Understanding environmental attributes associated with 'Wartezustand' refugee children's physical activity: studies of refugee accommodations in Berlin

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Figure 0 Acknowledgements

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*. means this accommodation is closed by script summarising time, same as below, more details in AT1.2.4.

Abbreviations

PA: physical activity

UNICEF: United Nations High Commissioner for Refugees

UMRs: unaccompanied minor refugees

AMRs: accompanied minor refugees

BAMF: Bundesamt für Migration und Flüchtlinge (Federal Office for Migration and Refugees)

BumF: Bundesfachverband unbegleitete minderjährige Flüchtlinge (Association for Unaccompanied Refugee Minors)

SenFin: Senatsverwaltung für Finanzen (Sarrazin Senate Department of Finance)

EAE: Erstaufnahmeeinrichtungen (initial reception)

GAE: Gemeinschaftsunterkunften (community accommodation)

MUF 1.0/2.0: Modulare Unterkünfte für Flüchtlinge (Modular accommodation for refugees)

LAF: Landesamt für Flüchtlingsangelegenheiten Berlin (State Office for Refugee Affairs Berlin)

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

HIC: high-income country

LMIC: low- and middle-income country

GIS: Geographic information system

FNP: Flächennutzungsplanung Berlin (Land use planning Berlin)

AWO: Arbeiterwohlfahrt landesverband Saarland e.V (Saarland State Association of Workers' Welfare e.V)

EJF: Evangelisches Jugend- und Fürsorgewerk AG (Evangelical youth and welfare work AG)

Abstract

Studies have shown that refugee children often spend a considerable amount of time in refugee accommodations, where they face an uncertain transition (wartezustand). Such temporary settings make it difficult for refugee children to engage in physical activity (PA), which is essential for their health and development. It has been shown that a large proportion of refugee children are not sufficiently physically active. It is possible that the built environment around refugee children hinders them from being active. There is a strong evidence base for neighbourhood environmental attributes associated with non-refugee children's PA. However, this evidence base is unlikely to apply to refugee settlements, as they are unique and different from typical neighbourhood environments. To facilitate refugee children's PA, it is necessary to identify environmental factors in relevant contexts associated with their PA. The literature review of this dissertation identified a small number of studies on this topic. However, research is still at an early stage, and there is limited understanding of how diverse environmental attributes in and around refugee accommodations are related to children's PA levels. The dissertation, therefore, examined the following three research questions, each focusing on distinct aspects of refugee settlements:

a. What are micro-environmental characteristics of refugee accommodations associated with refugee children's PA?
b. What are meso- environmental characteristics around refugee accommodations associated with refugee children's PA?
c. What are perceived environmental barriers and facilitators of refugee children's PA in/around refugee accommodations, from both parents' and children's perspectives?

Six refugee accommodations in Berlin were selected as primary study sites. Quantitative and qualitative research methods were used to investigate the abovementioned research questions. For research questions a and b, space syntax was mainly used to investigate the spatial characteristics of refugee accommodation in spatial characteristics of micro environments (within refugee accommodation) and meso environments (around refugee accommodation). Refugee children's overall PA time and identified PA spaces (internal, external, formal and informal) were collected with staff surveys, field trips and open source. For research question c, the detailed PA timelines of 15 refugee children (6 to 13 years old) and perceptions of PA environments by children and parents were captured by questionnaires and drawing workshops from one representative accommodation. Moreover, semi-structured interviews and photovoice sessions were conducted with three children to obtain an in-depth understanding of children's perspectives of existing environments for PA.

In micro environments, results indicated that PA space size was unrelated to children's PA. The vital predictors were more straightforward spatial layouts, fewer floors, and accessible corridors that were easy to reach internal and external PA spaces. On the other hand, children spent less time on PA for accommodations with more complex spatial structures, floors, unconnected corridors, and difficulty reaching PA.

In meso environments, children spent more time on PA, and more active PA spaces could be found if neighbourhoods had more investigated road segments and PA spaces located in highly accessible road networks.

Refugee children and their parents identified micro environments as the centre of their daily PA; therefore, external and internal PA spaces were important for children's PA. Moreover, having informal PA spaces in meso environments facilitated their PA, and children regarded them no different from formal PA spaces. However, most refugee parents expressed their concerns about the lack of safe, accessible neighbourhood playing fields.

Building on the findings, evidence-based design strategies to help refugee children be more active in refugee accommodations were proposed. They include both micro-environmental attributes within refugee accommodation and meso-environmental attributes around refugee accommodation. They will inform policymakers, designers and refugee accommodation managers in retrofitting existing refugee facilities and designing/locating new refugee facilities, with a view to encouraging refugee children's engagement in PA. Supplementary, spatial typologies (micro) and neighbourhood forms (meso) which supported children's PA were summarised on this basis, to which related-participators can evaluate existing buildings (micro) or location choice (meso) for refugee accommodation purposes.

Keywords: refugee settlement; active play; barriers; built environment; space syntax

Chapter 1. Background and Literature Review

1.1 Introduction

Research has identified built environmental attributes are associated with children's physical activity (PA). However, less is known about the environmental correlations of refugee children's PA. This chapter first introduces backgrounds of refugee accommodation systems for children and their families in Germany and existing built environments for refugee children's PA. The narrative review summarises the current evidence of associations between built environment attributes and refugee children's PA. Six databases were searched with three sets of terms related to exposure (built environment), outcome (PA), and target population (refugee children aged 6-12 years). Eight studies (one quantitative; seven qualitative) met the inclusion criteria. Key PA barriers were limited play space and lack of neighbourhood safety. The design of refugee facilities and surrounding environments should provide better access to formal, informal and safe spaces for children's play.

This discussion will identify the research gap to current evidence of associations between built environment attributes and refugee children's PA and establish three potential research questions that will be explored further in this dissertation: spatial characteristics in micro and meso environments, perceived environmental barriers and facilitators, and refugee children's PA. These three research questions bring all theories, objectives and studies together to contextualise the structure of this dissertation.

1.2 Refugee children and accommodations in Germany

1.2.1 Definitions

The author would like to identify several terms which will be discussed in this dissertation:

School-aged refugee children

This dissertation will refer to 'refugee' children. The word will cover children with (or whose parents have recognised) refugee status or who are asylum seekers (Hek, 2005).

The terms' refugee' and 'asylum-seeker' have specific legal and social meanings:

An asylum-seeker is a person who has crossed an international border in search of safety and applies to be given refugee status under the 1951 UN Convention (the paragraph below will explain the definition under German context).

A refugee is "…someone who is unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion." under the Geneva Refugee Convention status of refugee (UNHCR, 2019).

Not all refugees entering Germany are entitled to asylum systems. The asylum law offers different protection types for refugee children and their families, mainly depending upon their country of origin and threat to their lives upon returning. On this basis, three types of identity status can be given from current situations in Germany (Federal office for migration and refugees, 2019):

1. An asylum seeker – is a person who intends to file an asylum application but has not yet been registered by the related office as a formal applicant.

2. An asylum applicant – is a person whose case is still with the BAMF and whose status has not yet been decided.

3. A person entitled to protection or entitled to remain – is a person who has been identified as a refugee or receives an alternative form of protection by the German state.

The term 'unaccompanied' means human beings under the age of 18 who have been separated from both parents and is not cared for by an adult who, by law or custom, is responsible for doing so (UNHCR, 1997), so-called unaccompanied minor refugees, UMRs.

The report of German refuge children by Berthold (2014) mentioned that school-aged (6 to 12 years old) is the main focus of child-specific care; most are accompanied refugee children (so-called accompanied minor refugees, AMRs) with their families, which is also the focus group of our dissertation.

Wartezustand/transit period

Legislative changes in the right of asylum and residency extend allowable length of short term refugee accommodation (initial receptions) from three to six months. However, present studies showed that it is not a single case for them to stay longer than eight months or even years (BumF & UNICEF). It also reported in six primary study sites later in Chapter 3 that families might stay in refugee accommodations for years. Otherwise, in principle, refugee accommodation is explicitly excluded from the child and youth welfare law (§ 44 Abs. 3 S. 1 AsylG I.V.m. § 45 SGB VIII)[1]. these temporary living conditions put pressure on refugee families.

Lewek and Naber (2017) notice that refugee children are primarily in "wartezustand" in Germany. They are waiting for a permanent stay, access to education or health services, participation in leisure activities, or merely a decision about where they will spend their future. These stresses can affect the development of children adversely.

During the data collection, changing parameters happened all the period (e.g., legal changes, restructuring of the asylum and reception system, new forms of emergency management). This dissertation documents this "wartezustand" from the perspectives of available documents, study sites and in-depth interviews with home managers, children care departments, refugee parents, and refugee children themselves. It does not aim to provide general information about situations in all refugee accommodations in Germany due to the nature of studies and the size of the samples. The study focuses on meaningful insights into the primary problem areas and documents realistic situations of refugee children in their accommodations, which also go beyond the research aims.

It is also worth mentioning that only recently (75% of examined studies in review published after 2015, 100% after 2010), the voices of refugee children been presented and heard by our practitioners and researchers—the information presented in this research where refugee children's actual words are putting forward.

Micro, meso, and macro environments

Much less research has focused on refugee accommodations and their surroundings as an individual built environment level (Edwards, 2004; Rima et al., 2006). Researchers have explored these *built environments* critically and tried to define the various nuances in the process. For instance, Zeiher (2003) argues that some facilities are spatially limited and subject to temporary access restrictions

1 The operating permit procedure in SGB VIII ensures that facilities where children and adolescents are permanently housed should be designed to ensure the well-being of children and adolescents.

since they are often designed by adults. There is no necessity for children to overcome these restrictions by exploring new activities or going elsewhere to pursue them, leading to spatially fixed physical activity structures (Kim et al., 2014). A more specific definition of environments should be defined.

Bronfenbrenner's ecological systems theory (1986) has been applied as a framework to understand refugee children's day-to-day activities (Yohani, 2008; McBrien & Day, 2012). The built environment around refugee children includes three environmental layers of interest: *micro environment; meso environment,* and *macroenvironment*. The *micro environment* is the immediate vicinity of the child's accommodation and contains the structures with which the children directly contact in their daily lives (McBrien & Day, 2012). Examples include the home/refugee camp and its designated playground (Hjern & Bouvier, 2004). The *meso environment* is the intermediate layer beyond the immediate surroundings but within the broader neighbourhood, including local schools, communities, streets and open spaces. The *macroenvironment* involves large-scale features of urban environments such as access to transport infrastructure and regional centres (Popyk et al., 2019). Figure 1.2.1 is a conceptual diagram illustrating these three layers.

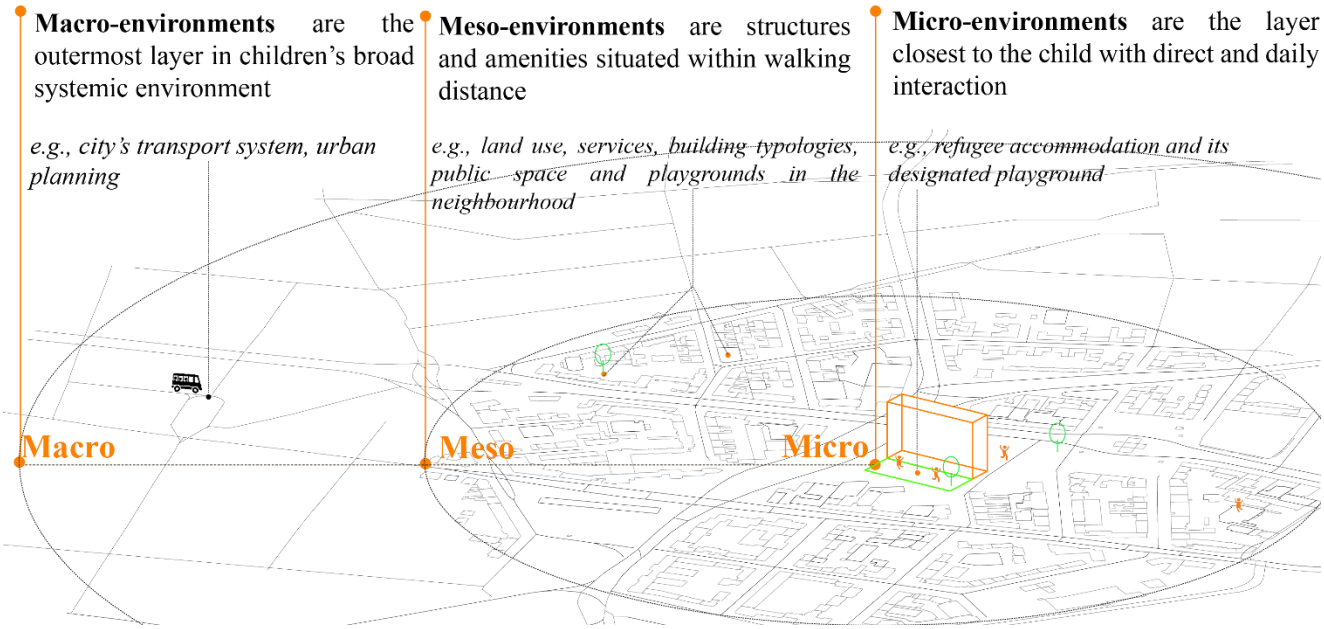


Figure 1.2.1 Diagram of environmental attributes on micro, meso and macro level interacting with refugee children's PA

1.2.2 Demographics of refugee children

The European refugee crisis (2020) resulted in more than 1.8 million people coming to Germany for asylum-seeking in the past few years, among which one-third are underage (BAMF, 2020a); moreover, extensive adjustments to laws on asylum and residence (Asyl- und Aufenthaltsrecht) came into force (Die Bundesregierung, 2015). Both factors had significant impacts on refugee accommodation systems in Germany. Despite enormous efforts at all levels, local authorities, states, and federal governments were overburdened to cope with realistic situations, resulting in delaying distribution of refugees among municipalities. While some families were able to move into private homes (Privatwohnung) directly after leaving initial receptions (Erstaufnahmeeinrichitung), others were allocated to emergency accommodations (Notunterkunft) and community accommodations (Gemeinschaftsunterkunft) for several years (Lewek & Naber, 2017, Table 1.2.21). Still, many

fugitive families were provisionally surviving with their children in tents, gymnasiums, and other temporary shelters (Beikler, 2017; Diemand, 2017; fluechtlingsrat Bremen, 2015).

Table 1.2.21 How long do children, youngsters and families stay on average in initial receptions?

Less than seven days	8.30%
Less than one month	9.70%
Less than three months	29.20%
Less than six months	**30.60%**
Less than eight months	**6.90%**
Less than one year	**11.00%**
as long as one year	**2.80%**
as long as five years	**1.40%**
in total investigated initial receptions	72

Source: UNICEF Report (2017), BAMF

As shown in Table 1.2.22, on average, 44% of the refugee/asylum seekers in Germany are underage; and 6.5% are school-aged (6-12). AMRs are explicitly included in figures as 'dependents' since they are considered as being taken care of by their relatives. Actually, more refugee children might stay in Germany since these official figures are based on those who applied for asylum. Currently, no available database holds statistics on AMRs and UMRs separately.

Table 1.2.22 Underaged asylum demographic by age in Germany (2015 to 09.2021)

Age group	**Year**							on average
	2015	2016	2017	2018	2019	2020	01-09.2021	
Under 6 years old	13%	15%	26%	30%	33%	36%	32%	26.3%
6 to 11 years old	**7%**	**8%**	**7%**	**8%**	**1%**	**7%**	**7%**	**6.5%**
11-18 years old	11%	13%	12%	11%	10%	10%	11%	11.0%
Under 18 years old	31%	36%	45%	48%	43%	53%	50%	43.9%
In total /number	138314	45072	89243	78213	53863	102581	52540	79975

Source: Das Bundesamt in Zahlen every year from 2015 to 09.2021, BAMF

There are also available statistics relating to nationality. Until September 2021 (BAMF, 2020b), the most applications in Germany were from Syria, Afghanistan, Iraq, Turkey, mix-countries, Somalia, Georgia, Eritrea, Nigeria, and Iran Islam. Republic. For UMRs, the leading countries of origin from the latest annual report were Afghanistan, Somalia, Guinea, Eritrea, Syria, Iraq, and Gambia (Deutscher Bundestag, 2020). Consequently, Germany receives applications from over 100 countries. These figures reflect particularly volatile situations: asylum figures indicate an increasing number of refugee children who stay in transit/waiting periods, ongoing conflicts, and deprivation across countries in the world.

1.2.3 Asylsystem and refugee accommodation in Berlin

Refugee accommodation (micro) and its immediate neighbourhood (meso) were centres of refugee children's built environments and daily lives. The present studies show the issues of built environments that affect children's daily life, such as lacking indoor space for privacy (Berthold, 2014), conflicts from space occupation (Anderson, 2001), lacking infrastructure for daily life activities (BumF & UNICEF, 2016), or what this dissertation concerns, refugee children themselves

find ‘no available place’ for playing in existing built environments (Anderson, 2001; Berthold, 2014; BumF & UNICEF, 2016; Lewek & Naber, 2017).

To identify and further investigate this issue, refugee children’s living conditions during their asylum applications in Germany, or more specific, in Berlin, need to be introduced. Figure 1.2.3 illustrates accommodation types for refugee families upon their asylum process: after asylum application submission, refugee families are designated to live in arriving centres or nearest available refugee accommodations. The competent federal states will then distribute them into an initial reception (Erstaufnahmeeinrichtung, EAE) as their first station in Germany. This process is called EASY distribution (BAMF, 2018a). After applications evaluations, most families will be settled in community accommodation (Gemeinschaftsunterkünften, GAE) for internal distribution. Private residences are possibly directly after leaving EAE (e.g., in Berlin) or a specific evaluation. Accommodation distributions may differ depending on federal states, but the entire accommodation decision happens before the asylum procedure completion[2]. Families from safe countries of origin (BAMF, 2018b) may be required to stay in EAEs or emergency receptions for an uncertain period.

Besides basic distribution refugee accommodation processes, two new types came into force to cope with inadequate living situations. Temporary residential containers, so-called “Tempohomes”, are built in Berlin for refugees’ transitional period staying until regular accommodations are available (State Office for Refugee Affairs Berlin, 2020).

Another type is Modular accommodation for refugees (MUF). This 46-weeks completed building, from prefabricated concrete modules, is high standard with an 80-years guarantee (LAF, 2018). On 23rd February 2016, the Senate meeting reached a consensus for MUFs (Pankower Allgemeine Zeitung, 2016). 28 locations were selected in coordination with different districts and contractors. More than half are in operation right now. MUF 2.0 is the second generation of MUF; 25 locations were decided in a Senate meeting in March 2018 (SenFin, 2018). In total, 53 new MUFs are under construction in Berlin.

For UMRs, accommodations will be covered in special reception (besondere Aufnahmeeinrichtun) under a child and youth welfare framework. There are no clear boundaries between these UMRs and AMRs: they may have entered as UMRs but later reunited with their families in Germany or other countries and became AMRs (FOCUS Online, 2017).

By data summarisation, refugee accommodation systems were still under development. New forms/prototypes of refugee accommodations are emerging.

2 For an overview of the accommodation requirements of the individual federal states cf. Wendel (2014): Accommodation of Refugees in Germany, p. 59 ff. After recognition by the BAMF, refugees are obliged to move out of the community housing, since they are no longer provided for under the Asylum Seekers Benefits Act. If you find an apartment, the Job-center will pay the rent. If they do not find a home, they may either stay in the temporary housing or become formally homeless and must be housed as homeless by the responsible municipality.

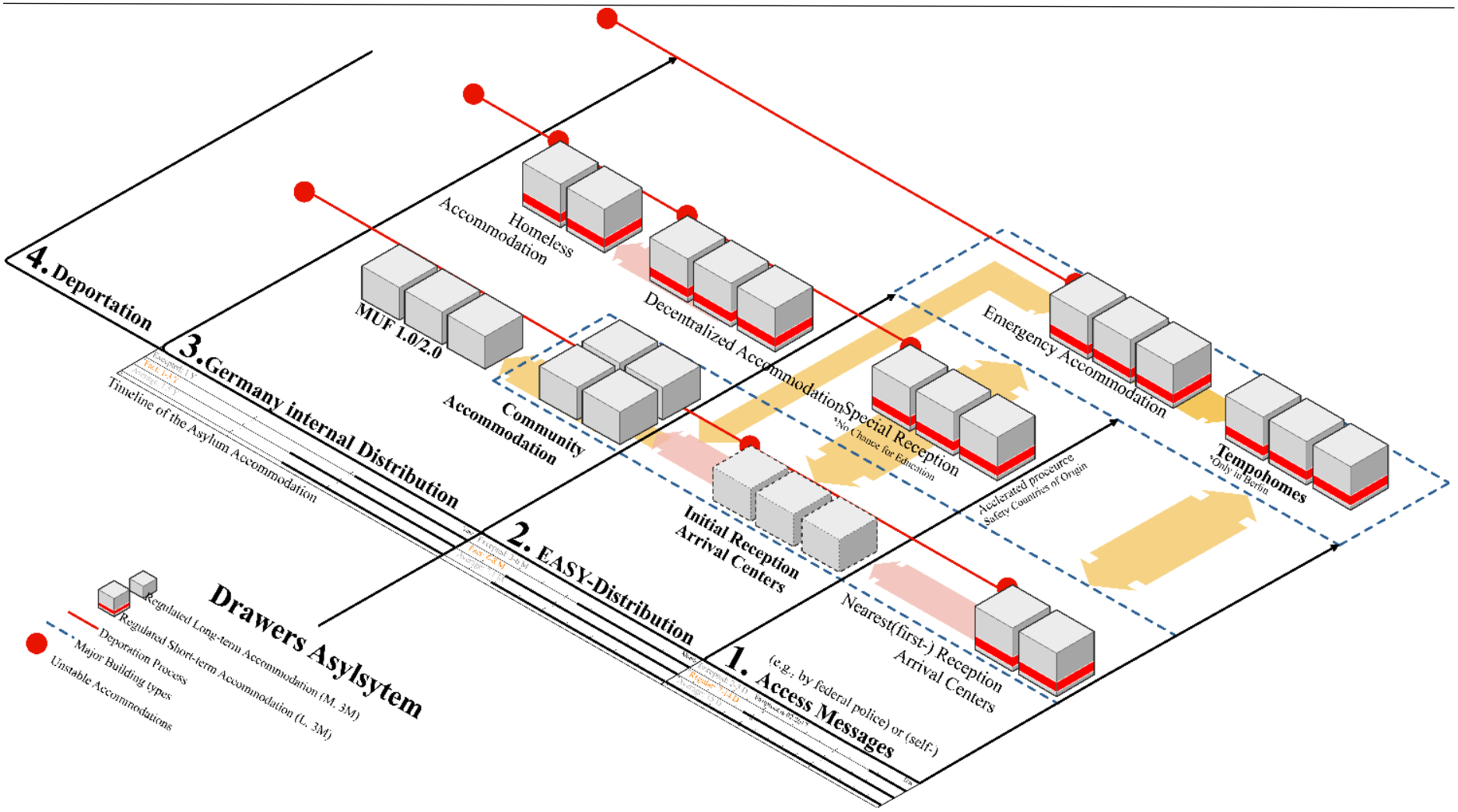


Figure 1.2.3 Accommodation and Asyl system for refugee families

source: UNICEF and BAMF report, State Office for Refugee Affairs Berlin (LAF)

1.2.4 Overview of investigated refugee accommodations in this research

As shown in Figure 1.2.41, six primary refugee accommodations (A to F) are investigated in micro and meso environments from Chapter 3 to 5. As a supplement in Chapter 6, four more refugee accommodations (AD1 to AD4) are investigated in micro environments, and 12 additional refugee accommodations(AD1 to AD12) are investigated in meso environments. The chosen sites in this dissertation involved identifying through particular criteria such as accommodation types, sizes, numbers of children residents, database accessibility and locations (sampling strategy in Chapter 2.5). Appendices Table 1.2.4 provides an overview of refugee accommodations and their neighbourhoods investigated in this dissertation.

For all accommodations that will be investigated in micro environments, half (5) are EAEs; one is emergency accommodation, and another is a special accommodation (for UMRs or single mothers with children). Moreover, there are two Tempohomes, and the rest five are GAEs. On the subject of all investigating accommodations, Nine of them already closed by the scripting summarising time (10.2021[3]). The operating accommodations are either well-operated EAEs or newly built MUFs; a similar situation is also indicated in Figure 1.2.42. Since the numbers of refugee accommodations reflect direct numbers of asylum-seekers, the accommodation types reflect their living conditions. It is evident that the refugee accommodation system in Berlin is becoming more organised from experience.

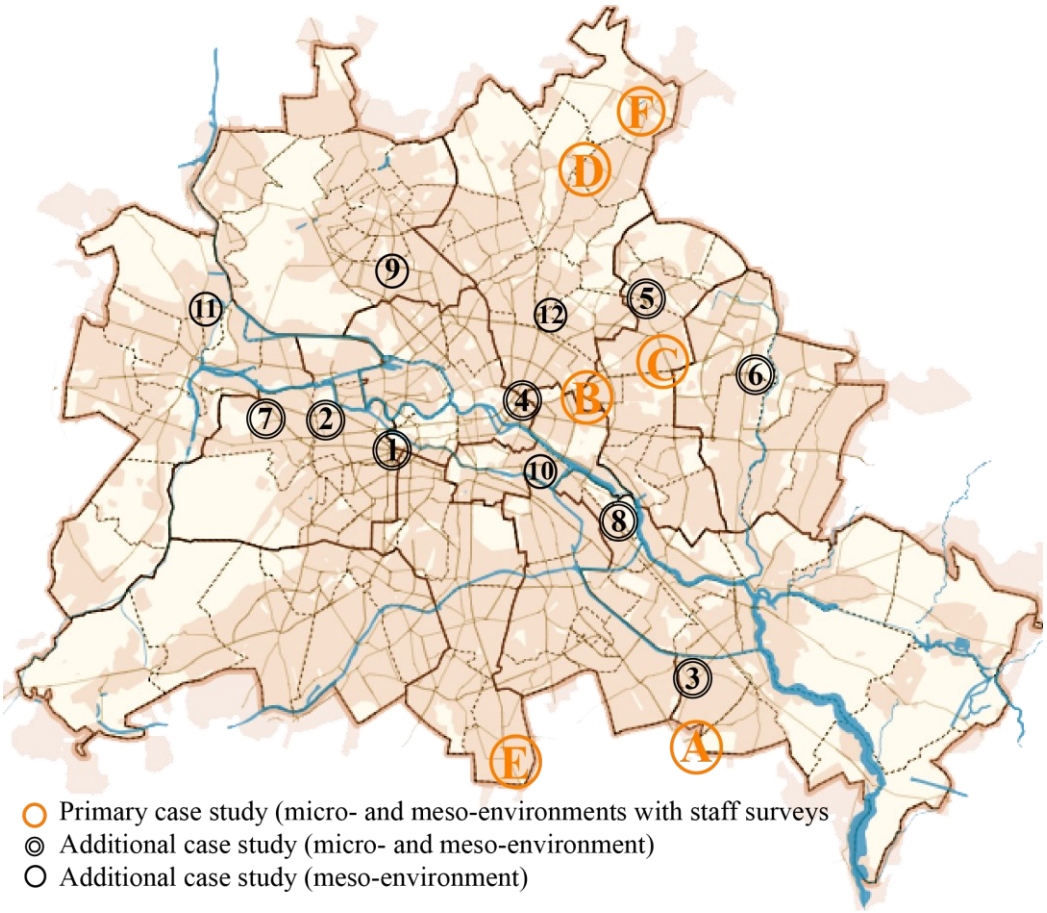


Figure 1.2.41 Investigated refugee accommodation by geographic distribution

[3] This is the summarising time for all collected data, individual case will be mentioned separately.

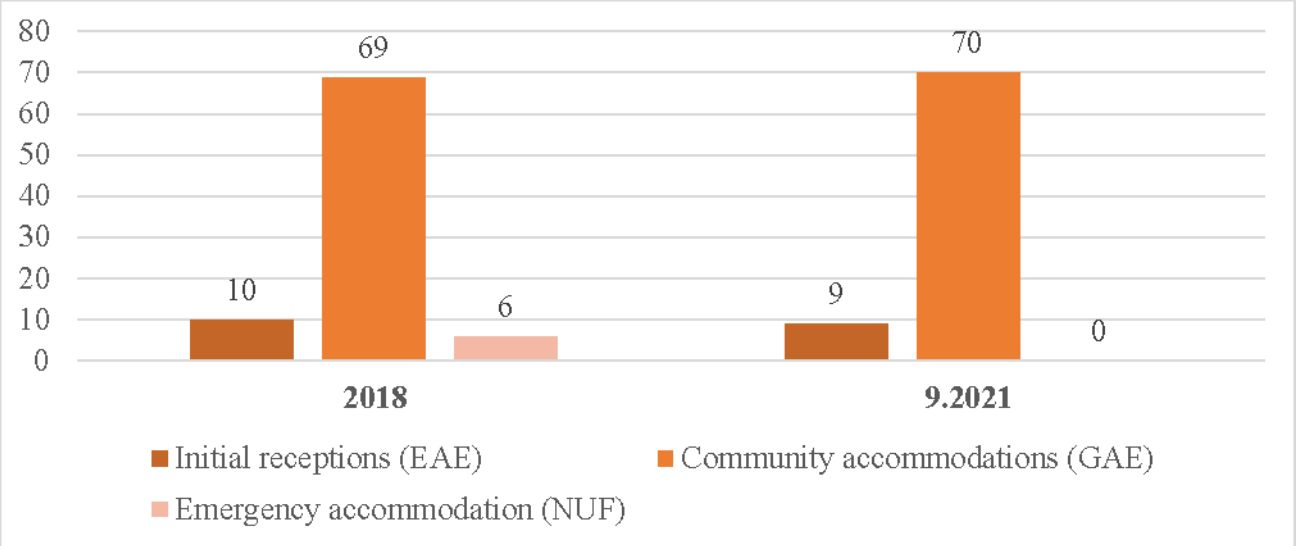


Figure 1.2.42 Refugee accommodation numbers by types in Berlin: 2018 vs 09.2021 (source: State Office for Refugee Affairs Berlin (LAF))

1.3 Review background

Physical activity is known to provide health benefits to children (Janssen & LeBlanc, 2010). It helps children build a robust body, stable mental health and healthy relationships with peers (Salvy et al., 2008; Mota et al., 2009; Ahn & Fedewa, 2011). Despite the strong evidence supporting the health benefits of PA and public health efforts to promote children's PA, over 80% of children globally do not meet the recommendation of engaging in 60 minutes of moderate-to-vigorous intensity PA per day (Guthold et al., 2020). Thus, increasing PA among children is a critical public health goal (Twisk, 2001; Tremblay et al., 2011; Okely et al., 2012).

PA levels appear to be even lower among refugee children who have recognised refugee status or are asylum seekers (Hek, 2005). A UNICEF report showed that refugee children rarely met daily PA guidelines (Lewek & Naber, 2017). Being physically active can be particularly beneficial for refugee children, who have to live in unfamiliar and uncertain situations, which can be stressful (Anderson, 2001). Participation in PA and sport can also help them build social ties with peers, transcending national boundaries and language barriers (Block & Gibbs, 2017). Since refugee children have limited opportunities to engage in organised sports and exercise (Montgomery, 2002, Allport et al., 2019), taking part in informal PA such as active play is particularly important for them (Hertting & Karlefors, 2013). Given that the number of refugees and their children is increasing (European Refugee Crisis, 2020) and that lack of PA can have a long-term impact on children's health and development (Mei et al., 2016), it is critical to develop policies and initiatives that can promote PA among refugee children.

Multiple factors may be modified to facilitate children to be physically active. One relevant domain is the built environment, which refers to human-made space and structure in which people live, work/study and engage in recreation on a day-to-day basis (Roof & Oleru, 2008). Built environmental attributes have been shown to be associated with non-refugee children's PA Several literature reviews (Sandercock et al., 2010; Ding et al., 2011; Maitland et al., 2013; Sterdt et al., 2014; Messing et al., 2019) have reported that built environmental attributes such as access to physical activity facilities (playgrounds, greenspaces), availability of sidewalks, neighbourhood perceived safety, and levels of development (urban vs rural) are consistently associated with non-refugee children's PA.

However, the existing findings of environmental attributes relevant to non-refugee children's PA may not apply to refugee children. Non-refugee and refugee children live in very different settings. For example, refugee families and their children are typically assigned to refugee camps or other temporary accommodation once they arrive in a host country (Federal office for migration and refugees, 2019). Such facilities are often built in isolated and inaccessible areas of cities (Bhimji, 2016). Even those granted long-term/permanent visas tend to have limited options about where to live and are more likely to reside in disadvantaged areas (Dunkerley et al., 2006). Due to such living arrangements, it is possible to argue that refugee children live in less favourable conditions than non-refugee children for engaging in PA (Lewek and Naber, 2017). An increasing number of studies have begun to investigate environmental attributes associated with refugee children's PA However, to build an evidence base that can inform relevant policies to promote refugee children's PA, research findings on this topic need to be synthesised. The investigations mentioned above and research paid little attention to built environments, the design or spatial characteristics of refugee accommodations and their neighbourhoods; however, this research gap should be identified and investigated.

1.4 Review methods

1.4.1 Study search and screening procedures

A systematic search of peer-reviewed publications was conducted by one author (SC) in August 2020. Six electronic databases (PubMed, Web of Science, SPORTDiscus, ERIC, ScienceDirect, and SpringerLink) and one refugee-related journal (Journal of Refugee Studies) were individually searched using three sets of search terms on built environments, physical activity, and the target group. A full description of search queries is shown in Appendices Table 1.4.1. The study selection and screening process were managed using Zotero reference manager software (Corporation for Digital Scholarship, 2020). The articles identified in the search were screened based on their title and abstract first, then based on full text. The initial screening was performed by one author (SC), with randomly selected studies re-evaluated by another author (MK) for consistency. Screening based on full-text articles was carried out by SC, and the results were checked by AC. Any disagreements between them were resolved in consultation with TS. This review was preregistered in PROSPERO (CRD42020201186).

1.4.2 Inclusion criteria

The following inclusion criteria were applied: (1) peer-reviewed journal articles published in English between 2000 and 2020; (2) studies including healthy refugee children and unaccompanied refugee minors aged between 6 and 12 years old; and (3) studies examining associations of built environmental attributes with refugee children's PA either quantitatively or qualitatively. Articles with a broader age range were considered eligible if they included the 6-12 years age group, and distinct environmental correlates may exist for PA among younger children (2–5 years) (Lovasi et al., 2011) and adolescents (13–18 years) (McGrath, 2015; Roemmich et al., 2018). Studies where parents reported children's PA were also eligible. The review start date of 2000 was chosen, given that refugee children's physical activity has been examined only recently.

1.4.3 Data extraction

The following information was extracted from each article: author; publication year; study type (quantitative/qualitative), study design (quantitative only); sample characteristics (size, age, country of origin); study settings (location/host country, length of stay); built environmental attributes (categorised into micro, meso, and macro levels) and measurement methods; PA measures and measurement methods; analysis methods; and findings. Relevant data were extracted, double-checked and all studies were independently appraised by two authors (SC and AC). Any

discrepancies were resolved through discussion between them.

1.4.4 Data synthesis

It was considered that assessing the quality of each study formally would not add useful information at this stage due to the fact that research on refugee children's PA and the built environment is still at an early stage, where most studies are cross-sectional, small scale, and exploratory. A relationship between an environmental attribute and a PA measure was considered a distinct case for quantitative studies. A positive relationship between them (e.g., more playgrounds related to more PA) was coded "+", while non-significant relation was coded "0". Qualitative studies were analysed thematically using NVivo software in three stages: (1) line-by-line coding of primary studies; (2) organising codes into themes and (3) development of analytical themes. Differences in opinion between the reviewers were discussed until consensus was reached. A narrative review was chosen after a full-text evaluation of included studies due to a small number of eligible articles, most of which were qualitative in design. These reasons also precluded meta-analysis. The final integrated synthesis consists of a narrative commentary for each of three built environment levels and combines the results of quantitative and qualitative syntheses.

1.5 Review results

1.5.1 Characteristics of the studies reviewed

Figure 1.5.1 shows the article search/screening process flowchart according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement (Moher et al., 2009). A total of 493 studies initially identified were reduced to 47 after screening based on title and abstract. Of these, eight studies (one added at the last stage from authors' reference lists) remained after the full-text screening. Characteristics of the selected studies are presented in Table 1.5.1. Most (75%) studies were published in the past five years, and half were conducted in the USA. One of the included articles examined a local refugee camp in Palestine(Veronese et al., 2020). Most of the studies were qualitative, while there was one quantitative study, which observed the number of park users before and after park development for refugees (King et al., 2015). PA was measured either as self-report or parent-report in 7 studies. One study used observation by researchers (King et al., 2015), while two studies combined observation and self-report measures (Guest, 2013; Veronese et al., 2020). Demographics of participants in these studies were as follows: the majority (63%) of the studies investigated children from multi-ethnic backgrounds, and 37% of them came from Muslim countries. Half of the studies examined those with a transit period (in the host country), in which participants spent no more than six months. All of the studies investigated meso environmental attributes (primarily neighbourhood-level factors), with four studies also examining micro environments' attributes. A detailed description of each study is provided in Appendices Table 1.5.11 to 1.5.12.

