of SuperPark crowds well. Based on this, the survey results should be seen as indicative of the experiences and views of the larger SuperPark young visitor population.

The survey data was preprocessed using Microsoft Excel, where clear duplicates and incomplete or humorous answers were removed. Data analysis and presentation was prepared by using the open-source statistical computing language R and the software tools of RStudio.

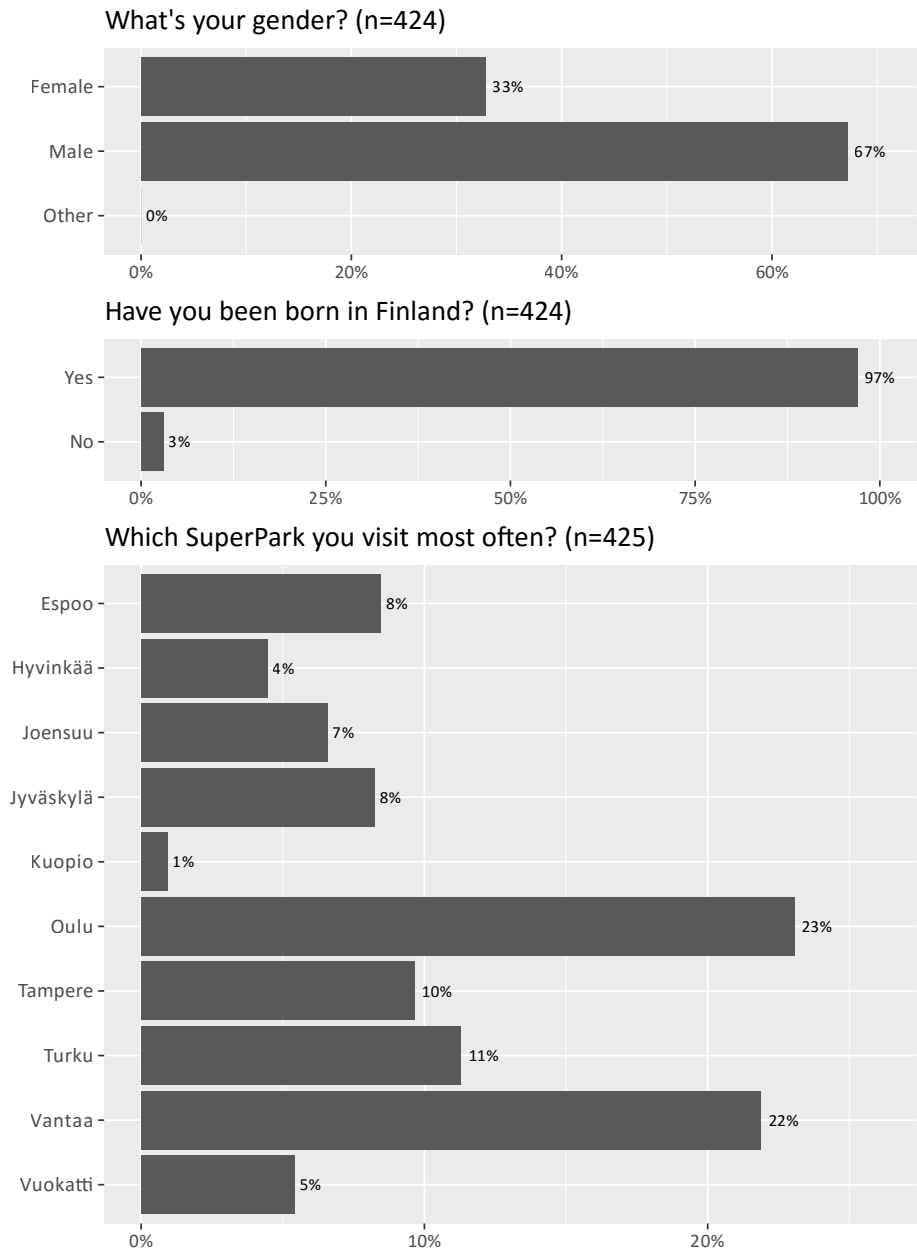


Figure 1. Background details for the survey respondents.

3. RESULTS

3.1. Friends or family: social life in SuperPark

Who do young people spend time with in SuperPark? Is SuperPark an adult-led organized activity, or is it a setting of self-controlled social life for young people and their peers? Do young people exercise in SuperPark by themselves or is it always a group activity? How much interaction between strangers is there in SuperPark? On our survey and interviews, we sought to address these questions by asking young people about the company they keep in SuperPark.

Figure 2 shows that friends were overwhelmingly the most frequent companions for young people in SuperPark. Respondents were asked to select all companion types with whom they participated in SuperPark activities. Nine out of ten young people visited SuperParks with their friends, and visiting alone was very rare. Family members were also infrequent company to the respondents, though the wording of the question here might be interpreted to refer to the family unit as a whole. Our interviews and observations showed that some young people were tasked with keeping company to their younger siblings in addition to seeing their friends and peers. The frequency of responses highlighting people met in SuperPark as companions was low. This suggests that social cliques were mostly formed outside of SuperPark, although our other results showed that SuperPark was also a place to meet new people (chapter 3.3.).

When looking at the results across genders, it can be seen that females participated in SuperPark with their family more often than males (figure 2). The males engaged in activities alone or with people they met in SuperPark more often than the females. Our interview material included some teenage girls who were in the park with their siblings, but no boys. Perhaps traditional gender roles were still being displayed here, and young females are more frequently encouraged to keep company for their smaller siblings than boys. Understandably, family companions were more common among the young teenagers than the older teenagers (19 % and 13 % of respondents, respectively). The older teenagers visited SuperParks alone more frequently (10 % of 15–19-year-olds, 7 % of 12–14-year-olds).

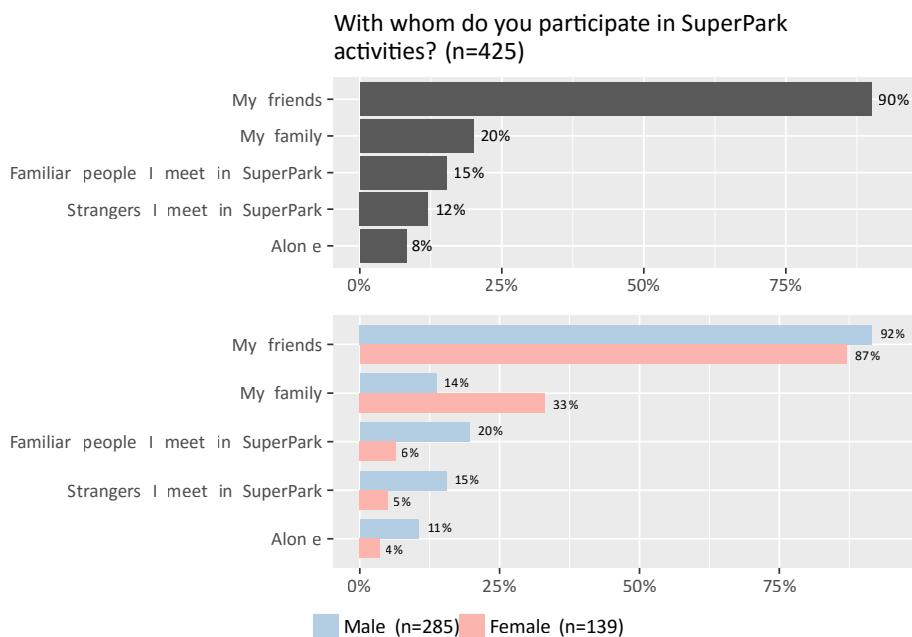


Figure 2. Companions in SuperPark.

