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To cite this article: Janke E. van Dijk-Wesselius, Dieuwke Hovinga, Marit de Koning, Jolanda Maas & Agnes E. van den Berg (2020): Parental perspectives on green schoolyards: advantages outweigh disadvantages, but willingness to help is limited, *Children's Geographies*, DOI: [10.1080/14733285.2020.1751071](https://doi.org/10.1080/14733285.2020.1751071)

To link to this article: <https://doi.org/10.1080/14733285.2020.1751071>



Published online: 10 Apr 2020.



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Parental perspectives on green schoolyards: advantages outweigh disadvantages, but willingness to help is limited

Janke E. van Dijk-Wesselius ^{a,b}, Dieuwke Hovinga^a, Marit de Koning^a, Jolanda Maas^c and Agnes E. van den Berg^d

^aResearch Group Nature & Children's Development, University of Applied Sciences, Leiden and Thomas More Hogeschool, Leiden, Netherlands; ^bDepartment of Experimental and Applied Psychology, Vrije Universiteit Amsterdam, Amsterdam, Netherlands; ^cDepartment of Clinical, Neuro and Developmental Psychology, Vrije Universiteit Amsterdam, Amsterdam, Netherlands; ^dFaculty of Spatial Sciences, Department of Cultural Geography, University of Groningen, Groningen, Netherlands

ABSTRACT

Parental involvement is critical to the successful implementation of green schoolyards. This paper reports results from two surveys that asked a total of 402 parents of children in schools with green and paved schoolyards about their appreciation of the schoolyard, children's behavior in the schoolyard, (dis)advantages of a green schoolyard, and willingness to become involved. Parents from schools with a green, compared to a paved, schoolyard showed higher appreciation of the schoolyard and more often reported that the schoolyard supports varied play and other behaviors. Parents generally saw more advantages than disadvantages of a green schoolyard, and many parents indicated that disadvantages, such as children coming home dirty, are not very important to them. Parents wanted to be involved in designing a green schoolyard and with schoolyard activities. However, they were less willing to help with maintenance, and their time to help is limited.

ARTICLE HISTORY

Received 14 May 2019
Accepted 8 March 2020

KEYWORDS

Schoolchildren; Elementary schools; Natural play; Parental views; Restorative environment; Sustainable schoolyards

Introduction

A movement to green schoolyards and reconnect children to nature is gaining momentum around the globe, weaving the ideas of urban sustainability and ecological design together with children's well-being, healthy development, academic achievement, and community engagement (Danks 2010; Dymont and Green 2018). This movement is primarily driven by concerns about children's decreasing contact with nature. This disconnection of children from nature has been related to factors such as urbanization, parental concerns about dangers from traffic and strangers, and children's screen-based lifestyle (Tanja-Dijkstra et al. 2019; Veitch, Salmon, and Ball 2010). Greening schoolyards provides a unique way to reconnect children with nature, since schoolyards are among the few places where children from all backgrounds can go and play freely (Raith 2018). Despite the many benefits of green schoolyards, schools often struggle with parental support and collaboration (Redman 2013). Since parental involvement is an important success factor for the realization and maintenance of green schoolyards, the current article focuses on gaining insight in parental perspectives on green schoolyards.

Green schoolyards are schoolyards with natural elements (such as shrubbery, trees, flowers, sand, water, grass hills) where children are invited and encouraged to interact, play and learn in and with nature. An increasing body of research shows support for the beneficial impact of green schoolyards

for children's well-being and development (Bates, Bohnert, and Gerstein 2018; Van Dijk-Wesselius et al. 2018). Previous studies indicate that green schoolyards are appreciated by children (Maas et al. 2013; Samborski 2010), stimulate physical activity (particularly in girls) (Coen et al. 2019; Mårtensson et al. 2014; Pagels et al. 2014), foster varied and creative play behavior (Fjortoft 2004; Malone and Tranter 2003), enable children to escape from stress (Bagot, Allen, and Toukhsati 2015; Chawla et al. 2014) and support building social relationships (De Vries et al. 2013; Maas et al. 2013). Furthermore, green schoolyards offer opportunities to stimulate environmental awareness in children (Bentsen, Mygind, and Randrup 2009).

A green schoolyard thus seems to be a promising enrichment for primary schools. However, realization and maintenance of a green schoolyard costs time, money and energy. Several evaluations of schools' experiences with greening schoolyards show that, on the 'road to success', parental involvement is an important factor (Maas, Muller, and Hovinga 2014; Redman 2013; Van Nispen tot Pannerden, Tegels, and Van Laar 2014). These reports suggest that a good connection and communication with parents during and after construction could prevent conflict, minimize concerns about safety and dirty clothes, and stimulate willingness to help with the maintenance of the schoolyard.