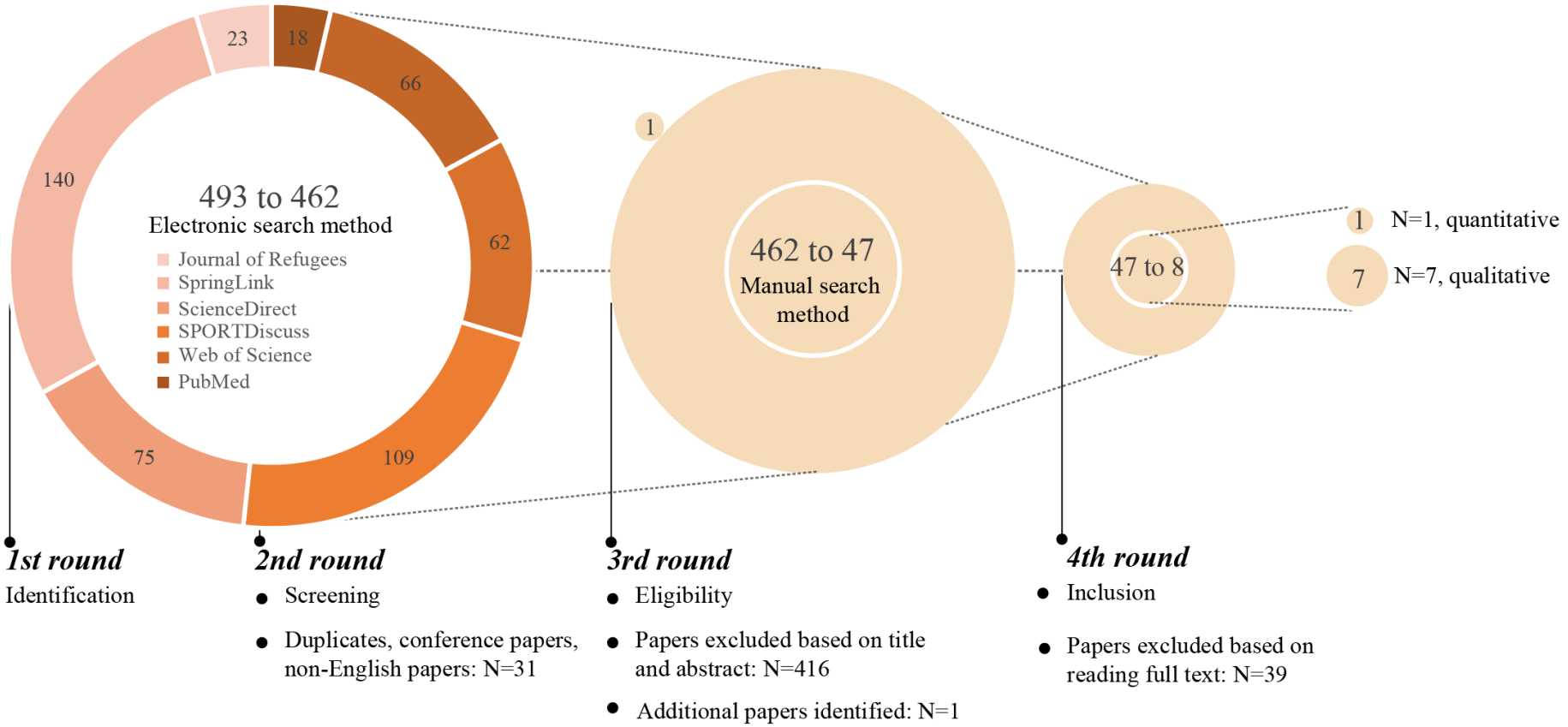


Figure 1.5.1 Flow chart of database search and screening

Table 1.5.1. Characteristics of eight studies included in the review

No.	Authors	Publication year	Study design	Study settings	Countries of origin	Length of stay	Environment-levels	Sample size	PA measurement
1	King et al.	2015	quant.	HIC, USA	Ethnic minority	1-3 years	meso	park observation study	observation
2	Allport et al.	2019	qual.	HIC, UK	*Somali	> 3 years	micro (home), meso	N= 6	self- and parent-report
3	Arcan et al.	2018	qual.	HIC, USA	Somali, Latino, Hmong	> 3 years	micro (home), meso	N= 67	parent-report
4	Guest	2013	qual.	HIC, USA	No specific, multi-ethnic	<6 months	meso	N= 239 of 380	observation and self-report
5	Hertting & Karlefors	2013	qual.	HIC, Sweden	No specific, multi-ethnic	<6 months	meso	N= 20	self-report
6	MacMillan et al.	2015	qual.	HIC, Australia	*Iran, Indonesia, Pakistan, Malaysia, Kenya, Uganda	<6 months	meso	N= 19	self-report
7	Veronese et al.	2020	qual.	LMIC, Palestine	*Palestine	<6 months	micro (refugee camp), meso (school, community)	N= 29	observation and self-report
8	Wieland et al.	2015	qual.	HIC, USA	Cambodia, Mexico, Somali, Sudan	Not mentioned	micro (home), meso	N= 127	self-report

*: Muslim percentage (%) of total population > 70%; qual.: qualitative; quant.: quantitative; HIC: high-income countries; LMIC: low- and middle-income countries; “meso” refers to neighbourhood environments unless otherwise specified.

1.5.2 Micro environments

Available living unit space

The *micro environment*, which refers to refugee children's home/refugee camp and its immediate vicinity, was examined in four qualitative studies (Allport et al., 2019; Arcan et al., 2018; MacMillan et al., 2015; Veronese et al., 2020). One factor found to be relevant to PA was the availability of sufficient living unit space for play at home. Two studies (Allport et al., 2019; Arcan et al., 2018) reported that cramped living arrangements were barriers to children playing actively indoors. For example, Somali mothers, who had migrated with their families to Bristol, UK and were residing in tiny apartments within residential tower blocks, described the lack of individual space and communal facilities within the housing schemes as barriers to their children's physical activity as external PA spaces (Allport et al., 2019). Similarly, in a US study (Arcan et al., 2018), Somali, Hmong, and Latino parents who had migrated to Minnesota reported that lack of indoor space in their apartment blocks was a barrier to physical activity.

Internal and external PA spaces

Only one study conducted in a refugee camp setting included a reference to the design of refugee accommodation and indicated that 'dedicated spaces' for play inside the camp (internal and external) helped children to engage in PA frequently by providing them with a safe environment (Veronese et al., 2020). There was no quantitative study on micro environments and refugee children's PA.

1.5.3 Meso environments

The meso environment comprises refugee children's school/community and broader neighbourhood. All studies reviewed (both quantitative and qualitative)examined meso environments in relation to refugee children's PA (Table 1.5.3).

Table 1.5.3 Summary of built environment attributes associated with refugee children's PA (numbers are the study number shown in Table 1)

Environmental level	Built environmental attributes	Quantitative	Qualitative
		Relationships found	**Relationship identified**
Micro-environments	Available living unit space		2, 3, 6, 7
	Formal space for PA		7
Meso-environments	Formal space for PA	1 (renovation of play area)	
	Informal space for PA (public, outdoor, green, places for gathering)		2, 3, 5, 6, 7, 8
	Neighbourhood safety (traffic-, sidewalk-organisation, violence)		2, 3, 4, 6, 7
	Accessibility to formal space for PA		2, 3, 4, 6

Formal activity space

It was found that there are two types of activity space relevant to refugee children's PA One is 'formal', while the other is 'informal' activity space (investigated in the next section). In this review, formal space is a play space/area explicitly built for the purpose of physical activity, sports and exercise, including playgrounds, basketball courts, and sports fields (Allport et al., 2019; Arcan et al.,

2018; Guest, 2013; Wieland et al., 2015).

A pre-, and post-construction observational study (King et al., 2015) investigated refugee children's physical activity before and after an undeveloped open space adjacent to transitional homes for refugees was transformed into a recreational park. Increased PA was observed in spaces designed for PA after renovation (e.g., play area, ball courts, garden) in children. Moreover, a higher proportion of female children observed within the park post-construction engaged in vigorous physical activity than those observed pre-construction. From the supplementary material provided by the corresponding author, observed cases of girls inside the park boundaries rose from 13% to 79% after the construction. It rose from 35% to 75% for boys. Overall, 85% PA observed in the play area was moderate to vigorous intensity. Purpose-built play spaces and sports facilities were associated with proportionally more moderate-to-vigorous physical activity and less sedentary behaviour than shaded sitting areas. Overall, the use of adjacent streets, alleys and surrounding parking lots has declined after a park redevelopment.

Limited accessibility to formal space for PA was cited as a negative influence on refugee children's PA. Qualitative studies reported that limited or lack of access (Allport et al., 2019; Arcan et al., 2018) or lack of transportation to exercise facilities (Guest, 2013; Wieland et al., 2015) were barriers to refugee children's PA. Moreover, one study indicated that access to outdoor facilities could increase refugee children's PA (MacMillan et al., 2015).

Informal activity space

The importance of 'informal space for PA' was also a prominent theme that emerged from the qualitative studies. Informal space for PA includes any urban spaces that are readily and freely available by refugee children. Such spaces enable children to engage in physically active, spontaneous play (Allport et al., 2019; Hertting & Karlefors, 2013; MacMillan et al., 2015; Veronese et al., 2020). Children mentioned a lack of space to gather and play as a group, which appeared to discourage them from engaging in PA (Wieland et al., 2015). Another study of migrants in the USA reported that refugee children preferred being active in informal gathering spaces with friends rather than engaging in formal sport (Wieland et al., 2015).

Safety

Another theme that emerged was neighbourhood safety. Four studies reported that neighbourhoods and school environments need to be safe for refugee children to play (Allport et al., 2019; Arcan et al., 2018; MacMillan et al., 2015; Veronese et al., 2020). Migrant mothers expressed concerns about traffic problems and danger from violence in the UK (Allport et al., 2019). Since parents considered that adult supervision was required for children's activities outside, they preferred to keep their children at home (Allport et al., 2019). Thus, parents' safety concerns can be a major factor restricting refugee children's PA.

1.5.4 Macro environments

None of the studies included in this review investigated any attributes of *macro environments,* such as transport systems or urban versus rural areas.

1.6 Discussion and research questions

This review identified eight studies examining associations of *micro* and *meso environments'* characteristics with refugee children's PA. Firstly, all but one of the studies were qualitative, and

most of them were conducted in the last five years (75%). The empirical research on associations between the built environment and refugee children's physical activity is in its infancy. Secondly, qualitative studies suggest that *micro* and *meso environments* are relevant to refugee children's PA. These include available living unit spaces (micro) and accessible formal and informal spaces for PA and safety (meso). One quantitative study found that installing a formal play area in undeveloped greenspace resulted in greater use of that area for PA by refugee children(King et al., 2015). Only one study reported a low- and middle-income country (LMIC) setting where children stayed in a temporary refugee camp. All other studies reported on refugee facilities (non-camps) within high-income countries (HICs).

1.6.1 Micro-environmental attributes associated with refugee children's PA

It was reported that refugee children have limited access to neighbourhood places for their play (Allport et al., 2019). In such a situation where meso environments are not conducive to children's physical activity, *micro environments* (refugee accommodation and its immediate vicinity) are likely to play an important role in refugee children's PA in camps and non-camp settings. However, existing studies on micro environments do not suggest that refugee facilities provide adequate opportunities for children's PA. One study reported that being physically active indoors at home is not practical due to noise and space issues (Arcan et al., 2018). The other study found that apartment blocks utilised passageways, stairwells, and basement areas as makeshift exercise spaces for occupants (MacMillan et al., 2015). However, they may not be totally safe for children to play. It is recommended that additional spaces suitable for children to be active should be provided in/around their accommodations.

1.6.2 Meso-environmental attributes associated with refugee children's PA

In *meso environment*s within HICs, one study argued that free access to outdoor space and parks are particularly important for refugee children since their financial situation would not allow them to participate in organised sports and other fee-based activities (Allport et al., 2019). However, local parks are not always safe places to play in deprived areas (Williams et al., 2020), often chosen as a site for refugee accommodation (Anderson, 2001). Given that safety may be a particular concern, research needs to identify what measures can be implemented to ensure parks are safe for refugee children to play. Natural surveillance seems like an important principle in which actions and behaviour in a park can be observed by "eyes on the street" (Allport et al., 2019). Future studies from HICs can examine other park features (e.g., size, features, distance) that encourage refugee children's active park use. Only one study was conducted in an LMIC setting (Veronese et al., 2020). It illustrated that refugee children without access to safe and suitable spaces for PA (e.g., parks) had to use space such as roads, streets and other open spaces despite dangers from military confrontation. Further studies should focus on settings in LMICs to identify PA barriers and facilitators in diverse contexts.

Moreover, accessibility to formal and informal spaces for PA was cited as an important influence on refugee children's active built environments for PA. As mentioned before, qualitative studies reported limited/lack of access (Allport et al., 2019; Arcan et al., 2018), or transportation to exercise facilities (Guest, 2013; Wieland et al., 2015) were barriers to refugee children's PA. Moreover, one study indicated that access to outdoor facilities could increase refugee children's PA (MacMillan et al., 2015). Further studies should investigate how could accessibility contribute to refugee children's active built environments for PA.

Research on refugee children's PA and the built environment is still at an early stage, where most studies are cross-sectional, small scale, and exploratory. Still, a few cues could be found associated

with meso environments for refugee children's PA. The quantitative study reviewed highlights the importance of formal activity space in the built environment for refugee children's PA. (King et al., 2015) It found that children's energy expenditure in park areas increased from 2010 to 2012 after an undeveloped green space park had been transformed into a recreational park with subdivided functional activity zones. It suggests the importance of a high-quality park with suitable facilities and amenities rather than the mere presence of a park. Identifying design attributes of parks relevant to refugee children's PA is informative for design and management of refugee-related facilities.

1.6.3 Perceived environmental barriers and facilitators of refugee children's PA

Qualitative studies reviewed reported the importance of informal space for refugee children to engage in physical activity from children's (Hertting & Karlefors, 2013; Wieland et al., 2015) and parents' perspectives (Allport et al., 2019). However, this may be a reflection of the lack of opportunities for them to take part in sports and exercise. Given that it can be challenging to organise sports in refugee settings, it is crucial that there is at least an informal space such as open spaces where children can be active with friends during leisure time. It is thus conceivable that diverse opportunities (both formal and informal spaces) are essential for refugee children's PA. Considering that participation in sports activities involves not only physical activity but also social interactions, providing refugee children with such opportunities is likely to have multiple benefits (Guest, 2013).

With regard to safety concerns, they are often about road safety or local crime for children (Ding et al., 2011). However, refugee children need to adapt to new, unfamiliar environments when they come to their host country. Since they may have escaped from war situations or have experienced military occupation (Veronese et al., 2020), they may be more cautious and sensitive about safety issues than non-refugees (MacMillan et al., 2015). Such concerns by their parents are particularly salient, as where children can play typically dictated by their parents (Allport et al., 2019). Future research needs to pay particular attention to how refugee children and parents perceive danger in surrounding environments and to what extent it is different from non-refugee children and parents. This review did not find studies that examined the role of *macroenvironment* in refugee children's PA, although it was found to be related to non-refugee children's PA (Sandercock et al., 2010). Considering that the location of refugee accommodation is a matter for the discretion of local authorities, future research on this topic is needed to inform where best to build refugee facilities to enhance refugee children's activity, health and safety.

1.6.4 Gaps in the literature and research questions

Three research questions could be drawn from abovementioned discussions since lack of studies examining spatial characteristics of play areas and perceived environmental factors of refugee children's PA, as shown in Figure 1.6.4:

a. What are micro-spatial characteristics of refugee accommodations associated with refugee children's PA (examined in Chapter 3)?

b. What are meso-spatial characteristics around refugee accommodations associated with refugee children's PA (examined in Chapter 4)?

c. What are perceived environmental barriers and facilitators of refugee children's PA in/around refugee accommodations, from both parents' and children's perspectives (examined in Chapter 5)?

Following the research questions, this research further evaluates current design or spaces to contribute to school-aged refugees' physically active, with two more themes feedback to the research questions:

- Which spatial characteristics and perceived environmental facilitators contribute to higher PA levels of refugee children (discussed in Chapter 6)?
- What conclusions can be drawn from the scalable study sites (discussed in Chapter 8), and which kinds of spaces should be facilitated or added (discussed in Chapter 7)?

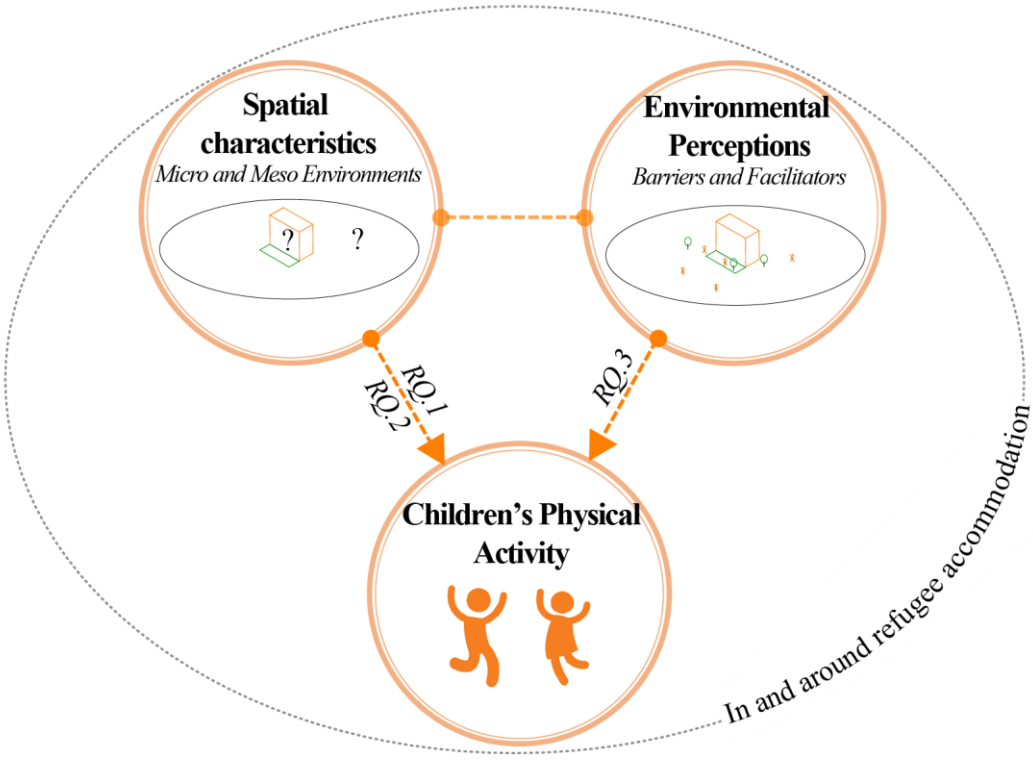


Figure 1.6.4 Three research questions concerning refugee children's PA discussed in this dissertation

Although this chapter contributes to linking three research questions, there is a lack of evidence in literature to show a significant relationship between spatial characteristics in micro and meso environments and perceived environmental barriers/facilitators for refugee children's PA. Several needed explanations of each research question are as follow:

(1) Several definitions of spatial characteristics were identified in this chapter: external and internal PA spaces in micro environments or formal and informal spaces in meso environments. Chapters will examine the qualities interdependencies of PA environments in more depth;

(2) It was pointed out from this chapter that refugee children's current built environments may be barriers for their PA. Moreover, research studies have shown that refugee children and their parents may have different spatial perceptions for PA (e.g., neighbourhood safety). Refugee children's daily PA related to built environments and how could this affect PA environments/spaces, more clarity should be provided to understand the logic behind this relation;

(3) A better understanding of how these three research questions would give further knowledge for scholars' investigation of the logic behind relationships between refugee accommodations existing built environments and refugee children's PA.

1.7 Research aims and chapter overview

This dissertation aims to bridge the gaps of current built environmental attributes associated with refugee children's PA. The research questions will be disentangled through a series of investigations through eight structured chapters:

Chapter 1 explains the situation for refugees and their accommodation and reviews relevant literature on environmental attributes in existing built environments concerning their PA, which also help bridge the gap among three research questions: spatial characteristics in micro and meso environments and perceived environmental barriers/facilitators.

Chapter 2 outlines approaches adopted in this dissertation and give reasons for methodology choices. Quantitative and qualitative research methods were combined to investigate abovementioned research questions. Space syntax was used to investigate the spatial characteristics of refugee accommodation in micro and meso environments. Staff surveys, semi-structured interviews, and field trips were utilised to understand and provide the spatial information of each accommodation and children's PA. Parents questionnaires, workshops, and photovoice were applied to assess their detailed PA patterns and PA-related space insights from parents' and children's perspectives. Ethical considerations and the process of obtaining ethics approval is discussed in the final section of this Chapter.

Chapter 3 investigates the first research question of six primary refugee accommodations from Berlin in micro environments. It analyses spatial characteristics of refugee accommodations associated with refugee children's PA with space syntax. It also compares these studies from different spatial measures as connectivity, step depth from living units to PA spaces (internal and external) and global integration. Additionally, four refugee accommodations are presented to deepen the typology in Chapter 6

Chapter 4 investigates the same six study sites in meso environments of their neighbourhoods through space syntax as the second research question. It analyses their potential PA spaces and available PA spaces from children and parents' perceived neighbourhoods; moreover, active PA spaces with space syntax. An additional 12 neighbourhoods are presented to deepen the typology in Chapter 6.

Chapter 5 investigates refugee children (aged 6-13) and their parents about their perceptions and perspectives of existing built environments in/around refugee accommodations for children's daily PA as the third research question. It includes parents' questionnaires, drawing and playable

workshops with 15 children and photovoice with three. Qualitative results from this Chapter also serves to evaluate findings from Chapter 3 and 4. Chapter 3 to 5 identified three research questions with quantitative and qualitative data.

Chapter 6 provides a comprehensive summary of findings and brings together findings from the aforementioned chapters to discuss built environments for refugee children's PA integrally. Furthermore, it brings together all results across different empirical chapters, unites findings into a coherent argument relating to the existing literature, and discusses limitations.

Chapter 7 outlines further research directions provides strategies, implications and recommendations from design fields based on previous results for those refugee accommodation operators, architects, urban planners and refugee policies.

Finally, Chapter 8 synthesises the key points of previous chapters and explains how the proposed study will contribute to the field by then.

Chapter 2. Methodology

2.1 Introduction

Qualitative and quantitative research methods were combined to analyse six refugee accommodations in micro and meso environments. Besides, four refugee accommodations in micro environments and 12 refugee accommodations' neighbourhoods in meso environments were also investigated with indicated spatial measures. First, space syntax was used to investigate how PA-related spaces (micro and meso) were interconnected in a spatial network and calculate various spatial measures. Second, questionnaires and semi-structured interviews with home managers and children care departments, and field trips were used to identify PA spaces for children's daily PA. These two aspects responded to the first two research questions: what are micro and meso spatial characteristics associated with refugee children's PA?

Third, questionnaires with ten parents and workshops (games and drawings) with 15 refugee children (aged 6-13) in one accommodation were conducted to understand children's perceptions of existing built environments for their PA. Furthermore, a 3-day photovoice with three refugee children from two prototyped families was investigated to get an in-depth understanding of refugee children's daily PA patterns. This qualitative aspect reflected the third research question: what are perceived environmental barriers and facilitators of refugee children's PA in/around refugee accommodations from parents' and children's perspectives?

The methods were selected after several techniques attempting based on ethical considerations; meanwhile, pretested with refugee accommodation staff. Specific ethical considerations and the process of obtaining ethics approval will be discussed in the final section of this chapter.

2.2 Sampling strategy and eligibility criteria

The sampling strategy of refugee accommodations is based on purposeful criteria (Cohen & Crabtree, 2006): available open-access data, operating during sampling time, numbers of children residents (6 to 12 years old), types, sizes, and locations. The author had sent interview requests to 23 children-included refugee accommodations from May 2018 to February 2019. Eight refugee accommodations accepted the interview with preconditions, and six finally completed the entire data collection (quantitative). Moreover, one accommodation with a better trust network (to the author) was chosen for qualitative study with refugee families. Besides, another 12 accommodations (4 in

micro and 12 in meso environments) were chosen for spatial analysis based on neighbourhood and accommodation types with accessible data.

2.3 Space syntax: spatial characteristics of micro and meso-environments associated with refugee children's PA

2.3.1 Settings and data collection

The author had investigated six primary refugee accommodations in Berlin on micro- and meso-environmental scales in Chapter 3, including three EAEs, two GAEs, and one Tempohome (Figure 2.3.11). The study sites were anonymised and named accommodation A to F based on interview times and refugee accommodations types.

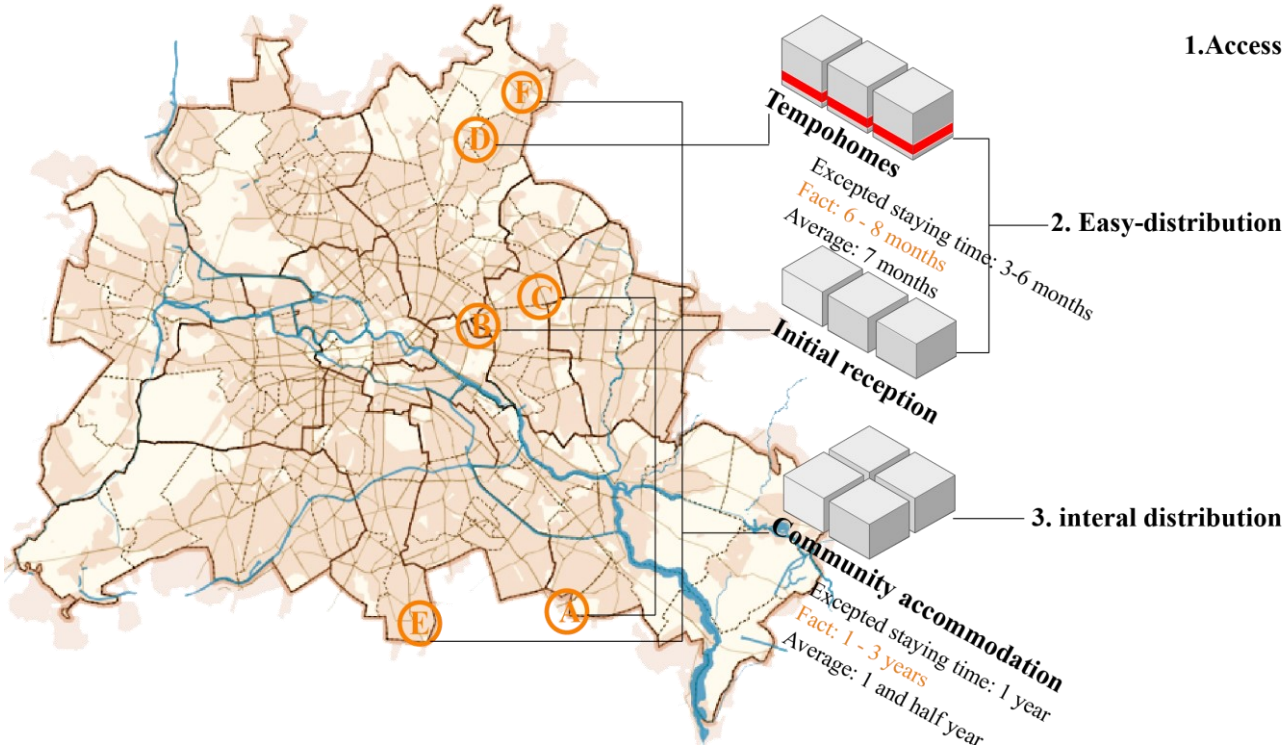


Figure 2.3.11 Refugee accommodation types and distribution

Two staff surveys (home manager and children care staff) were devised from primary research data collection in micro-environments. Questionnaires and semi-structured interviews depicted questions based on accommodation types. Accommodation's floor plan used for further analysis was updated by:(1) available online database; (2) staff surveys; (3) field trips[4]; from July 2018 to May 2019. Spatial measures and accessibility of internal and external PA spaces were analysed through space syntax methods. The research design of Chapter 3 is a mixed-method consisting of software-based open-source data collection, staff surveys with field trips and software-based space syntax analysis (Figure 2.3.12a), on the purpose of validating software results through questionnaires and interviews in terms of analysis and its effects (Amiriparyan et al., 2020).

In meso-environments, the primary data of road segments[5] were obtained by the Geographic Information System (GIS) software of OpenStreetMap (2020) and edited with Elk 2 (Logan, 2016) as a set of tools to generate the map and topographical surfaces using open-source data (Figure

[4] Due to the local laws and superior protection terms from the accommodation operator, case E was missing for this step.
[5] accessible pathways for pedestrians

2.3.12b). Models were set up in Rhino 6 environments to generate road segments landuse and facility functions as essential inputs; the detailed coding of each spatial characteristic category is shown in the Appendices Table 2.3.1. The reason for using unofficial OpenStreetMap instead of the official landuse of Berlin (FNP, FIS-Broker, 2021) is to respond to 'wartezustand/transit period' as mentioned in Chapter 1.2.1. This dissertation aims to document built environments for refugee children at a specific time range; OpenStreetMap has more potential to real-time reflect situations of the surroundings than FNP since FNP changes the overview for year periods. These elements were used as inputs for calculating the respective requirements of PA-related facilities. 500m and 1000m radius circles from refugee accommodations were set up as graphic representation backgrounds.

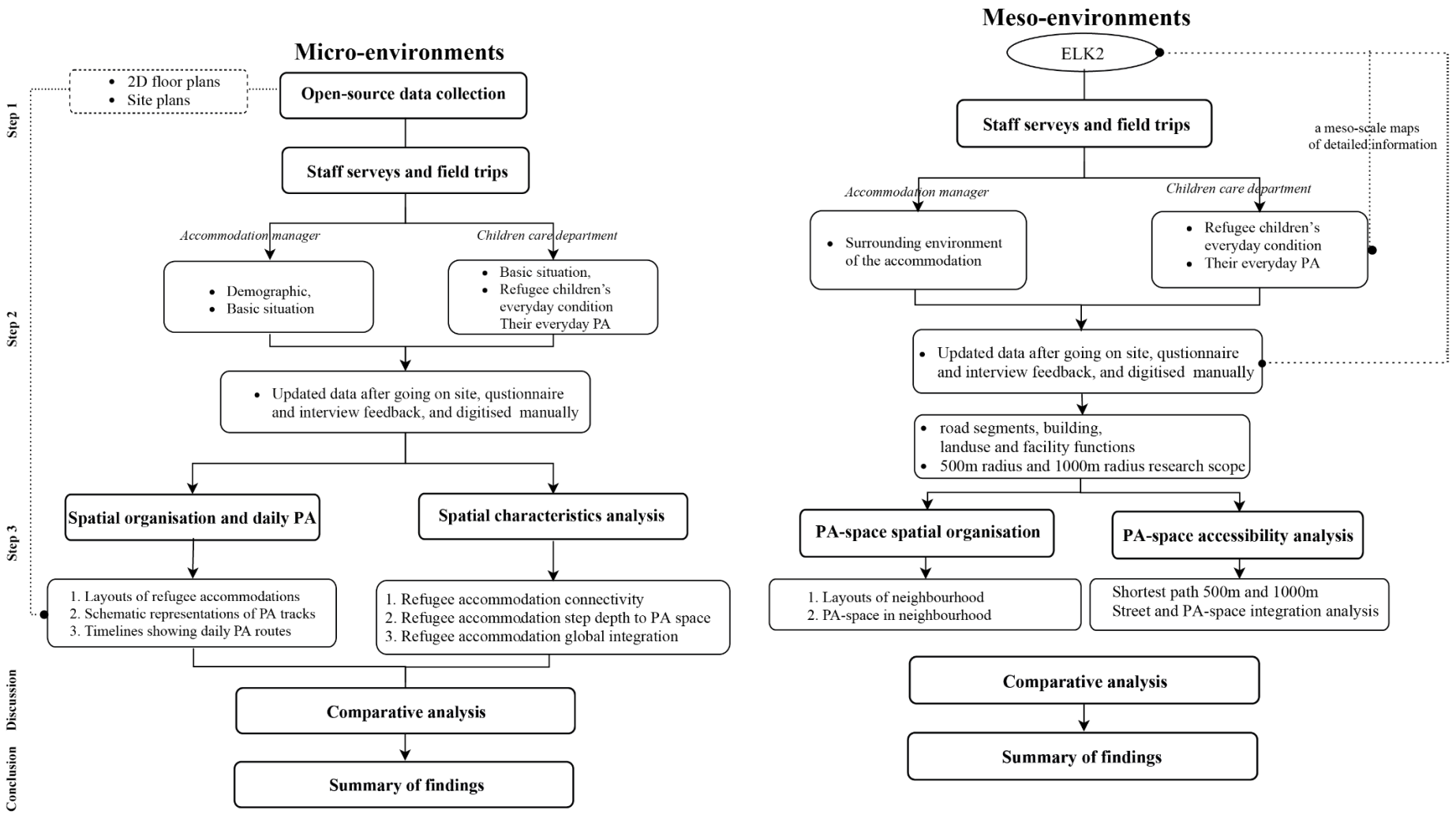


Figure 2.3.12 Schematic for the research design in (a) micro-environments; (b) meso-environments

2.3.2 Surveys of refugee accommodation staff

Face to face questionnaires with home manager and children care department

Face-to-face questionnaires are conducted by an interviewer asking questions of a respondent in person to allow the interviewer to explain and probe out questions (Neuman, 2012). Participants may be more willing to give more extended periods in a face-to-face situation rather than phone, clarify wording, and probe for more information for complex questions (*Face-to-Face Questionnaires*, 2011). The questionnaire had a friendly qualitative design for non-experts, applying with a semi-structured interview and a field trip.

There were three blocks of questionnaires for home managers, including nine questions for demographic information, four questions about basic situations, three questions about the existing micro environments and two questions about meso environments (AQ2.2.21 in German/English). Questionnaires for children care departments include three questions about basic situations, four questions about the existing micro environments, four questions about neighbourhoods, four questions about refugee children's daily PA lives and a detailed daily PA timeline table (AQ 2.2.22 in German/English). The interviewees were requested to identify 'playfields' for refugee children in their neighbourhoods with maps and photos, more details in Appendices questionnaires. Additionally, staff were required to rate existing built environments for children's PA with five-degree questions from '1 (worse) to 5 (excellent). The question example is space for children to play in the accommodation (e.g., playroom), where/how are they (Please show on the map). Results were collected individually for each accommodation, allowing a detailed data exploration where average results were discussed. Besides, all interviewees were fully informed about the whole research process (e.g., emails, papers, orally) and signed information sheets (AI 2.2.23D in German).

Semi-structured interviews with field trips in micro-environments

After questionnaires, semi-structured interviews and field trips with staff (home manager and/or children care department) were conducted to investigate internal and external PA spaces (e.g., playrooms, playground), how activities happened in the accommodations, and PA programs provided by accommodations. Interviews were conducted while walking in the refugee accommodation, around 30 minutes. A semi-structured interview example is, "When is the playing room available for children?". Questions were flexible raised from questionnaires, depending on the reality; six accommodations but one (E) completed this process.

2.3.3 PA measurements

Measures of children's PA in micro environments

This part of research is grounded in principle from local authority or accommodation that refugee children's playing needs to be under supervision of adults (e.g., partners, children care department, volunteers). The review shows that refugee parents have extra consideration for children's PA. Precisely, the author investigated PA as 'opportunities of PA for children', including mainly two aspects by staff reports: (1) organised activity (e.g., play workshop, sports program) and (2) free play under supervision. Detailed subdivision of PA types could not be achieved, and specific condition that was not covered above will be mentioned later.

Measures of PA spaces in meso environments

Two themes emerged from the review: formal PA spaces, sport as acting formally, where activities were carried out in PA facilities or space that intends for PA and informal PA spaces, where physical

activities were performed with friends during leisure time; the formal and informal PA spaces in this dissertation are defined and represented by existing *Map Features* (2020) in Table 2.3.3 with a detailed reference in Appendices Table 2.3.3. Observations were also used in this step as the researcher took photos and trips of identified neighbourhood playfields by staff.

Table 2.3.3 Map feature and coding of potential PA space

category	map feature coding*
Formal PA space	
Sport facility	sport centres; sport facilities
Park	all kinds of parks; garden; resort
Playground	all kinds of public ball playground; public playground
Informal PA space	
grassland	open grassland; green space

* for better understanding, the namely words used here may differ from search strings, more detail AT2.3.3

A subdivided PA spaces concept will be given here based on abovementioned concepts, which allows index change simply:

Potential PA space: all PA spaces (formal and informal) in the research scope from GIS map;

Accessible PA space: potential PA space located less than 500m and 500 to 1000m away from target accommodation;

Active PA space: *accessible PA spaces* located in roads has top 20% global integration of all investigated road segments; a subdivision will be high accessibility (top 10%) or medium accessibility (top 10% to 20%).

2.3.4 Spatial characteristics of micro environments

Reorder space and colour coding

The accessibility graph is developed to express differences in spatial models by reconstructing and positioning a specific space at the starting point. In this dissertation, accessibility graphs were obtained by SYNTACTIC (2018). It is a plugin for grasshopper coding in Rhino 6 environments. The method was selected after trying several techniques to represent data. As three accessibility graphs in Figure 2.2.41, SYNTACTIC showed higher capability for space syntax calculation from multi-floor plans while giving more comfortable and graspable space descriptions. As for clear visualisation and analysis, the author reordered the colour coding of access graphs as (1) different colours represented different spatial functions (or floors), and (2) line links indicated if spaces were integrated or divergent; (3) sizes of circles represented actual spaces size in scale. Conclusionally, the colour reordered coding follows the rules as below (Figure 2.3.42):

- Solid grey circles represented stairs/elevators;
- Hollow black circles represented corridors;
- Coloured solid circles represented living units on different floors;
- Solid orange circles represented PA space (internal and external).

Figure 2.3.41 Different display of one floor plan (a) Agraph; (b) depthmap; (c) SYNTACTIC

Summary statistics table and diagram will be combined with this graph as a supplemental explanation. Moreover, living units on the same floor will be divided into different zones with Roma numbers (e.g., zone I) in complex floor settings. Multi-building or building complex will be numbered with different alphabet characters (e.g., building a), while multi-external PA spaces as number 1 to N.

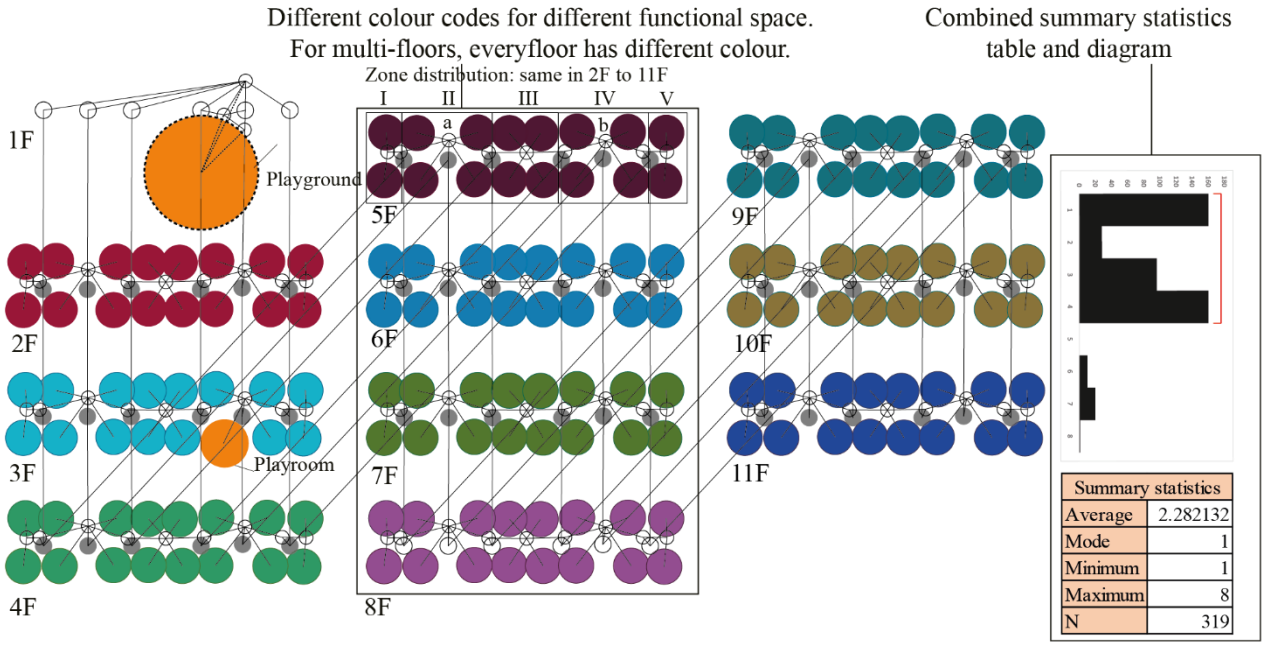


Figure 2.3.42 Size circles and colour display example

Living units for indoor playing

This study used a four-person living unit (two parents and two children, Figure 2.3.43) for minimum spatial evaluation since it was the most common component type based on all staff surveys. Due to the Berlin Data Protection Act (Berliner Vorschrifteninformationssystem & Kopfbereich, 2018), superior protection terms of specific refugee accommodations, International Refugee Law (IRL) and ethical considerations, individual family data could not be obtained for each accommodation. Therefore, the author investigated the possibility for indoor PA based on available area size (exclude WC and kitchen). This spatial calculation abstracts from refugee accommodation regulation as each one has $9m^2$ for living space (Lewek & Naber, 2017) and European children indoor playing space requirement standard of Early Childhood Education (2020). Eventually, there are three spatial calculations for 'indoor PA possibility' as insufficient for indoor PA[6] (available area < $41m^2$), possible for indoor PA ($41m^2 \leq$available area $<46m^2$), or spatial sufficient for indoor PA (available area $\geq 46m^2$). This calculation exists as an individual measure in this dissertation to illustrate the minimum playing units for children's PA, which will be investigated independent but not included in spatial measures calculation since how children play in living units were unknown by the available database.