In order to delve further into the characteristics of SuperPark as a focus of group activity, we asked the respondents whether they talked about SuperPark with their friends or on public social media. It is hypothesized that the more a hobby or a park is talked about, the more it is charged with meaning and significance, and the greater is its role as a site of social interaction. In order for a place to truly exist for young people, it also has to be talked about.

The results of the study showed that between friends, SuperPark was a subject of conversation for a clear majority of young people, with very few respondents refraining from this kind of conversation (figure 3). As a place worth talking about, SuperPark was a part of the youth life also outside the park and its activities. However, only a quarter of the respondents participated in public discourse on social media. In both cases, talking about SuperPark was less common among the females than the males (figure 4). Based on a separate question about the means of following SuperPark online, it appears reasonable to assume that the most prominent sites of social media discussion are the ones currently popular among teenagers: Instagram, Snapchat and YouTube.

Our interview material illuminated many different forms of conversations about SuperPark. For some very active freestyle scooterers, SuperPark and its

facilities and equipment were an integral part of a ubiquitous scooter life-style and therefore were a constant topic. For other more infrequent visitors, the conversations focused on the practical arrangements of times and means of transportation.

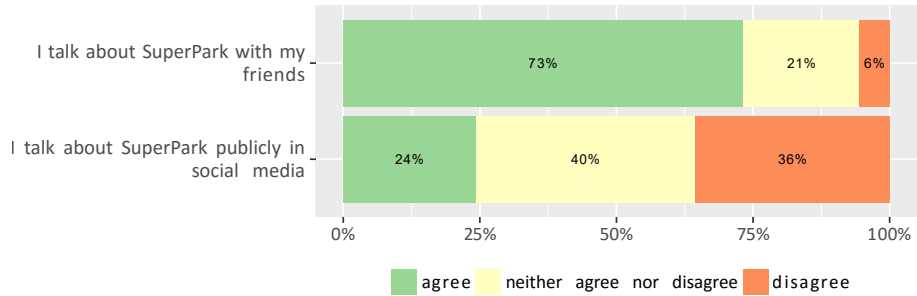


Figure 3. Statements concerning SuperPark as a topic of discussion.

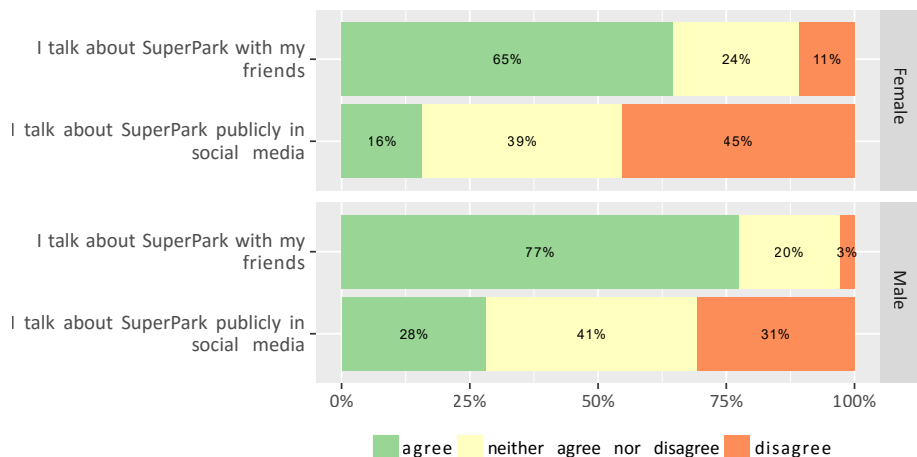


Figure 4. Statements concerning SuperPark as a topic of discussion, for different genders.

We also presented the respondents with two statements regarding the social hierarchies inside SuperPark. More specifically, we wanted to assess whether differences in skills create hierarchies or model behavior among the SuperPark visitors. Skill-based hierarchies are a phenomenon which we have previously studied inside life-style sports communities (Rannikko & Liikanen 2015). These power structures are interesting, because they are sometimes found inside sports that otherwise avoid competitions, classifications or “castes” inside the community. These hierarchies might be the subtle distinctions between who can

and cannot be active or assertive, but they can limit participation opportunities for the less experienced. For example, some female skateboarders do not like to practice at a busy skate park among the more assertive males. We were also interested in the existence of role models. Well-known practitioners could play a role in making SuperPark activities more desirable and in highlighting model behavior. Role models could also represent development targets for the tricks and skills that young people develop in otherwise freeform sports environments.

The results suggested that in SuperPark, skill-based hierarchies were mild or did not appear at all. A clear majority of the respondents indicated that the most skilled people did not dictate what young people do together in SuperPark (figure 5). On the issue of role models, the respondents were less unanimous. One-third of the respondents recognized role models and another one-third did not. Views on skill-based decision-making were quite similar across the genders and the age groups, but on role models there was a difference. It was markedly more common for males (figure 6) and 12–14-year-olds to have someone to look up to (figure 7).

Coupled with material from the interviews and the observations, the data suggested that in general, SuperParks provided a fair and equal footing for most visitors, and were not dominated by strong cliques or competing groups. As a commercial sports environment, SuperParks are not contested spaces in the same way as streets and skate parks often are. The role models recognized by our interviewees were mostly impressive practitioners visible on YouTube or Instagram. These included, for example, girl skaters, famous gymnasts, or especially skillful trampoline tricksters frequenting the local SuperPark. The survey results suggested that it was harder for the females and the older teenagers to find relatable role models. This highlights the importance of media representation in sports and hobbies. If young women do not see enthusiastic people like themselves involved in SuperPark-like activities, they will be less eager to participate.