In general, parental involvement can be difficult to realize. There are differences between parents in their needs, barriers and ideas on how they can and wish to be involved (Crozier and Davies 2007). Furthermore, parental involvement can be challenged by a dominant vision of schools thinking mostly from their own perspective on how parents can serve the school's agenda (Pushor and Amendt 2018). In this perspective, parents can be labeled as hard to reach or difficult to motivate if they do not comply with the school's proposed practices.

Although schools generally acknowledge that parental involvement is important for a successful implementation of a green schoolyard, little is known about how parents view the (green) schoolyard and how they want to be involved. This lack of knowledge may cause a gap between the assumptions of primary schools and parents' actual views. Such a gap could lead to ineffective attempts of schools to involve parents (Hornby and Lafaele 2011). In general, an open disposition towards parental views and beliefs may not only help schools in determining an appropriate starting point for collaboration, but also provide notions on what to emphasize, which pitfalls to anticipate and how to properly steer the process (cf. Pushor and Amendt 2018).

The present study aims to gain more insight into parental perspectives on green schoolyards. More specifically, this study aims to (1) compare how parents (including caregivers) from schools with green and paved schoolyards evaluate their schoolyard in terms of general satisfaction, behaviors supported by the schoolyard, and problems related to dirt and safety, (2) examine parental views on advantages and disadvantages of a green schoolyard, and whether these views differ between parents who have experience with a green schoolyard and parents who do not have such experience, and (3) assess parents' preferences regarding how they want to be involved in green schoolyards, and their willingness to become involved.

Method

Schools and schoolyards

This study uses data from two surveys among parents and caregivers from schools with green and paved schoolyards. The first survey was conducted in 2012 among parents of schools in the Dutch town of Helmond as part of a larger study on green school yards. Four schools were included in the present analysis, of which one had two schoolyards, leading to a total of five schoolyards. Two of the five schoolyards were green schoolyards and three were predominantly paved with tiles. At the time of the survey, one of the green schoolyards had been recently greened, the other one had been greened for many years. The size of the five schoolyards included in the study varied between 480

and 5000 m², and on average, the two green schoolyards were larger (3800 m²) than the three paved schoolyards (1784 m²).

The second survey was conducted in 2015 among parents of schools in the Western part of The Netherlands as part of a larger study on greening schoolyards. Ten schools were included in the present analysis, of which six had a green schoolyard and four had a paved schoolyard. At the time of survey, all green schoolyards had been recently greened in the past five years. The size of the schoolyards varied between 422 and 1660 m², and on average the six green schoolyards were larger (1046 m²) than the four paved schoolyards (736 m²).

All schools in both studies were located in moderate (1000–1500 addresses per km²) to highly urbanized areas (1500+ addresses per km²). According to the Netherlands Bureau of Statistics, more than half of the inhabitants of the Netherlands live in such areas, which makes the sample relevant for a large part of Dutch society.

Respondents

Table 1 summarizes the core demographics of the respondents in the two studies. The first survey comprised 137 parents and caregivers (83.9% female) of children in grades 4–6 (ages 7–11, 49% girls) of which 45.9% were from schools with a green schoolyard. The second study comprised 265 parents and caregivers (79.2% female) of children in grades 4–7 (ages 7–11, 52% girls) of 10 elementary schools of which 52.8% were from schools with a green schoolyard. In both studies, a majority of the respondents were highly educated and had a paid job. Parents from schools with paved and green schoolyards had a similar socio-demographic profile. However, in Study 2 parents from schools with a green schoolyard were more often female than parents from schools with a paved schoolyard, and they were also relatively highly educated. Parents in Study 1 reported on younger children than parents in Study 2. However, within each study, there were no differences between green and paved schoolyards in the age of children that were included in the questionnaires.

Questionnaires

Two separate questionnaires were developed for the two studies, tailored to the specific context and interests of the schools. A subset of questions from the original questionnaires was used in the current analysis. For both studies, this selection included similar, but differently phrased, questions about parents' appreciation of the schoolyard, children's play behavior, and issues related to safety and dirt. Additional open-ended questions about the advantages and disadvantages of a green schoolyard were selected from the questionnaire of Study 1, while additional questions about parents' involvement in greening the schoolyard and their willingness to help were selected from the questionnaire of Study 2.

Both questionnaires were part of larger research projects in which impacts of green schoolyards were measured in various ways, ranging from children's self-reports to objective video observations and tests, and teachers' evaluations. The selection of outcome measures for these research projects

Table 1. Sample characteristics.