[6] 41=9*4+2.5*2, which equals to 4 times minimum living space (9) plus two times possible indoor playing space (2.5)

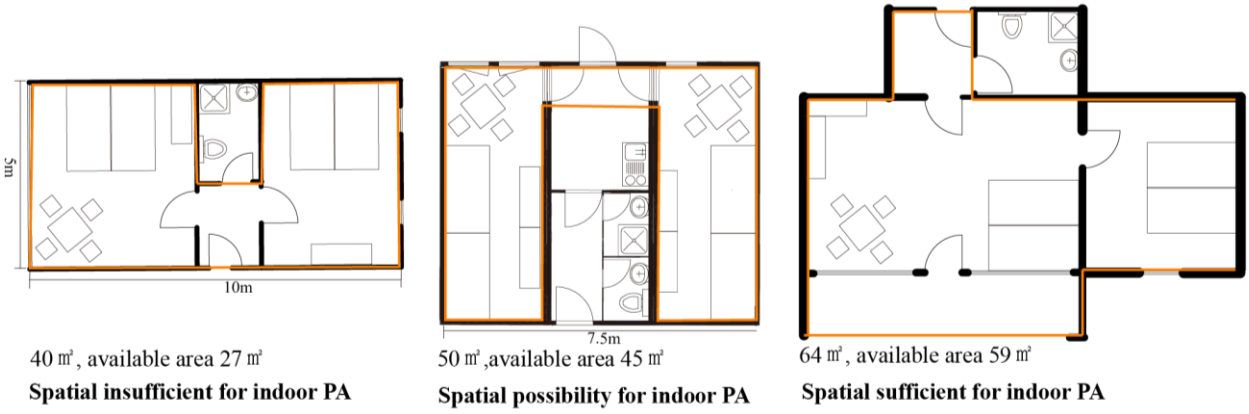


Figure 2.3.43 Living units comparison for indoor playing

External and internal PA spaces accessibility analysis

In space syntax analysis, external and internal integration values investigating the relationship between indoor and outdoor spaces may not significantly differ when outdoor space is neglected. Still, they can make a substantial impact (Şen & Baran, 2020). The calculation and investigation of residential spaces' external and internal integration values help explain the energy-related occupant behaviour such as PA in the spatial model's planning and organisation (Henk et al., 2013). Investigated PA space in micro environments would be divided into internal PA spaces as designated playing space inside refugee accommodations (e.g., playroom, Figure 2.3.44) and external PA spaces, which referred to outside playing space designated to this accommodation (e.g., playground, Figure 2.3.45).

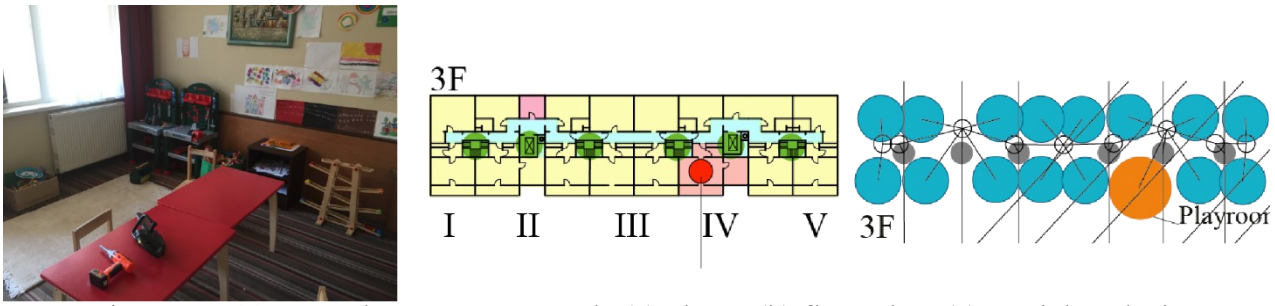


Figure 2.3.44 Internal PA space example (a) photo; (b) floor plan; (c) spatial analysis visualisation

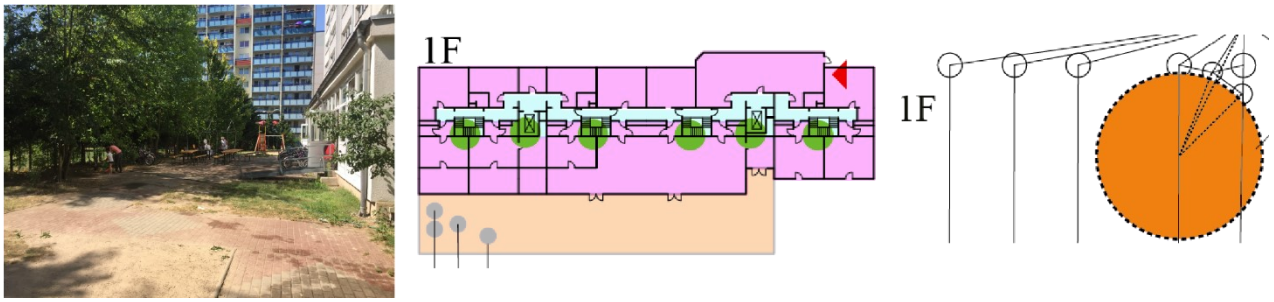


Figure 2.3.45 External PA space example (a) photo; (b) floor plan; (c) spatial analysis visualisation

Connectivity

Connectivity is a dynamic local measurement that measures the number of spaces immediately connecting space of origin (Hillier & Hanson, 1989). To simplify: connectivity is the number of connected neighbours to investigated space. It helps describe the relative level of control over the

connected components (Wu & Guo, 2014). Connectivity is chosen in this study because it is one of the most used local measures and applied to refugee accommodation analysis in other studies (Buonocore & Cutini, 2017; Potangaroa & Chan, 2010).

Data analysis: application of space syntax in micro environments

There are many reasons for employing space syntax as a spatial measurement tool related to refugee children's PA. Space syntax has the spatial capability to explain children's movement (e.g. PA), safety, and sense of place, relying solely on spatial characteristics of neighbourhoods (Lerman et al., 2014). It is also well suited to detect associations between aspects of built environments most related to PA among children (Cutumisu & Spence, 2009) or working with refugees' built environments (Potangaroa & Chan, 2010, 2010). Furthermore, the descriptors of spatial layout seem to resonate with the way people develop spatial knowledge and navigate through environments (Hanson, 2003). Since refugee children can use mental maps to represent spatial knowledge about their environments concerning PA (Hertting & Karlefors, 2013), space syntax may better represent environments concerning refugee children's perceptions. Recently, increasing articles showed potentialities of space syntax working in urban environments interdisciplinary (Esposito et al., 2020), which provides an alternative method of measuring street connectivity, avoids complicated databases containing urban form (Huang et al., 2020). Space syntax provides a simple way of assessing neighbourhood safety, space and designed place for PA-based only on street network data (Cutumisu & Spence, 2009). Thus, space syntax is applied to evaluate the existing built environments concerning refugee children's PA in this dissertation.

Step depth illustrates which spaces are deeper and shallower than other spaces, related to the transitions formed by doors (Hillier & Hanson, 1984). This measure has been used more often when investigating a specific space (Law et al., 2012; Talavera-Garcia, 2012). For example, in Figure 2.3.46, suppose the step depth of a living unit is six; readers know it takes six math steps to get from this space (dark blue) to investigate PA spaces (orange) in the building. If the step depth of another space (light blue) is five, readers understand it is closer in the distance compared to blue space. Internal and external PA spaces will be investigated in one diagram if they connect directly (Figure 2.3.47a, accommodation C). In contrast, two diagrams will be located separately (Figure 2.3.47b, accommodation A).

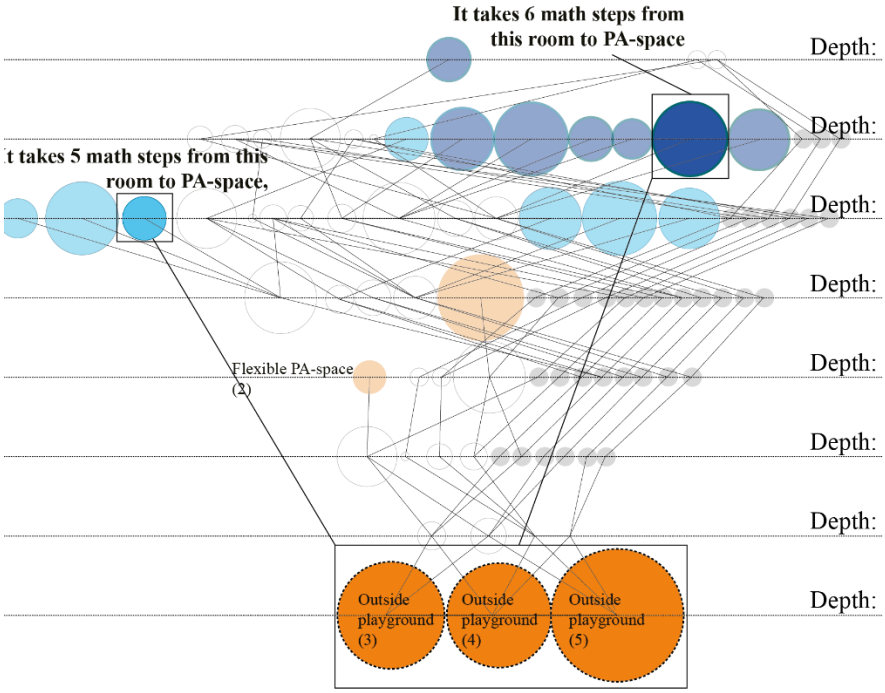


Figure 2.3.46 step depth analysis example shows the different step depth

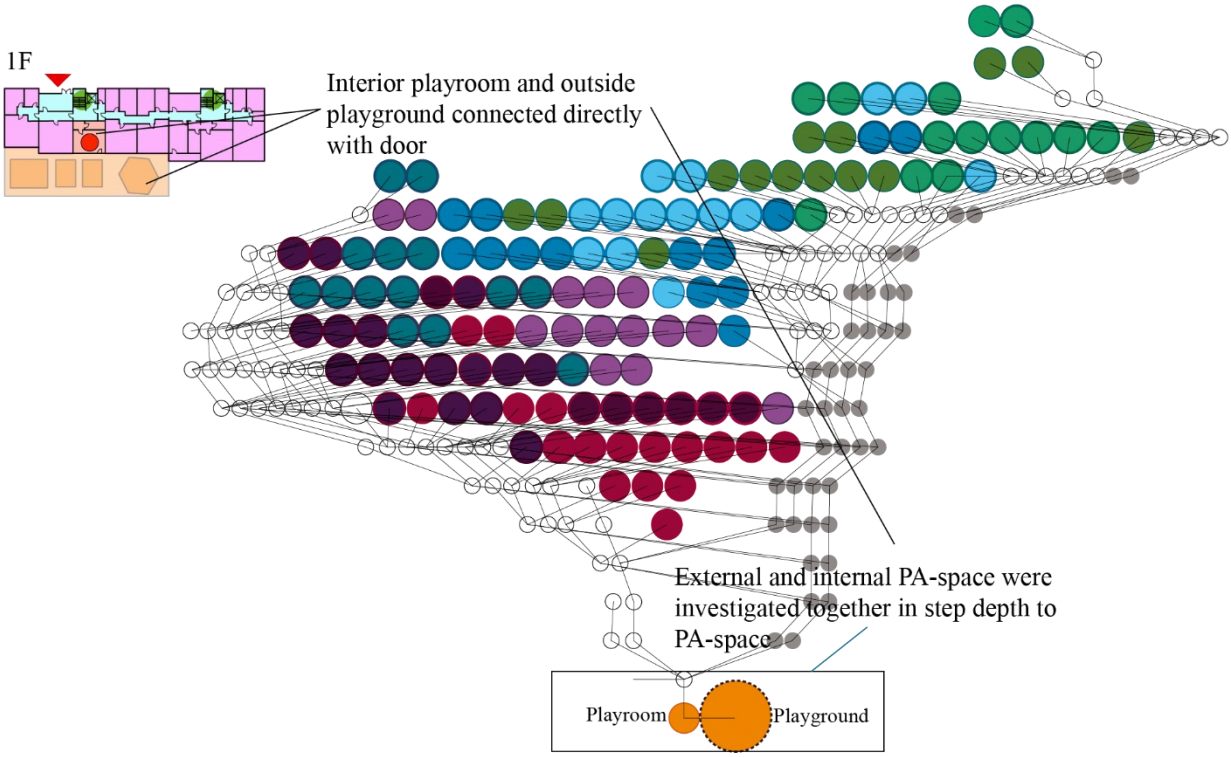


Figure 2.3.47a Example for internal and external PA space analysis together

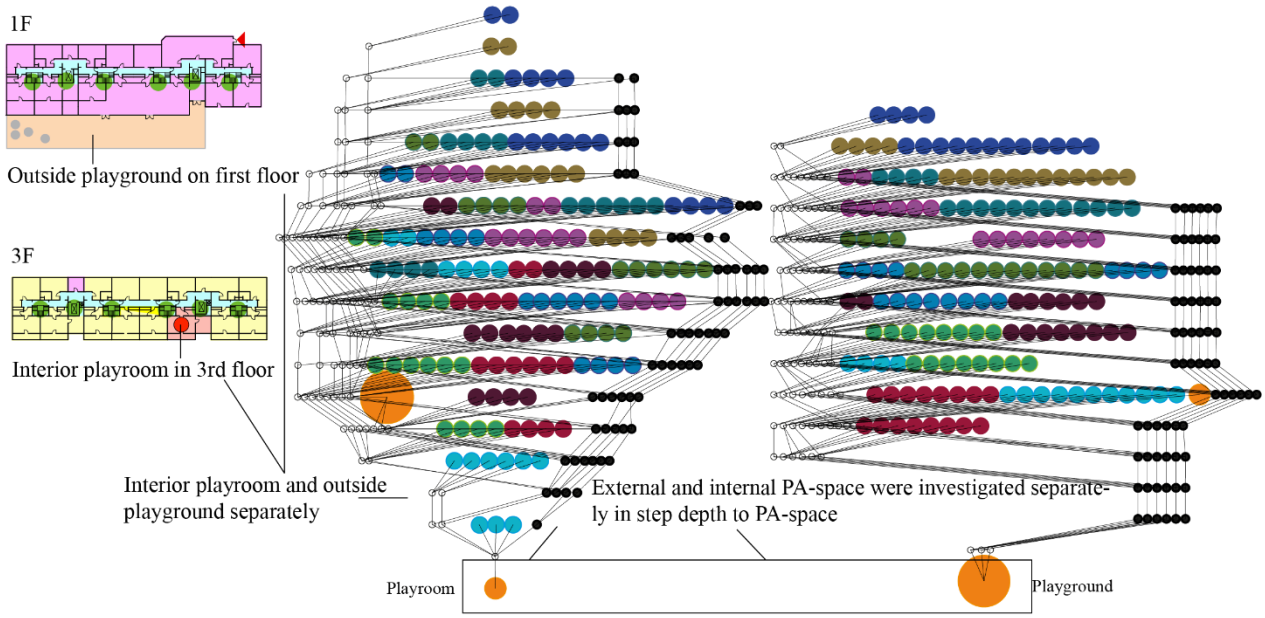


Figure 2.3.47b Example for internal and external PA space analysis separately

2.3.5 Spatial characteristics of meso environments

Accessible PA spaces: spatial characteristics of meso environments

Accessible PA space is identified by a set of components from DeCodingSpaces Toolbox (2020); it is a plugin for algorithmic architectural and urban planning in GrasshopperTM graphical algorithm editor. The primary approach represents the city network as inversions of road segments (Dawes & Ostwald, 2013) and calculates graphs' various metrics, such as the shortest path (Dijkstra, 1959). The methodology detail will be presented as follow:

Angular measure

Dijkstra algorithm (2020) was implemented to obtain shortest paths from a refugee accommodation to all defined potential PA spaces. Figure 2.3.51 gives examples of two points to find shortest paths: In an unknown city or disadvantaged built environments, it is hard to follow the mathematical shortest path (a) with complicated turns, users feel comfortable walking and orienting on straight lines (Lerman et al., 2014; Fuchkina, 2017) as b and c. Angular measure is introduced for this purpose; it reflects how much the path is straight (how large, in terms of angles, changing of directions was along the path) and is combined with the geodesic measure coefficient to control the influence (Crane et al., 2020). This study chose the angular measure in Figure b to include more potential PA space.

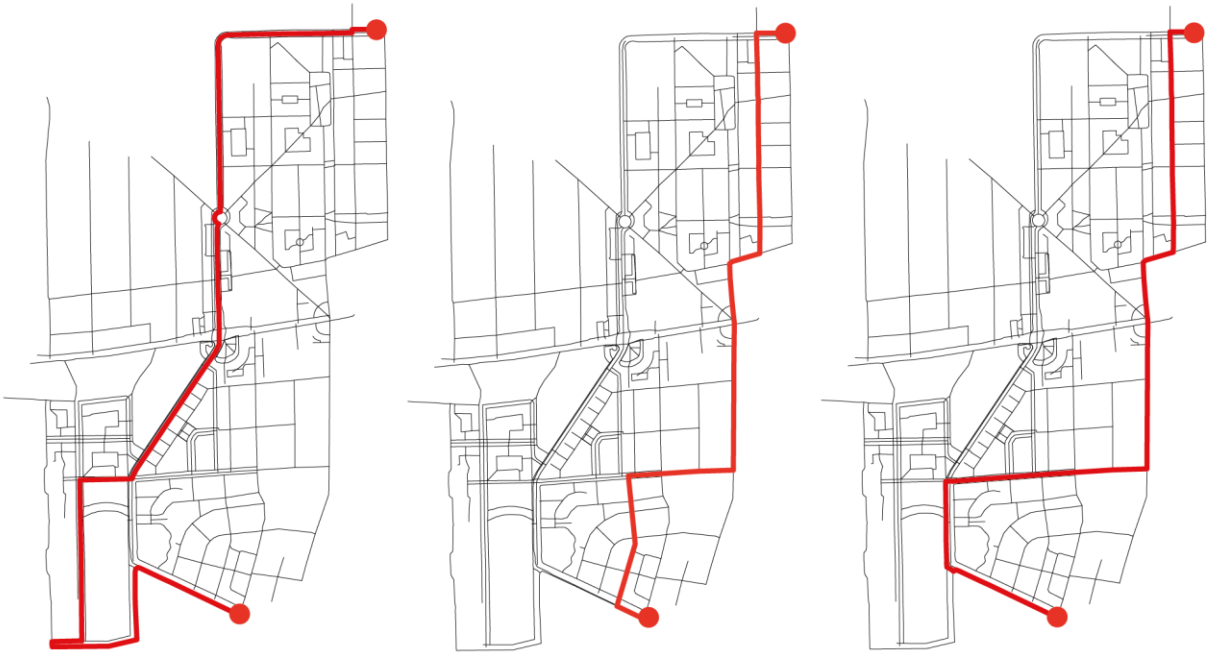


Figure 2.3.51 (a) shortest path with 0 angular influence; (b) shortest path with 0.5 angular influence; (c) shortest path with 1.0 angular influence

Road segments weight

Research evidenced that parents are worried about neighbourhood physical safety concerning traffic (Allport et al., 2019). The author reflected this in analysis by assigning equal index values to every road segment. It will ensure all path calculations happen on existing road segments; as shown in Figure 2.3.52a, no shortcut is allowed when the paths are completed. Diagram for an additional shortest path (allowing shortcut) shows in Figure 2.3.52b.

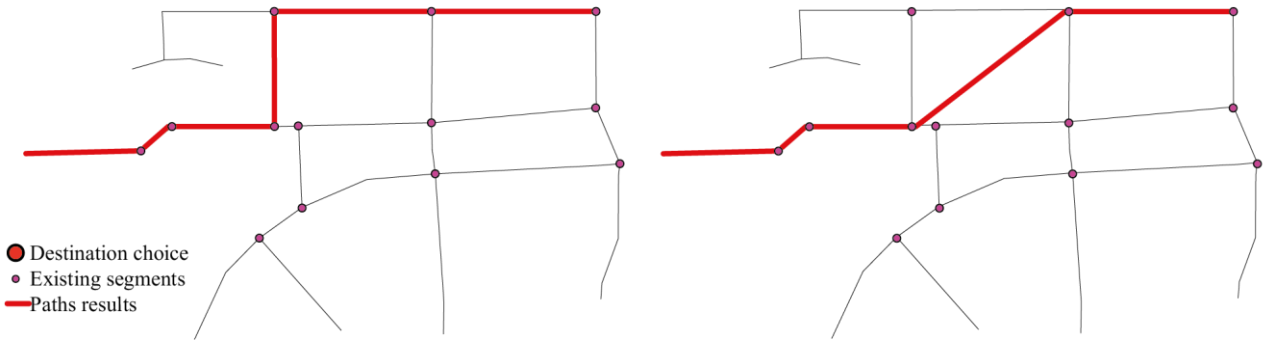


Figure 2.3.52 (a) shortest path result with existing segments weight 1; (b) shortest path allows additional short paths with different weight

Definition of destinations as PA space

The method in Figure 2.3.53a was chosen to define destination choices of PA space. The nearest shape point of PA space to origin points (refugee accommodation) was chosen as the destination, then built a vertical segment and chose the closest existing whole segment as a destination. Figure 2.3.43b and c show other possibilities, such as PA space centre points used the perpendiculars road segment split and perpendicular road segment as destinations. The advantage of Figure 2.3.43a is evident among these graphs to include more potential PA spaces. Additionally, the chosen existing road segments will be defined as ‘PA space located street’.

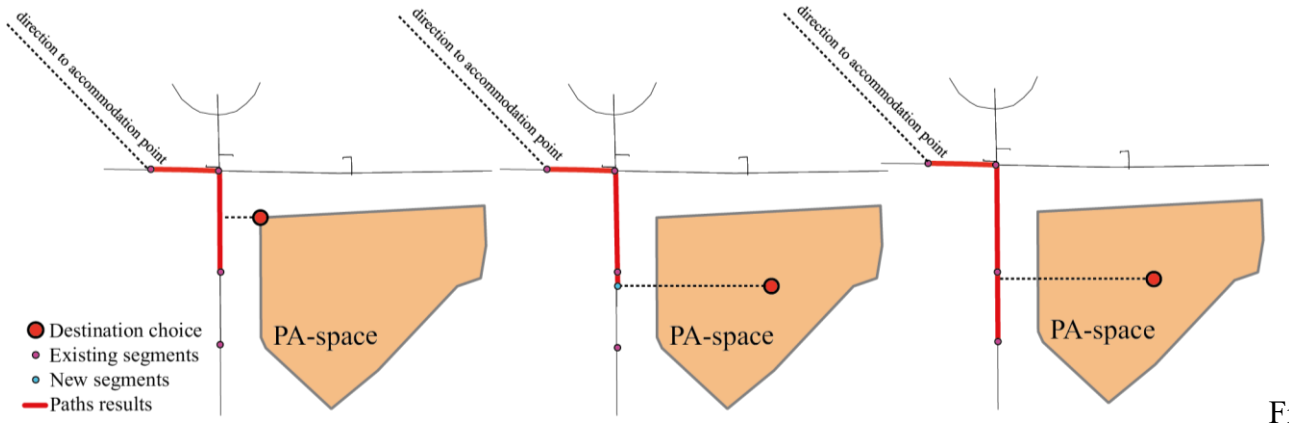


Figure 2.3.53 (a) shortest path result with new segment and closest point(b) new segment and centre point (c) exist segment and centre point

As method choices mentioned before, two scopes of shortest paths to PA space were set: (1) shortest paths under 500m (from refugee accommodation to PA space) represents children's perceived neighbourhoods by approximated 10-15 minutes' walking (Wolch et al., 2011; Almanza et al., 2012); (2) shortest paths from 500m to 1000m since this walking distance represents parental neighbourhood (Oliver et al., 2015; de Vuijst & van Ham, 2017). Moreover, staff also mentioned that refugee children always go out with their parents. It is evident that refugee children's neighbourhood scopes are decided by their parents due to worrying and supervision. Examples are shown in Figure 2.3.54ab of the shortest path from refugee accommodation to a PA space under 500m and from 500 to 1000m. All inputs (road segments, points, curves, or other elements) were mathical simplified and optimised before calculation since some approaches may lead to matrix re-computation.

Figure 2.3.54 The shortest path from refugee accommodation to a PA space (a) under 500m; (b) from 500 to 1000m

Active PA spaces: application of space syntax in meso environments

Besides being chosen by coding from shortest paths, it also manually checked and selected from depthmap analysis (Figure 2.3.55ab). Global integration reflects how physically intimate space is related to all other spaces, which indicates its potential as an active destination.

Precisely, the streets with an integration ranking in top 10% form the foreground network, as defined by Professor Hillier, refers to space with the best (high) accessibility. The streets with an integration ranking in top 20% constitute the main skeleton of the urban spaces, and the author sub-counts this index as 10% to 20% as medium accessibility, distinguishing from high accessibility (Vaughan, 2007). With an integration ranking in the bottom 80%, streets form the background network, where residents travel less efficiently (Huang et al., 2020), which identifies low accessibility in this research. Figure 2.3.5c analyses an example that 29% of the PA space in total are located in the high accessibility streets, 21% are medium accessibility. For PA spaces maximum 500 meters away from the accommodation, 60% of the PA space are located in highly accessible streets; others are in medium accessible streets (40%). In a 1km calculation, 11% of the PA space is located in high accessibility roads, and 11% are medium accessibility.

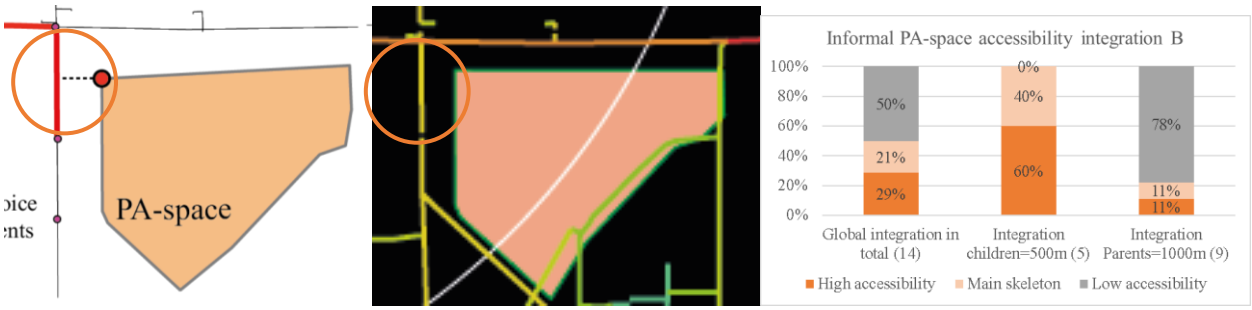


Figure 2.3.55 (a) PA space located street; (b) PA space located street in depthmap integration analysis; (c) global analysis example

2.4 Perceived environmental barriers and facilitators of refugee children's PA

2.4.1 Setting and participants

Fifteen children (ages 6 to 13, all in primary school) and ten parents in accommodation A participated in the questionnaire and workshop stage during one week in 2019-06. The participant families were from four indicated countries of origin: Moldova, Iran, Iraq, and Azerbaijan, as shown in Appendices Table 2.4.1. Parents evaluated the existing built environment for children's PA from four aspects. Children's PA timelines were explored and sketched from playable workshops. Moreover, a photovoice workshop was designed to gain in-depth insight into individual refugee child's perception and experience of their PA. Three children completed these three days of photovoice in June and July 2019, taking meaningful photographs and videos of places related to their PA experience with provided cameras. This second empirical phase served to review and deepen the qualitative methodology.

2.4.2 Parents' questionnaire

After approving the home manager's required documents (Chapter 2.6), the author applied different recruitment movements inside the accommodation (e.g., post, leaflet, Figure 2.4.21ab). Most parents with children were informed about this study by staff in advance. The author prepared translated questionnaires for the parents (English, Persian, Albanian, Russian and Kurdish, AQ2.4.21).

Moreover, accommodation staff who speak Arabic, Russian, and Persian helped the author during the questionnaires. Parents were first asked to provide demographic information of their children with two questions; then, four questions were given to ask if the existing living units, internal PA spaces, external PA spaces and neighbourhood PA spaces were accessible for their children with a five-point scale. Continually, there were three questions about their feeling for the neighbourhood (e.g., safety, friendly). Questionnaires ended with two questions and a filling timeline with figures describing the detailed PA timeline of their children. While parents answered questionnaires in the playroom, the author and their children would finish the following workshops in 30 minutes for each family.

As a better understanding for parents from different countries or origin, the author used 'PA spaces accessibility (is there a space for your children's playing)' instead of 'rates of PA environments' in parents' questionnaires after a pre-test. Parents could answer differently based on their points of view even though they were not experts for specific questions. Results from parents' questionnaires were collected and served to understand environments for children's PA from parents perspectives. All interviewed participants were fully informed about the whole research process in papers and orally by their language and signed authorised translated information sheets (AI2.4.22D, German).

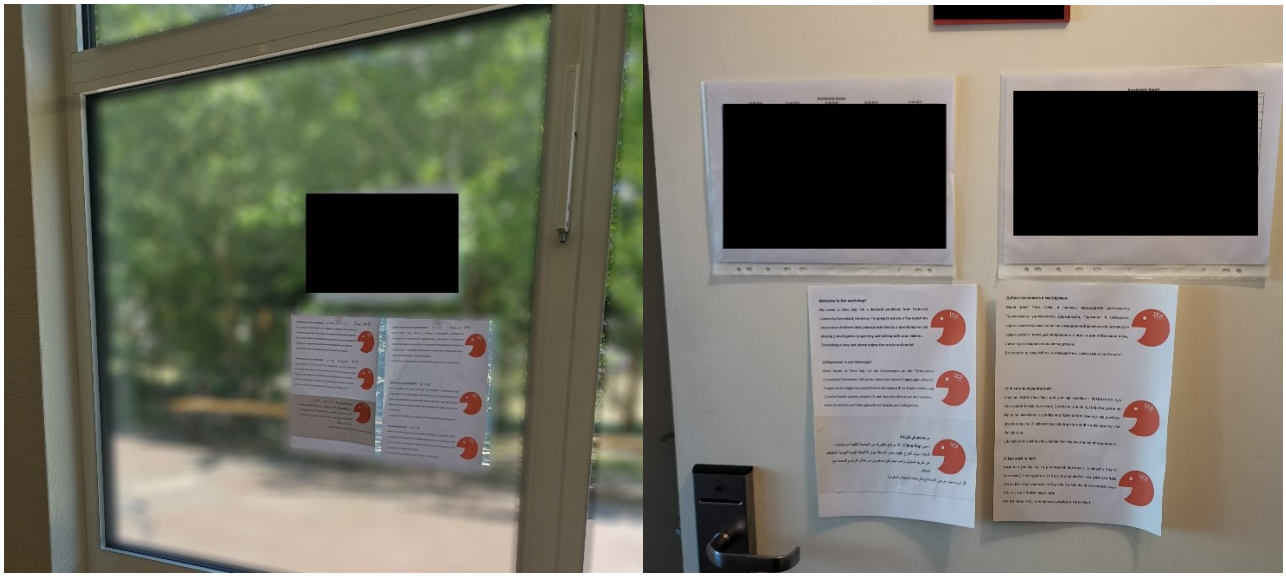


Figure 2.4.21 Leaflet for participants (a) at canteen; (b) on the door of children's room

2.4.3 Workshops: clock poll and 'draw us about your playing'

Workshops 1 started with a children's PA timeline survey, called the clock poll (Figure 2.4.31a). The children entered (by speaking or movement) their regularly visited places, activities and specific time into a clock drawing (where, when). This workshop worked as a supplement material of children's daily PA timeline table provided by parents (Figure 2.4.31b); a short questionnaire for children was supplied with this workshop in Appendices questionnaires AQ2.4.31.

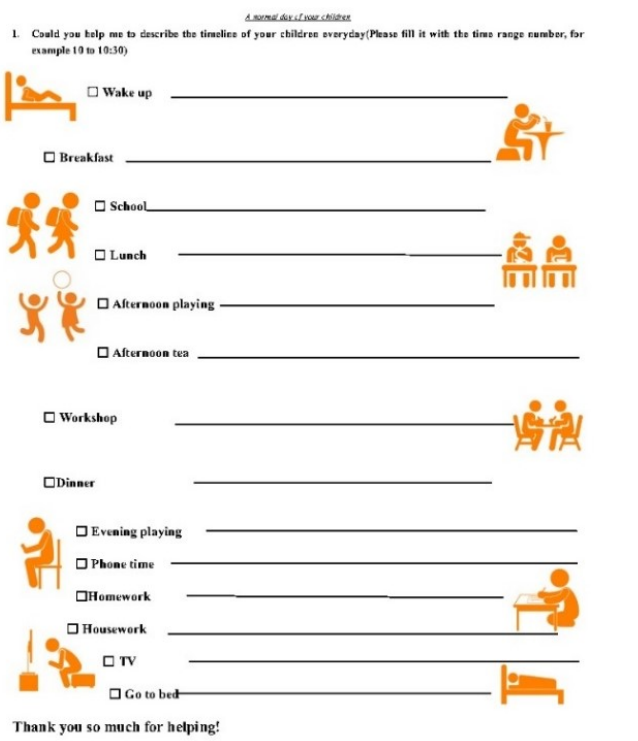


Figure 2.4.31 (a) clock poll for children; (b) daily PA timeline questionnaire for parents, English

Refugee children were asked to draw their play place in workshop 2 (Figure 2.4.32): every child got an A3 paper with defined environmental scale boundaries (your room, your accommodation, outside in their languages), and they were asked to sketch the facilities/place/equipment where/what they were playing in/with. A total of 15 children took part in workshops 1-2, with demographic information listed in Appendices Table 2.4.3.

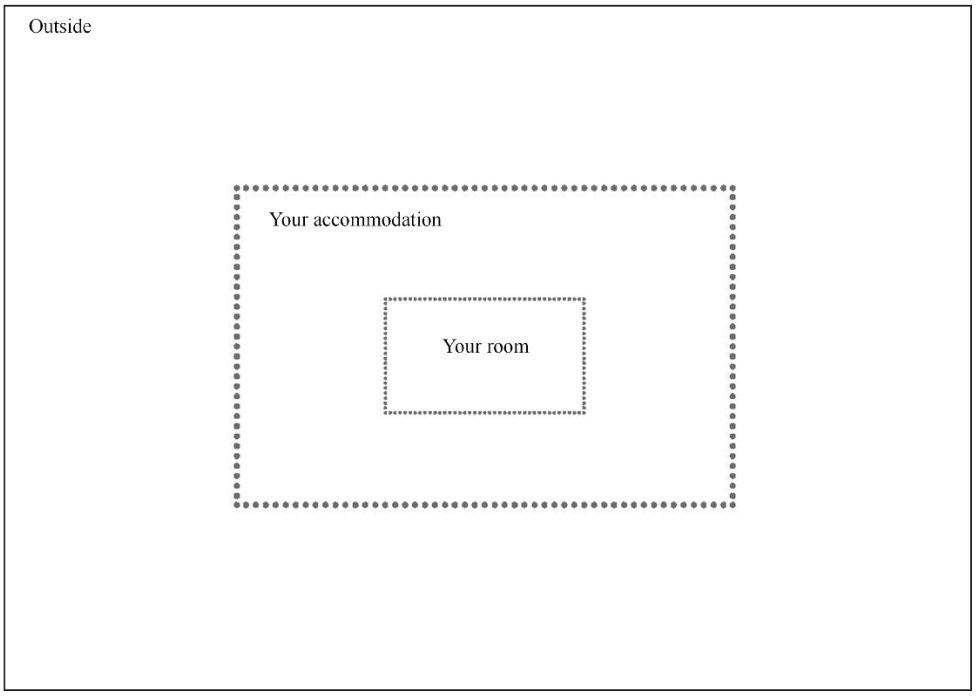


Figure 2.4.32 Example paper for drawing, English

2.4.4 Photovoice

The key to approaching children in research is to use techniques suitable for them, such as participant observation and interviews combined with task-based and creative methods, e.g., photography and drawings (Punch, 2002). Photography has revealed children's perspectives as arbiters of their own experience and allows them to document and perceive places that blind spots adult researchers, including refugee children (Clark, 1999; Svensson et al., 2009). Research supports that photography is widely used in refugee children studies (Gifford et al., 2007; Oh, 2012; Yohani, 2008). Literature indicates that photography appears particularly prevalent when exploring different environmental levels among minority children (Byrne et al., 2016). With the emerging new digital technologies, 'Photovoice' (2020) has been concluded as an appropriate communicative tool among children in marginalised situations (Briski, 2004). Moreover, Article 13 in the Unicef Report of Child Right (1989) emphasises the freedom of children's expressions, which encouraged us to apply more children-oriented methods in research.