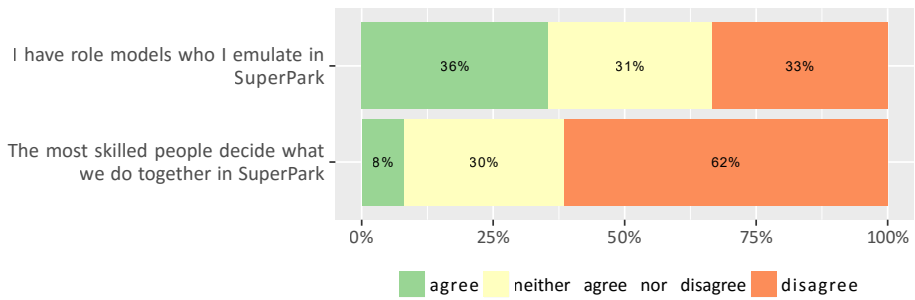


Figure 5. Statements concerning hierarchies and role models in SuperPark .

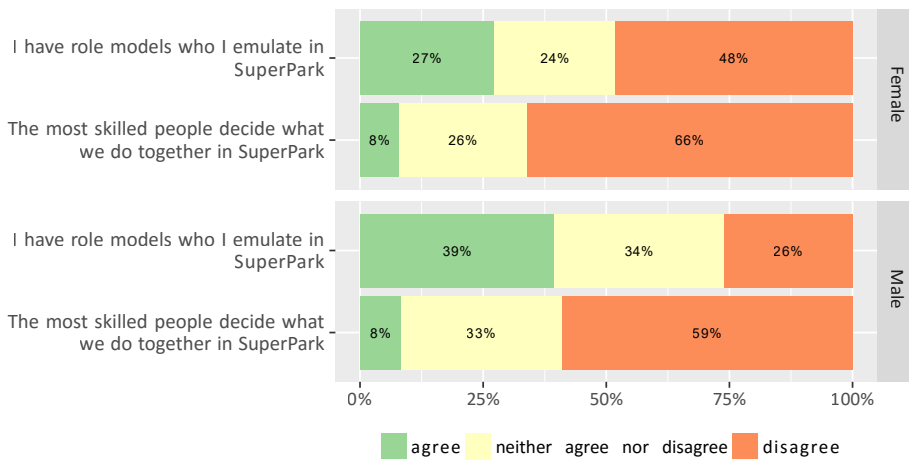


Figure 6. Statements concerning hierarchies and role models in SuperPark, for different genders.

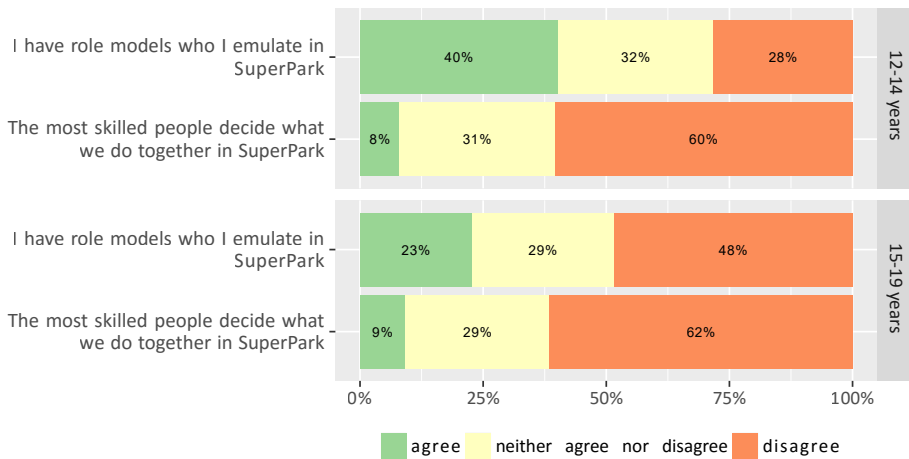


Figure 7. Statements concerning hierarchies and role models in SuperPark, for different age groups.

3.2. Activity for all: social accessibility of SuperPark communities

Equality and equal opportunities are particularly hot topics in current Finnish sports policy discussion (Liikanen 2017, Pyykkönen 2016). These are also noteworthy elements in building new sports environments or services. If we as a society seek to make sure all young people can reap the benefits of physical activity, we have to make sure that sports is accessible to all. For companies providing sports opportunities, this is also a business issue; when their beneficial activities are accessible to everybody, they also expand their customer base. Diversity and equality is a win-win strategy.

To address the issues of equality and accessibility in SuperPark communities, we asked the young SuperPark visitors to evaluate statements regarding gender equality, minority groups and discrimination. The respondents were almost universally in agreement with the statement “SuperPark suits girls as well as boys”. This statement was designed to gauge the young people’s sense of gender accessibility in their everyday park settings. Disagreement with this statement would most likely reflect the lack of females in the activities, rigid gender roles inside the park, or the respondents’ own views of girls as somehow inferior participants in park activities. Among the SuperPark respondents, however, only a near-negligible proportion of the young people expressed these kinds of views (figure 8). This positive outlook on gender accessibility was uniform across the genders (figure 9) and the age groups (figure 10). Despite the discrepancy in representation suggested in the previous chapter, both the males and the females regarded SuperPark to fit girls as well as boys.

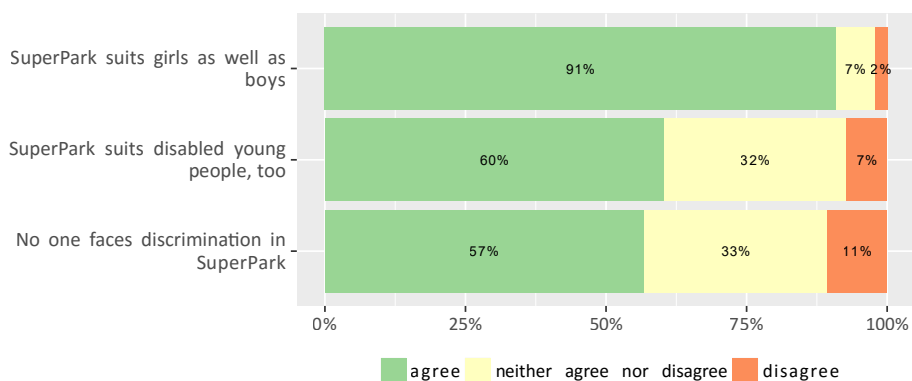


Figure 8. Statements concerning social accessibility in SuperPark.