	Study 1		Study 2	
	Paved (<i>N</i> = 74)	Green (<i>N</i> = 63)	Paved (<i>N</i> = 125)	Green (<i>N</i> = 140)
Age, in years, <i>M</i> (<i>SD</i>)	39.3 (4.2)	40.9 (4.3)	40.7 (5.6)	42.4 (4.3)
Female	85.1%	82.5%	78.4%	88.1%
High education level	62.2%	60.3%	65.6%	75.7%
Paid job (> 12 hrs p/w)	68.9%	77.8%	73.6%	82.1%
Gender of child (% girl)	45.9%	51.6%	52.0%	52.2%
Age of child, in years, <i>M</i> (<i>SD</i>)	7.96 (0.9)	7.90 (0.9)	8.88 (1.0)	8.66 (1.0)

was based on a combination of theoretical insights and practical considerations which are beyond the scope of the present article. The questions for parents were derived from the measures used among children and teachers, to obtain an inclusive and comparable perspective on the – real and perceived – benefits of green schoolyards.

Appreciation

The questionnaires included three questions about the appreciation of the schoolyard. First, parents in Study 1 were asked to answer to the statement ‘I am satisfied with the schoolyard’ on a Likert scale ranging from 1=‘completely disagree’ to 5=‘completely agree’. Second, parents in Study 2 were asked ‘How would you grade the schoolyard’ on a scale from 1 to 10. Parents in Study 2 also evaluated the schoolyard on a 5-point semantic differential scale that included the items: unnatural/natural, boring/adventurous, ugly/beautiful, not a nice place/nice place, not a nice atmosphere /nice atmosphere, not fun /fun, unsafe/safe, and dirty/clean. An exploratory factor analysis with varimax rotation yielded a clearly interpretable 2-factor structure that accounted for 73.3% of the variance. The first factor ‘Atmosphere’ accounted for 55.5% of the variables and includes six items: the schoolyard is a nice place, has a nice atmosphere, is adventurous, fun, beautiful and natural (Cronbach’s alpha = .91). The second factor ‘Clean and safe’ accounted for 17.8% of the variance and included the two items on cleanness and safety of the schoolyard (Cronbach’s alpha = .67). Scores on the two factors were calculated as the average of the scores on individual items.

Behavior in the schoolyard

Questions on children’s behavior in the schoolyard were derived from validated taxonomies of children’s play behavior, such as the Play Observation Scale (Rubin 2001). Parents in Study 1 were asked to indicate on a 4-point scale (1 = never; 2 = almost never, 3 = sometimes; 4 = often) the occurrence of four types of behaviors in the schoolyard: (a) children playing together; (b) physical activity of girls; (c) physical activity of boys, and (d) conflicts.

Parents in Study 2 were asked to indicate on a 4-point scale (1 = completely not true; 2 = not true; 3 = true; 4 = completely true) the degree to which the schoolyard supports six types of behavior, clustered in three categories: (a) social play – play together, learn to act responsibly to each other; (b) active and varied play – engage in physical activity, play diverse games; (c) environmental behavior – learn about nature, learn to act responsibly to their environment. There was also an answer option ‘I cannot estimate this’. Respondents who chose this last option (*N* ranging between 2.0% and 16.3% for the various behaviors) were excluded from the analyses. Parents also rated the importance of the different types of schoolyard behavior on a 3-point scale (1 = no, 2 = a little, 3 = yes). Scores for each of the three behavioral categories were calculated as the average of the scores on the two individual items.

Safety and dirt

To assess parental experiences with safety, parents in Study 1 were asked to answer the questions ‘How often do problems at the schoolyard occur due to a lack of a clear view?’ and ‘How often do accidents occur at the schoolyard?’ on a 5-point scale ranging from 1 = never to 5 = often.

Parents in both studies were asked how often they have experiences with children becoming dirty at the schoolyard, with response options ranging from 1 = never to 5 = always in Study 1, and from 1 is never to 7 = always in Study 2. In both studies, parents were also asked whether they mind if their child comes home dirty, with response options yes/no in Study 1 and yes/a little bit/no in Study 2.

Advantages and disadvantages of green schoolyards

The questionnaire of Study 1 contained two open-ended questions that asked parents to write down, in their own words, the advantages and disadvantages of a green schoolyard.

Involvement

Parents in Study 2 at schools with a green schoolyard were asked several questions about their involvement in greening the schoolyard. First, they were asked how parental involvement in designing the new schoolyard was organized at their school, with response options 'all parents had a direct voice', 'only through the parents advisory council', 'only through a select group', 'no involvement' and 'otherwise, namely ...'. Parents were also asked to select their preferred type of involvement from these options. Two other questions asked parents how often they would be willing to help with (a) activities at the green schoolyard, like festivities and lessons, and (b), the maintenance of the green schoolyard, with response options 1 = never, 2 = once per year, 3 = once per half year, 4 = once every four months, 5 = monthly, 6 = weekly. In addition, they were posed the open-ended question 'What withholds you from involvement in activities and maintenance at the green schoolyard?'