Three refugee children from two prototyped families took part in the second stage, and at least one of their parents from each family were informed about the research and signed authorised translated information sheets (AI2.4.4D in German). German and English were used in oral communications and interpretations. One child (Nicola) spoke German well enough to respond and communicate with the author, and the English spoken father from another family did the Arabic translations for his children during interviews. Three cameras were handed to children by the author under the supervision of their parents; meanwhile, children were informed about photography of their daily playing for three whole days from morning (when they get up) to evening (when they go to bed). The mission was explained to children as rough abstracts:

- record your daily PLAY lives and what you would like to PLAY with
- record what you found interesting in playing
- record where you are playing
- record what else you would like to share with us related to the three topics mentioned above

Children finished three days' photography (included videos) independently without influence by the author (parents might take some photos under requests to represent children's PA experience). After data collection, the author printed photos and represented them on an A1 poster by correct timelines with different location scales (Figure 2.4.4a). Unstructured interviews about specific photos were conducted on this basis; the children were asked to put different mood tags (Figure 2.4.4b) and explain their feelings or what they would like to share when taking photos.

Figure 2.4.4 (a) A1 poster example for unstructured interviews (process material); (b) mood tag examples

2.4.5 Data analysis

Qualitative data analysis concerning refugee children's daily PA was based on parents' questionnaires, playable workshops and photovoice. The mood tags worked as carriers, helping the children express their emotions. Another carrier was drawing and the clock, which reminded the children of their daily PA experience on different scales. More demonstratively explanations and groups of quotations could be reassembled into three themes, with the theoretical backgrounds (Bronfenbrenner, 1979; Zeiher, 2003; Qvortrup, 2017) using NVivo software: (1) daily PA timeline; (2) environmental spatial perception; (3) PA patterns. The first two themes responded and contributed to the third one. This design allows possibilities for reading and backtracking, with arisen quotations grouped by themes in Chapter 5. These quotations' extractions as textual analysis record or identify paragraphs from texts or mood images in the qualitative analysis linked by common themes or ideas, allowing text indexation into categories through thematic coding (Cohen & Crabtree, 2006); meanwhile, those related to more than one participant may indicate holistic aspects of refugee children daily PA.

2.4.6 Researcher characteristics and reflexivity Statement for the qualitative study

This research is based on the Urban Design and Planning Unit (UDP), Department of Architecture, Technische Universität Darmstadt, Germany, seeking innovative approaches to children-centred urban design. Built-environments related to refugee children's health behaviours (e.g., PA) in Germany not only is understudied, but much of its first empiric material is challenging to approach. The UDP mission is to deliver empiric data and evidence-based strategies to inform the much-needed transformation towards more healthy and inclusive cities for refugee children. SC had lived in Berlin for four years at the time of the study, and she had been a children department volunteer in this refugee accommodation since April 2017. She is a non-Arabic speaker but an experienced social worker for communication. MK is an expert in Urban Design and Health and the research supervisor. TS is an expert in the built environment and health-related behaviours and the research supervisor.

Step 2 served to collect and retrieve data; a parallel data collection process was used to gather qualitative and quantitative data simultaneously (Chapter 3 to 5); a detailed timeline of data collection dates and locations is shown in Appendices Table 2.5.

After data collection, Step 3 helped to manage data by detecting and removing (or optimising) errors and inconsistencies in a data set or database due to computer corruption or inaccurate entry input of data.

An integrated designed data combination was used in step 4. It is an approach to mixed-methods evaluation, where qualitative and quantitative data are integrated into an overall design. It is also an iterative process, where findings from some qualitative data were used to inform quantitative data collection, vice versa, or simultaneously, qualitative and quantitative data are collected and analysed together (Caracelli & Greene, 1997). In this step, data were generated from qualitative data (Chapter 5) and used to understand and explain results from quantitative data (Chapter 3 and 4) in-depth.

Various methods were used for data visualisation in step 6 as a scatterplot for displaying the relationship between quantitative variables plotted along axes. A series of dots represented the position of investigations from the data set, and a bubble chart word tree used branches to connect words to the other words that appear nearby in the data in qualitative datasets were also used in this process. These approaches aimed to provide ways to communicate complicated comparable data sets quickly and easily with visual display.

2.5 Ethics approval and consent to participate

The whole study design, including questionnaires (home manager, children care departments, families), field trips, interview designs and workshops, have passed the Technical University of Darmstadt Ethics Committee evaluation [7] with a trackable number EK 26/2019 (Appendices document 2.6), ensuring that the research conforms with general ethical principles and standards[8]. Meanwhile, the author also provided Erweitertes Führungszeugnis (similar to no crime provement) requested by refugee accommodation A as a requirement to work with refugee children.

Several research methods involved human participants - methods from Chapter 2.2 to 2.4 applied in Chapters 3 to 5: staff interviews, parents' questionnaires, children's workshops and photovoice. All potential staff participants were fully informed about the study via email. The author approached them again on data collection day, explained the study methods, potential risks, and benefits, and then obtained signed information sheets. As refugee families, potential participants were fully informed about the study by staff in advance with their languages. The author approached potential participants on the days of data collection explained, and obtained informed sheets from each one before conducting the research. All data were anonymous and securely protected so that nothing could be attributed to an individual participant. The signed information sheets (electronic or paper) are well kept and can be only accessed by the author.

Some issues with obtaining ethical approval should be discussed. This dissertation adopted a more explorative approach as methodology combinations, some of which has not been often used in refugee accommodation environments: such as game playing and photovoice. Therefore, besides the ethics committee evaluation, prior testing with two staff (home manager and children care department) was applied to ensure the questionnaire was appropriate for refugee families. Additionally, the practicalities of the study design for particular research groups should be discussed. What worked well on paper did not necessarily work in practice, and some difficulties in collecting data after the ethics approval of the project were encountered. For example, the author tried to recruit participants and obtain informed consent before the study, as stated in the ethics application, but it is impossible for all cases. As the author applied these interviews in refugee accommodation, the work environment was so unpredictable that participants were recruited by parents informing each other. Therefore, the author had to explain the study concisely to mid-term participants, where misunderstanding may be produced during this unexpected process. In conclusion, it is suggested that a community with experience in research of ethics approval would be a good starting point for researchers. Before applying for ethics approval, cultural or language-specific of interviewees should be considered.

[7] https://www.intern.tu-darmstadt.de/gremien/ethikkommisson/index.de.jsp (last call: 10.2021)

[8] This is a standard procedure for all research involving living human participants to minimise the risk of harm, protect both participants and the author, and ensure that the research is conducted ethically.

Chapter 3. Spatial characteristics of refugee accommodations associated with refugee children's PA in micro environments

3.1 Introduction

This chapter evaluated six primary refugee accommodations in Berlin (Figure 3.11) of their micro spatial characteristics concerning refugee children's PA. Accommodation A, B, and C as initial receptions (EAE) were children's first stations in host countries. Layouts of EAEs were various since they were typically admitted in existing buildings. Accommodation D, Tempohome, was a one-floor residential container integrated with external PA spaces where refugee families had short-term staying. Last two accommodations were similar to existing residential buildings as community accommodations (GAE); one former retirement home E and one newly-built container block F were chosen for study sites. Refugees families were expected to stay here for at least two years.

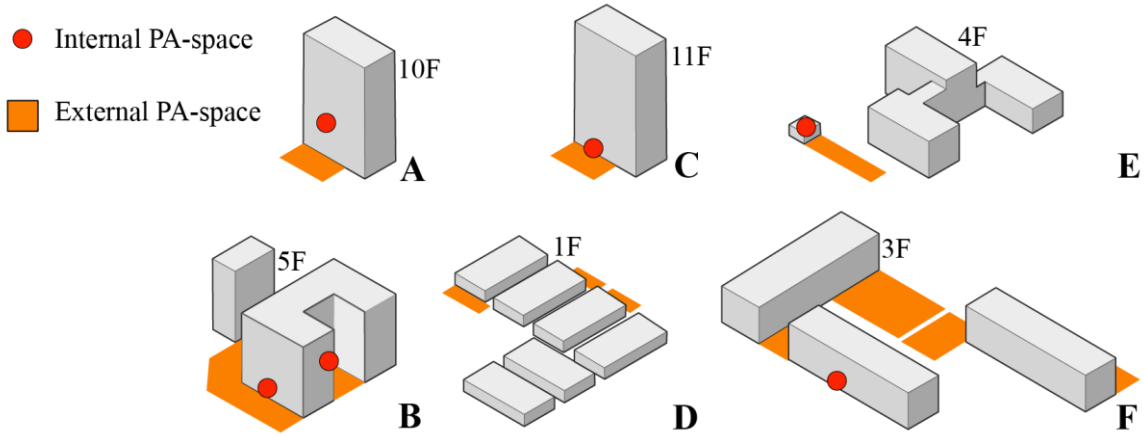


Figure 3.11 Simple spatial representations of six study sites

Several different measures were used to analyse spatial characteristics of each study case which as local connectivity, step depth to internal and external PA spaces and global integration. All measures were presented with visibility graph analysis, as introduced in Chapter 2.3.1. Moreover, four additional study sites will be investigated in Chapter 6.

This chapter investigates micro environments spatial information with obtained analysis data; further, interpreting the relationship between refugee children's PA and their existing micro environments as the first research question (Figure 3.12); the findings are also vital in presenting a qualitative comparison, besides interpreting the existing spatial characteristics related to children's PA. Evidence provided in this chapter will be a valuable reference for the sustainable decisions of refugee accommodation from designs and evaluation views present in Chapter 7.

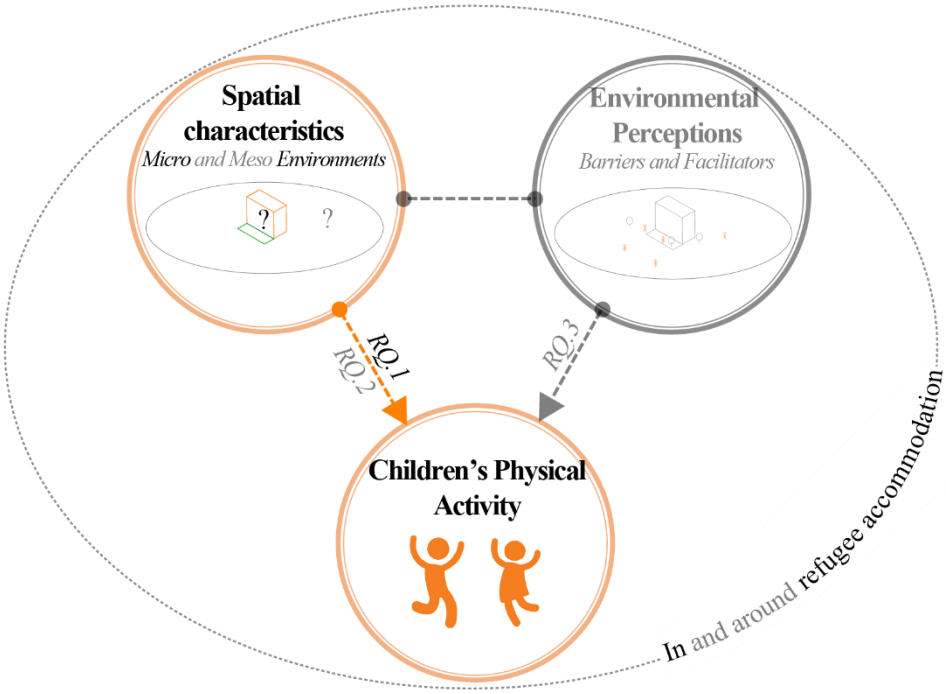


Figure 3.12 A diagram showing research question 1 and children's PA discussed in the chapter

3.2 Data obtained from each study site

3.2.1 Accommodation A: former airport hotel

Accommodation A is an initial reception (EAE) located in the southeast of Berlin, currently operated by Christliche Jugenddorfwerk Deutschlands e. V. The former use of this building was an airport hotel built in 1974. It has 11 floors with 100 individual living units maximum of four people. 18 persons work full-time in the staff team, and two work mainly for children. Meanwhile, a volunteer team of around three people are working specifically for children.

This accommodation opened in December 2015, accepting mainly families with children. Most of the families came from Muslim and Asian countries of origin. The maximum capacity of this accommodation is around 400 persons. By the interview time (30.07.2018), 250 people live in the accommodation, with 70 under 18 years old and 30 being school-aged (6-12 years old).

Families are expected to stay in this accommodation for not more than six months. Still, most of them stay longer; for example, one family has stayed here for already two and a half years. Most children go to welcome classes in primary school, and some who stay here longer already go to regular German classes.

Spatial characteristics

The internal PA space is one interior playroom (64 m^2) on level 2 (Figure 3.2.11a, Figure 3.2.12a), closing to the third stair and right elevator. It is the same typology as a living unit with a balcony for two children's families (Figure 3.2.13, available area 59m^2). The simple typology represents a 'corridor' type as the main corridor runs in the middle that connects all functions (Figure 3.2.11b). Each floor has a similar floor plan with four stairs and two elevators. To reach the internal PA space, children need to go outside their rooms, find the closest elevator/stairs, then get to level 2. The playground designated for this accommodation is on level 0, with a total area of 390 m^2. After

passing through the canteen (only when it opens at mealtime), another corridor, or outside the main entrance, the children can arrive at this external PA space. There are two swings, a slide and a sand playground in this outdoor playground (Figure 3.2.12b). Most service rooms (e.g., offices, reception, canteen) are located at level 0. As for the spatial analysis, the author divides each floor plan for the living unit connecting to the same corridor part into five zones, namely zone I to V (Figure 3.2.11a).

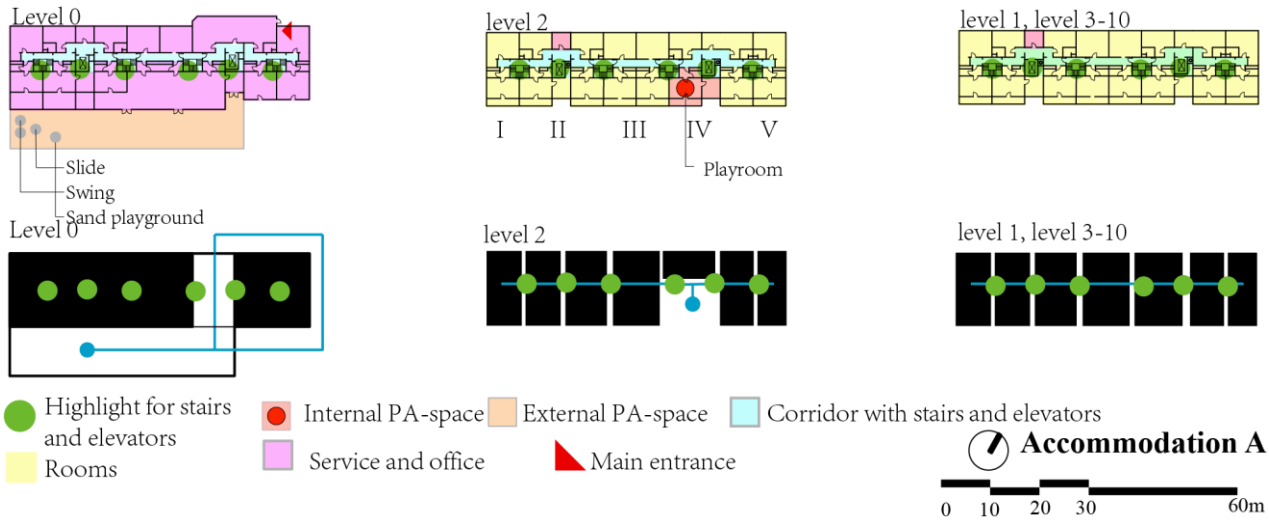


Figure 3.2.11 (a) layouts of study case in micro environment; (b) simple typology representation

Figure 3.2.12 (a) internal PA space; (b) external PA space

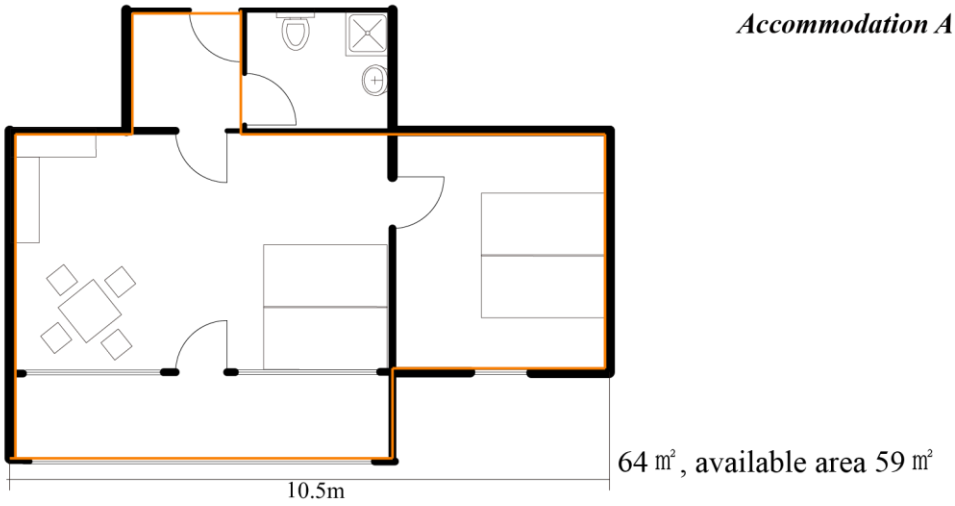


Figure 3.2.13 Living unit example

Opportunities of PA

Children usually get up at 6:30 (Figure 3.2.14), the canteen opens from 7:00 to 9:00 for breakfast. Children stay at school from 8:00 to 14:00. Some may have additional classes and end school until 16:00. The internal PA space (playroom) opens from 16:30 to 18:00; otherwise, children may go outside for playing under adults' supervision—dinner service daily from 19:00 to 21:00. Most go to the study room for homework after dinner. Children usually go to bed at around 22:00.

Opportunities of PA for children is from 16:30 to 18:00, around 1.5 hours (either in playroom or playground) per day under adults' supervision. There is an organised football workshop every two weeks on Wednesday from 16:30 (playground). The night play after dinner is individual and mainly happens inside the accommodation.

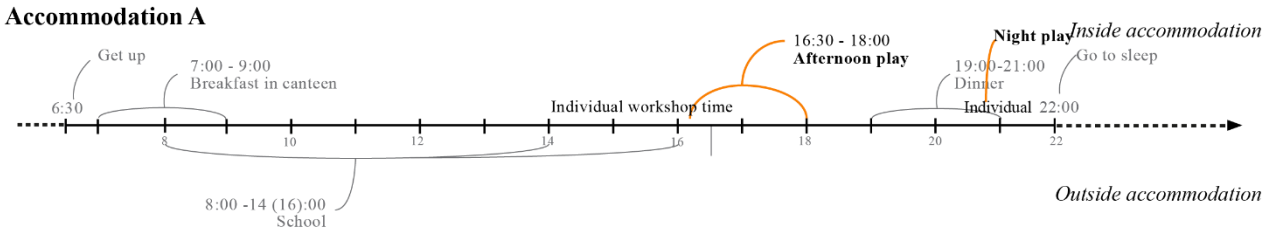


Figure 3.2.14 Opportunities of PA

Spatial measure analysis

The connectivity analysis identifies that all living units inside accommodation are lower in connectivity as 1.0 (Figure 3.2.15). The integrated corridor on level 0 is most connected; the second corresponding parts are the main corridor (Zone I, II) that connect directly to two stairs and one elevator on each floor. Even though every floor corridor is shaped like an entire rectangle, it separates into five spaces due to the old fire protection standard. Translating these corridors' connectivity back to accessibility means that separated corridors increase the difficulties for living units to get to the internal and external PA spaces. The maximum connectivity is 8.0 (level 0 corridor), with average connectivity is 2.3.

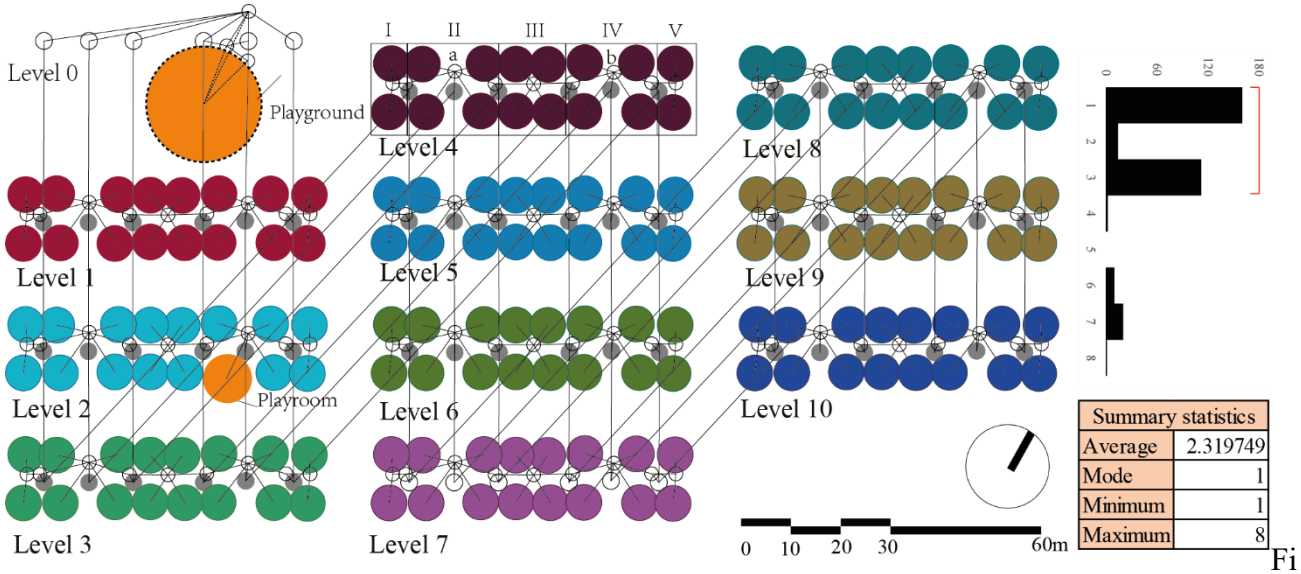


Figure 3.2.15 Connectivity analysis

The step depth to internal PA space (level 2 zone IV) strongly identifies Zone IV on each floor closest to the internal PA space (Figure 3.2.16a) since they connect through elevators. The second nearest parts are Zone III and V on each floor which children go with corridors. Zone I is most far away from the internal PA space due to separated corridors in general. The maximum step depth is 18.0, with an average step depth of 10.0.

As shown in Figure 3.2.16b, the external PA space step depth analysis strongly identifies that living units close to elevators and stairs are more accessible to external PA space (zone II and IV on each floor). For example, zone I, III and V on level 3, far from the stairs and elevator, may have the same 8.0 step depth as the stair corridor-related zone II and IV on level 4. Furthermore, accessibility decreases with floors. The maximum step depth is 15.0 (level 10, zone I, V), which means the most faraway space in the accommodation is 15 steps away. On average, every space is 8.6 steps away from the external PA space.

In summary, with a living unit of 58 m^2 available in size, it is spatial sufficient for indoor playing. However, the separate corridor is inconvenient (average connectivity =2.3) on each floor which makes it difficult for children to reach external PA space (8.6) and internal PA (10.1). Such spatial characteristics give low accessibility for PA spaces internally and externally.

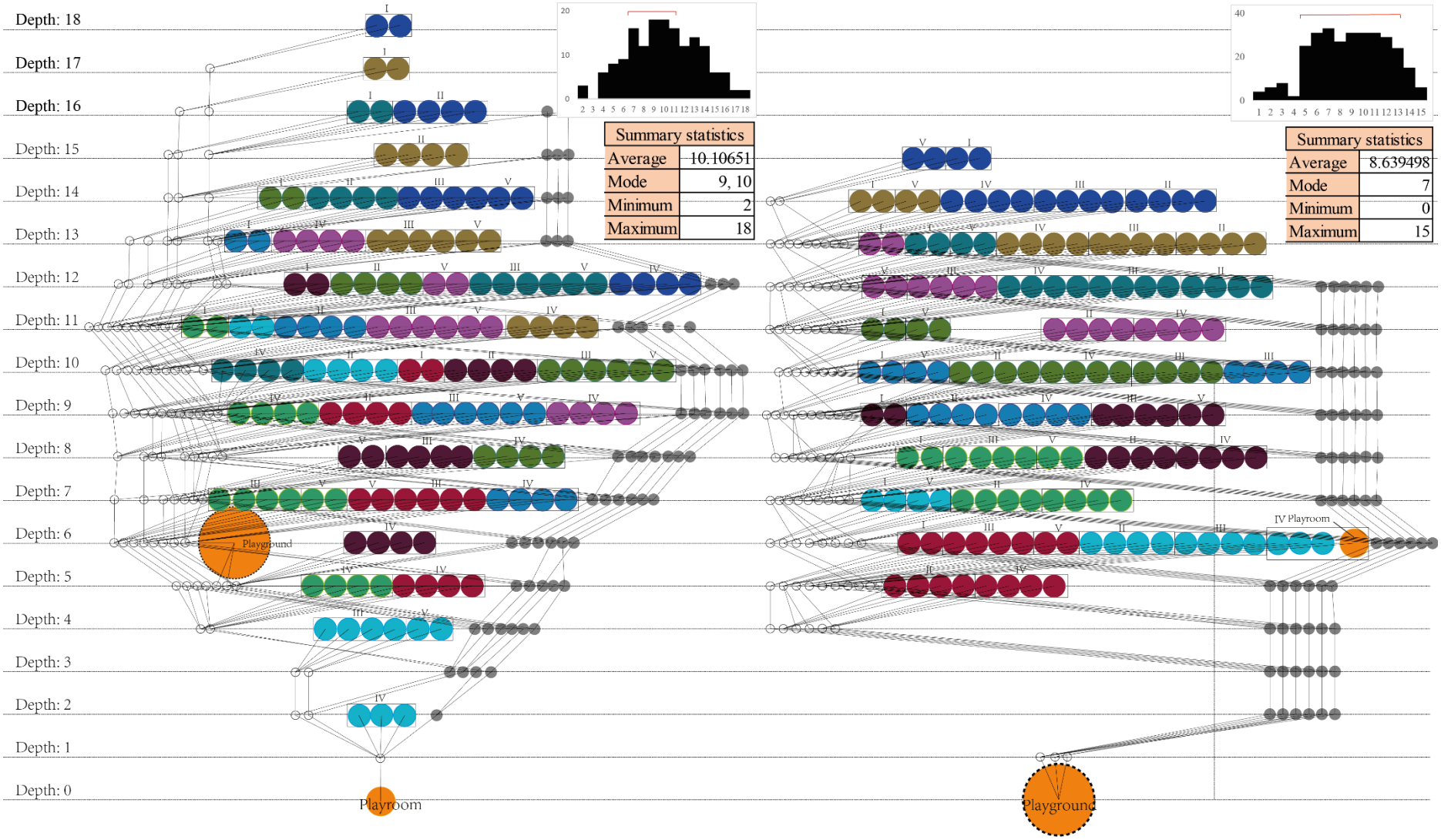


Figure 3.2.16 (a) step depth to internal PA space; (b) step depth to external PA space

3.2.2 Accommodation B*[9]: former building complex

Accommodation B was part of a building complex in East Berlin, which consisted of a 1913-1914 historical protected industrial building. After reconstruction from 1992 to 1995, a new building was added to the existing ones. Arbeiterwohlfahrt landesverband Saarland e.V (AWO) ran these add parts as an EAE from September 2014 to summer of 2019. Extensive renovation work, such as fire protection for refugee accommodation, was done in 2013 before refugees moved in.

This accommodation had five floors and 170 living units, providing living units maximum of four people. There were 25 full-time members in the staff team, including four children care staff. By the interview time (16.10.2018), there are 490 persons in this accommodation with a total capacity of 500. More than half are from Muslim countries of origin, while others are from Asian or African countries. 155 of the refugees are under 18 years old, while 33 are around 6 to 12 years old.

School-aged refugees usually stay here for four months to one year, but one family already stays here for three years. All school-aged children go to welcome classes in primary schools.

Spatial characteristics

There are two internal PA spaces on level 0. One is a playroom (1, 362 m^2) for children near the main entrance (Figure 3.2.21a, Figure 3.2.22a), another one is a flexible open space (2, 65 m^2) inside the accommodation, which turns into a movie space once a week in the evening. It is also a playing corner for children (e.g., rock climbing or jumping from mat to mat). Service rooms are set on level 0 (building b, c) with a big canteen (c). Since living units are temporary, a zone divided by corridors and existing concrete walls with available plans are used for spatial analysis (zone I to VIII). A typical living unit in accommodation B (building a) for a four-person family is 45 m^2, available in size (Figure 3.2.23).

Simple typology represents a ‘corridor’ in building a and a typical ‘U-turn’ in building b (Figure 3.3.21b). By going through the nearest elevator or stair, children in building b go to level 0 for internal PA space or outside for external PA space. Children in building a need to go to another building for internal PA space. There are three external PA spaces linked together around this accommodation. (3) is a functional playground with one ping-pong table, playable wood bridge and sand playground (Figure 3.2.22d, 673 m^2); for the rest playfields, one (4) is next to the functional playground (Figure 3.2.22c, 665m^2). Another is a rectangle square (Figure 3.2.22e, 937 m^2).

[9] * means this accommodation is closed by script summarising time, same as below, more details in AT1.2.4.

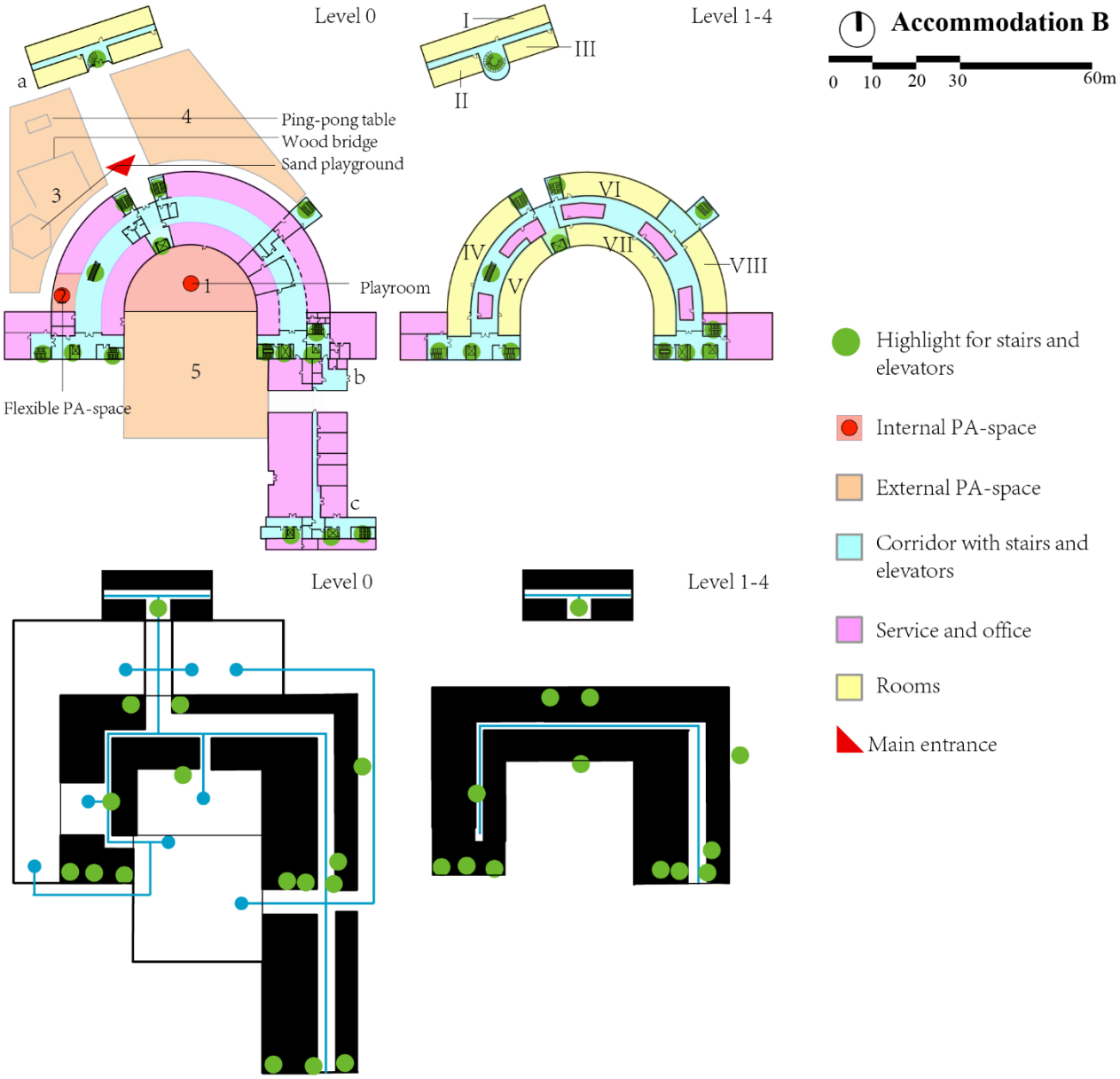


Figure 3.2.21 (a) Layouts of study case in micro environment; (b) simple typology representation

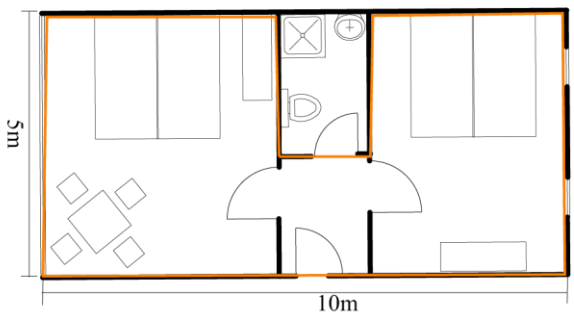
Figure 3.3.22 (a) internal PA space 1

(b) internal PA space 2

(c) external PA space 3

(d) external PA space 4

(e) external PA space 5



Accommodation B living unit example
1:150

50 ㎡,available area 45 ㎡

Figure 3.2.23 Living unit example

Opportunities of PA

Children get up at 7:00 (Figure 3.2.24a), breakfast is serviced from the same time to 9:00. School time is usually from 8:00 to 14:00. For children going back from school, afternoon play happens around 2 hours, from 16:00 to 18:00. Dinner is available from 19:00 to 21:00; children usually go to bed at 22:00.

Opportunities of PA for children is four hours:14:00 to 16:00 for free play with volunteers and 16: 00 to 18:00 for around 2 hours per day under adults' supervision. The PA program is very flexible by the available volunteer who comes every day (14:00 to 16:00, inside the playroom, Figure 3.2.24b). Night play after dinner is individual and mainly happens inside the accommodation.

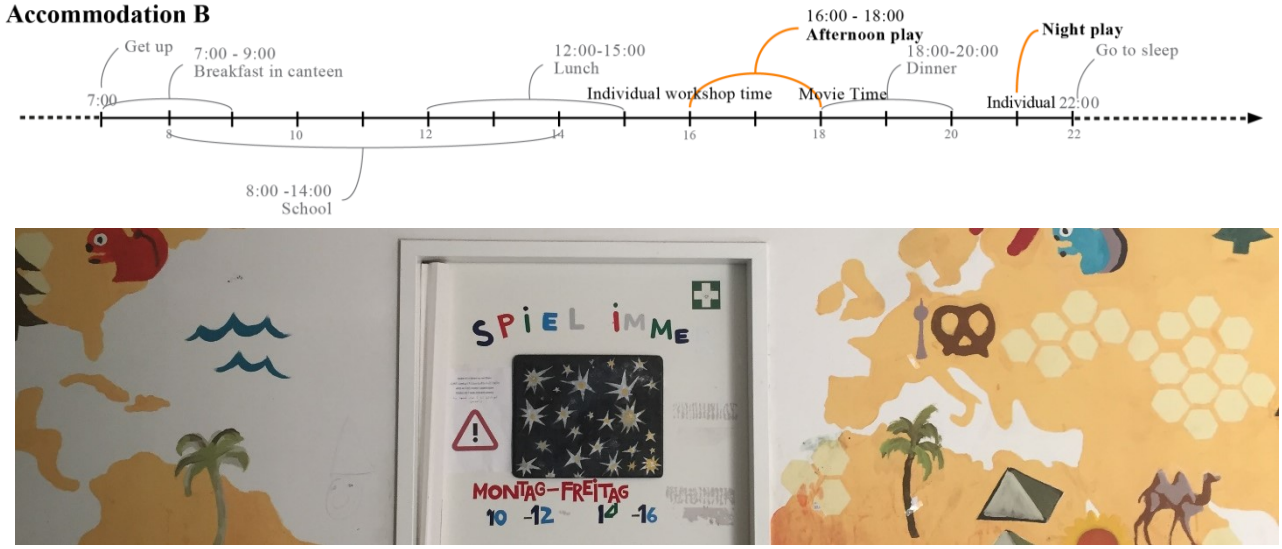
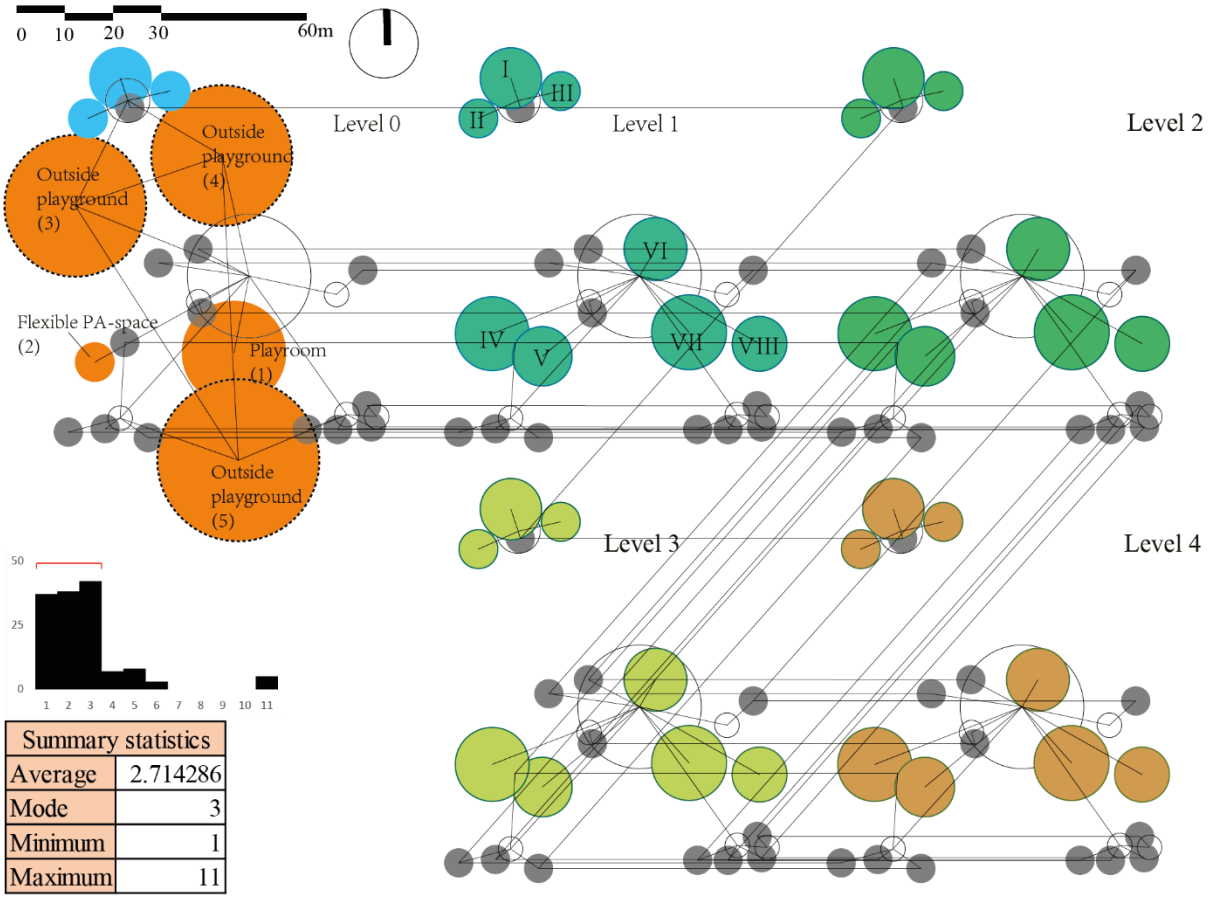


Figure 3.2.24 (a) Opportunities of PA; (b) Activity schedule on the door

Spatial measure analysis

The connectivity (Figure 3.2.25) analysis identifies that accessible main corridor (big white circles) on each floor as most connected of 11.0. All elevators and stairs connect directly with the main corridors, and living units (zone I to VIII) on each floor are relatively low in connectivity as 1.0. The maximum connectivity is 11.0, with average connectivity of 2.7.