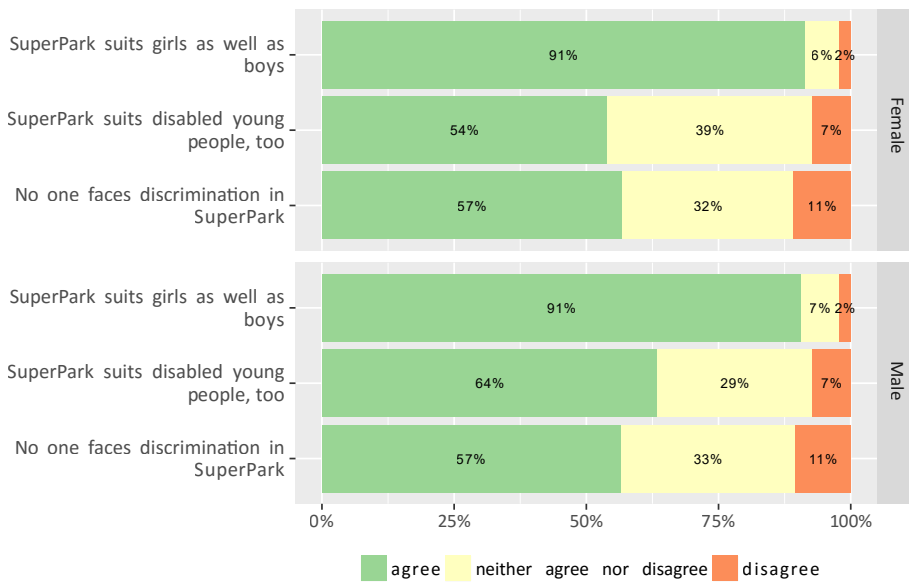


Figure 9. Statements concerning social accessibility in SuperPark, for different genders.

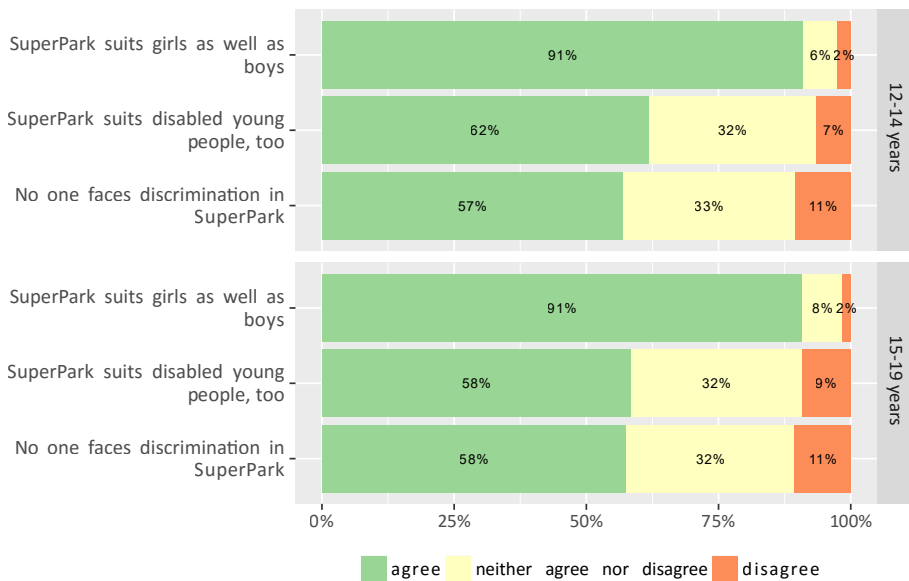


Figure 10. Statements concerning social accessibility in SuperPark, for different age groups.

Views on disabled young people’s access to SuperParks were also positive, although not as uniform. A majority of the respondents agreed that SuperPark suits disabled young people (figure 8). Many expressed uncertainty on this

issue. Non-disabled young people are often unaccustomed to thinking about their surroundings from a disabled person's point of view, and the diversity of disability might make young people wary of making assumptions in generalized form. However, the results also showed that very few young people expressed negative views on the suitability of SuperPark for their disabled peers. Interestingly, the males had more positive views on this statement than the females (figure 9). No notable differences could be seen across the age groups (figure 10).

The third statement aimed to gauge the young people's experiences on discrimination in SuperPark. The word "discrimination" is distinctly negative in its connotation, and the statement here was framed in absolute terms, akin to the style of common anti-discrimination campaign slogans: "No one faces discrimination in SuperPark". More than half of the young respondents agreed. As with the previous statement on disability, approximately one-third of respondents were uncertain about the issue, and only few admitted that discrimination existed in SuperPark. The responses on discrimination were almost identical between the females, the males and the different age groups (figures 9 and 10).

Discrimination was also addressed in another question about possible factors limiting the respondents' opportunities to visit the parks, and the results were similar as above. Only very few respondents saw discrimination as an issue limiting their access to SuperParks (figure 11). The most prevalent limiting factors were the lack of money, time, or transport; although all of these were only selected by a minority of the respondents. Based on the interviews, the young people were dependent on their parents especially in terms of money for the tickets, but often also for transport.

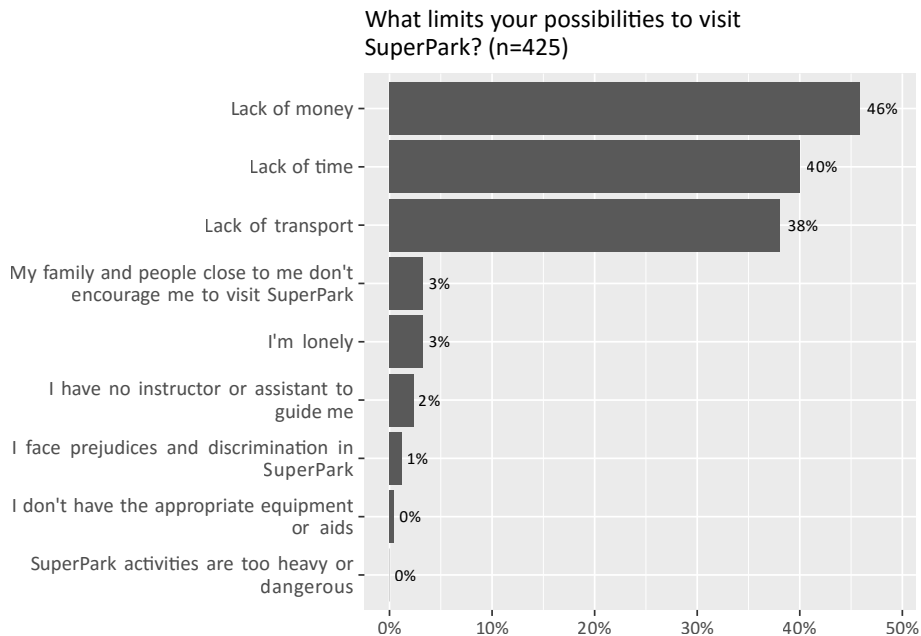


Figure 11. Factors limiting access to SuperPark.

Our results showed that the majority of the young visitors saw no discrimination in SuperPark. It is worth noticing, however, that everyday discrimination is often invisible to people not belonging to the minority groups. Many young people today are undoubtedly aware of this, and understandably refrain themselves from expressing absolute opinions on the subject. Nevertheless, these results suggested that discrimination was not a major, commonly talked about issue among the young people inside SuperPark. Among the respondents of our survey, very few saw discrimination as a problem affecting them.