Procedure

In Study 1 data were gathered by giving the children who participated in the study a paper questionnaire in an envelope and asking them to hand it to their parents. No stamp was needed for sending it back. The questionnaire was distributed in September 2012 and had a response rate of 49.4%.

In Study 2 first a link to an online questionnaire was included in the newsletter parents receive weekly from their school. Because the response rate remained low (12.0%), a paper questionnaire was distributed in the same way as in Study 1. This increased the response rate to 33.0%. Data were gathered from July 2015–July 2016.

In the introduction of both questionnaires, the aims and background of the study were explained, and it was stressed that participation was anonymous and voluntary. After this introduction, parents could indicate their consent by adding their signature.

Analysis

Data were analyzed using SPSS version 24. One-way ANOVA was used to test for differences in appreciation of the schoolyard between parents from schools with green and paved schoolyards. For single items measured at 4- or 5-point scales with approximately equal intervals between points we first ran equivalent nonparametrical tests to confirm that the outcomes were similar to those of the ANOVA. Differences in categorical items were analyzed using Chi-square tests. Answers to the open-ended questions on (dis)advantages were analyzed with a grounded theory approach. Grounded theory research involves inductive and deductive cycles (Miller and Kuhaneck 2008). Our analysis started with open coding; reading the answers and writing down the themes that were addressed in a few words. These themes were then compared in search for umbrella themes and subthemes. For each (sub)theme, the percentage of parents that mentioned an advantage or disadvantage in this theme was calculated. Since one answer may fit under several themes, total percentages can exceed 100%.

Results

Differences between schools with green and paved schoolyards

Table 2 gives an overview of the mean scores of parents from schools with green and paved schoolyards on questions about appreciation of the schoolyard, the behavior supported by the schoolyard, and issues with safety and dirt.

Appreciation of the schoolyard

As shown in Table 2 parents from schools with a green schoolyard show more appreciation of their schoolyard than parents from schools with a paved schoolyard. Parents of green schoolyards on

Table 2. Means (plus-minus standard deviation) at schools with green and paved schoolyards, with test values and effect sizes.

	Study	N	Total	Green	Paved	F	p	η_p^2
Appreciation								
Satisfaction (1–5)	1	136	3.41 ± 1.11	4.16 ± 0.75	2.78 ± 0.97	83.34	<.001	.38
Grade schoolyard (1–10)	2	264	6.47 ± 1.45	7.05 ± 1.29	5.82 ± 1.35	57.02	<.001	.18
Evaluation (1–5)	2	241						
Factor 1 ‘atmosphere’			3.30 ± 0.89	3.78 ± 0.66	2.69 ± 0.77	139.13	<.001	.37
Factor 2 ‘clean and safe’			3.60 ± 0.90	3.47 ± 0.95	3.76 ± 0.82	6.12	.014	.03
Behavior								
Behavior in schoolyard (1–4)	1	135						
Play together			3.90 ± 0.33	3.89 ± 0.36	3.90 ± 0.30	<1	ns	.00
Conflicts			2.49 ± 0.69	2.40 ± 0.64	2.58 ± 0.73	2.30	.131	.02
Activity girls			3.48 ± 0.64	3.61 ± 0.62	3.38 ± 0.65	3.83	.05	.03
Activity boys			3.60 ± 0.60	3.68 ± 0.57	3.54 ± 0.63	1.97	.163	.02
Support of behaviors (1–4)	2							
Social behavior		218	3.22 ± 0.49	3.22 ± 0.49	3.22 ± 0.50	<1	ns	.00
Active and varied play		241	3.12 ± 0.57	3.29 ± 0.55	2.90 ± 0.52	32.36	<.001	.12
Environmental behavior		219	2.41 ± 0.78	2.77 ± 0.77	1.97 ± 0.62	74.08	<.001	.26
Safety and dirt								
Safety problems (1–5)	1							
Accidents		136	2.52 ± 0.71	2.58 ± 0.69	2.47 ± 0.73	<1	ns	.00
Lack of overview		127	2.46 ± 0.83	2.60 ± 0.86	2.33 ± 0.80	3.37	.069	.03
Dirt								
Coming home dirty (1–5)	1	137	2.69 ± 0.99	3.33 ± 0.86	2.14 ± 0.73	77.92	<.001	.37
Coming home dirty (1–7)	2	257	3.43 ± 1.92	3.91 ± 1.87	2.87 ± 1.93	20.48	<.001	.07

average are well-satisfied with their schoolyard, give it a more than sufficient grade, and consider their schoolyard to have a positive atmosphere. Whereas parents of paved schoolyards are more neutral in their evaluations. However, although parents generally consider their schoolyard to be clean and safe, parents from schools with a green schoolyard rate the schoolyard as less clean and safe than parents from schools with a paved schoolyard.