Summary statistics	
Average	2.714286
Mode	3
Minimum	1
Maximum	11

Figure 3.2.25 Connectivity analysis

The step depth to internal PA space (Figure 3.2.26a) analysis identifies zone I to III on level 0 in building a is nearest to internal PA space among all living units (step depth = 4.0) since they are both on level 0. However, since the internal PA space in another building b, step depth increased to 7.0 from level 1 in Zone I to III. Living units (Zone IV to VII) are integrated and generally connected to internal PA space from 5.0 to 8.0 in step depth.

Step depth to external PA space (Figure 3.2.26b) identifies that internal PA space and external space are in good connection with a step depth of 2.0. Zone I to III on level 0 in building a is also near external space through the corridor. The maximum step depth is 8.0 means that the rooms on the fifth floor are 8.0 steps away from the external PA space, while on average, every space is 4.8 steps away from the external PA space.

In summary, living units is 45 m^2 in size, which is possible for indoor playing. Nevertheless, accommodation B is well connected to internal (5.5) and external (4.8) PA space on average. Even though accommodation B is low in connectivity (average connectivity = 2.7), corridors are connected to living units. Given the size of the layout and the step depth to external and internal PA space, accommodation B is in good accessibility of internal and external PA spaces in micro environments with identifiable, accessible and prominent corridors.

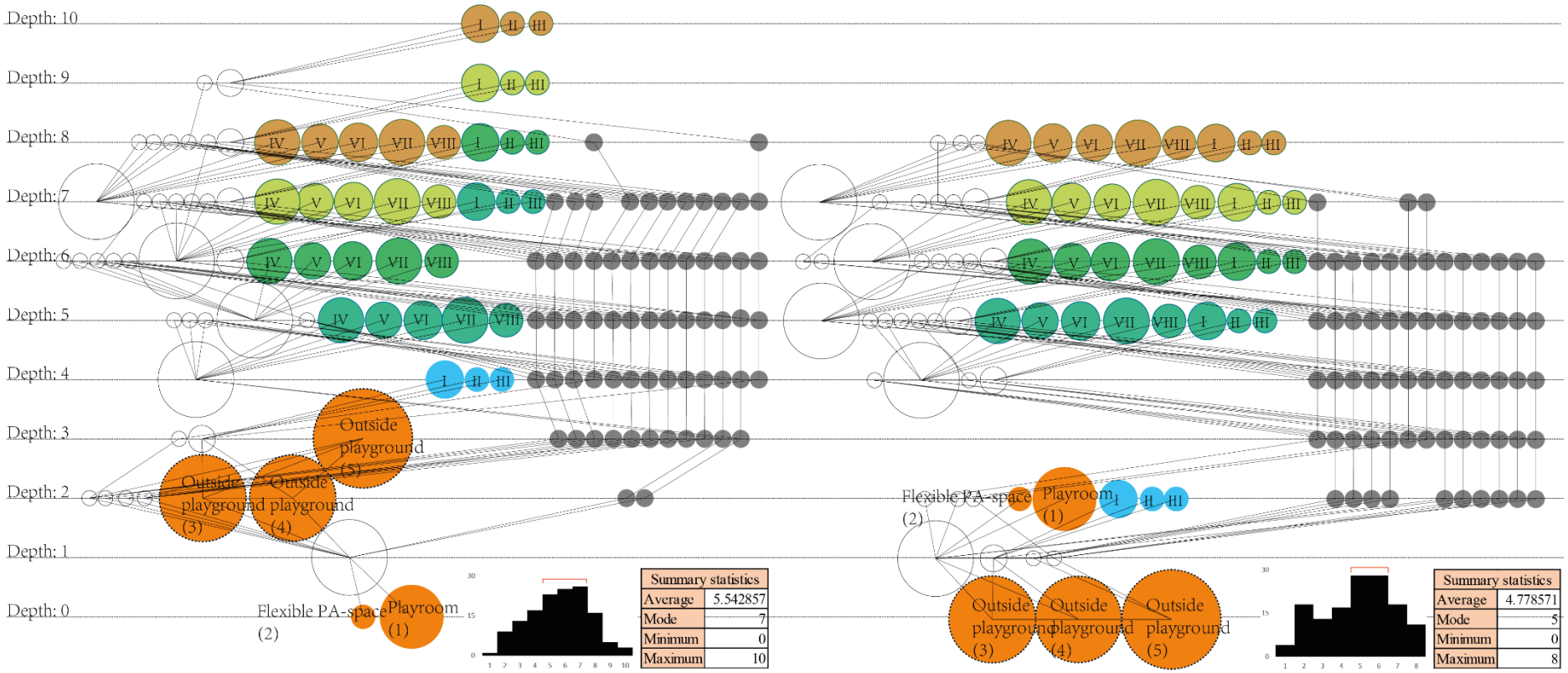


Figure 3.2.26 (a) step depth to internal PA space; (b) step depth to external PA space

3.2.3 Accommodation C: former high-rise residential block

Accommodation C is a residential block (1980s) that opened in December 2012 as an EAE. AWO runs this accommodation right now as initial receptions (EAE). This ten-floors building has 127 living units with a maximum capacity of 350 people. It offers apartments for up to 6 people. There are 13 staff in the work team, and two of them work mainly for children.

By the interview time (23.10.2018), 217 persons live in this accommodation. It has 87 underaged refugees; 27 among them are school-aged. Most families are expected to stay for three months; however, a family has already stayed there for more than three years. All the children are studying in welcome classes in primary schools.

Spatial characteristics

Similar to accommodation A, C represents a 'corridor' typology (Figure 3.2.31b) where the main corridor runs in the middle and connects all living units on both sides. Children find the nearest elevator/stair then go down to level 0 to reach internal or external PA spaces. The internal PA space is a playroom (41m^{2,} Figure 3.2.31a, Figure 3.2.32a) and links directly to a playground as an external PA space (Figure 3.2.31a, Figure 4.2.32b). This playground provides various play equipment, such as a small ball playground, two ping-pong tables and a sand playground with a slide. Children share this 302 m^2 playground with other neighbourhood children. A typical living unit is shown in Figure 3.2.33, with an available area of 38 m^2. In spatial analysis, like accommodation A, each floor plan is divided into seven zones, namely zone I to VII, by living units connected to the same corridor.

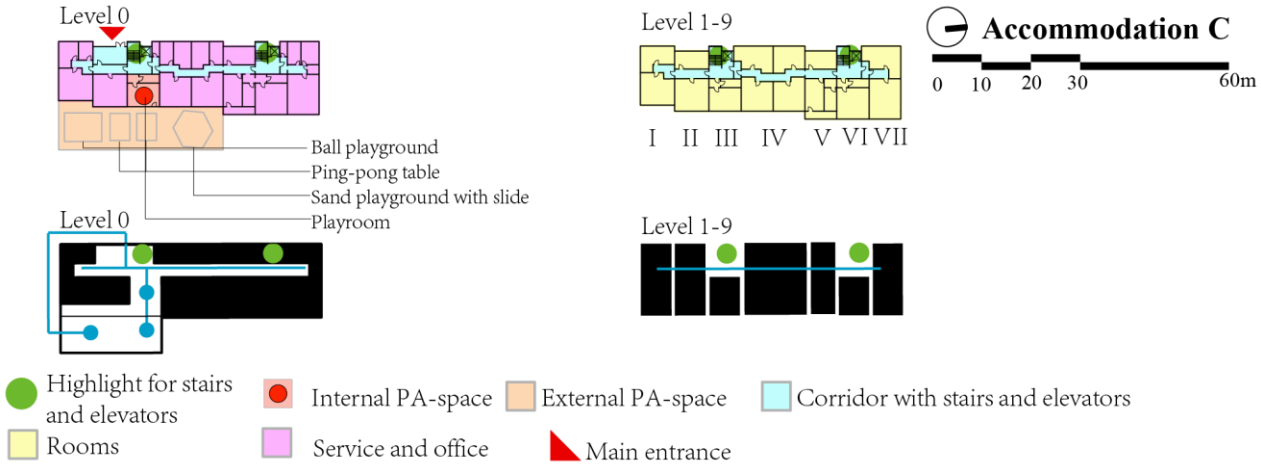


Figure 3.2.31 (a) Layouts of study case in micro environment; (b) simple typology representation

Figure 3.2.32 (a) internal PA space; (b) external PA space

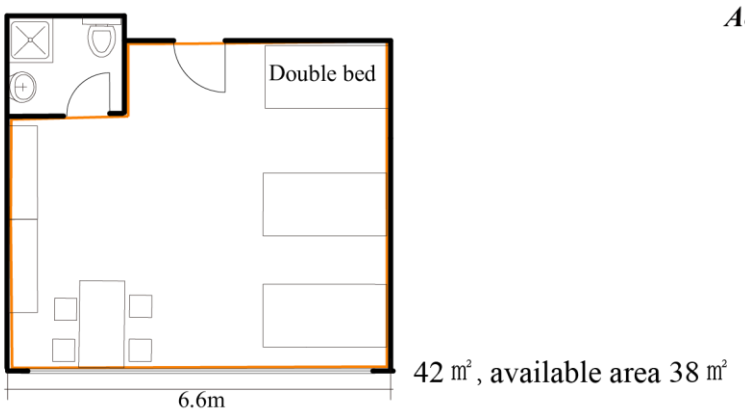


Figure 3.2.33 Living unit example

Opportunities of PA

Children usually get up at 6:00 (Figure 3.2.34a), and the canteen offers breakfast from 8:00 to 10:00. Children go to school after and come back at around 13:00. The canteen serves lunch from 12:00 to 15:00. Children play for 2 hours after, and the playroom opens from 16:00 to 18:00 (Thursday from 15:00) freely for school-aged children. Bedtime is also different among children.

Opportunities of PA for children is from 16:00 to 18:00, around 2 hours per day for children. There are organised activities (dance, music, and play together, Figure 3.2.34b) from 14:00 to 18:00 every Tuesday. Night play after dinner is individual. It is worth mentioning that since children share external PA space with the neighbours, even though their building is close to the playground, play happens by turns. They may have a limited chance for outdoor PA in micro environments when other children in the neighbourhood already occupied the playground space or equipment.

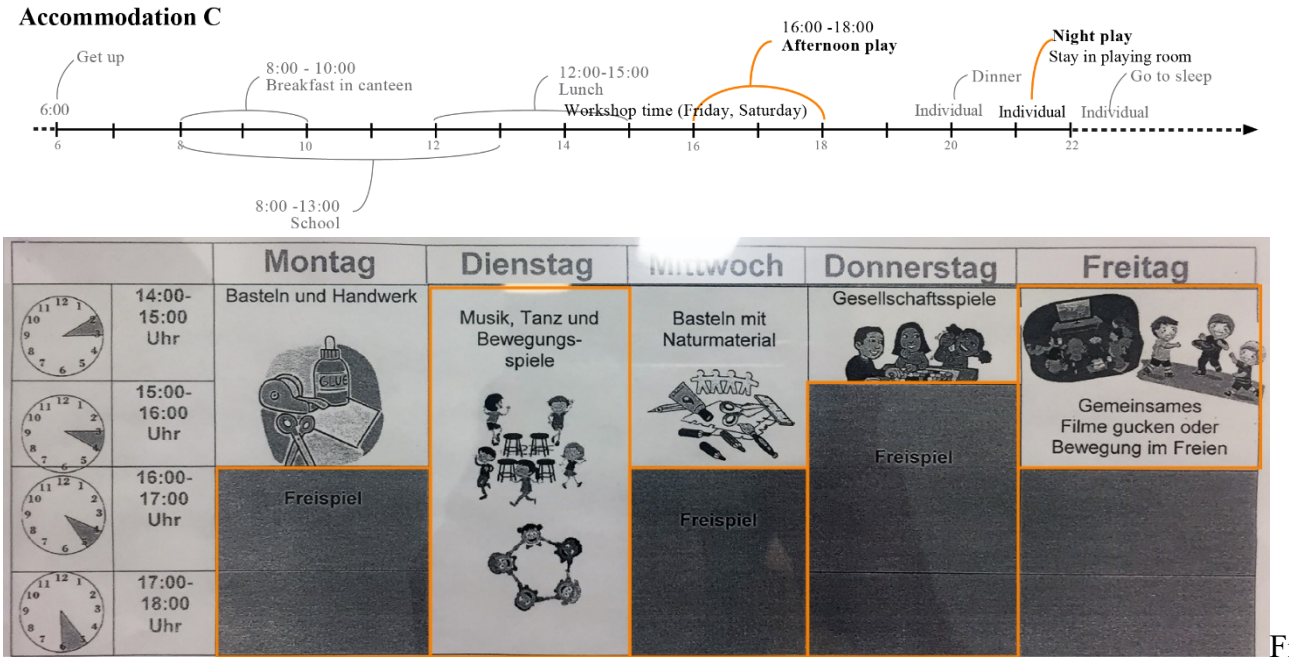


Figure 3.2.34 (a) Opportunities of PA; (b) organised activity schedule

Spatial measure analysis

The connectivity analysis identifies main corridors (Zone IV) directly linked to four living units being the most connected (Figure 3.2.35). Like accommodation A, main corridors are separated into seven spaces and every living unit with the lowest connectivity of 1.0 to parts of the main corridors. Maximum connectivity is 6.0, with average connectivity levels of 2.2.

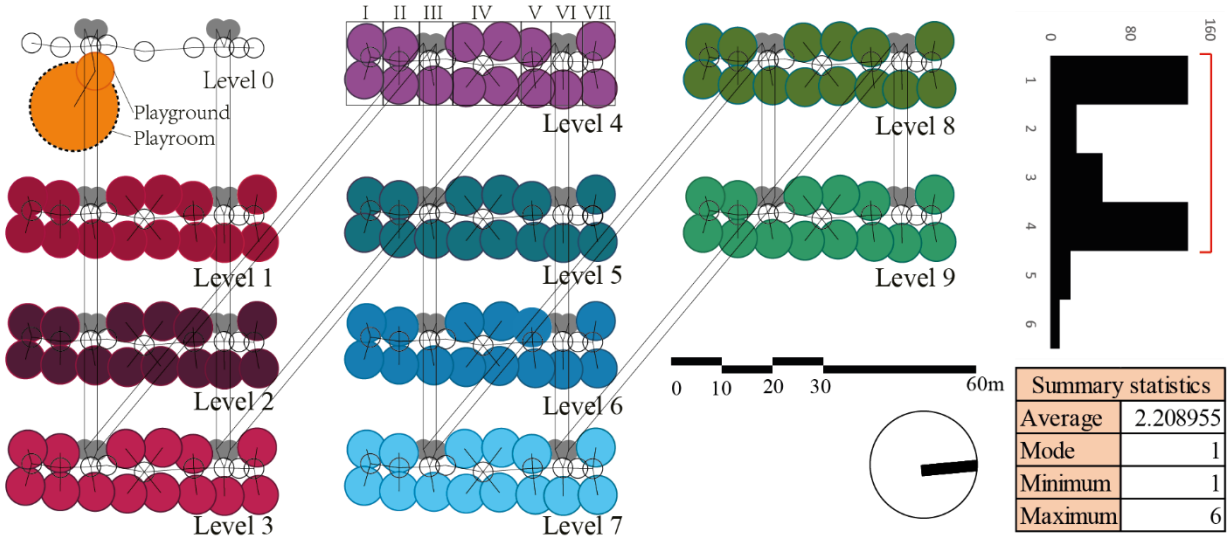


Figure 3.2.35 Connectivity analysis

The integrated step depth diagram resulting from internal and external PA space connected directly together (Figure 3.2.36) identifies Zone III on each floor as closest to PA space since they are close to the left elevator stair combination. The second nearest parts are Zone II, next to Zone III. Zone VII is general most far away from PA space due to the structure of separated corridors. Accommodation C has a maximum step depth of 18.0 and an average of 2.2 due to the separated corridors' structure and 11 floors.

In summary, accommodation C has complex spatial characteristics resulting in lowly accessibility from living units to internal and external (10.4) PA spaces and average connectivity (2.2). Moreover, it is insufficient for indoor playing (available area 38m^2). Even though internal and external PA space is connected, such spatial characteristics give no help to increase PA space accessibility due to the unconnected corridors and floors. Additionally, the shared external PA space with neighbours may reduce children's PA overall. Conclusively, such a spatial characteristic gives a low possibility and insufficient space for PA. It is also evident from these two refugee accommodations (A and C) that floors are positively correlated to step depth to PA spaces and negative related to children's PA levels.

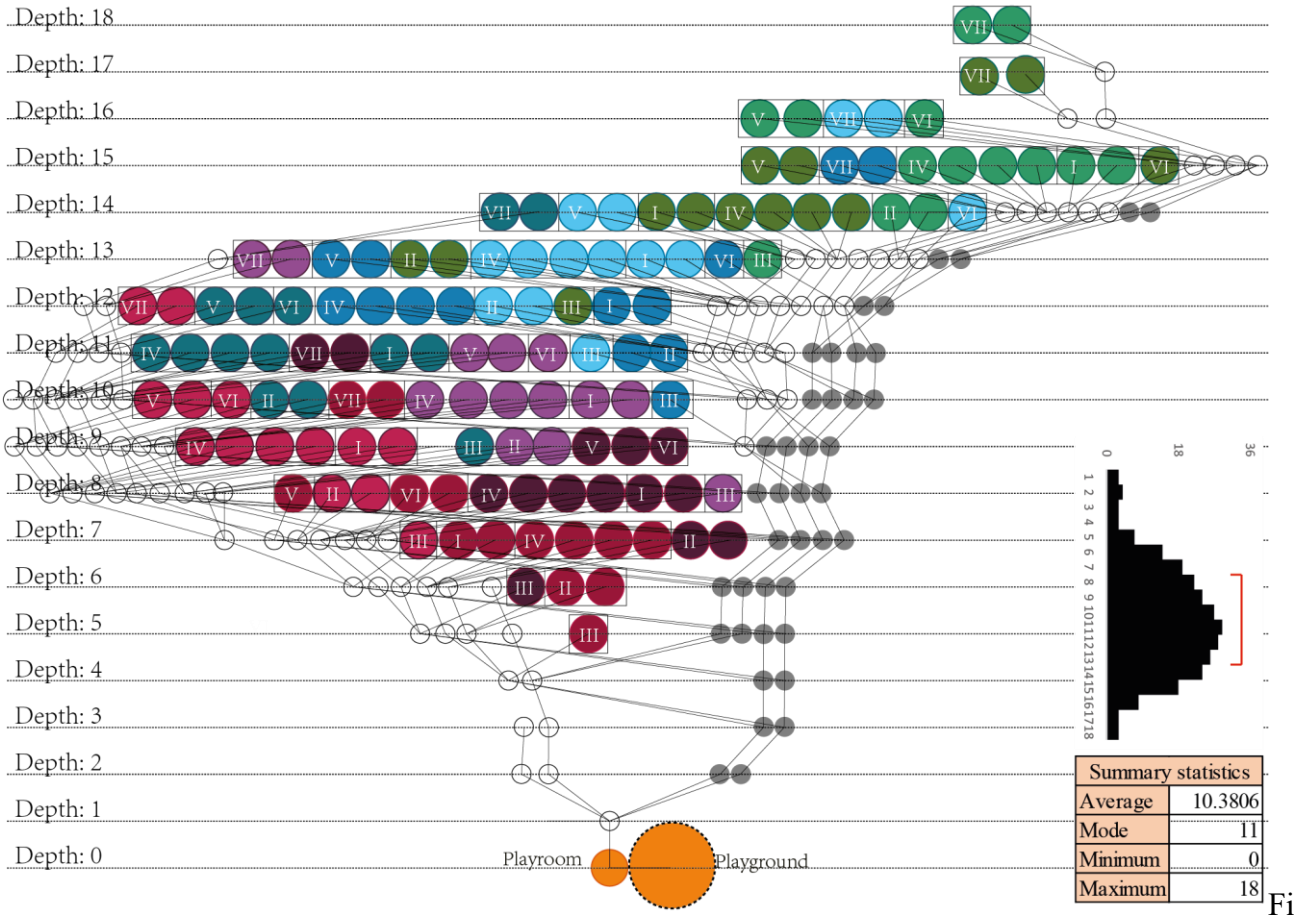


Figure 3.2.36 Step depth to external and internal PA space

3.2.4 Accommodation D*: newly built Tempohome

As clarified in Chapter 1.2.3, Tempohomes is a temporary housing program in Berlin that addresses the scarce accommodation situation. Refugee families will have a transitional period here until available space in regular accommodation. Accommodation D contained nine one floor container integrations, while seven were living units for refugees, namely building a to g, and another two were office and service rooms for staff. There were 15 people in the staff team, while two worked mainly for children. This accommodation was operated by Evangelisches Jugend- und Fürsorgewerk AG (EJF) from December 2016 to July 2019.

There were 64 living units (3 containers as one living unit) inside the accommodation, mainly four persons. As shown in Figure 3.2.41, every living unit combination has its own WC and a small kitchen (available area 27m^2). It was also an LGBTQ friendly accommodation. By the interview time (14.02.2019), 170 people live in this accommodation with a maximum capacity of 256. Most of them are from Muslim countries of origin. As mentioned before, the purpose of this accommodation is for ‘transit’. The staying period for refugees is relatively unstable. They may only stay here for a few days, or some of them may stay here as long as the accommodation exists.

The accommodation has around 20-30 school-aged children (detailed information could not be provided due to EJF superior protection terms). They are either in welcome classes or regular classes in primary schools.

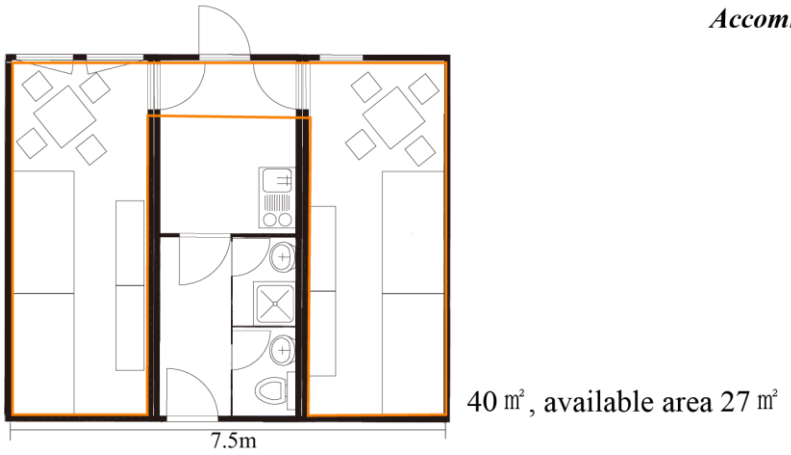


Figure 3.2.41 Living unit example (Senate Department of Health, Care and Gender Equality)

Spatial characteristics

Typology representation is quite evident in this one-floor accommodation as 'multi-racetrack' type (Figure 3.2.42b) where living units are the centres, corridors run around units and then go across units in the middle. Instead of an entire internal PA space, there are three small playgrounds around the containers. They are filled with playable children playground equipment (1, 135m^2; 2, 148m^2; 3, 103m^2, Figure 3.2.42a). Children can easily reach the outside playgrounds outside the containers (photographs could not be taken in this accommodation due to EJF superior protection terms).

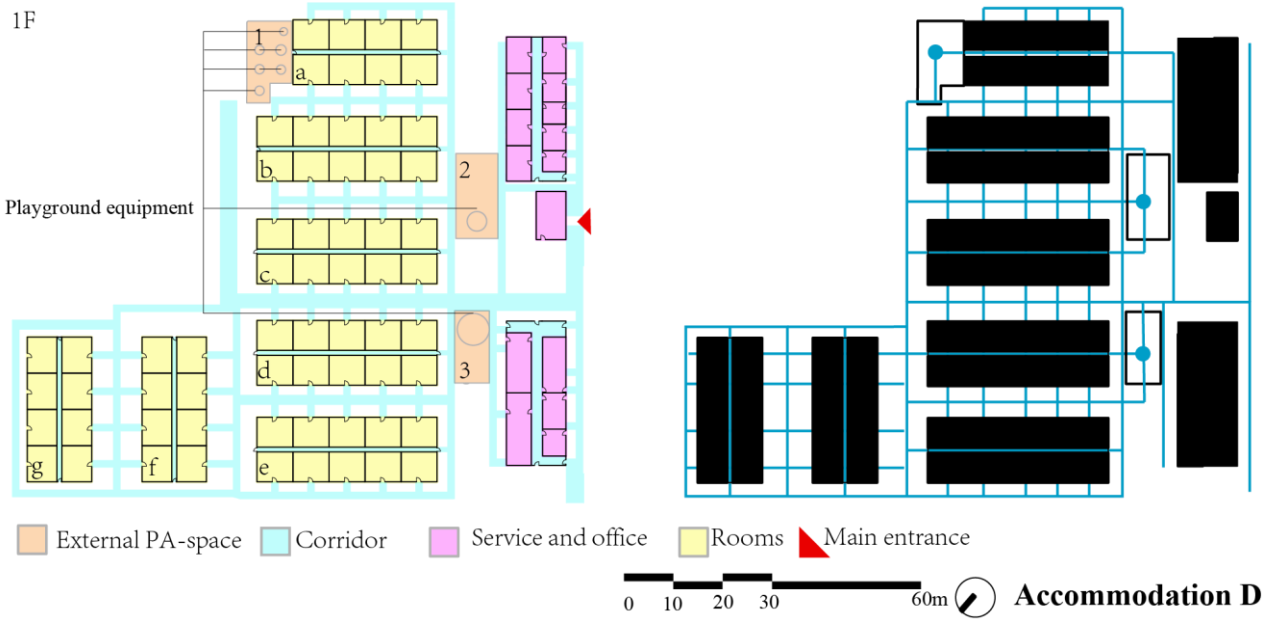


Figure 3.2.42. (a) layouts of study case in micro environment; (b) simple typology representation

Opportunities of PA

As mentioned above, since every family has their kitchen, children's timeline shows their individuality. They may have different schedules for getting up and breakfast (Figure 3.2.43a). Generally, after school time (8:00 to 14:00), children gather for afternoon play from 15:00 to 18:00. At the same time, children may go to a workshop based on their choice.

Opportunities of PA for children is from 15:00 to 18:00, around 3 hours per day for children. The night play after dinner is individual. As shown in Figure 3.2.43b, there are specific organised activities for children every Wednesday (17:00) and Saturday (18:00), and they usually play longer time (2 to 3 hours) in this organised activity.

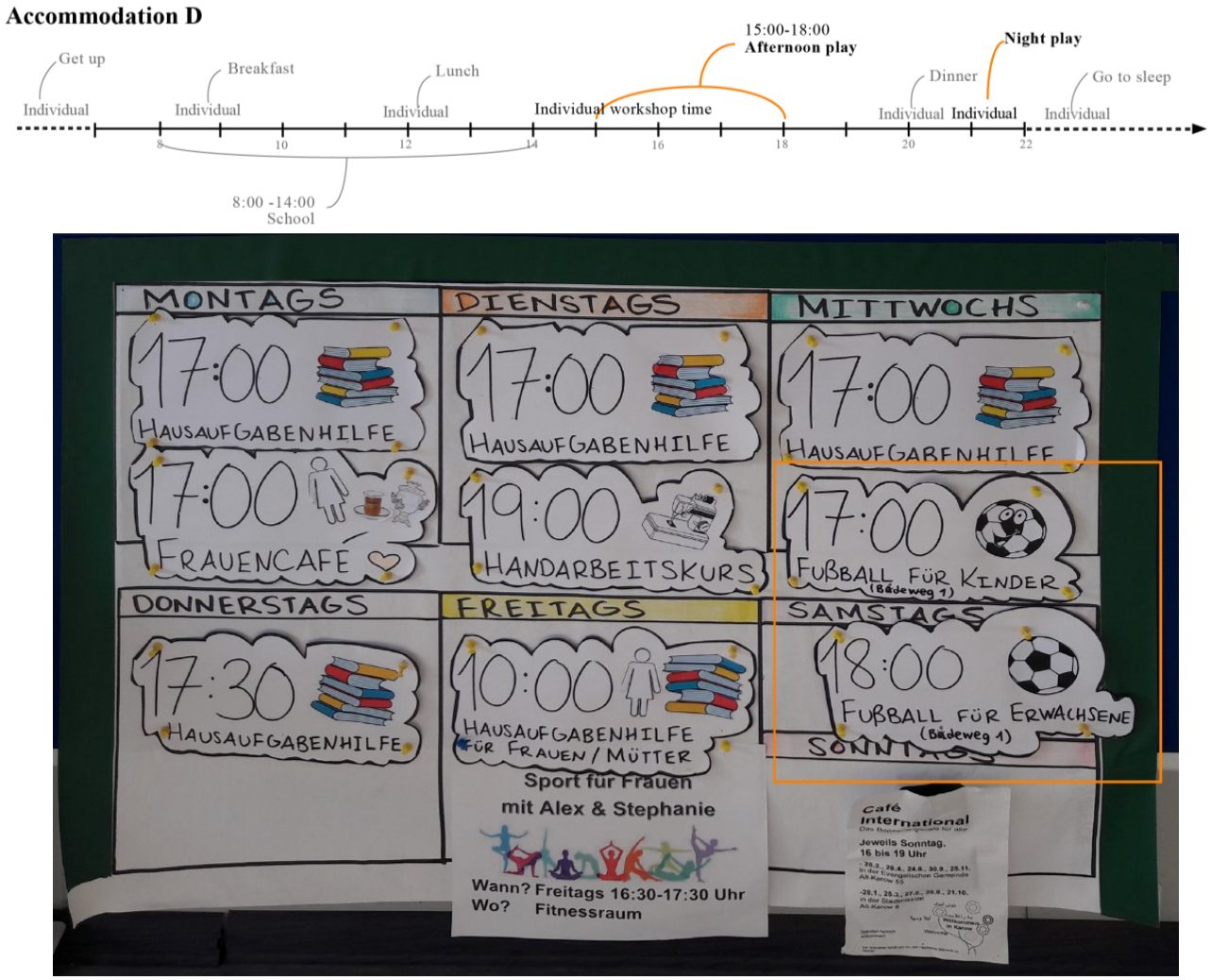


Figure 3.2.43 (a) Opportunities of PA; (b) organised activity schedule

Spatial measure analysis

Connectivity diagram of accommodation D is quite evident and apparent. All three external PA spaces are in good connectivity with containers (Figure 3.2.44). Maximum connectivity is 46.0 (external PA space 1), followed by playgrounds (3) and (2) as 39.0 and 21.0; most living units connect directly to playgrounds with average connectivity levels of 4.5.

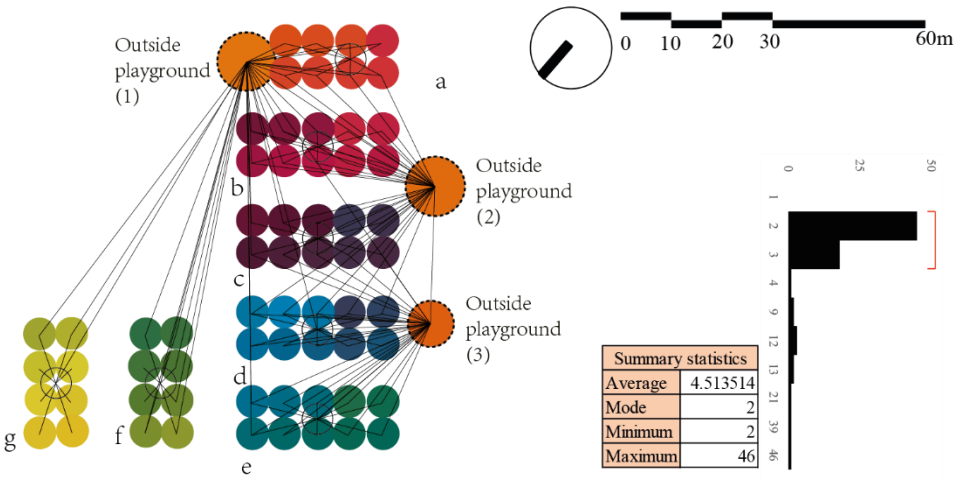


Figure 3.2.44 Connectivity analysis

For step depth analysis, as mentioned before, for most living units, children can reach external PA spaces easily by going outside the containers (Figure 3.2.45). The maximum is only two because few containers from building f and g are unlinked directly to the external PA space. On average, every space is 1.1 steps away from the external PA space.

In summary, there is only one floor and container connected directly with external PA space. Such a spatial characteristic provides a potential of PA space accessibility, especially multi-external PA space with an average step depth of 1.1. Significant parts of the living units are well connected, with average connectivity of 4.5. However, there is no internal PA space in this accommodation, and the living unit (available 27m^2) is spatial insufficient for indoor playing, which may reduce the chances of PA when the situation (e.g., weather) is not suitable for outdoor playing.

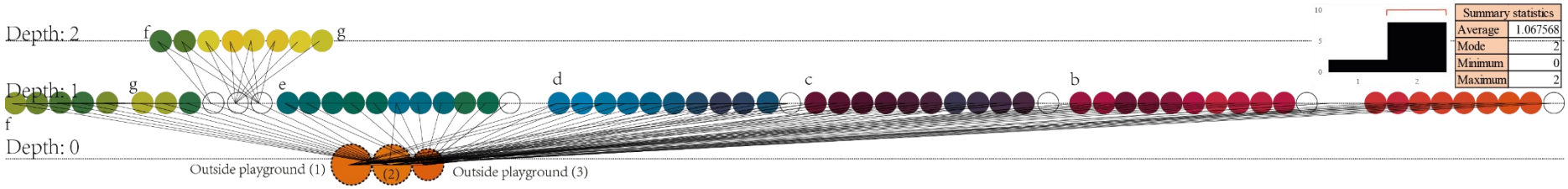


Figure 3.2.45 Step depth to external PA space

3.2.5 Accommodation E*: former retirement home

Accommodation E was historical buildings integration (1961) located in the south of Berlin. After comprehensive renovation, EJF operated the buildings as a community accommodation (GAE) from July 2015 to October 2020. The building was a former retirement home and hospital.

Accommodation E had 90 rooms, with a maximum capacity of 265 people. It provided mainly two, and three bedrooms with family apartments of up to 6 persons. There was a communal kitchen on every floor. All residential units have individual toilets, most with bathrooms. 13 persons worked full-time in the staff team, and two worked mainly for children. Compared to other accommodations, E had stringent protection standards. The site was fenced entirely and isolated from their neighbourhoods and entered through only a street-side gate after security check. The building and designated space were guarded around by the security team all the time, and all necessary security cameras were responded directly to the police.

Currently (20.11.2018), 200 people live in this accommodation. 67 are under-aged; 18 are between 6 to 12 years old, all going to regular classes in primary school[10]. Most of the families stay here for 1 to 2 years. Furthermore, one family has already stayed here for four years. Since this is almost the last refugee accommodation of their asylum application, three conditions mostly happen after they move out of GAEs: (1) move to a regular apartment if their asylum application is completed; (2) move to another community accommodation if this one is not available (e.g., closed); or (3) go back to their hometown if the asylum-application is rejected.

Spatial characteristics

Typology representation is evident in these four floors accommodation as ‘tuning fork’ where living units are leaves connected directly to corridors as breaches in Figure 3.2.51b. Internal PA space (Figure 3.2.51a, 144m^2) is housed in a separate building with a play area on level 0 and separate rooms on level 1. A playground with playable equipment as an external PA space (273m^2) is connected to the internal PA space. Children need to go outside for internal PA space. A typical 4-bed room for a family is 45m^2 available in space with a balcony (Figure 3.2.52). Like accommodation D, photographs could not be taken in this accommodation due to EJF superior protection terms.