Interviewer: Who can do this sparring?

Anna: Any one. If you are interested, if you like it, then just do it, because there is nothing like, "you have to be like this", or "you have to be like that".

Bella: Yeah. And no age restrictions either, really.

(“Anna” and “Bella”, 14- and 15-year-old girls)

In summary, our findings suggested that from the point of view of the young people who frequent SuperParks, the communities and activities inside the parks were quite open and accessible to the diversity of the youth. As SuperParks provide exercise activities that are different from the traditional forms of organized sports and promote fun and self-development instead of competition,

they appear to offer a level playing field for young people with differing skills and athletic backgrounds. The visitors' positive attitudes on diversity could be a major asset in the further promotion of accessibility and equality in SuperParks.

As the next chapter shows, the diversity of activities in the parks is also a big factor in SuperPark's popularity among the visitors.

3.3. What does SuperPark mean: reasons and goals for visiting

Young people's leisure time is a scarce resource. From the onset of childhood, many different hobbies, companies and forms of entertainment compete for the attention and life-style choices of young people. There are tasks and commitments that a teenager is forced to do and have whether they desire it or not, and there are activities that they themselves choose or yearn for. A young person might show great determination to go wherever, or do whatever, they want. They might beg or bargain with their parents for permission, funds or transportation, and they might work, save and study to gather the material or immaterial resources they need. On the other hand, a teenager may also make very spontaneous decisions on how they spend their time. Either way, for those of us who wish to support positive behaviors and well-being without suppressing young people's individuality and agency, understanding the motivations behind their interests is the key. In this study, we wanted to understand why young people spend their time in SuperParks and what kind of meaning their activities hold for young people.

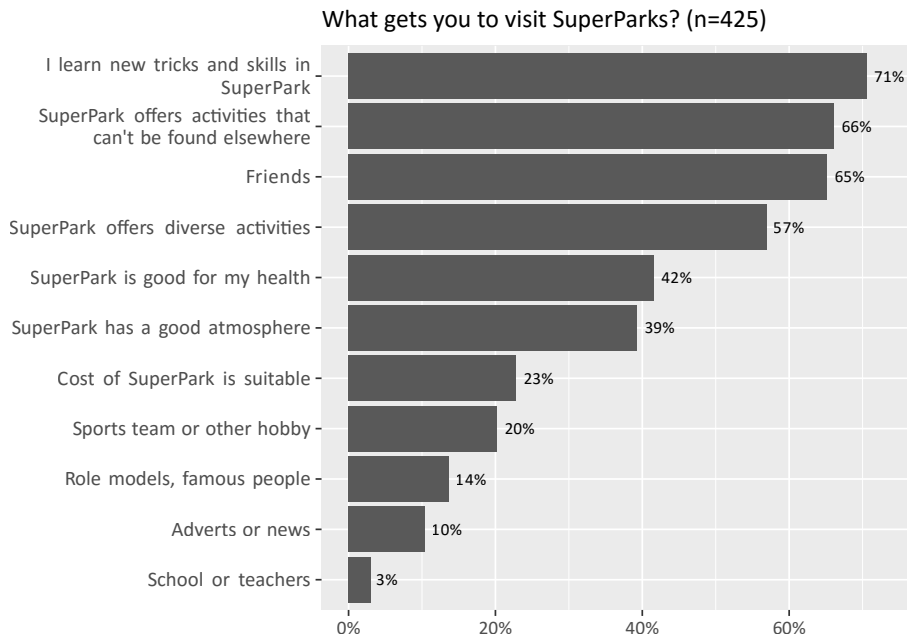


Figure 12. Reasons to visit SuperPark.

In the survey, we asked a straightforward question: What gets you to visit SuperParks? We presented the respondents with a list of options and asked them to select all that apply, and provided an option to type in other reasons. Figure 12 shows the results. There were many prominent reasons for visiting SuperParks. Four different reasons were picked by more than a half of the respondents, and total of six were picked by at least one-third of the respondents. The most often expressed reason was learning new tricks and skills. The second most prominent reason were the unique activities offered in SuperParks, and more than a half of the respondents also appreciated the diversity of the SuperPark activities.

Interviewer: Does visiting or exercising here influence your everyday life? I mean, what you do elsewhere?

Emilia: Yeah. So, if you find something nice in your free-time, then you want to do it at home, too.

Interviewer: Well, can you give an example of this?

Emilia: Well, for example, if you've learned some new trick, then it will stay on your mind, so that you want to do it all the time and learn more new tricks.

Interviewer: It could be inferred that the new trick is learned right here?

Henna: Yeah, because there are wicked good trampolines here.

(“Emilia” and “Henna”, 12-year-old girls)

The third most frequently chosen reason was the social aspect of SuperParks: friends (see chapter 3.1.). These three points should be regarded as SuperParks' key attractions for young visitors. They were also widely discussed in the interviews.

Interviewer: What motivates you here?

Antti: At least I'm motivated, if I watch some video where someone is here and does some nice tricks. So that at least motivates me.

Benjamin: Same here. And also, friends [motivate], too.

(“Antti” and “Benjamin”, 12- and 14-year-old boys)

After these, there were additional two reasons that applied to many if not most of the visitors. Almost one-half of the respondents saw that SuperPark's positive health effects were a reason for visiting (figure 12). The next most frequently chosen factor was SuperPark's atmosphere. The health option represented the often-discussed physical well-being benefits of physical activity. It was included in the list as a way to find out how the prominent health-related discourse is prioritized compared to other reasons that had more to do with the social, actionable and emotional functions. The results showed that quite many young visitors recognized the positive health effects of SuperPark, but health as a reason for visiting was not nearly as popular as these other aforementioned factors. Similarly, the atmosphere option represented the psychological well-being aspects of SuperPark as recreational environment.

It is worth noticing that in the eyes of the young respondents, the influence of teachers, advertisements and role models on visiting was small. Sport teams or other hobbies had a slightly bigger effect. This could be clearly observed during field research in SuperPark in the form of sports teams' group visits. According to these results, adults' influence was rarely the reason for SuperPark visits. But adults did have a role to play as facilitators, as evidenced by the obstacles for visiting in chapter 3.2.

There are some, albeit rather small, differences between the females' and the males' reasons for visiting (figure 13). These can be summarized as follows: Learning was clearly a more popular reason among the males than the females. The women, on the other hand, appreciated the diversity and uniqueness of activities more commonly than the men did. The females also more frequently indicated (or admitted) that advertising influenced their decision to visit. For

the women, the most popular reasons were activities and friends, and learning skills was only the fourth most popular reason.