Children’s behavior

As shown in Table 2, most parents in Study 1 indicate that children often play together, and that conflicts do not occur very often, regardless of whether the schoolyard is green or paved. While physical activity levels of girls in the schoolyard are generally rated to be lower than those of boys, parents from schools with a green schoolyard report higher physical activity levels of girls than parents from schools with a paved schoolyard.

According to parents in Study 2, green and paved schoolyards are equally supportive of social behavior. Across both types of schoolyards more than 90% of parents find it true or completely true that the schoolyard supports children to play together and act responsibly towards each other. However, parents from schools with green and paved schoolyards differ in the degree to which they rate the schoolyard supportive of active and varied play. A large majority (92.7%) of parents from schools with a green schoolyard find it true or completely true that the schoolyard supports physical activity and varied play, against 76.6% of parents from schools with a paved schoolyard. These differences are even more pronounced for environmental behavior. On average, 63.6% of parents from schools with a green schoolyard find it true or completely true that the schoolyard supports children to learn about nature and to act responsibly to the environment, against only 24.7% of parents from schools with a paved schoolyard. However, parents in Study 2 rated environmental behavior as important (58.4%) less often compared to social behavior (92.6%) and active and varied play (95.4%).

Safety and dirt

In general not many problems with safety are reported. Most parents in Study 1, regardless of whether their schoolyard is green or paved, indicate that accidents and problems arising from children being outside of the view of the supervising teacher occur almost never or sometimes.

Across both studies, parents from schools with a green schoolyard report their child coming home dirty more frequently than parents from schools with a paved schoolyard. However, when asked whether they mind when their child comes home dirty, the majority of parents in both studies (> 78%) say they do not mind. In Study 1, where parents could only choose between 'yes' or 'no', there was no significant difference between parents from schools with green and paved schoolyards. In Study 2, where parents had the additional option of indicating that they mind 'a little', parents from schools with a green schoolyard significantly more often chose this option (27.7%) compared to parents from schools with a paved schoolyard (14.2%), $\text{Chi}^2(1) = 7.50, p < .01$.

Advantages and disadvantages of green schoolyards

In Study 1, parents were asked to list advantages and disadvantages of a green schoolyard by means of open-ended questions. Table 3 gives an overview of the themes that were identified and the prevalence of the themes amongst parents from schools with a green and parents from schools with a paved schoolyard.

Advantages

A total number of 270 advantages were mentioned by parents in Study 1, with an average of 1.97 per parent (range 1–6). Twelve out of 137 parents mentioned no advantages. One parent (from a school with a green schoolyard) explicitly said that she did not see any advantages of a green schoolyard. The average number of advantages mentioned did not differ between schools with a green and a paved schoolyard, $p > .4$. However, responses by parents from schools with a green schoolyard were generally more detailed and elaborate. For example, while a parent from a school with a green schoolyard would say 'gardens, animals, grass etc. constitute a healthy living environment

Table 3. Percentages of advantages and disadvantages of a green schoolyard mentioned by parents from schools with green and paved schoolyards, with test values (Study 1).

	Total (N = 137)	Green (N = 63)	Paved (N = 74)	Chi ²	p
Advantages					
Environment					
Aesthetics, nice atmosphere	30.7%	19.0%	40.5%	7.40	<.01
Nice play environment	16.8%	23.8%	10.8%	4.12	<.01
Activity					
Challenge ,discovery, adventure	22.6%	23.8%	21.6%	<1	ns
Varied play	16.8%	14.3%	18.9%	<1	ns
Physical activity	8.8%	12.7%	5.4%	2.27	.13
Shelter, play hide- and seek	3.6%	3.2%	4.1%	<1	ns
Nature					
Experience, connect, respect nature	21.2%	22.2%	20.3%	<1	ns
Learn about nature, outdoor education	15.3%	22.2%	9.5%	4.27	<.05
Health and well-being					
Healthy, restorative	26.3%	14.3%	36.5%	8.66	<.01
Safe, less incidents	10.2%	15.9%	5.4%	4.06	<.05
Protection from sun	7.3%	1.6%	12.2%	5.62	<.05
Other	6.6%	7.9%	5.4%	<1	.00
Disadvantages					
Maintenance and costs					
Dirt	25.5%	27.5%	32.4%	4.01	<.05
Dirt					
Dirt in general	12.4%	13.1%	14.5%	<1	ns
Dirty clothes	9.5%	14.3%	5.4%	3.13	.08
Safety and health					
Lack of overview	11.7%	12.7%	10.8%	<1	ns
Dangers and accidents	9.5%	7.9%	10.8%	<1	ns
Insects, pests, allergies	5.8%	7.9%	4.1%	<1	ns
Restricted play opportunities					
	10.2%	12.7%	8.1%	<1	ns

that can indirectly be very educational for children', a parent from a school with a paved schoolyard would simply say 'it is healthy and children can learn about nature'.