[10] special condition, children reunited with their families in GAE, they may be newcomers and need to go to welcome classes, more detail Chapter1.2.3

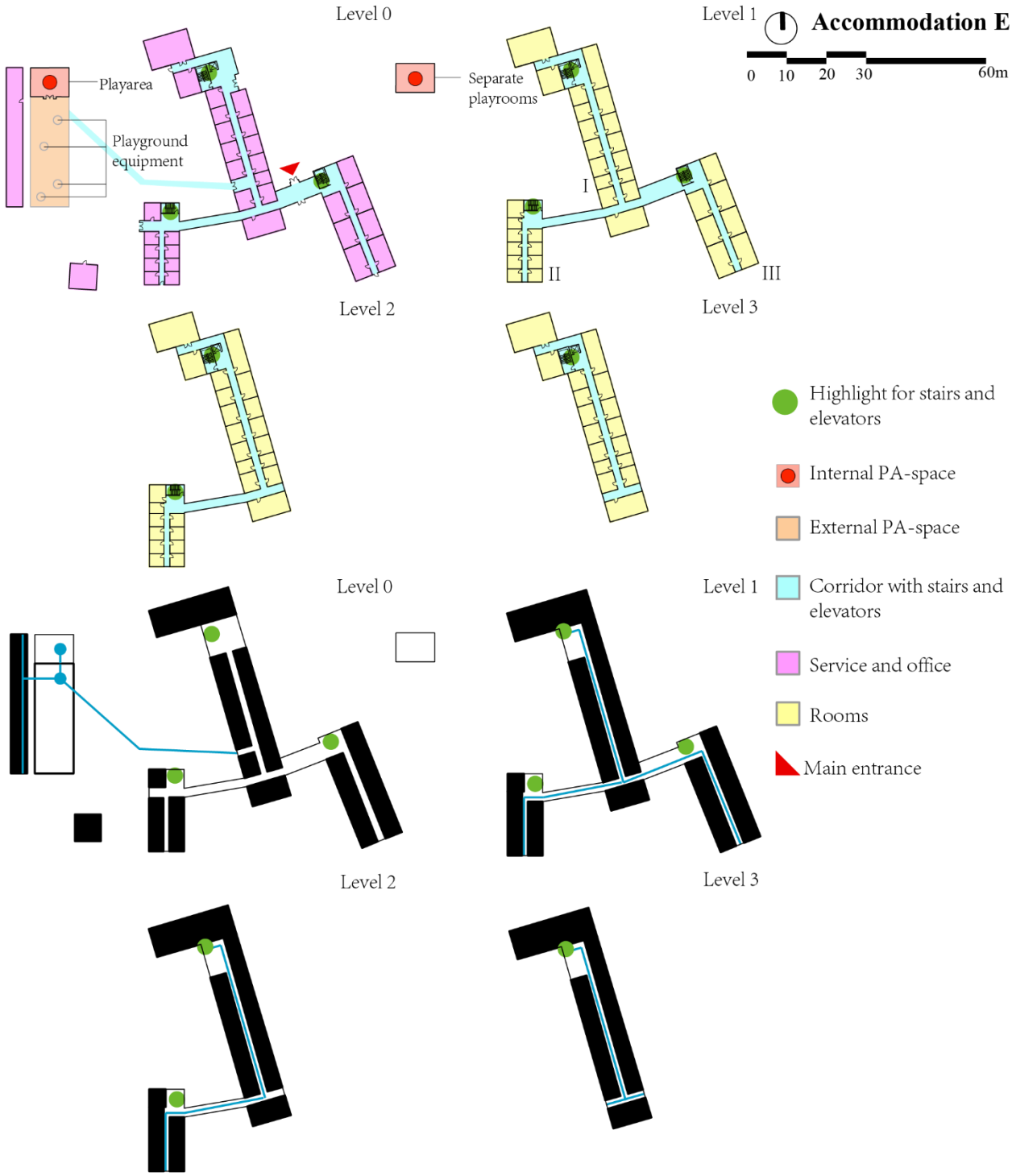
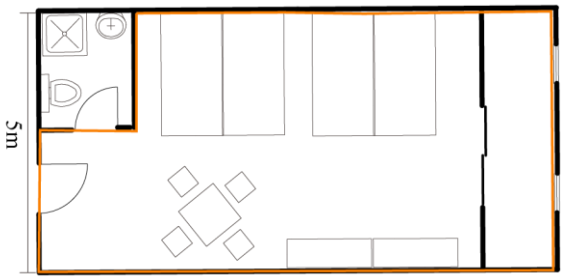


Figure 3.2.51 (a) layouts of study case in micro environment; (b) simple typology representation



Accommodation E living unit example
1:150

52.3 ㎡,available area 45 ㎡

Figure 3.2.52 Living unit example

Opportunities of PA

Children usually get up at 7:00 (Figure 3.2.53); after individual breakfast, children go to school from 8:00 to 14:00. Afternoon playing happens around 2 hours from 15:30. Since living conditions in GAE are more like regular apartments, dinner, night play, and bedtime are individual for children.

Overall, PA's time is from 15:30 to 18:00, around 2.5 hours, either in internal or external PA spaces under supervision. There are flexible workshops at weekend on soccer, badminton and jump rope. Parents usually go to this workshop together with their children.

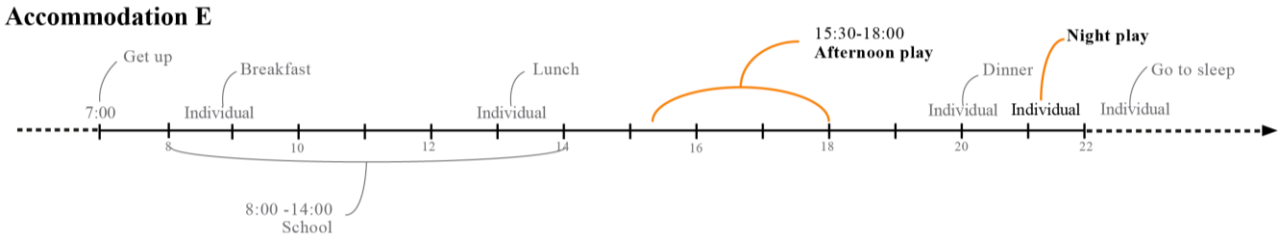


Figure 3.2.53 Opportunities of PA

Spatial measure analysis

As a former retirement home and hospital, the corridors on each floor are accessible without barriers. All living units have minimum connectivity as 1.0. The main corridor on level 1 has the most connectivity of 36.0. The average connectivity is 2.0, as shown in Figure 3.2.54.

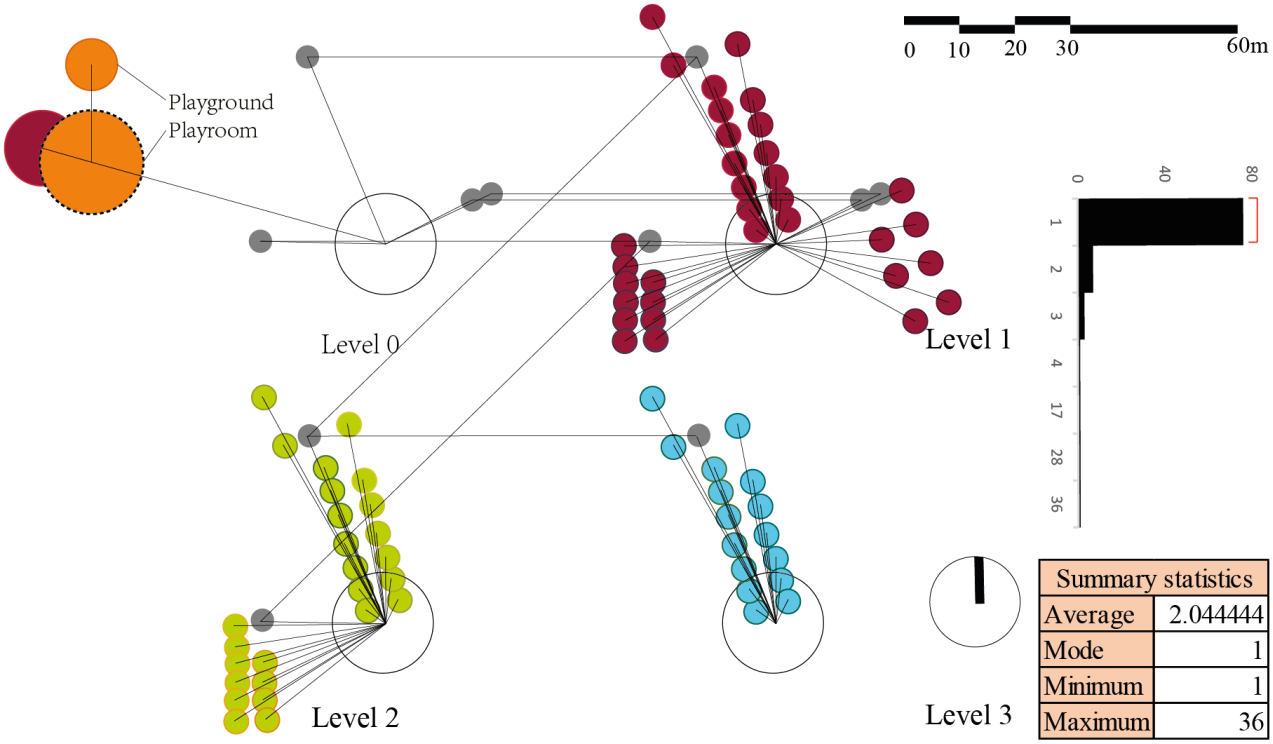


Figure 3.2.54 Connectivity analysis

Like connectivity, the step depth analysis identifies that the primary corridor on level 0 is nearest to internal and external PA space (Figure 3.2.55). Due to the barrier-free corridors, living units on

every floor have the same step depth to PA space. Almost the whole building is integrated with a maximum step depth of 7.0 from living units to the entire PA space and an average of 5.5.

In summary, accommodation E has average PA space accessibility with an average step depth of 5.3 and connectivity of 2.0. Even though the corridor is accessible, prominent and well-integrated, separated internal and external PA spaces reduce accessibility for children to enter. Moreover, with an available living unit of 45 m^2, there is a possibility for indoor playing.

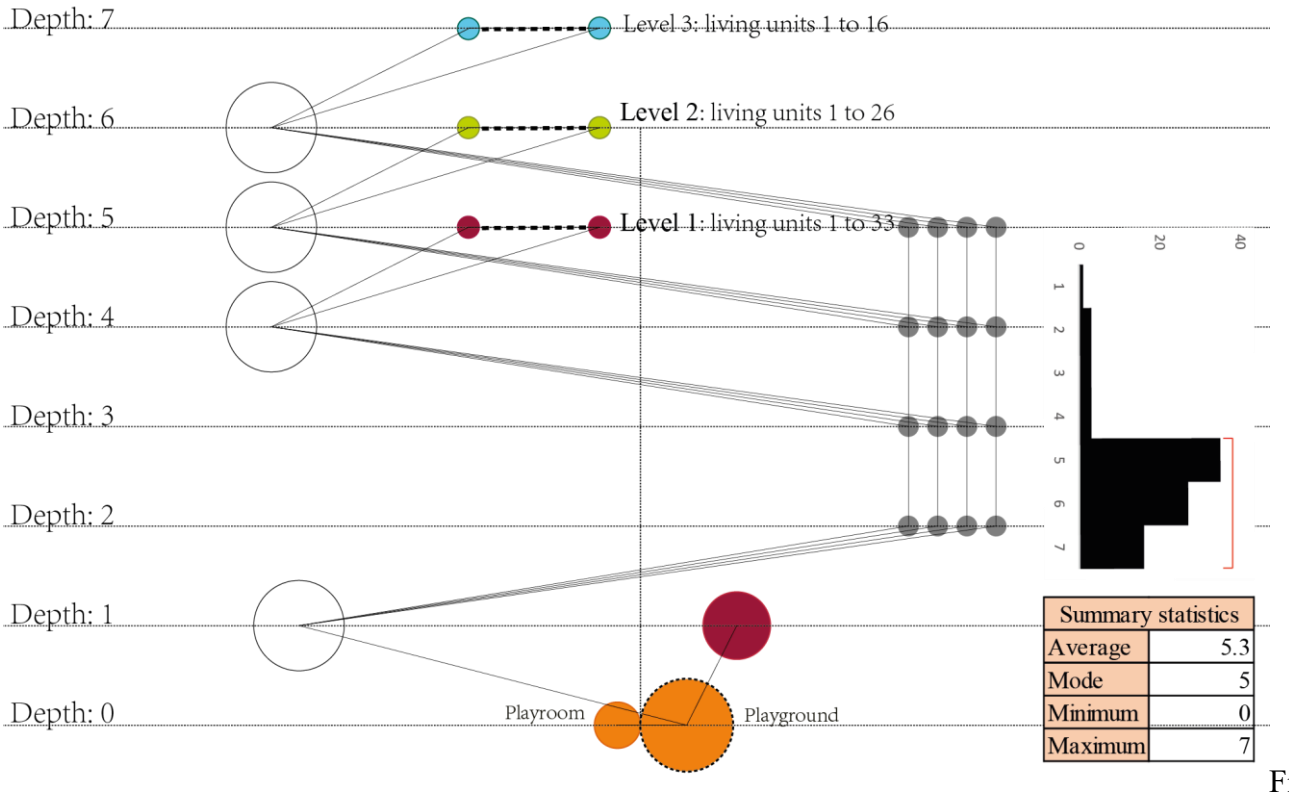


Figure 3.2.55 Step depth to external and internal PA space

3.2.6 Accommodation F*: newly built container blocks

Accommodation F was three container integrations from April 2015 to September 2020. AWO ran these containers as a GAE. 30 persons worked full time in the staff team, and three worked mainly for children; meanwhile, a group of volunteers worked explicitly for children.

By the time of the interview (23.01.2019), 424 people live in accommodation with a maximum of 560 people. 80% of the residents are from Muslim countries of origin. For the detailed demographic information of children, 100 residents are underaged, and 30 are school-aged (6-12). Most of the children go to regular classes in schools. Children go to special welcome courses if they have recently reunited with their families. Families are expected to stay here for 2 to 3 years, and some families already stay here for four years.

Similar to accommodation D, F was also containers. F was flexible in structures that containers can either be combined or separated as minimum one (Figure 3.2.61). There were 251 living units (one container) in F for a maximum calculation. It is shown in the diagram that every floor had its community kitchen and shared WC.

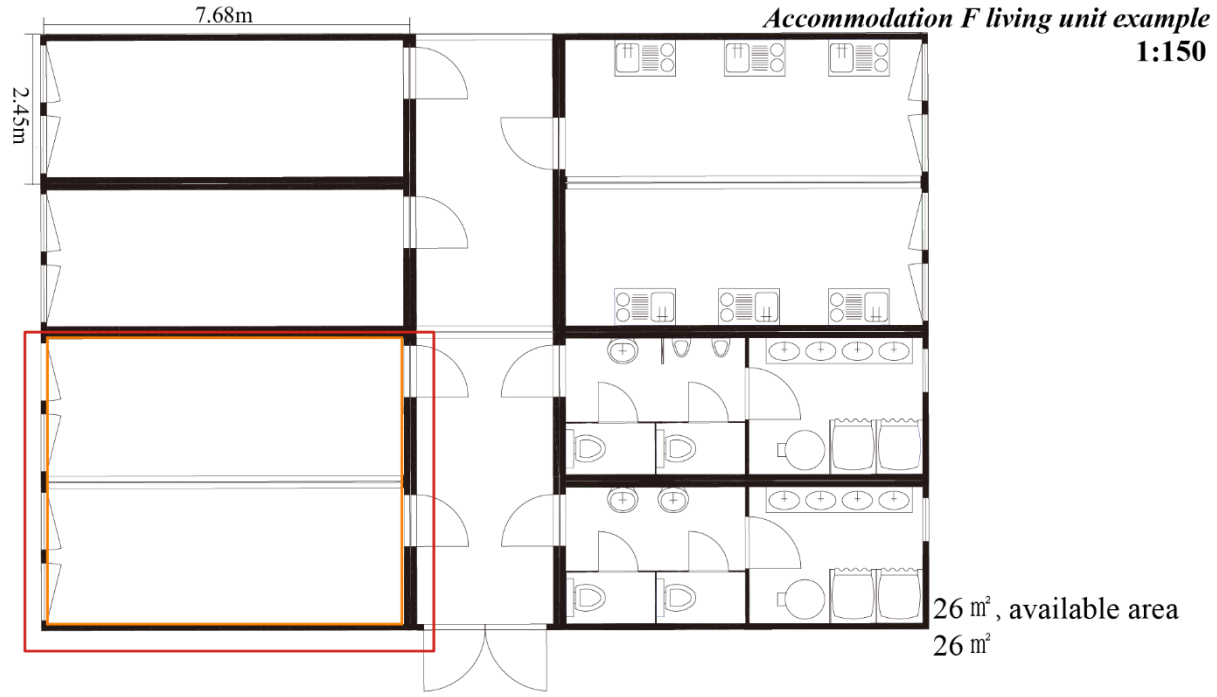


Figure 3.2.61 living unit example (CONTAINEX Container-Handelsgesellschaft m.b.H)

Spatial characteristics

Internal PA space as two containers' combination is located on level 0 of building b (Figure 3.2.62a, 26 m^2). Additionally, there is a girl-specific playroom under construction. Various external PA spaces are provided, such as a sand playground (465m^2, Figure 3.2.62b), a non-rectangular football field (2545 m^2, Figure 3.2.63a), a regular playground with PA equipment such as a slide, playing ring and castle (720 m2, Figure 3.2.62c) and a basketball playground (420 m^2, Figure 4.2.63d). Typology represents a 'multi-tracks' typology similar to accommodation D, where the main corridor runs in the middle of the buildings (a, b, c). Children go outside accessing main corridors and go down through both sides' outdoor stairs if their living units are on the second or third floors. Two containers (26m^2 in available) living will be used in the spatial analysis.

Figure 3.2.62 (a) internal PA space 1; (b) external PA space 2; (c) external PA space 4; (d) external PA space 5

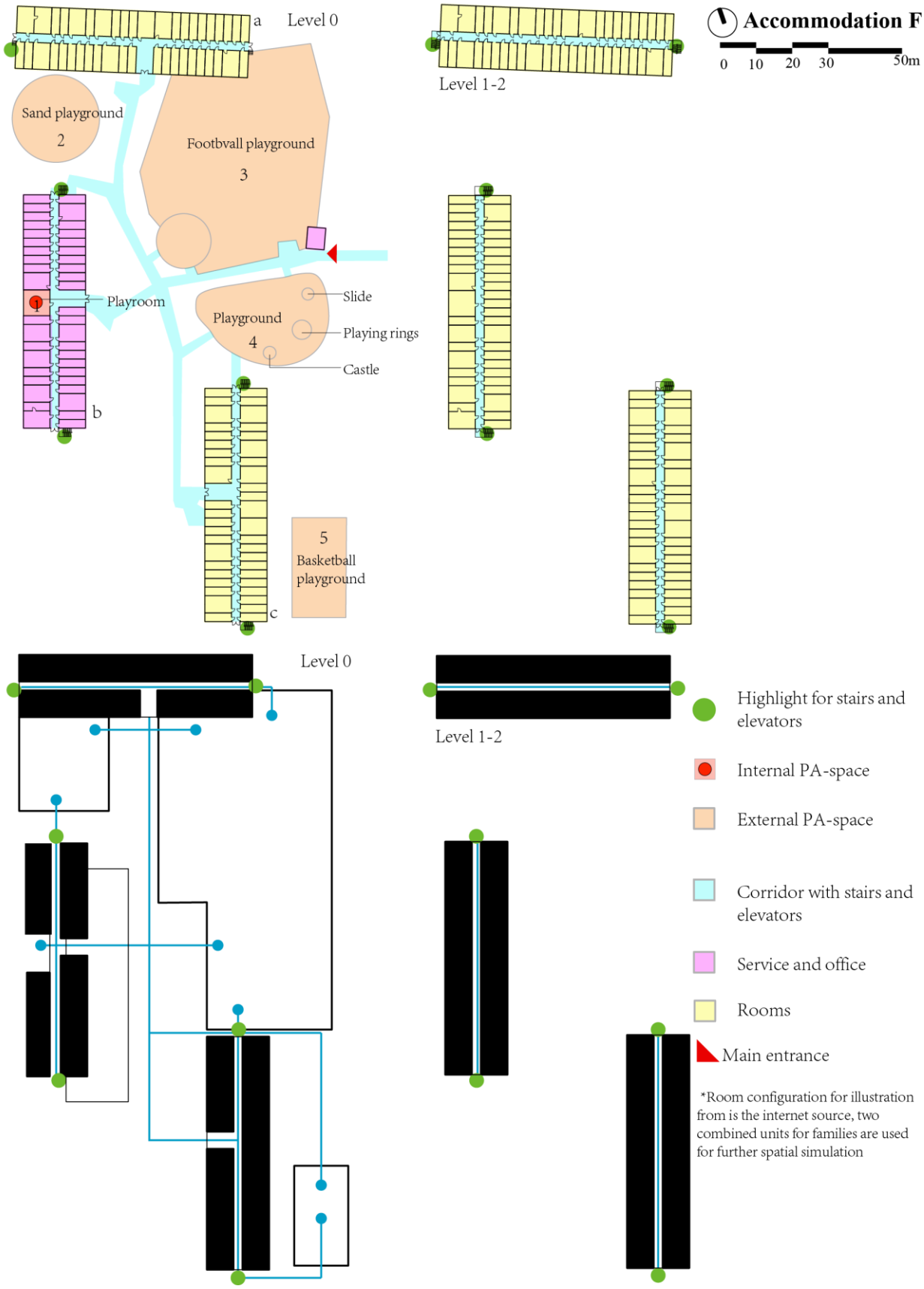


Figure 3.2.63 (a) layouts of study case in micro environment; (b) simple typology representation

Opportunities of PA

Children usually get up at 7:00 (Figure 3.2.64a); after individual breakfast, children go to school from 8:00 to 14:00. Afternoon play begins at 14:00. Meanwhile, there are workshops every workday except Wednesday for school-aged children from 14:00 to 16:00 in the playroom. Family sport workshops are every Friday from 14:00 to 16:00, while children play until 19:00. Dinner and bedtime are individual.

Opportunities of PA for children is daily from 14:00 to 19:00. There is an organised activity for children every workday except Wednesday (14:00 to 16:00) in the playroom. Every Friday, they can choose organised activity between playroom play and sport in playgrounds (Figure 3.2.64b).

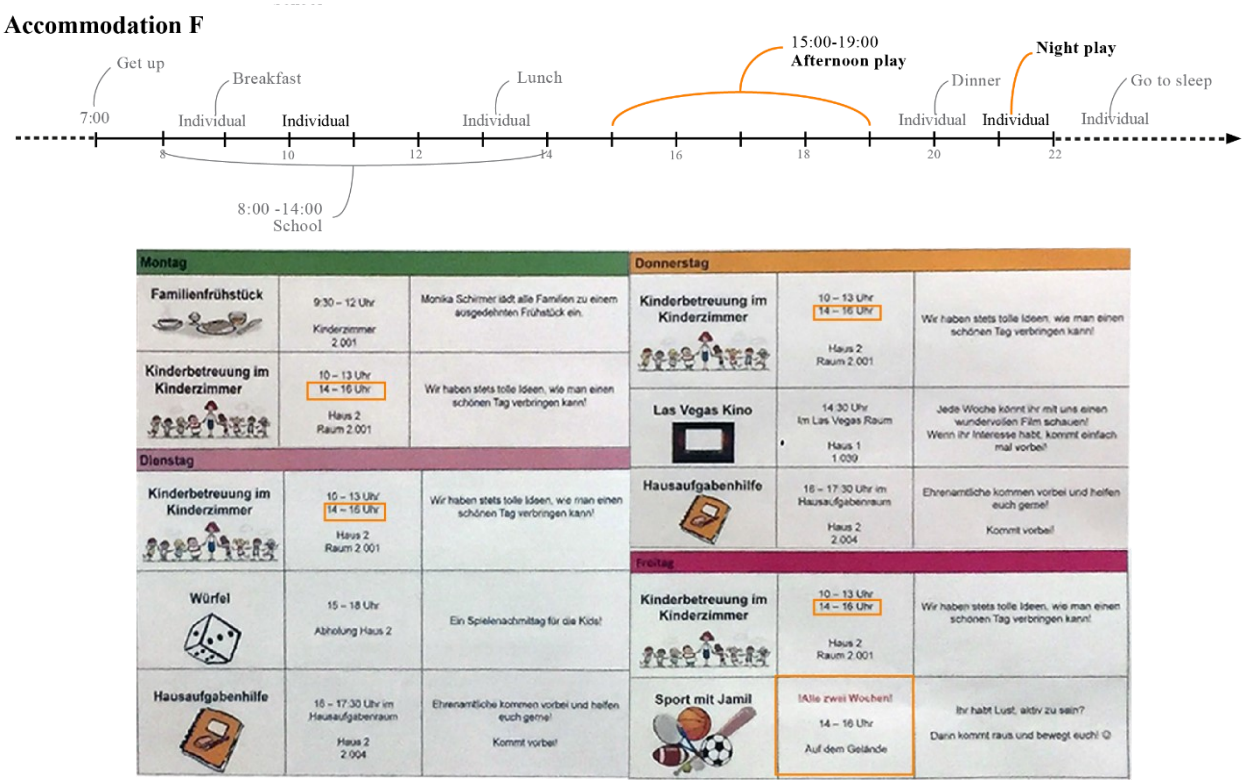


Figure 3.2.64 (a) Opportunities of PA; (b) organised activity schedule

Spatial measure analysis

Connectivity analysis of accommodation F is precise, as shown in Figure 3.2.65. Every living unit shows minimum connectivity of 1.0 to barrier-free corridors of each floor. Every corridor has the same connectivity of 28.0 except level 0 corridors of the building connected directly to the external PA space (3) with maximum connectivity of 29.0. The outdoor corridor connects all external PA spaces as 12.0 in connectivity levels. The average connectivity is 2.1.

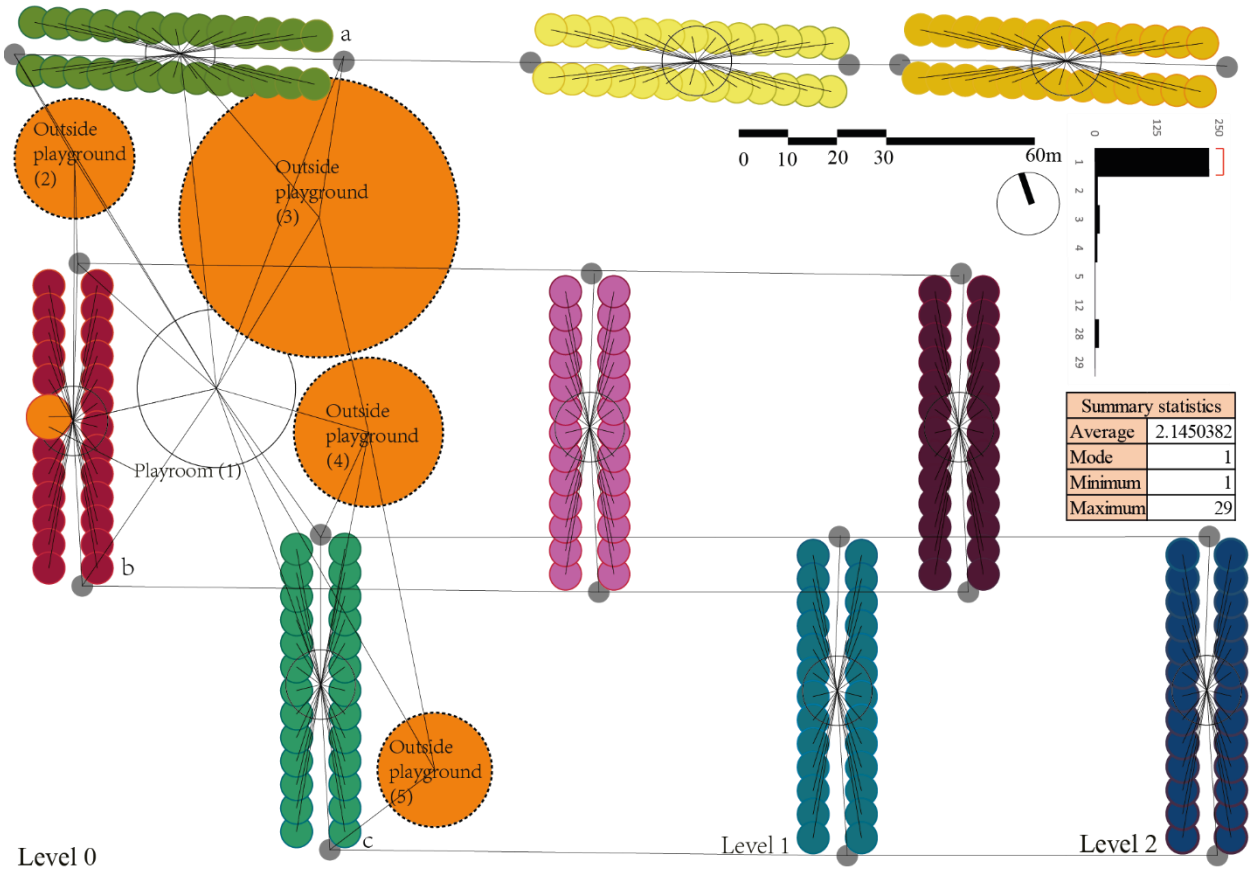


Figure 3.2.65 Connectivity analysis

As shown in Figure 3.2.66a, step depth to internal PA space identifies living units in building b nearest to the internal PA space of all living units and an external PA space (2). Living units on level 0 of building a and c is 4.0 steps away from the internal PA space. The maximum step depth to internal PA space is 7.0. An average of 5.0 for every living unit to go to internal PA space.

Step depth to external PA space identifies living units on each floor have equal step depth to external PA space since every building has it directly connected external PA space (Figure 3.2.66b). As one of the living units on level 0 of building b, internal PA space is 2.0 steps away from external PA space in general. Step depth increases as the floor go up, maximum step depth is 5.0 for every living unit on level 2, and the average step depth to the external PA space is 3.5.

In summary, given its size and spatial characteristics, there is no chance for children's indoor playing with a living unit of 26 m^2 in size. However, accommodation F has good accessibility to external and internal PA space with an average step depth of 3.5 and 5.0. The corridor on each floor of every building is integrated. It is possible for children from every building floor to efficiently and equally reach external PA space. Moreover, the external PA space is 2.0 or 3.0 step depths from the internal PA space.

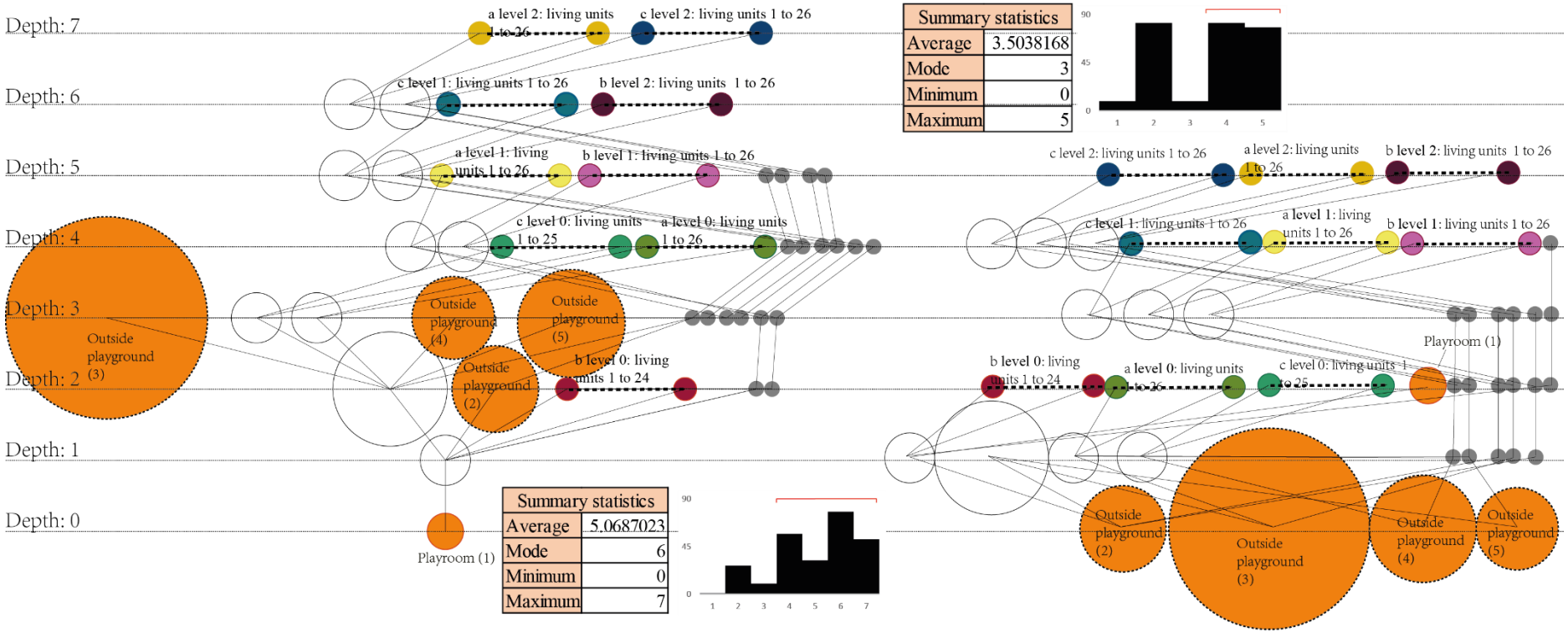


Figure 3.2.66 (a) step depth to internal PA space; (b) step depth to external PA space

3.3 Comparative analysis

This section gives a comparative overview of study sites at micro-environmental levels, referring to results discussed in the previous sections. Firstly, a basic comparison of the similarity and differences in study sites. It then investigates the PA space size comparison and looks deeper into PA timelines. Finally, and most importantly, comparisons of all study sites' spatial measure value of connectivity, step depth to PA space, and the integration.

3.3.1 Comparison of findings across study sites

Table 3.3.1 illustrates that most accommodations address existing buildings, and newly built accommodations were temporary containers. Existing buildings accommodations might also inherit defects such as complicated spatial characteristics (A and C), temporary space distribution for living units (B) and isolation settings from the neighbourhood (E), which might lower accessibility for PA spaces. Newly built containers (D and F) also had disadvantages as they own the smallest 4-persons living units of all accommodations (40m^2, 26m^2) or no internal PA space (D). The author could not detailly conclude for current investigations due to small samples.

Table 3.3.1 Comparison basic PA spatial parameters cross 6 case studies

Accommodation	Children aged 6-12*	Countries of origin*	Current population * | capacity	Former use	Total floor area/㎡	type	Floor	Existing period
A	30	Muslim and Asia	250|400	Hotel	10021	EAE	11	12.2015-current
B	33	Asia and Africa	490|500	Sanitary facility	7810	EAE	3	09.2014-08.2019
C	27	Multi ethnic	217|350	Residential block	7070	EAE	10	02.2012-current
D	20-30	Muslim	170|256	Newly-built containers	2700	Tempo homes	1	12.2016-07.2019
E	18	Multi ethnic	200|265	Retirement home	4508	GAE	4	07.2015-10.2020
F	30	Muslim	424|560	Newly-built containers	10080	GAE	3	04.2015-09.2020

* By interview time

All accommodations had 20 to 30 school-aged refugee children for detailed demographic information by interview time. They were from various countries of origin, mainly Muslim countries. Four accommodations had already been closed when summarising this script; however, this empirical material and study will contribute to the knowledge of refugee children's research field, specifically for existing built environments concerning their PA.

3.3.2 Comparison between PA time and PA spaces size

PA spaces size and overall time children spent on PA of each study site are compared in Figure 3.3.2. Accommodation F had the most significant external PA spaces. Children in accommodations A, B and E could have indoor playing in their living units. However, children in accommodation D had

neither enough living units nor internal PA space. They would be relatively inactive as trapped in their living units if conditions were not available for outdoor playing. Among all study sites, accommodation B was the only one, with an indoor playing possible living unit, multi-internal PA space, and three larges outside playgrounds. All the other investigated accommodations had no spatial balance spatial characteristics in size appropriate for indoor PA space, internal PA space, and external PA space.

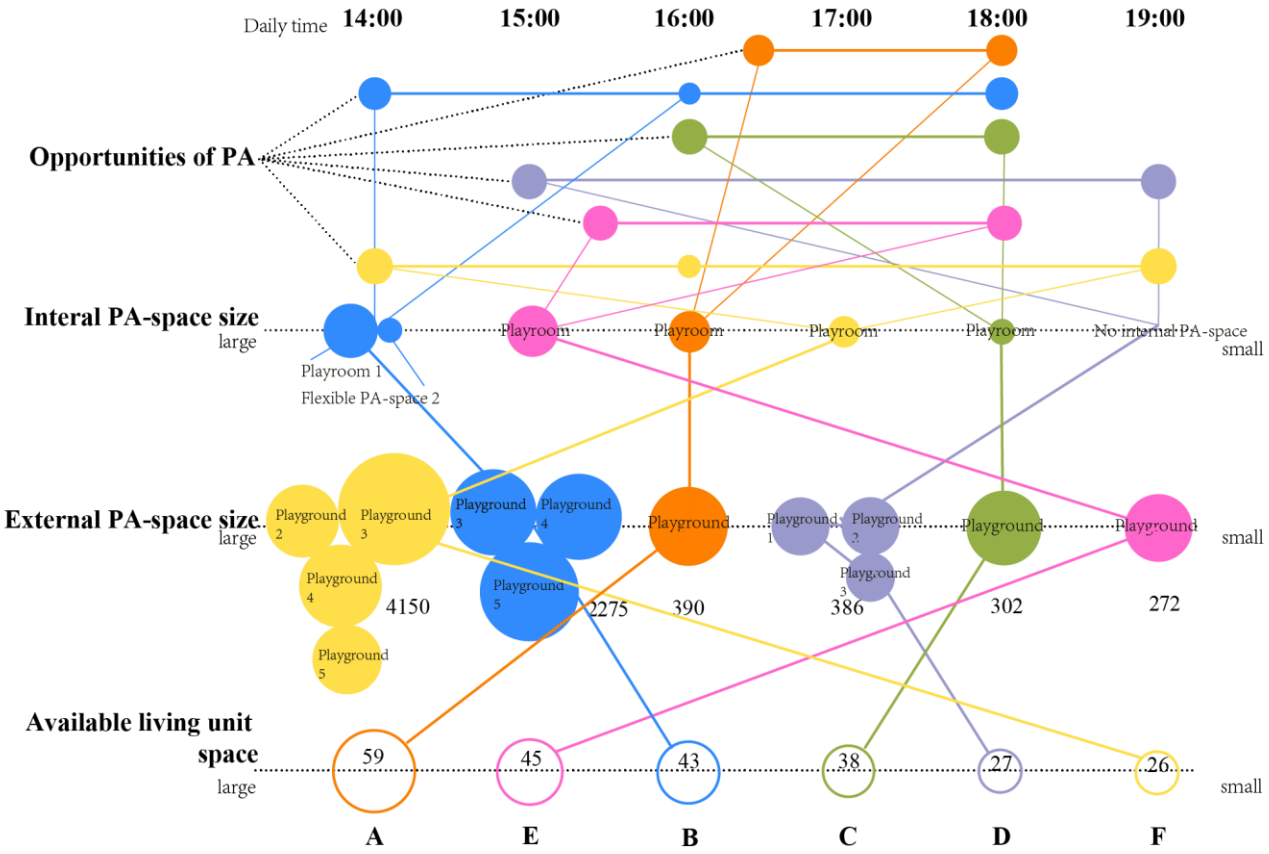


Figure 3.3.2 Comparison between PA time and PA spaces size of the six study sites.

Differences between the opportunities of PA for children were found for different accommodations. Children in accommodation F reported spending the most time as 5 hours on daily PA under supervision, and F also had the most significant external PA space as four different outdoor playgrounds and the fourth biggest internal PA space. Accommodation F provided free play under supervision in the internal PA space almost every workday (except Wednesday, Table 3.3.2) from 14:00 to 16:00. There was also an organised activity as football every Friday from 14:00 to 16:00, which means there were multiple choices for children on Friday. Accommodation B and D reported second opportunities of PA as around 4 hours per day. As mentioned before, B had the most significant internal PA space opens every workday from 14:00 to 16:00.