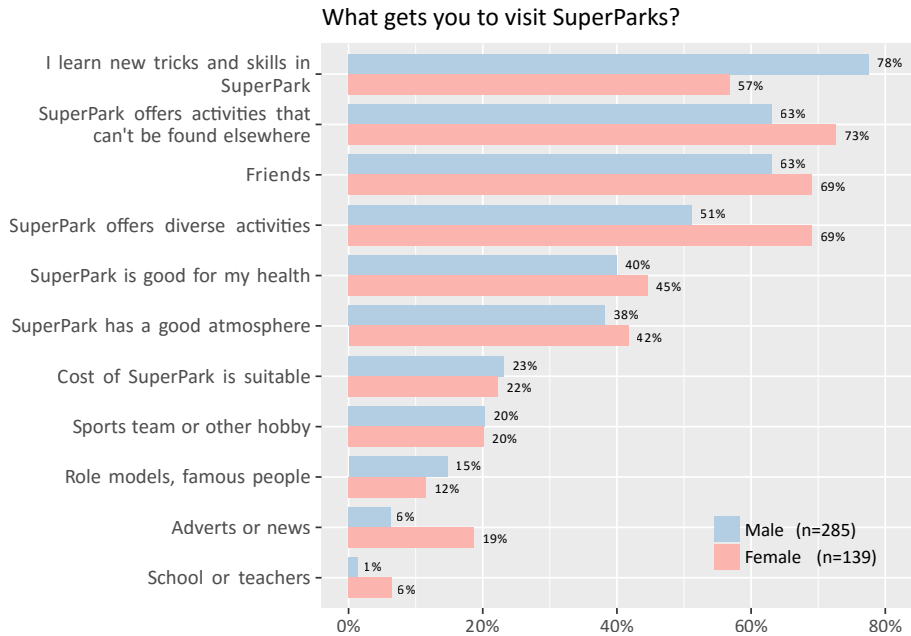


Figure 13. Reasons to visit SuperPark, for different genders.

We also probed the survey respondents for their goals for visiting SuperParks, using a similar questioning technique. Young people’s view of goals is interesting, because they can be seen to reflect both the values and plans related to their personal life-style. A young person who wants to win competitions has a different perspective on sports and exercise than one who is just looking for a good time with friends. Based on our interviews, it was clear that for some people the goals in SuperPark were linked to specific goals elsewhere in their life, especially in their main sport. For others, the goals in SuperPark were related to general goals for leisure. Either way, the goals illustrated the role SuperParks had in the young people’s lives and what SuperParks was being used for.

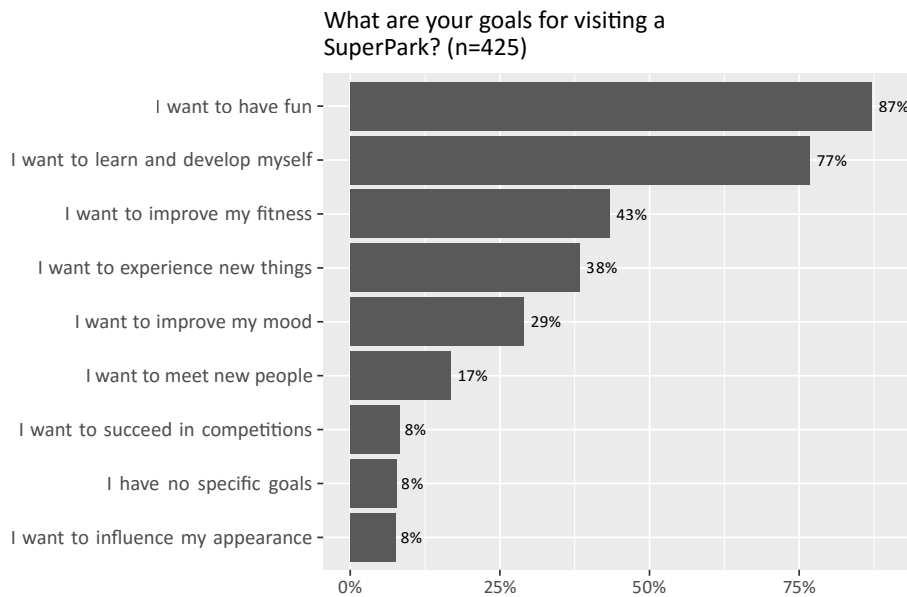


Figure 14. Goals for visiting SuperPark.

In this question, the most popular answers were even more distinct. Two goals were shared by a clear majority of the respondents: fun and learning (figure 14). Approximately nine out of ten respondents indicated that their goal was to have fun. Three-fourths of the young visitors wanted to learn and develop themselves in SuperPark. The importance of learning was again emphasized here. The simple emotion of fun was missing from survey options in the earlier question, but when offered here, it brought forth a simple result; Fun was a central goal, and SuperParks were places for having fun. Some interviews also highlighted what fun meant in practice. In this quote, fun was connected both to the social nature of the activities and the lack of skill-based hierarchies:

Interviewer: Fun, learning skills, even succeeding [in competitions] were previously mentioned [as goals]. Which of these is the most important for you?

Daniel: Well, I guess fun.

Eero: Fun it is, that thing were you do stuff with your friends together. That it doesn't matter if your mate is worse or better [than you], as long as you have fun. So that's the main thing.

(“Daniel” and “Eero”, 14- and 15-year-old boys)

Like health before, the goal of fitness was connected to the sense of physical well-being. It was picked by almost one-half of the respondents. It could also

be seen to represent a focus on the body image, but in order to clarify body-related goals we offered the goal of influencing appearances as a separate option. The results showed that appearance was the least popular goal, selected by less than one respondent in ten. The physical outcomes the young visitors sought in SuperPark activities had more to do with bodily skills and capabilities rather than looks.

The following, less popular goals were connected to the emotional and social aspects of SuperPark. Approximately one-third of the respondents saw new exciting experiences and mood improvement as their goals, and one respondent in six aimed to meet new people. All of these goals were more important to the SuperPark visitors than finding glory in competitions. Even though some young people visit SuperParks with their sports teams, SuperPark was not a venue for competition. The interviews showed that some young people saw SuperPark activities as beneficial for their other sports endeavors, but competitive success was rarely the goal of spending time in SuperParks.

Again, there were small gender-based differences in the popularity of certain goals among the respondents (figure 15). The males were more oriented towards learning and development, and in some cases, competitive success. In comparison, the females showed more affinity towards new experiences and mood improvement as goals. For the most part, the prioritized goals were similar for both the females and the males.