Advantages of green schoolyards were categorized into four broad themes. The first theme relates to positive aspects of the schoolyard environment. Within this theme, two subthemes were distinguished: aesthetics (e.g. a nice look and atmosphere), and a nice play environment for children (e.g. more pleasant for children to play). Although both advantages were broadly recognized, there were significant differences between parents from schools with green and paved schoolyards. First, while being the most frequently mentioned advantage by parents from schools with a paved schoolyard, aesthetics were less often mentioned by parents from schools with a green schoolyard. Instead, parents from schools with a green schoolyard most often mentioned as an advantage that the schoolyard is a nice play environment for children. This suggests that parents who have experience with a green schoolyard take more notice of how children experience and evaluate the schoolyard than parents who do not have such direct experience.

The second theme relates to children's activities afforded by the schoolyard. Within this theme, four subthemes were distinguished. First, the most frequently mentioned advantage within this theme is that a green schoolyard is challenging for children and promotes discovery, adventure and fantasy play. It is also frequently mentioned that a green schoolyard promotes varied play. Some parents also mentioned that a green schoolyard can promote physical activity, and provides places for hiding and shelter, that can be used, for example, to play hide- and- seek. There were no significant differences between parents from schools with green and paved schoolyards in the frequency with which these activity-related advantages are mentioned, although the promotion of physical activity was somewhat more often mentioned by parents from schools with a green schoolyard.

The third theme relates to the naturalness of a green schoolyard. Within this theme, the most frequently mentioned advantage by parents, regardless of whether their own schoolyard is green or paved, is that children can experience nature, connect to nature, respect nature, and enjoy being outdoors. Parents from schools with a green schoolyard also frequently mention that a green schoolyard enables children to learn about nature, and that it provides opportunities for outdoor education.

The fourth theme relates to health and well-being benefits. Within this theme, healthy and restorative effects (e.g. nature is calming, brings peace of mind, improves mood) are most frequently mentioned. Parents also mention that a green schoolyard is safe (mostly because the ground cover is soft, so that accidents from falling are less severe), and that it offers shadow and thereby protection from the sun. Parents from schools with a green schoolyard more often mention that it is safer for children, while parents from schools with a paved schoolyard more often mention benefits related to health and protection from the sun.

Parents also mentioned advantages that could not be classified into the four main themes. These other advantages included the naturalness of the schoolyard itself and the fact that it promotes biodiversity, that a green schoolyard stimulates all senses, that it provides opportunities for self-development, and that children feel at home in the schoolyard.

Disadvantages

A total number of 123 disadvantages were mentioned by parents in Study 1, with an average of 0.9 per parent (range 1–4). Thus, parents mentioned less than half as many disadvantages as advantages. Forty-eight out of 137 parents mentioned no disadvantages, of these, 21 explicitly said that they did not see any disadvantages. The number of disadvantages mentioned did not differ between parents from schools with green and paved schoolyards, $p > .37$. With a few exceptions, answers were generally short and not very detailed.

Disadvantages of green schoolyards were categorized into four broad themes. The first theme relates to maintenance and costs. Although it is broadly recognized that a green schoolyard requires more maintenance and is more expensive, this disadvantage is most frequently mentioned by parents from schools with a paved schoolyard.

The second theme relates to dirty clothes and dirt in general (e.g. children bringing sand into the classroom). Within this theme, children coming home with dirty clothes is somewhat more often mentioned by parents from schools with a green schoolyard. However, several parents (4.4%) explicitly added that they do not consider this to be an actual problem.

The third theme relates to safety and health issues. The most frequently mentioned disadvantage within this theme is a lack of overview, which makes it more difficult for teachers to keep an eye on the children, and gives children more hiding places where they can hurt other children. The second most frequently mentioned disadvantage in this theme is that green schoolyards can be dangerous and pose a higher risk of accidents, such as falling from a tree or drowning in a pond. Parents also mention health risks, such as nuisance caused by insects and pests, and allergies. The disadvantages within this category are generally mentioned by only few parents (< 13%) and there are no differences between parents from green and paved schoolyards.