Moreover, the second biggest external PA space belongs to Accommodation D; however, it had no internal PA space, organised football is offered every Wednesday and Saturday from 17:00 to 19:00. Children from accommodation C usually spend 3 hours on daily PA. They owned the second smallest internal and external PA space, and various activities happening in the playroom every workday: on Tuesday there was organised activity from 14:00 to 18:00, and children could go outside for a neighbourhood tour on Friday; playroom opened on other workdays from 15:00 or 16:00 to children and close until 18:00. Children in accommodation E spent 2 hours per day on PA from 14:00 to 16:00 in their separate playroom and playground, and they could also attend organised activities every

Saturday. Children in accommodation A reported spending the least time on PA of 1.5 hours. The playroom opened every workday except Wednesday from 16:30 to 18:00, and there was organised football activity every two weeks on Wednesday for children in their playground.

Table 3.3.2 Detailed PA time category

Accommodation	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
A	o 16:30-18:00, playroom	o 16:30-18:00, playroom	o 16:30-18:00, playroom • Every 2 weeks, football, playground	o 16:30-18:00, playroom	o 16:30-18:00, playroom	
B	o 14:00- 16:00 in playroom					
C	o 16:00-18:00, playroom	• 14:00-18:00, play together, playroom	o 16:00-18:00, playroom	o 15:00-18:00, playroom	o 14:00-18:00, *walking around together	
D			o 17:00-19:00, football, playground			o 17:00-19:00, football, playground
E						o 14:00-16:00, football, badminton, jump rope, playground
F	o 14:00-16:00, playroom	o 14:00-16:00, playroom		o 14:00-16:00, playroom	o 14:00-16:00, playroom • 14:00-16:00, family football, playground	

•, organised activity; o, free play under supervision; *this organised activity happens in meso-environments which will be explained in next chapter

In summary, internal and external PA space plays an essential role in refugee children's daily PA lives in micro environments, serving as spaces for play. Differences and similarities were found in children's PA concerning PA space size; however, there were no consistent results across all study sites.

3.3.3 Spatial measure analysis comparison

Figure 3.3.31 compares spatial measure analysis to provide an overview of spatial characteristics, and Figure 3.3.32 illustrates average step depth example of the living unit to internal and external PA space, pointing to some similarities. 11th-floor accommodation A and 10th-floor accommodation C had complex spatial layouts as separated corridors. They had similar average connectivity patterns, their step depth to the entire PA space was highest, and integration values were the lowest among all sites. Unlike C, A had a spatial living unit that was possible for indoor playing. Despite this advantage, children in A spent the least 1.5 hours on daily PA and organised football every two weeks. Children in C spent more time on PA as 3 hours, and various free play under supervision or organised playroom activity happened every workday.

One-floor accommodation D had the highest connectivity and integration value with multi-tracks typology. It was also nearest to the external PA space in step depth since it had only one floor and most living units connected directly to external PA spaces by corridors. The disadvantage of this accommodation was no available area for any indoor playing. Children spent 4 hours with twice-weekly organised activity on PA as the second most, despite only when it available for outdoor playing.

Three floors accommodation F had the lowest step depth to internal PA space since its simple layouts, and the corridor severed as a breach that connected all living units with multi-tracks typology. Children spent the most time on PA, about 5 hours per day. It also had the most considerable external PA space as four playgrounds. However, it had the smallest living unit, which was impossible for indoor playing.

Fifth-floor accommodation B and E had similar spatial layouts as big connectivity corridors that connected living units directly; the difference was that E had a separated building as the internal PA space. B is the only one with spatial balance characteristics such as indoor playing possible living unit, multi-internal PA space, and three larges outside playgrounds. Children spent 4 hours on PA here, and there was free play under supervision every workday. Children spent only 3 hours per day in accommodation E, and organised sport happened every Saturday. Detailed comparison of spatial values is presented in Appendices Table 3.3.3.

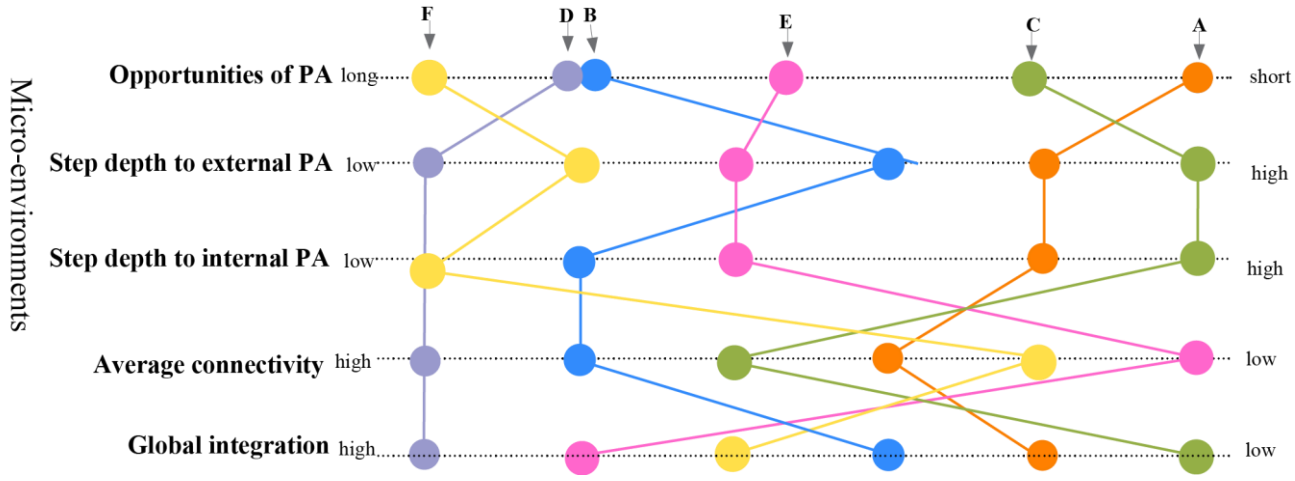


Figure 3.3.31 Comparison of overall findings of six study sites

Comparatively, studying the existing built environments for refugee children's PA is a highly complex analysis. Due to limited samples, it has difficulties using layout and corridor typologies to analyse spatial characteristics. This idea of classification using syntactic properties as a basis will be revisited later in Chapter 6, with four more study sites to discuss typologies more nuancedly.

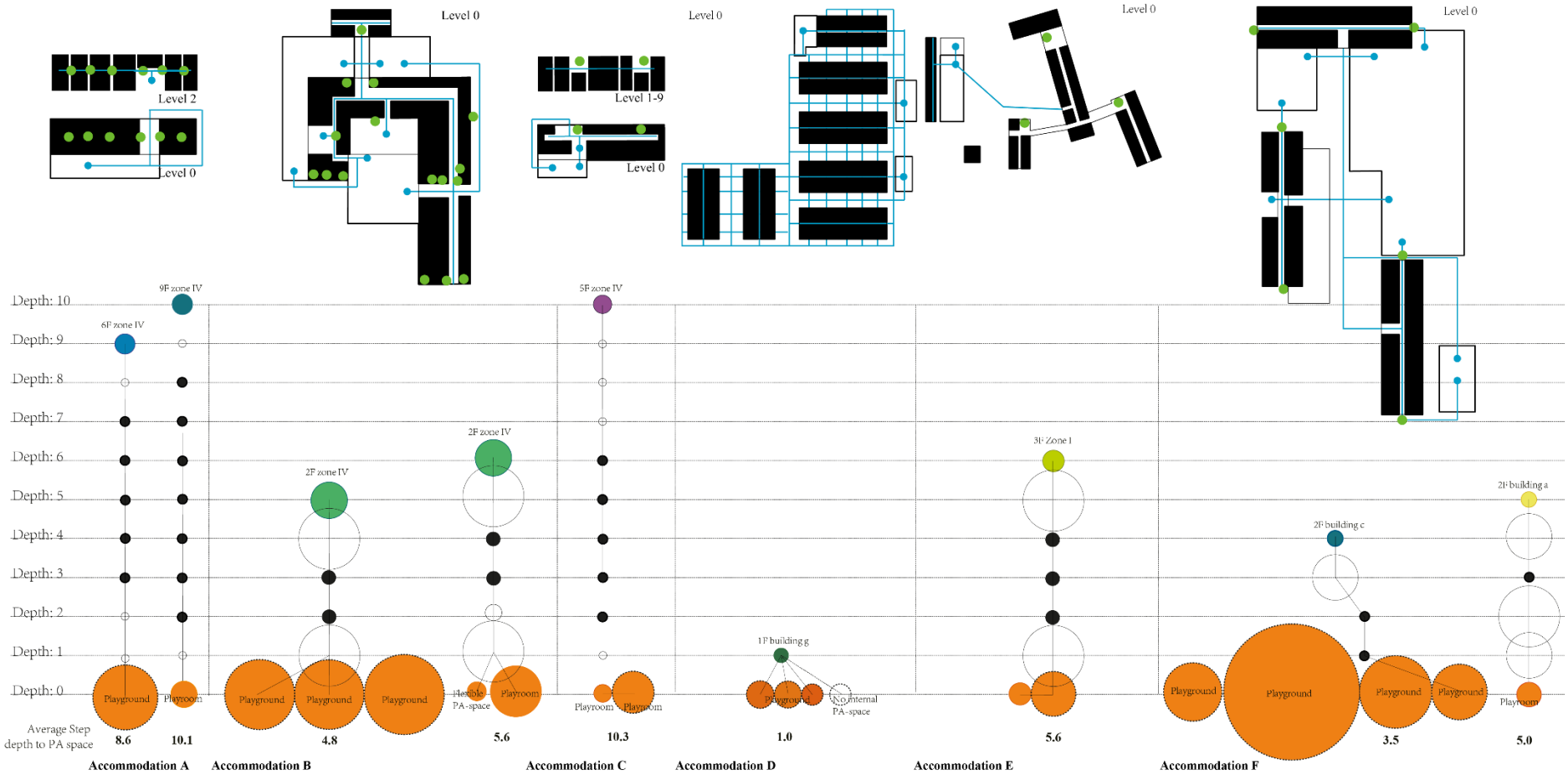


Figure 3.3.32 Average step depth example from living unit to internal and external PA space and typology

3.4 Summary of findings

This chapter compared spatial characteristics of six study sites using four different spatial measures: connectivity, step depth to PA space (internal and external) and integration. It was found that those refugee accommodations, which had a straightforward layout with an accessible main corridor, a simple shape of integrated cores (D and F) that connected living units directly together, were accommodations refugee children spent the most time on PA. On the other hand, those accommodations with complex spatial layouts combined with separated corridors such as A and C were the least integrated, and children spent the least time on PA. These accommodations had higher floors and provided more limited accessibility for internal and external PA spaces. Accommodations B and E with middle layouts also provided average integration and other spatial values. It revealed some genotypical properties of refugee accommodations' spatial network, i.e., their structural similarities over general functional similarities. No other clear relations were found between the spatial characteristics and children's PA time.

Although the research is done on micro environments' scales of Berlin refugee accommodations, it can also be used in other contexts. These study cases are essential in presenting and drawing attention to creating more active built environments for refugee children, especially in design and re-functionalised (for existing buildings) phase of refugee accommodations. Chapter 4 will introduce the same sets of cases in meso environments.

Chapter 4. Spatial characteristics around refugee accommodations associated with refugee children's PA in meso environments

4.1 Introduction

This chapter will evaluate the same sets of study sites of their existing meso environments for refugee children's PA. Site A, C and D were located in residential areas, while sites B and E were in industrial/grassland and undefined areas. Site F was located in a neighbourhood park. 12 refugee accommodation neighbourhoods are selected as additional study sites for further meso environments analysis presented in Chapter 6.

This chapter explores the scale of meso environments as the second research question (Figure 4.1). It will be supported with mathematical and concrete results, allowing analysis and evaluation using space syntax analysis for spatial characteristics in meso environments. Moreover, these study sites are provided empirical material for location choice. Evidence provided in this chapter will be a valuable reference for implications of refugee accommodation from designs and evaluation views in Chapter 7.

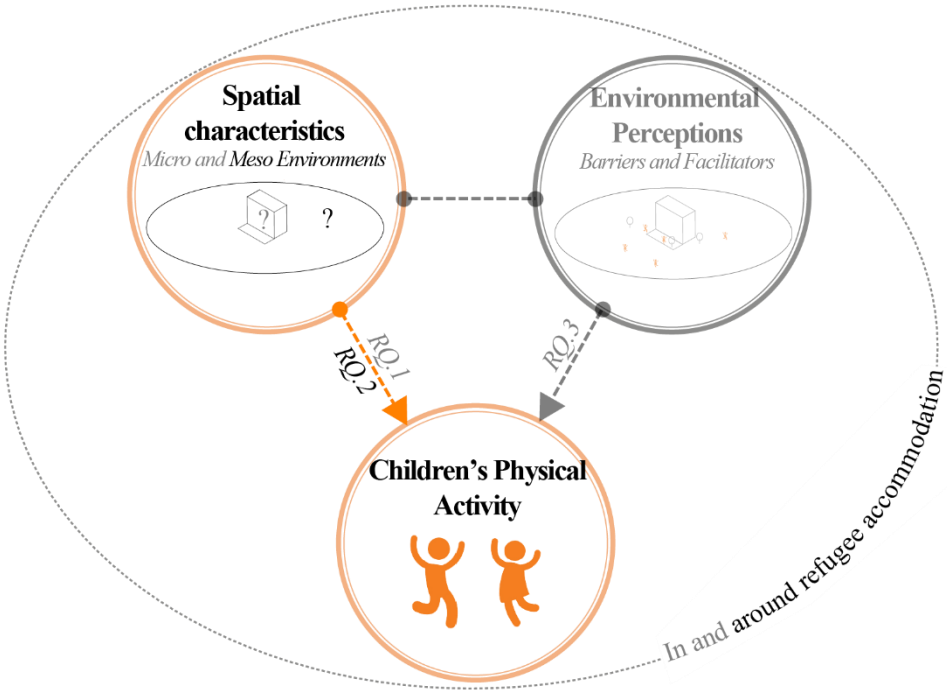


Figure 4.1 A diagram showing research question 2 and children's PA discussed in the chapter

4.2 Data obtained from each study site

4.2.1 Study site A: residential area near the airport

Spatial characteristics, potential and accessible PA space

Site A is located in the southeast of Berlin, surrounded by residential buildings. As identified in Figure 4.2.11a, the heavy traffic (railroads and highways) splits this area into parts and reduces accessibility. Various formal PA spaces exist in this neighbourhood, such as three sport facilities, nine playgrounds inside parks, and small playgrounds between residential blocks. There are also nine

park areas in the research scope. Moreover, 27 open public spaces around the neighbourhood as grassland inside residential areas or in open spaces are identified as informal PA spaces.

As shown in Figure 4.2.11b, there is no PA space accessible to children under 500 meters by walking. Two sport facilities (formal) and three informal PA spaces are accessible for children under 1 km parental walking distance; the left one (with a green circle) is also identified by staff as a neighbourhood playfield for children (Figure 4.2.12).

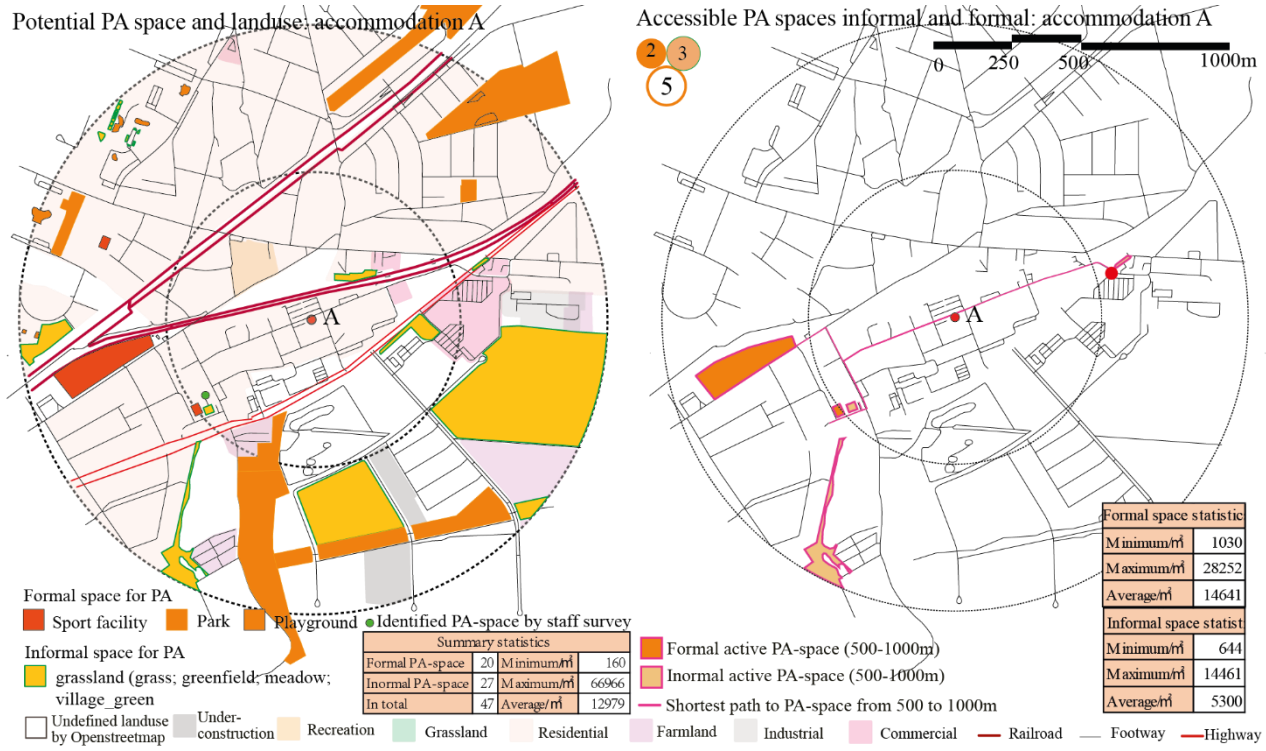


Figure 4.2.11 (a) potential PA space and landuse; (b) accessible PA spaces: informal and formal

Figure 4.2.12 Identified neighbourhood playfield by staff: a playground

Active PA space

As mentioned earlier, accessible formal PA spaces are two sport facilities; one is located in the highly accessible streets (Figure 4.2.13); another one stays in medium accessible streets. All accessible informal PA spaces are located in streets with high accessibility, and in total, 1576 road segments are investigated.

Figure 4.2.13. Global integration of accessible PA space located street

4.2.2 Study site B: industrial area and grassland

Spatial characteristics, potential and accessible PA space

Site B is located in an industrial area that connects greenspace directly; meanwhile, right parts next to this site are undefined in landuse (Figure 4.2.21a). The heavy traffic as primary roads on top divides this area into two parts. Site B is next to park-sport-facilities combinations and an extensive open grassland; both are mentioned in the staff survey as children's playfields (Figure 4.2.22ab). Most potential PA spaces in this neighbourhood are pretty sizable, and most parks are represented as branches with connected grasslands. There are six sport facilities, five playgrounds, 12 park areas as formal PA spaces, and 51 grasslands as potential informal spaces in this neighbourhood.

Staff identified park and sport-facilities combination is accessible under 500m distance (Figure 4.2.21b); furthermore, the branches shaped eight parks areas and a playground are also accessible in the parental distance. As for accessible informal PA space, the ample open space mentioned by staff is accessible next to site B. Five informal PA spaces are accessible in children's perceived neighbourhood distance, and nine informal spaces are accessible under parental distance.

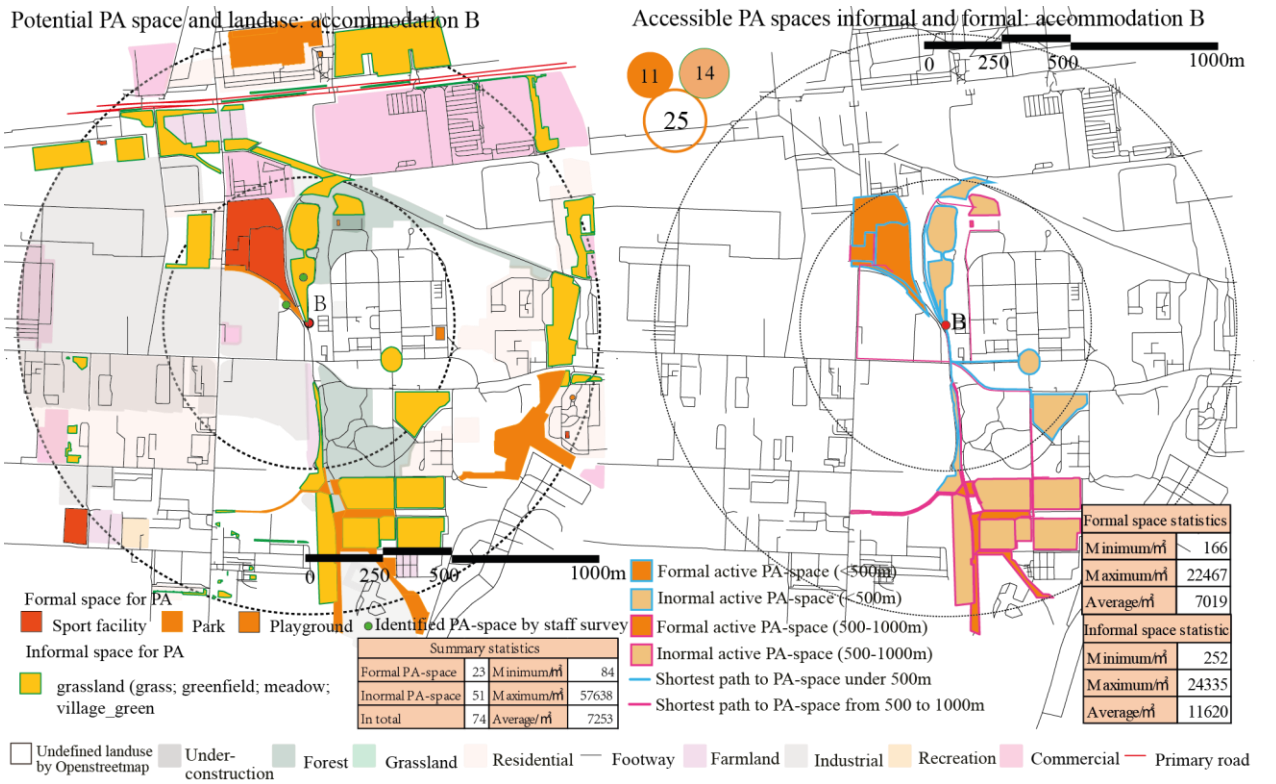


Figure 4.2.21 (a) Potential PA space and landuse; (b) accessible PA spaces informal and formal

Figure 4.2.22 Identified neighbourhood playfield by staff (a) open space; (b) park

Active PA space

Figure 4.2.23 analyses global integration calculation of accessible PA spaces located streets. For formal PA space 500 meters away, 100% of them are located in highly accessible streets. 13% of the PA spaces (500m to 1km) are located on highly accessible roads.

For accessible informal PA spaces under 500m, 60% are located in highly accessible streets. Others are medium accessibility. 11% of the accessible PA space (500m to 1km) are located in highly accessible roads, 11% are in medium accessible streets. In total, 2508 road segments are investigated.

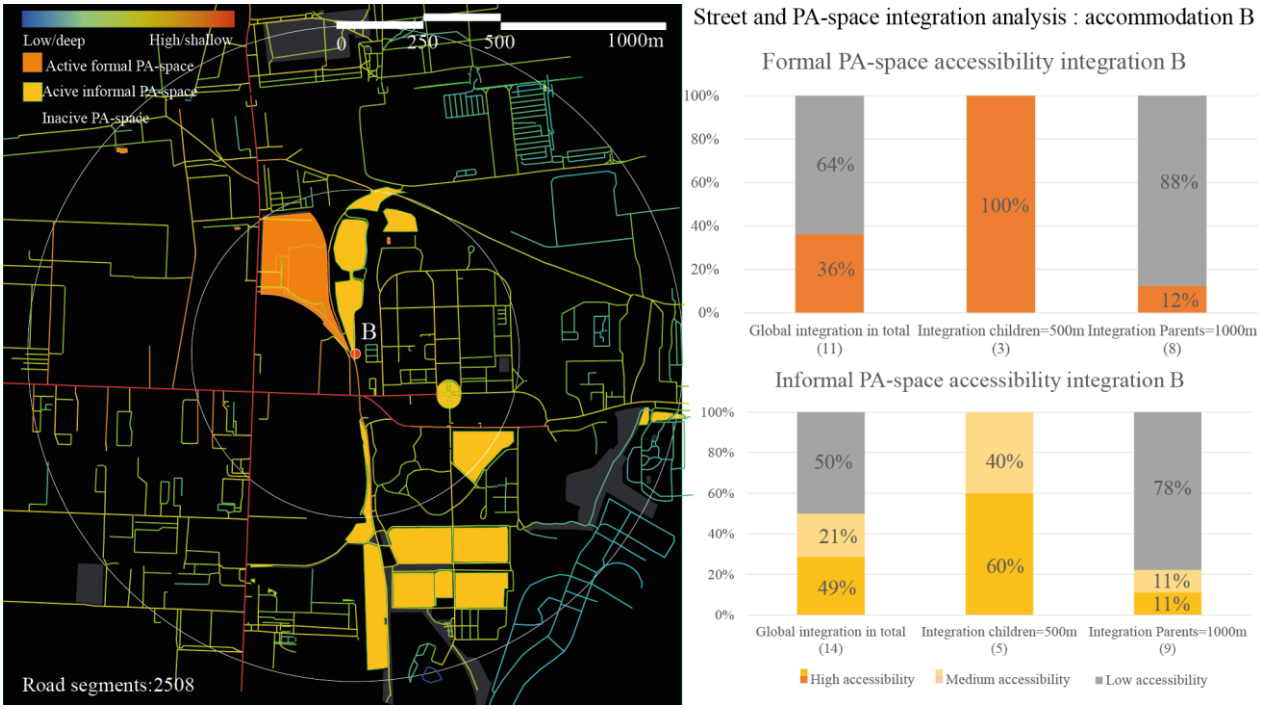


Figure 4.2.23. Global integration of accessible PA space located street

4.2.3 Study site C: small residential area

Spatial characteristics, potential and accessible PA space

Site C stays in a small residential area, surrounded by mix-use undefined areas (Figure 4.2.31a). Heavy traffic as primary roads cut this neighbour into two parts. C is also the only one with meso environments PA program: exploring the neighbourhoods every Friday (14:00 to 16:00, Figure 4.2.33). There are six parks and three playgrounds as potential formal PA space. 59 spaces are identified as informal PA space in this neighbourhood.

Only three formal PA spaces, one park and two playgrounds are accessible for children under parental distance (Figure 4.2.31b). However, there are many choices for children as informal PA spaces; the staff identified two intimate open spaces as playfields for children (Figure 4.2.3.2ab). As mentioned in Chapter 3.2.3, accommodation C shares designated external PA space as a playground in the micro environment with other neighbourhoods; Staff also mentioned that children often went to neighbourhood open spaces to play. They may be more motivated for meso environments playing. 12 informal PA spaces are accessible for children by 500m walking, and 30 informal PA spaces are accessible from a parental distance.

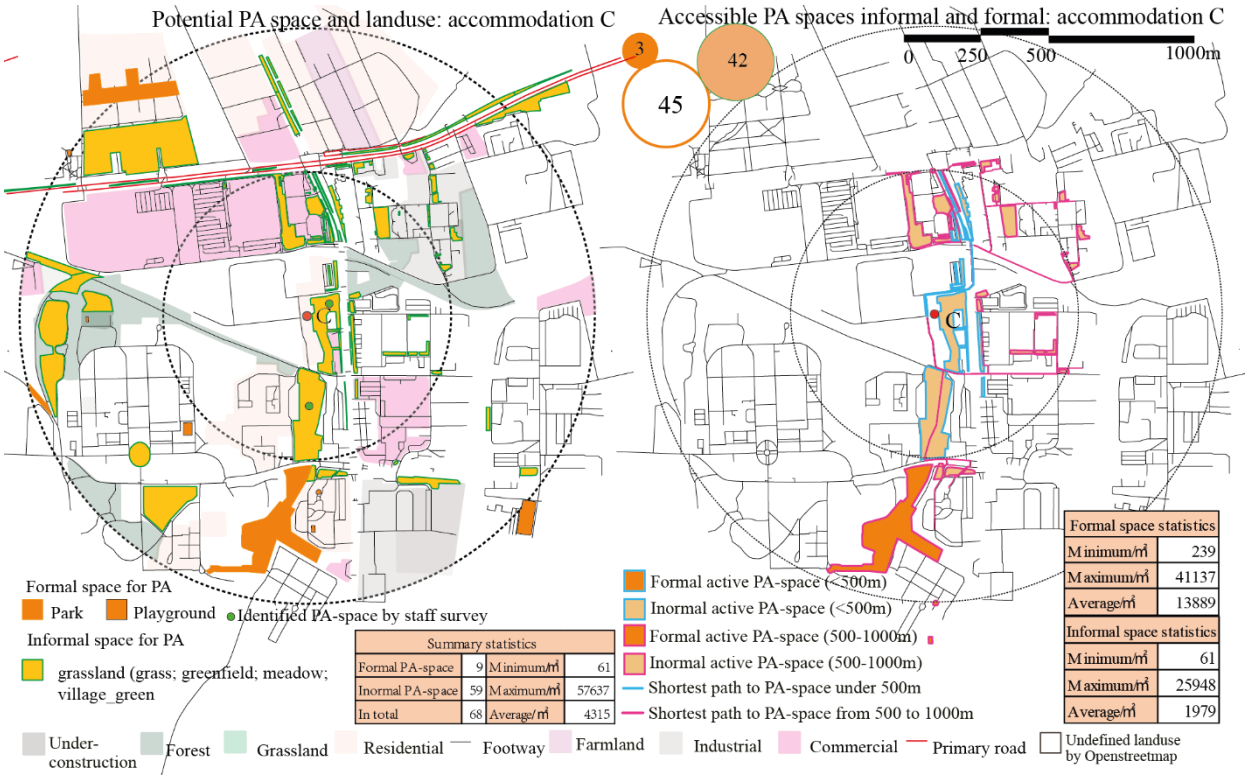


Figure 4.2.31 (a) potential PA space and landuse; (b) accessible PA spaces informal and formal

Figure 4.2.32 Identified neighbourhood playfield by staff (a) open space; (b) open space

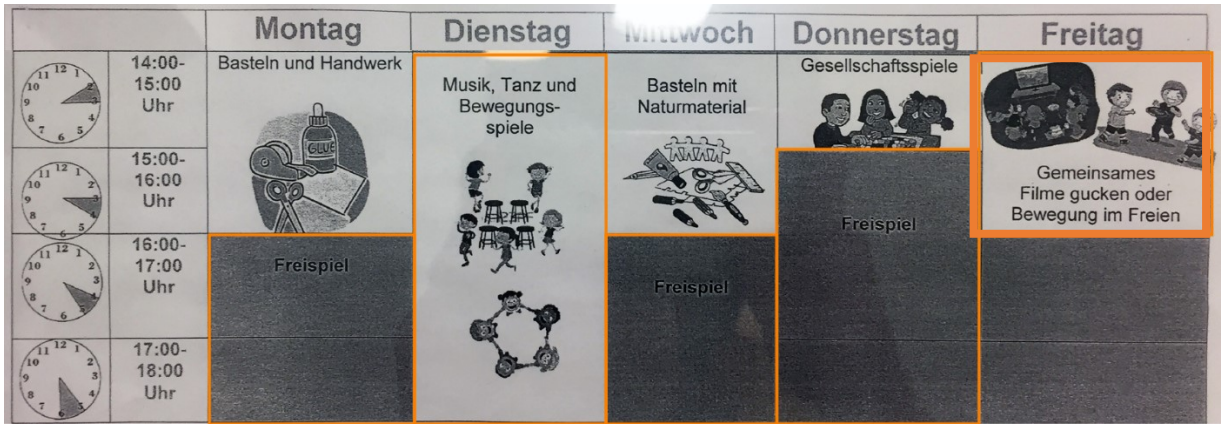


Figure 4.2.33 Organised activity schedule: accommodation C

Active PA space

2821 road segments are investigated, as shown in Figure 4.2.34. Three accessible formal PA spaces are all in low accessible streets. For accessible informal PA (500m), 75% are located in highly accessible streets, while 8% are medium accessibility. 13% of accessible informal PA space (500m to 1km) are located on highly accessible roads, and 27% are in medium accessible streets.

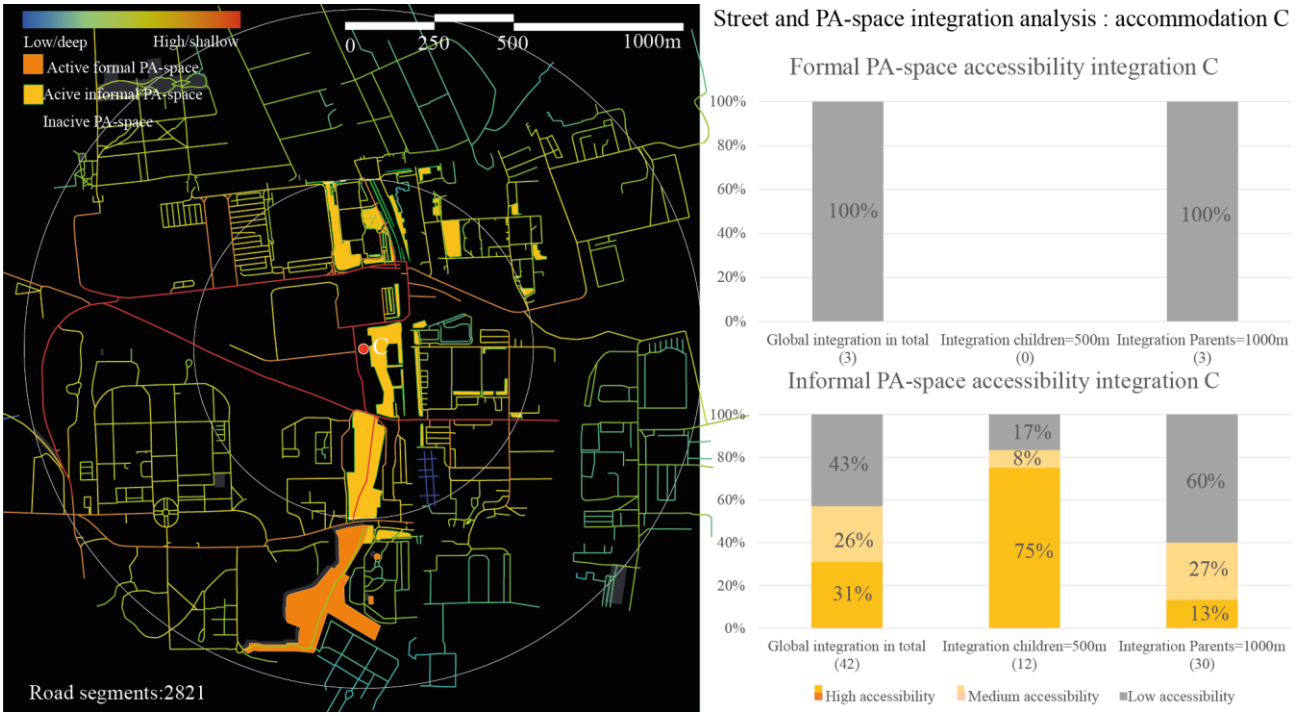


Figure 4.2.34 Global integration of accessible PA space located street

4.2.4 Study site D: sizeable residential area

Spatial characteristics, potential and accessible PA space

Site D has an integrated residential neighbourhood (Figure 4.2.41a) as no railway/highway goes across. Potential PA spaces are evident in this neighbourhood as five playgrounds between residential blocks. 13 grasslands between streets or residential blocks are also identified as potential informal PA spaces.

One of the five playgrounds mentioned above is accessible for children by walking less than 500m, and three are accessible under 1km parental distance (Figure 4.2.41b). There are five informal PA spaces under 500 meters' walking; staff identified one as a playfield for children. Photographs could not be taken immediately around this site due to EJF superior protection terms. There are another five informal spaces for children by parental distance.

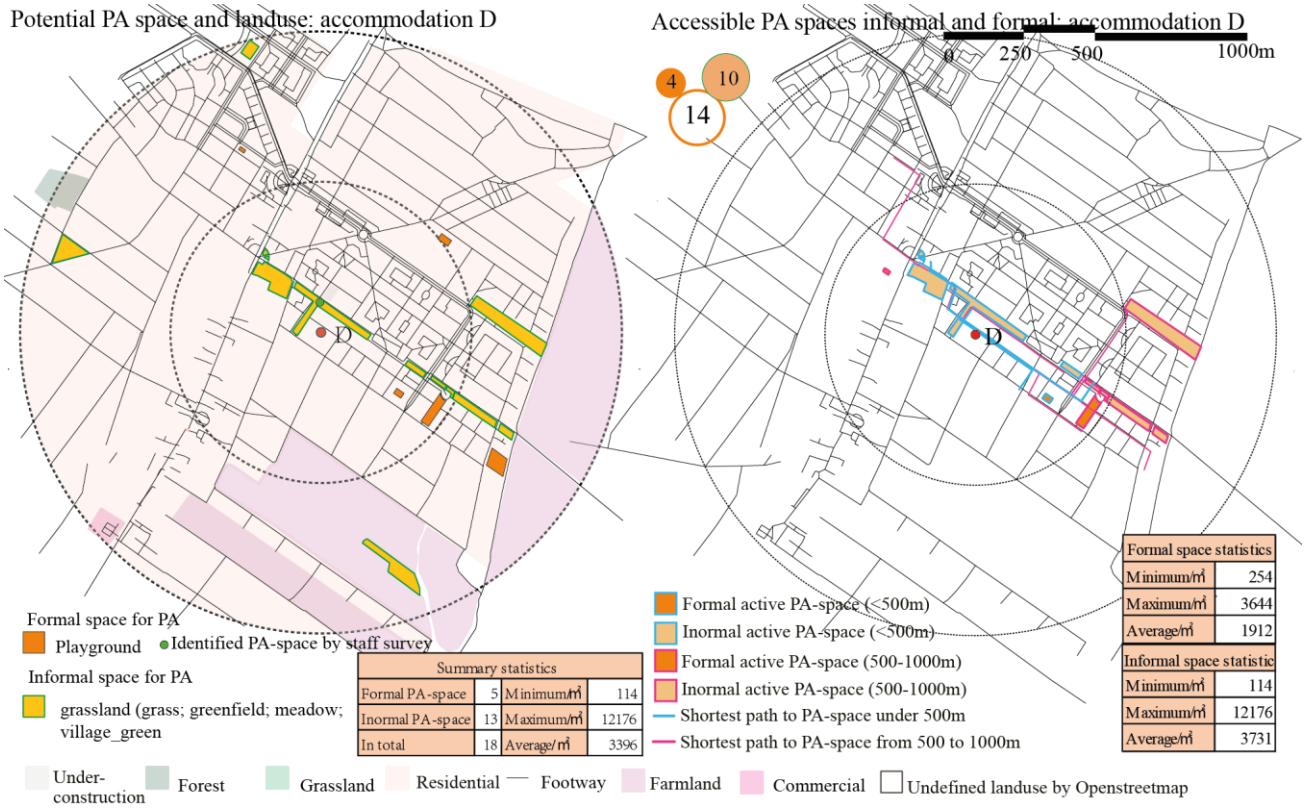


Figure 5.2.41 (a) potential PA space and landuse; (b) accessible PA spaces informal and formal

Active PA space

Figure 4.2.42 analyses global integration of accessible PA space located street: a playground as formal PA space under 500 m for children is located in a highly accessible street. Two accessible playgrounds (500m to 1km) are medium accessible. For accessible informal PA spaces under 500m, 60% are located in highly accessible streets. Others are medium accessibility, and 2020 road segments are investigated.