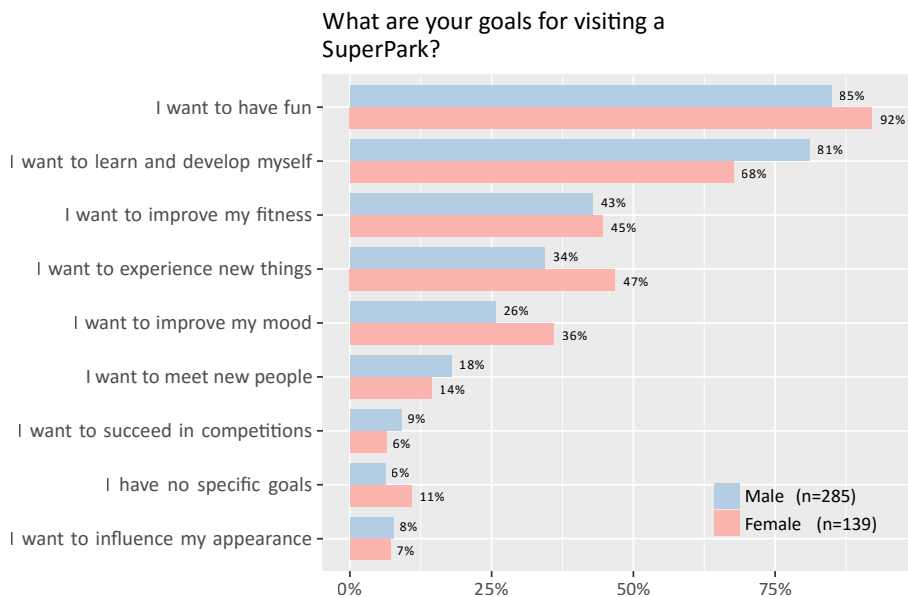


Figure 15. Goals in visiting SuperPark, for different genders.

In short, SuperParks were a place for fun, learning and development, and meeting friends, and their unique activities are major attractions. In terms of physical prowess, skills meant more to SuperParks' young visitors than fitness, appearance or health. In terms of social, emotional and psychological aspects related to well-being, young people emphasized close friendships, fun and excitement over new people and introspection on the mood and feeling of the place.

3.4. How do SuperParks' visitors see sports?

As a new and innovative environment for physical fun and games, SuperParks have the potential to provide enjoyable exercise for young people who are less physically active or dislike traditional forms of sports. Who are the young people who make use of these opportunities and frequent SuperParks? How do they exercise outside the parks, and what is their relation to sports and physical exercise? In order to gather information about the visitors' backgrounds in terms of physical activity, we asked the respondents and interviewees questions about their routines in and attitudes towards sports and exercise.

The survey respondents were asked how they normally practiced sports or exercise. The question presented a list of statements and asked the respondents to select all that applied to them. The results showed that almost all of the young respondents exercised one way or another (figure 16). Only one respondent in twenty indicated that they did not exercise at all. A clear majority of the respondents exercised together with others and only one-quarter of the respondents exercised alone. Similarly, team sports practiced in sport clubs were clearly more popular than individual sports among the respondents. One respondent in ten exercised with a trainer outside sports clubs. The Finnish wording in this case referred to e.g. guided gym training. These results showed that SuperParks' young visitors are mostly young people with some kinds of tendencies and habits for exercise, although a minority of them practiced sports in clubs. The results for the different genders showed that practicing in sports clubs and exercising alone were more common among the females than the males (figure 16).

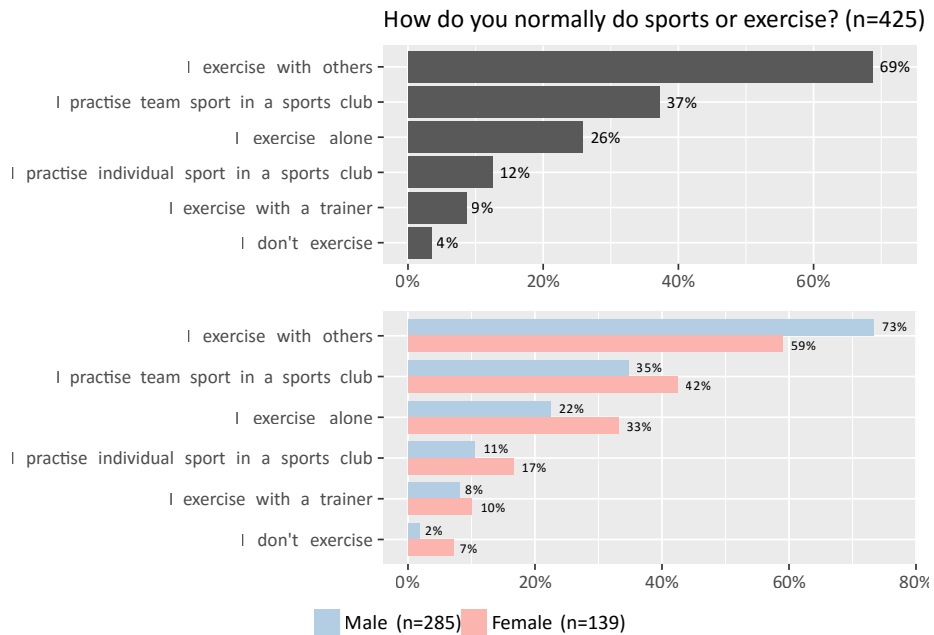


Figure 16. Forms of sports and exercise.

The survey data was corroborated by the interviews. Many young interviewees practiced some other sports in addition to frequenting SuperParks, and almost all of the interviewees regarded themselves at least somewhat sporty or physically active. Some interviewees only practiced sports closely related to SuperPark activities (skating or scootering), and a big part of their physical activity took place inside SuperParks, especially during wintertime. For few visitors sparking in SuperParks might be the sole form of exercise. Both the survey results and the interviews suggested that the male SuperPark visitors tended to favor unorganized sports or life-style sports, whereas most of the interviewed females practiced sports in sports clubs. For them, SuperParks provided an alternative environment for practicing more freestyle sports.

To further explore the young visitors' attitudes, we asked them to evaluate statements on sports and exercise. Three different statements probed the respondents' general relationship with sports and exercise (figure 17). One statement was designed to identify those for whom sports was a central part of life: "Sports and exercise is the most important thing in my life". Two-fifths of the respondents agreed, almost one-half were neutral and only few disagreed. This suggested that a significant portion of SuperPark visitors are sport enthusiasts. Another statement probed the respondents' attitudes towards competition in

sports. More than one-half disagreed with the idea that “most sports are too competitive for me” and only few agreed. Although SuperParks were mostly a competition-free arena, competition in general did not appear to be an especially important issue among the young visitors. The third statement gauged the respondents’ feelings about the dominant discourse on sports: “Constant talk of sports and exercise annoys me.” The results were similar as with competition. Most had no problem with sports talk. Overall, these results suggested that relatively few young people enter SuperParks with anti-sports attitudes.