The fourth theme relates to restricted play opportunities for children. This is a broad theme that includes several issues. Parents, for example, remark that the space that is taken up by trees and bushes cannot be used for playing, and some also say that a green schoolyard offers less opportunities for playing games like soccer. Parents also note that the playground can become muddy and less playable when it rains, and that grassy fields can be become trampled, after which they need to be fenced off for a long time in order to recover. Some parents also mention problems with vandalism and litter. There are no differences between parents from schools with green and paved schoolyards in the frequency with which these disadvantages are mentioned.

All disadvantages could be classified under the four main themes, parents did not mention any other disadvantages.

Parental involvement

Parents in Study 2 from schools with a green schoolyard answered several questions about their involvement and willingness to help. When asked how they were involved in designing the green schoolyard, 9.1% selected the option 'No involvement', 8.7% selected the option 'Only through the parent advisory council', 6.8% selected 'Only through a select group', and 5.3% selected 'All parents a direct voice'. Notably, parents from the same school often selected different types of involvement, indicating that it was not very clear to parents how involvement was arranged. This is further illustrated by the fact that 17.4% of the parents selected the option 'other, namely ...' and many who selected this option said they do not know how involvement was arranged.

When asked how they would prefer to be involved, most parents indicated that they prefer involvement through a representative group, for instance via the parent advisory council (39.0%) or a select group (27.6%). 'All parents a direct voice' was also chosen regularly (21.1%). Suggestions given at the answer option 'Other namely' were: putting the children and their wishes first, enabling all parents to send in ideas but having a select group take the decision, having no parental involvement or taking a democratic vote to several options (12.3% in total, each option individually < 5%).

When asked whether they would be willing to help with maintenance of the green schoolyard, over half of the 129 parents (51.7%) who answered this question said that they are not willing to help, 24.1% were willing to help regularly (every three months or more often), and 20.7% were willing to help every now and then (every half year or every year). Parents showed more willingness to help with activities such as organizing festivities or lessons in the green schoolyard. Only 25.4% of the 134 parents who answered this question were not willing to help with activities, 42.5% were willing to help regularly, and 22.5% were willing to help every now and then.

When asked whether something hindered them in helping with the green schoolyard, most of the 112 parents who answered this question reported they do not have enough time to help (36.6%). Approximately 1 in 5 parents (22.3%) did not report any obstacles. Other parents said they feel school is already too demanding in requesting help (16.9%), that they did not know there was a need for help (6.2%) or lack the expertise needed (5.3%). Reactions given at the answer option

‘Other namely’ were: a school shouldn’t ask parents for this, I don’t feel like it, personal circumstances, children and teachers should be involved first, major maintenance is needed before leaving it up to volunteers, or that they are unhappy with the green schoolyard altogether (all < 5%).

Discussion

In the present study data from two studies in the Netherlands were used to gain more insight in parental perspectives on green schoolyards. Parents from schools with a green schoolyard generally showed higher appreciation of their schoolyard than parents from schools with a paved yard, as indicated by their higher levels of satisfaction and more positive evaluations of the atmosphere at the schoolyard. However, green schoolyards were rated as less ‘clean and safe’ than paved schoolyards, and parents reported higher frequencies of children coming home dirty. Most parents said they do not really mind when this happens, although parents from schools with a green schoolyard more often minded a little than parents from schools with a paved schoolyard. These findings are in line with previous evaluations of green schoolyards (Van Nispen tot Pannerden, Tegels, and Van Laar 2014) which also indicate that parents usually do not mind dirty clothes, if a school invests in involving parents and creating support for the green schoolyard. In general, the findings of the present study suggest that parents do appreciate the green schoolyard and recognize its positive qualities.

Most parents find it important that children can engage varied and active play in the schoolyard, and they generally consider their schoolyard supportive of these behaviors. Parents from schools with a green schoolyard, however, more often report that their schoolyard supports varied play behavior and physically active play than parents from schools with a paved schoolyard. This is consistent with previous research showing that green schoolyards can stimulate more varied and active play behavior (see for a review, Chawla 2015). When asked separately for boys and girls, parents only report girls to be more physically active in green schoolyards. This finding is consistent with previous research (Coen et al. 2019; Pagels et al. 2014), and can be related to the fact that paved schoolyards are often dominated by boys playing soccer and other high speed activities, while green schoolyards offer more diverse opportunities for active play that also appeal to girls (Mårtensson et al. 2014; Mitchell, Tillmann, and Gilliland 2018).

Parents also find it important that children engage in social behavior in the schoolyard. Both parents from schools with a paved schoolyard and parents from schools with a green schoolyard generally consider their schoolyards to be supportive of social behavior. This finding goes against general notions that contact with nature can foster social cohesion and affiliation with friends (Hartig et al. 2014). However, school children tend to spend much of their time playing together, and conflicts do not happen very often and may not be very noticeable to parents. This suggests the importance of informing parents on the possible benefits of schoolyard greening for children’s social well-being.

An advantage of green schoolyards that is generally recognized by parents is that these provide more opportunities for learning about nature and how to act responsibly to the environment. This finding is in line with pedagogical views on the value of natural playgrounds for outdoor education (Bentsen, Mygind, and Randrup 2009). However, since many parents also indicate that they do not find it very important that a schoolyard supports environmental behavior, this advantage should not be overestimated.

In general, parents see more advantages than disadvantages of a green schoolyard. Moreover, many parents emphasize that disadvantages, such as children coming home dirty more often, are not very important to them. Parents from schools with green and paved schoolyards broadly recognize the same advantages and disadvantages. However, parents who have experience with a green schoolyard are more detailed and elaborate in their answers, more often frame the advantages from a child perspective, and they are less concerned about disadvantages related to maintenance and costs. This inside information could be shared with parents from schools with paved schoolyards to give them a more positive and realistic image.

Parents from schools with a green schoolyard indicate they want to be involved, in designing the schoolyard by a representative group, and individually in helping with activities and to a lesser extent with maintenance. This basically positive attitude provides a starting point for more action-oriented, participatory approaches to creating involvement, such as the formation of inclusive learning communities that link parents, teachers, and children in partnership (Davis and Cooke 1998). These approaches may help partners to discover forms of collaboration that appeal to shared interests, needs and abilities, instead of schools just hierarchically asking parents to do what they want. For example, by assisting teachers with outdoor learning in the green schoolyard, parents may become more engaged with both the green schoolyard and children's learning (Goodall and Montgomery 2014; Van Dijk-Wesseliuss et al. 2019).

Strengths, limitations and implications for future research

This study provides some first insights in parental views on green schoolyards. Because there was a group of parents with children in schools with a green schoolyard and a group with children in schools with a paved schoolyard, comparisons could be made instead of showing one side of the story. The combination of closed and open-ended questions gives a wide array of information. At the same time, the use of pre-structured questionnaires poses a limitation, often only one sentence or one word, limiting in-depth insight in their views. Many respondents gave very short answers to the open-ended questions. Future research could use face-to-face interviews with parents to gain more extensive insight.

Another limitation is that this study may not be fully representative due to overrepresentation of highly educated women and the low response rate in Study 2. Future research could use techniques that ensure a higher and more gender-balanced response, for example, a survey that is given to the parents directly during parent night. Another concern with representativeness is that this study was done in the Netherlands, with cultural values possibly affecting the results. As the green schoolyard movement is gaining momentum in other countries too (Hoffman 2010), future research could look at parental opinions in an international setting.

Because the study used a cross-sectional design, causal inferences about the impacts of a green schoolyard cannot be made. It is possible that differences in parental views between green and paved schoolyards are caused by variables other than naturalness. For example, green schoolyards were bigger than paved schoolyards, which may partly explain the differences. By using longitudinal or experimental designs future research may provide more insight into the causal role of naturalness in parental views of schoolyards.

A last limitation is that this study used questions on how parents think their children experience the schoolyard. However, answers to these questions may have limited validity since parents spend little time at or near the schoolyard while children are playing there. When answering the questions, parents probably relied mostly on their children's (and their teachers') stories. So some caution is warranted in drawing inferences from the current findings on the impact of green schoolyards on children's play behavior and well-being. Future research could place parental views next to the views of teachers and children to gain a more complete image of users' views of a green schoolyard. Comparison with objective measurements (e.g. accelerometer assessments or systematic observations of play behavior) can provide insight into how accurate parental views are when it comes to green versus paved schoolyards.

Concluding comment

In conclusion, this study shows that parents recognize many advantages of green schoolyards but they see downsides too. Thus, for schools it is important to communicate about the up- and downsides of a green schoolyard, why choices are made and how obstacles can be overcome. Parents want to be involved in the green schoolyard, but only up to a certain extent. Thus, schools should embrace

the positive perception of parents and be sensitive for their needs, concerns and capabilities. A good starting point for collaboration can be parents' willingness to help with activities. In general, the results indicate a potential for parental involvement in green schoolyards, which, if used in a careful and constructive way, may contribute to the development of a blossoming green schoolyard where children can prosper and grow.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by the Netherlands Organisation for Scientific Research (NWO), grant PRO 4-18.

ORCID

Janke E. van Dijk-Wesselius  <http://orcid.org/0000-0003-2108-2116>

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