One other statement (figure 17) examined SuperPark’s influence on young people’s exercise outside the park. The results are polarized in an interestingly even fashion. Approximately one-third of the respondents disagreed with SuperPark’s influence, but approximately one-quarter agreed. The task of assessing influence is in many cases quite difficult. The interview material highlighted many different ways SuperPark could visibly affect or subtly support physical activity outside the park. On the other end of the spectrum, there were skateboarders who built their own facilities based on ideas found in SuperPark. Interviewer: Does this park activity influence your sport activities outside the park? Did you get any ideas or anything?

Joona: Well, maybe that time when we built a skatepark by ourselves. (...) It was when I was here on a class trip, when I also skated [here], so it basically started out of that box there. That’s where I always did something [with the skateboard] and thought that I could build a thing like that. So it basically started from there.

(“Joona”, a 14-year-old boy)

On the other end, there were young people who viewed SuperPark as a venue reminiscent of amusement parks, separate from everyday life and its practices. In between, there were gymnasts and circus practitioners for whom SuperPark offered better facilities for building on the skills learned elsewhere, and coached athletes who saw trampolines as tools for strengthening their core muscles.

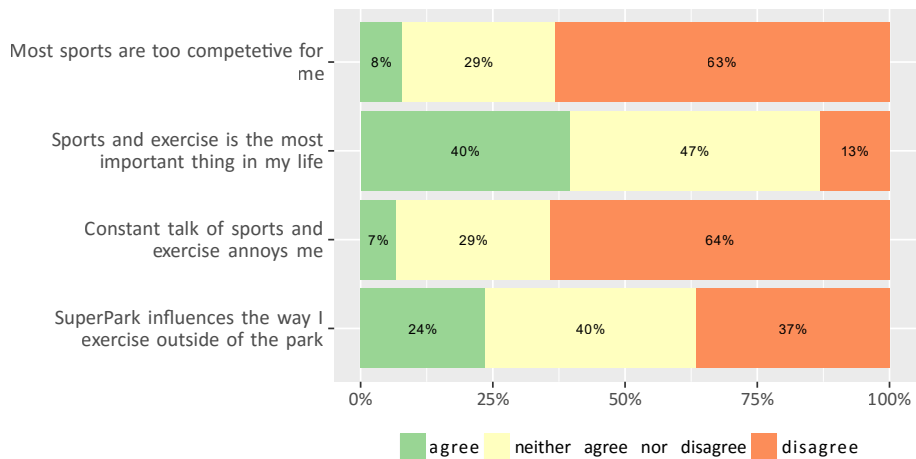


Figure 17. Statements concerning attitudes on sports.

Based on the respondents’ background info (chapter 2) and their views on sports, SuperParks appeared to attract both sports enthusiasts and casual exercisers among teenage boys and girls. Only few study subjects showed negative attitudes toward sports or express something that could be described as a “physically inactive” identity. The diverse activities of SuperParks attract diverse visitors with backgrounds in many kinds of traditional or life-style sports. But reaching more inactive young people appears to call for more development of services, targeted messages or examining the barriers of entry more closely.

4. CONCLUSIONS

In the other part of this research publication, Pesola et al. showed that SuperPark activities are intensive physical exercises that are likely to produce positive health results. Physiologically, activity in SuperPark, sparking, appears to be akin to going to the gym.

SuperParks are no gyms, however. In our study, we saw that what most young visitors look for in SuperParks were not exercise or health effects, but fun, tricks and company. The young people we met talked not about their heart rate but about the experiences and connections they found when visiting a park. They wanted to learn and develop their skills. They were drawn to the park because there was a lot to do there and because the park had the best trampolines and Air Tracks and only winter scootering facilities nearby. They liked the park's atmosphere and staff.

SuperPark connected young people both inside and outside of the park itself. Based on our results, SuperParks attracted young people from many kinds of backgrounds and with a variety of attitudes on sports and exercise. Almost all of the young people visited the park with their friends. Many of them had also found new friends in SuperParks. Sparking was also a topic of discussion outside the park. On top of this, many park-goers recognized the importance of non-formal learning from peers.

All this demonstrates the importance of the social aspects of park activity. People and communities have a big part in the success of SuperPark and are a critical factor if SuperPark and its kin are going to play a major role in increasing the physical activity of sedentary children. Our results showed that SuperPark have already succeeded in creating an environment for light and entertaining physical activity and social interaction between teenagers. The fine balance between young people's independent activity and adult guidance is worth cherishing. When parks grow, SuperParks will do well if attention is paid to the youth cultures inside the parks and communities are involved in the activities and development of the parks. The staff has a key role in safeguarding the atmosphere in the parks and preventing harassment or the formation of detrimental social hierarchies. In part, the same applies to local SuperPark "celebrities"; young people who might serve as role models for other park-goers. In the development of SuperParks, these human resources should probably be seen as important an investment as the technical facilities of the parks.

In reaching physically inactive young people, diversity is paramount. For many minorities and sedentary teenagers, exercise is complicated by previous experiences of exclusion and the lack of previous physical training. Safety in sports arenas is not only a question of preventing physical accidents. To serve these excluded groups, they also have to be socially safe spaces; free of harassment and discrimination. Regarding this, a major finding in our study was that the visitors see SuperParks as socially open and suitable for all kinds of people. The young people we surveyed and interviewed rarely faced discrimination in the parks. This suggests that SuperParks can play an important role in promoting equality in sports and reaching out to the excluded. However, equality and non-discrimination are best seen as processes, which require constant work and attention from those with the power of driving change. Considering the positive attitudes of the young SuperPark visitors, SuperParks could do well by proactively reaching out to some often-ignored and underserved groups, such as young people with disabilities or those with an unenthusiastic outlook on sports and exercise.

Contrasting the results on the SuperPark visitors with similar studies on the Finnish participants in life-style sports (Liikanen & Rannikko 2015) show interesting similarities and differences. The SuperPark visitors resemble their life-style sports cousins in exhibiting tolerant and open attitudes, focusing on personal development and practicing peer learning. Both groups also tend to exercise for a long time in one go and emphasize the importance of friends and the social aspects of their activity. On the other hand, the SuperPark visitors' own tendencies and attitudes towards mainstream sports practice remain less pointed, whereas many practitioners of life-style sports e.g. show disdain towards the competitiveness of mainstream sports. Based on our results the male park-goer's profile appeared to be closer to life-style sports sentiment. The female visitors were more involved in sports clubs and expressed more traditional views on sports. This is most likely a result of the biased gender structure of some life-style sports crowds (Liikanen & Rannikko 2015; Rannikko et al. 2013). However, it might also highlight potential in reaching out to young women with more "alternative" attitudes, who might not have found the opportunities SuperParks offer for entertaining exercise. Promoting female role models may be important in increasing the participation of young women.

It appears that for many young people, the first visits into SuperParks and sparking are also first visits into the world of less organized life-style-like sports, where exciting experiences and individual style trump competitive power plays and rigid classifications. Under SuperPark's roof, some benefits of alternative sports are brought into the mainstream.

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