Figure 4.2.42. Global integration of accessible PA space located street

4.2.5 Study site E: undefined neighbourhood

Spatial characteristics, potential and accessible PA space

Site E is located in a residential area with a big forest on the right side (Figure 4.2.51a). This neighbourhood lacks resources for PA spaces. A total of five parks are potential as formal PA spaces, and eight grasslands as informal PA spaces. The staff identified no playfield for children in this neighbourhood; they assumed that families stayed inside accommodation most of the time.

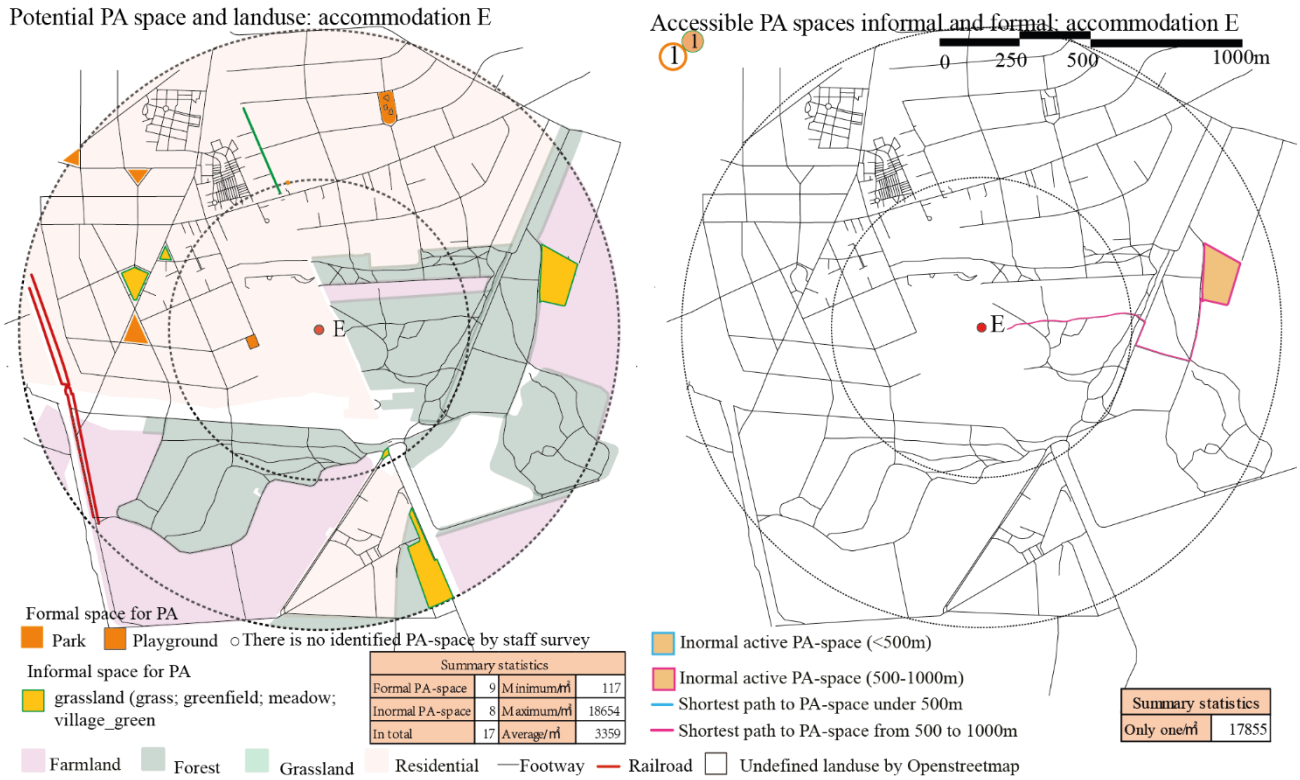


Figure 4.2.51. (a) potential PA space and landuse; (b) accessible PA spaces informal and formal

Active PA space

Figure 4.2.51b identifies only one accessible informal PA space from a parental distance. As shown in Figure 4.2.52, it locates in a low accessible street, which means no active PA space in this neighbourhood. 1662 road segments are investigated.

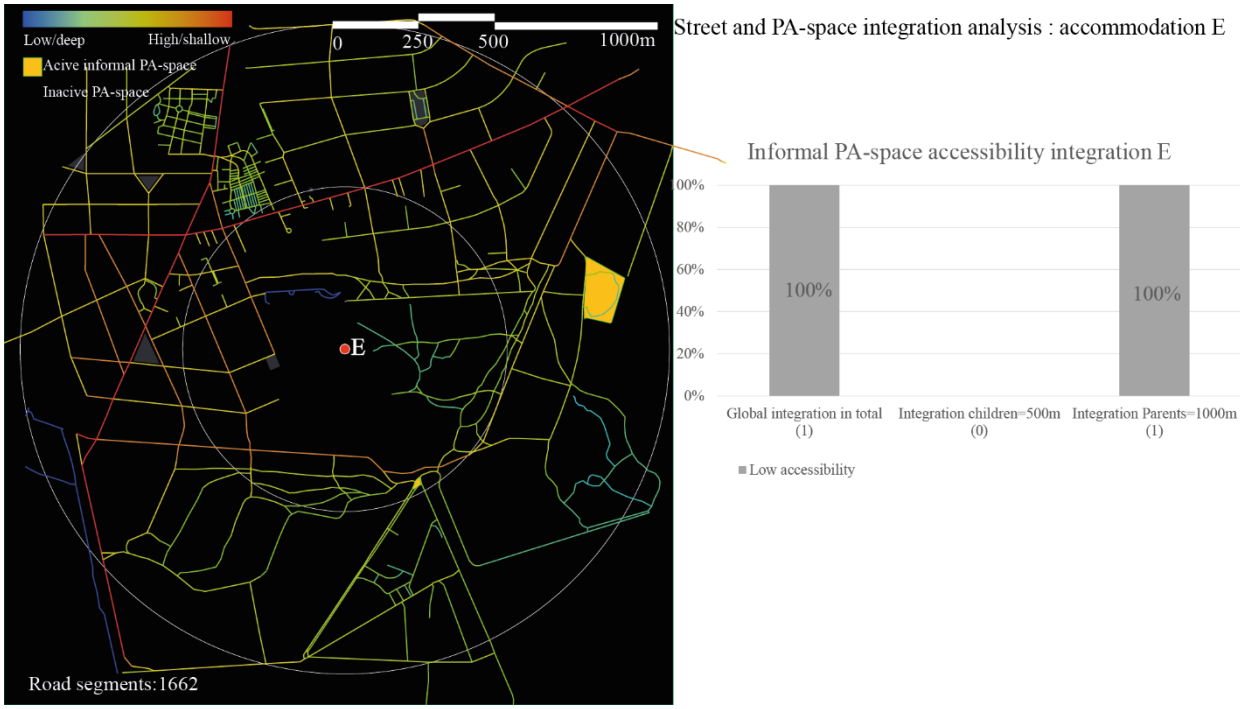


Figure 4.2.52. Global integration of accessible PA space located street

4.2.6 Study site F: inside a park

Spatial characteristics, potential and accessible PA space

Site F stays in an integrated residential neighbourhood with no railway/highway across (Figure 4.2.61a). The park where site F locates is also identified by staff as a playfield (Figure 4.2.6.2). There are also 15 other park spaces, six playgrounds, and three sport facilities as potential formal PA spaces in this neighbourhood. 15 grasslands are potential as informal PA spaces.

Among the playgrounds mentioned above, three are accessible by 500m walking; five other parks are also accessible for children in this distance. In 1km parental distance, 14 formal PA spaces can be assessed by children, including the three sports facilities, one playground and 10 park spaces (Figure 4.2.61b). As for the informal PA space, six are accessible for children by 500m walking, and three can be reached by parental distance.

Figure 4.2.61. (a) potential PA space and landuse; (b) accessible PA spaces informal and formal

Figure 4.2.62 Identified neighbourhood playfield by staff: park

Active PA space

Figure 4.2.63 analyses global integration of accessible PA spaces located streets; for formal PA space maximum 500 meters away, 38% are located in highly accessible streets, while half are in medium accessible streets. In a 1km calculation, 50% are located in highly accessible roads and 21% in medium accessible roads. For informal PA spaces maximum 500 meters away from the accommodation, 83% are located in highly accessible streets. In 1km calculation, 33% are located on high accessible roads. In total, 3025 road segments are investigated.

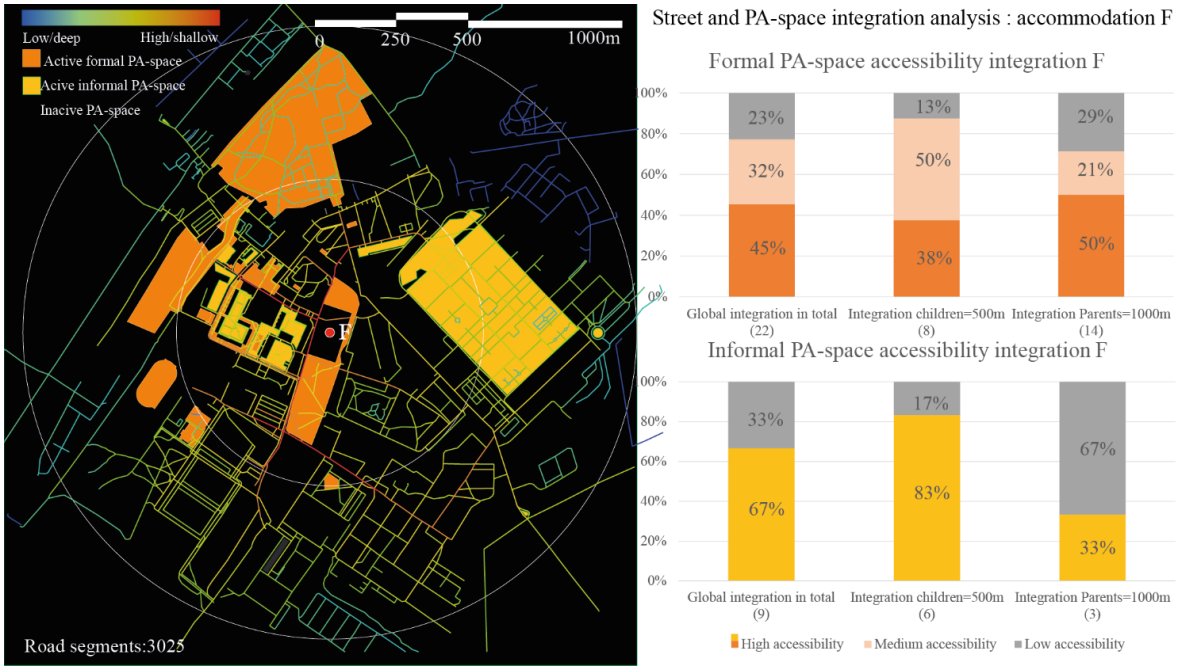


Figure 4.2.63 Global integration of accessible PA space located street

4.3 Comparative analysis

This section first gives a comparative overview of study sites in meso environments; then, a basic comparison of the similarity and differences in study sites of active PA space through numbers and distances. Finally, comparison across six primary study sites.

4.3.1 Comparison of findings across study sites

Active PA spaces under 500m

Active formal PA space under 500m by walking are compared in Figure 4.3.11. Site F has the most formal PA spaces of eight; three playgrounds (a to c) and five parks (1-5). The park where site F locates is also the identified playfield for children. Site B has the second most formal PA spaces as a park (1) and sport facilities (I, II) combination (I-III). Among them, sport-facility I is identified by staff as a playfield. For site D, there is only one playground accessible. Site A, C and E have no active formal PA space.

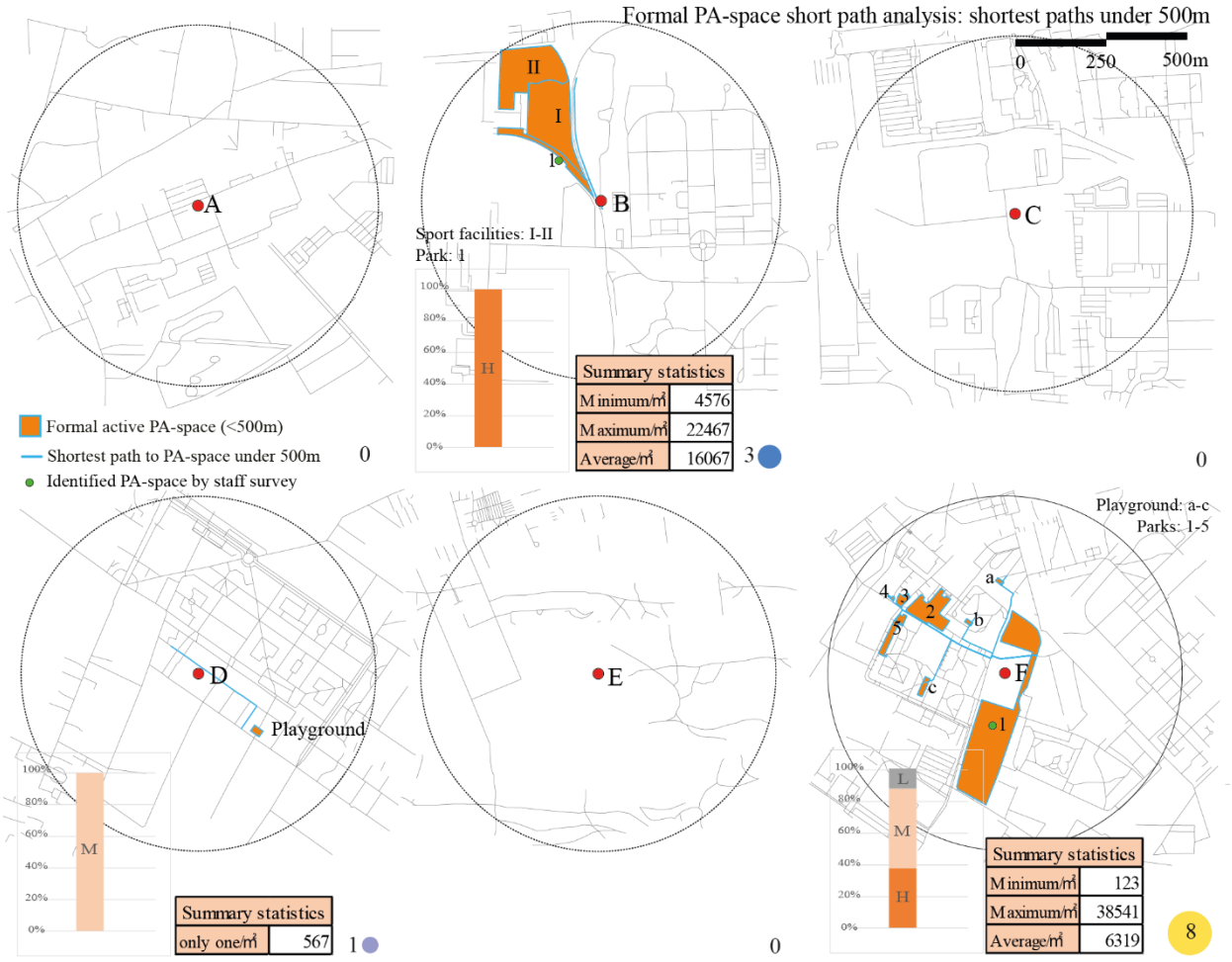


Figure 4.3.11 Active formal PA space under 500m

As for active informal PA space under 500m (Figure 4.3.12), site A and E have no active PA space. Site C, B and D have identified informal PA spaces as playfield(s); moreover, C had the most spaces as 12, followed by site F. The other two sites have equal numbers of active PA spaces as five.

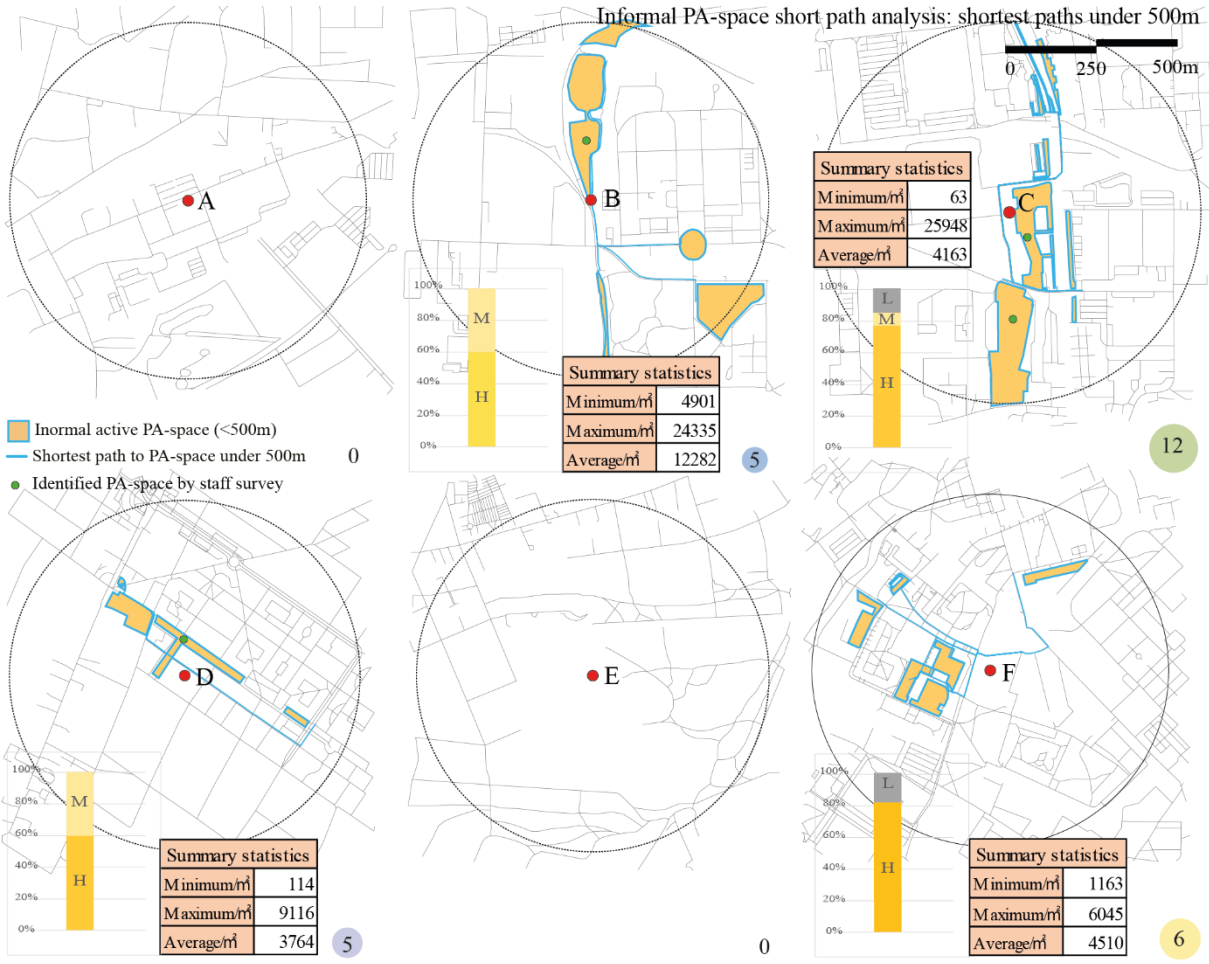


Figure 4.3.12 Active informal PA space under 500m

Staff perceptions of 'children's neighbourhood playfield' were raised from staff surveys: only two staff (B and E) identified formal PA spaces as parks for refugee children's playfields. Staff from other sites, including site B, identified 'open space', 'grassland' or 'green space' as playfields; both informal and formal PA spaces were pointed out as 'playfield'. There was no evident difference between these two types of spaces for refugee children's playing from staff perspectives.

Active PA spaces from 500 to 1000m

Site F has the most active formal PA spaces in 500 to 1000m calculation (Figure 4.3.13), including three sport facilities (I to III), two playgrounds (a and b), and nine parks. Site B also owns eight formal PA spaces as one sport-facility (I), one playground (a), and six parks (1 to 6). There are two playgrounds (a and b) and one park (1) accessible for site C, and three playgrounds around site D (a to c). No formal PA space is accessible for site E from this distance.

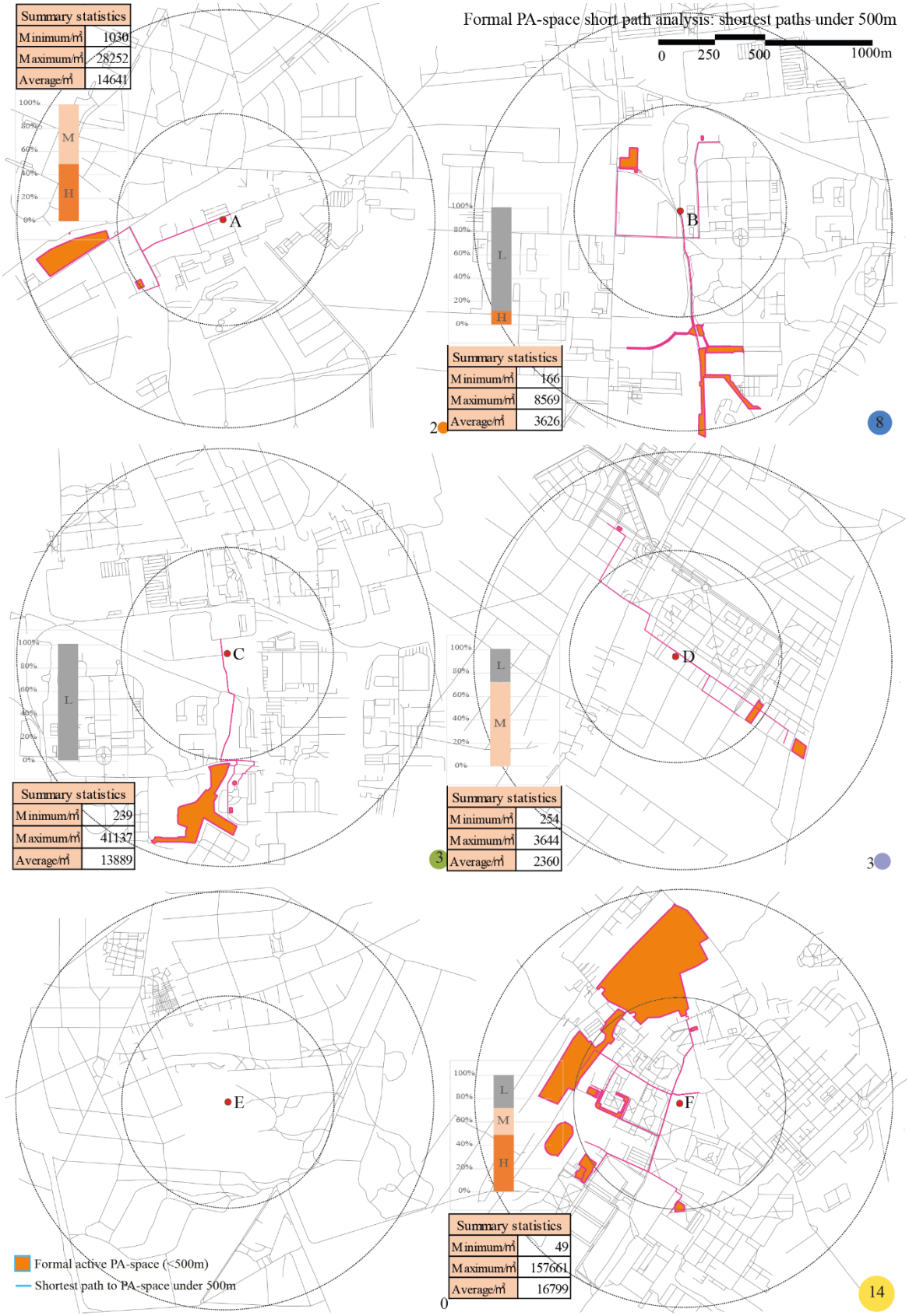


Figure 4.3.13. Active formal PA space from 500 to 1000m

As identified in Figure 4.3.14, site C has the most informal PA spaces as 30, followed by site B (9), D (5), F and A (3) and E, relatively.

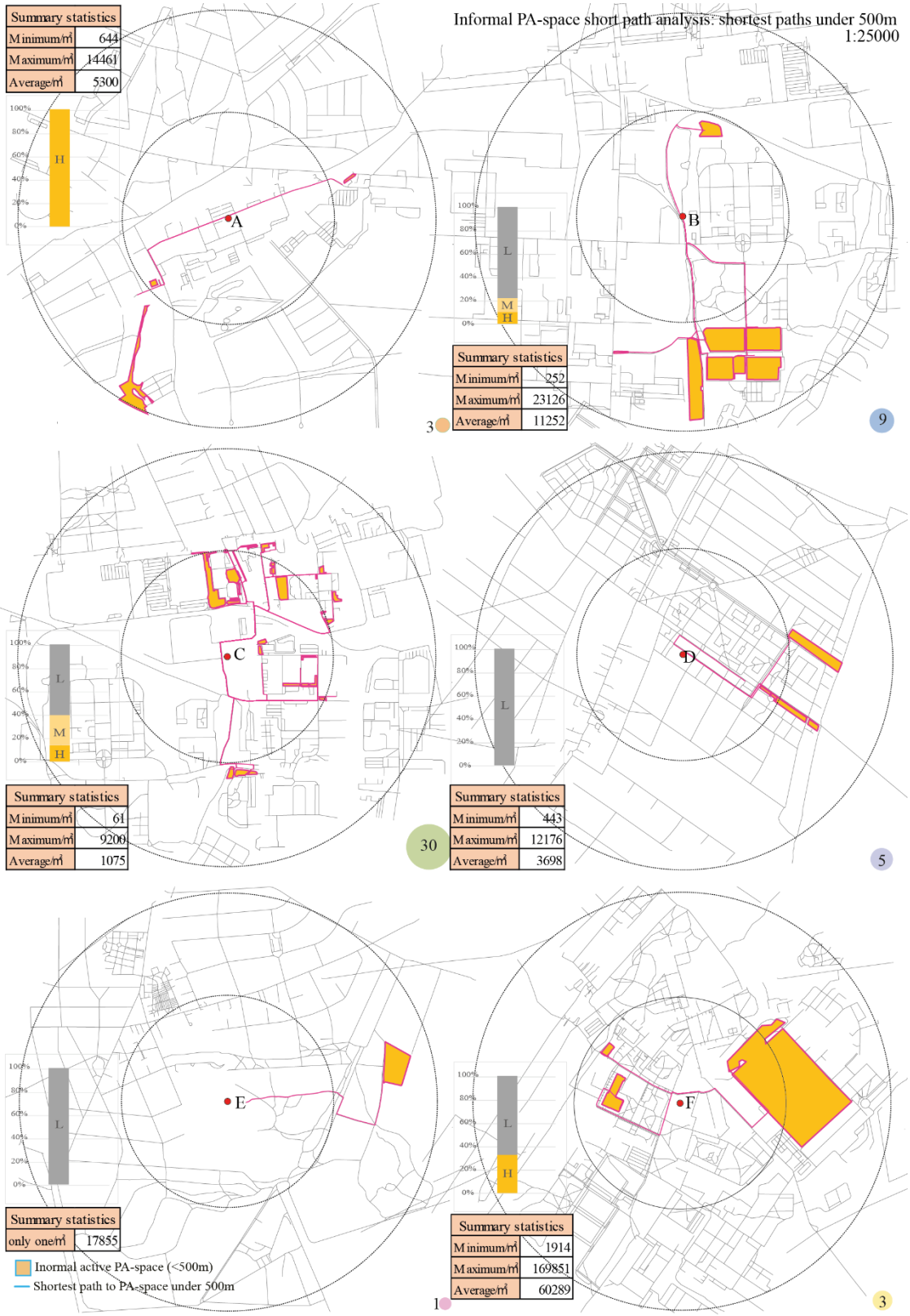


Figure 4.3.14. Active informal PA space from 500 to 1000m

4.3.2 Active PA space comparison

The numeric and graphic data of the findings of space syntax are all interpreted through a comparison in Figure 4.3.2. Children in site E lived in the most disadvantaged meso environments for PA, as an undefined landuse area with no active PA space and second least investigated road segments. Site A had fewer active PA spaces (5), the least investigated road segments, and both active informal and formal PA spaces were in parental neighbourhood distance. Site D also had limited active PA spaces (5), and all of them were identified as informal PA spaces less than 500m away. Site B and F had varied PA spaces and the most investigated road segments. Site F had the most variety of active PA spaces as formal and informal, from all distances. Site C had the second most active PA space; the limitation was that all active PA spaces were identified as informal.

Figure 4.3.2 Comparison of overall findings of six study sites

4.4 Summary of findings

This chapter embeds space syntax with many other methods for a much broader class of measures from a methodological perspective. Elk combined GIS has more comprehensive spatial data management and geographic analysis capabilities, which helped identify potential PA space and construct the spatial characteristics. The metric distance analysis based on Dijkstra algorithm indicated accessible PA space, and the topological analysis of space syntax was integrated into this study to evaluate the information of active PA space. Summary of findings are proposed as below:

This study proved the unbalanced distribution of PA-related resources in meso environments for different refugee accommodation locations in Berlin. This evaluation may be introduced to related decision-makers in the location choice process. Furthermore, the integration of space syntax was used to describe PA space's spatial characteristics by its located street. The integration reflects how if space is well-connected to all other spaces as its destination potentiality; a more integrated road has higher accessibility. From the global integration results analysis, most informal PA spaces, as open spaces are located on streets with high accessibility, indicate they are potentially for PA. Further study should focus on this potentiality for informal PA space.

Although the research is done on the regional scale of refugee accommodations in Berlin, it can also be used in other contexts, and more active PA spaces could be found for those neighbourhoods located in residential areas with no highways/railways across. Moreover, this chapter produced a lower data requirement feasible concept, making it easier for related practitioners to pre-evaluate (in location choice stage) or optimise existing PA-related meso environments more instantly.

Chapter 5. Perceived environmental barriers and facilitators of refugee children's PA in/around refugee accommodations: a study site

5.1 Introduction

This chapter aims to investigate perceived environmental barriers and facilitators of refugee children's PA in/around refugee accommodation A. Research has been done with a qualitative approach conducted in two stages, which response to research question 3 (Figure 5.1):

Stage 1 was formulated to understand children and parents' perceptions about their built environment in/around their refugee accommodation. The author spent one week with fifteen children (ages 6 to 13) and ten parents in June 2019, taking questionnaires, semi-structured interviews, and playable workshops applied. In this process, refugee children would evaluate the existing built environment for their PA. Moreover, their detailed timeline and perception would also be explored and sketched from workshops.

Stage 2 was designed to gain in-depth insight into individual one's PA patterns, so as perceptions and experiences of their daily PA. In this part, three children completed three days of photovoice in June and July 2019, taking meaningful photographs and videos of places related to their PA. This second empirical phase serves to review and deepen the qualitative methodology.

More qualitative data were provided by highlighting refugee children's daily PA in detail and into individuals, which was under-research before. This qualitative data also helped to understand anticipated results from quantitative results in Chapters 4 and 5. Moreover, themes generated from this qualitative work as the importance of informal PA spaces for refugee children's PA were investigated through quantitative approaches in Chapter 5. The qualitative data will be analysed and further discussed in Chapter 6.

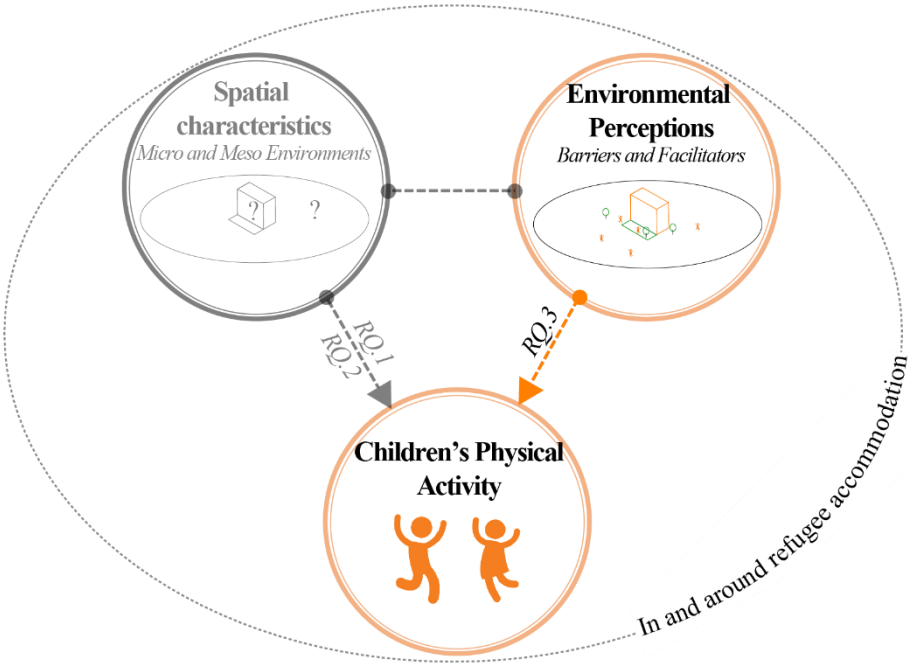


Figure 5.1 A diagram showing research question 3 and children's PA discussed in the chapter

5.2 Results of questionnaires and workshops

5.2.1 Insufficient formal PA spaces

As mentioned in Chapter 3, accommodation A is a former hotel; all interviewed families live in family living units, with two attached rooms and a connected balcony (Figure 5.2.11a). The canteen on level 0 serves buffets as their daily meals. Moreover, a playground is settled outside the canteen (Figure 5.2.11b) as an external PA space with facilities and equipment (e.g., swing, sand playground). There is one internal playroom on level 2, opening by schedule on workdays. This accommodation is next to a former airport, with poor public transportation and heavy traffic. Furthermore, this neighbourhood has few active formal or informal PA spaces (examined in Chapter 4).

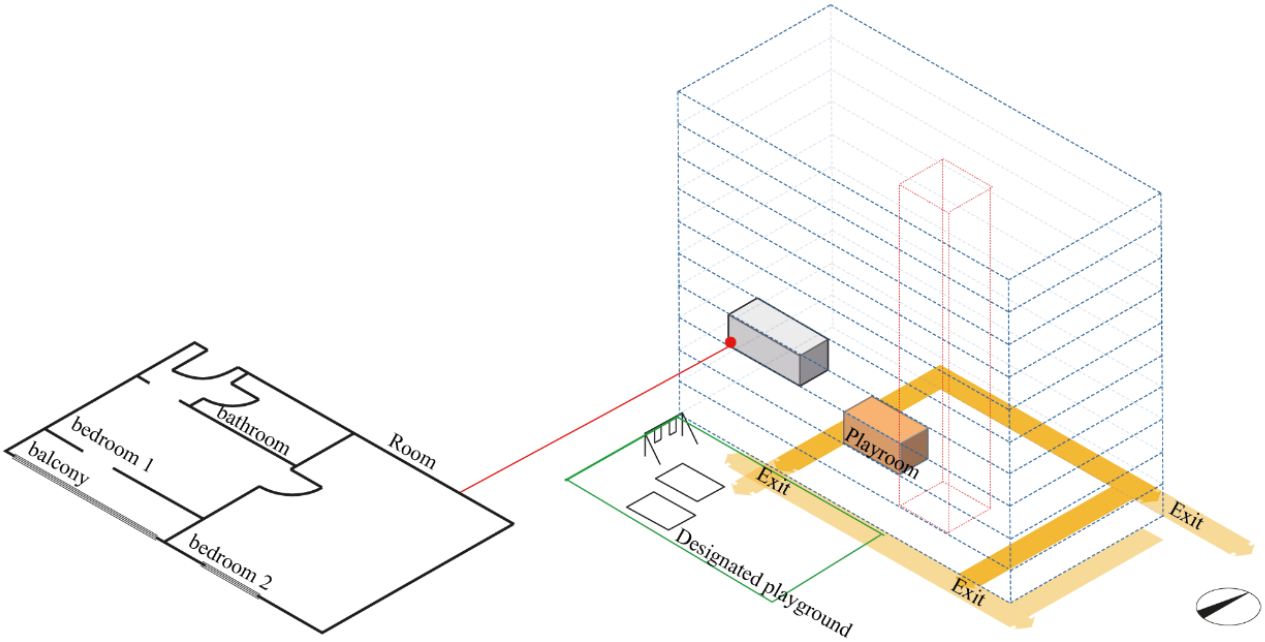
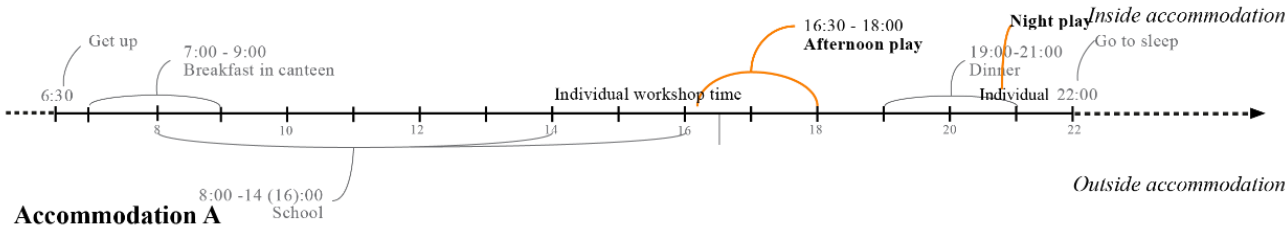
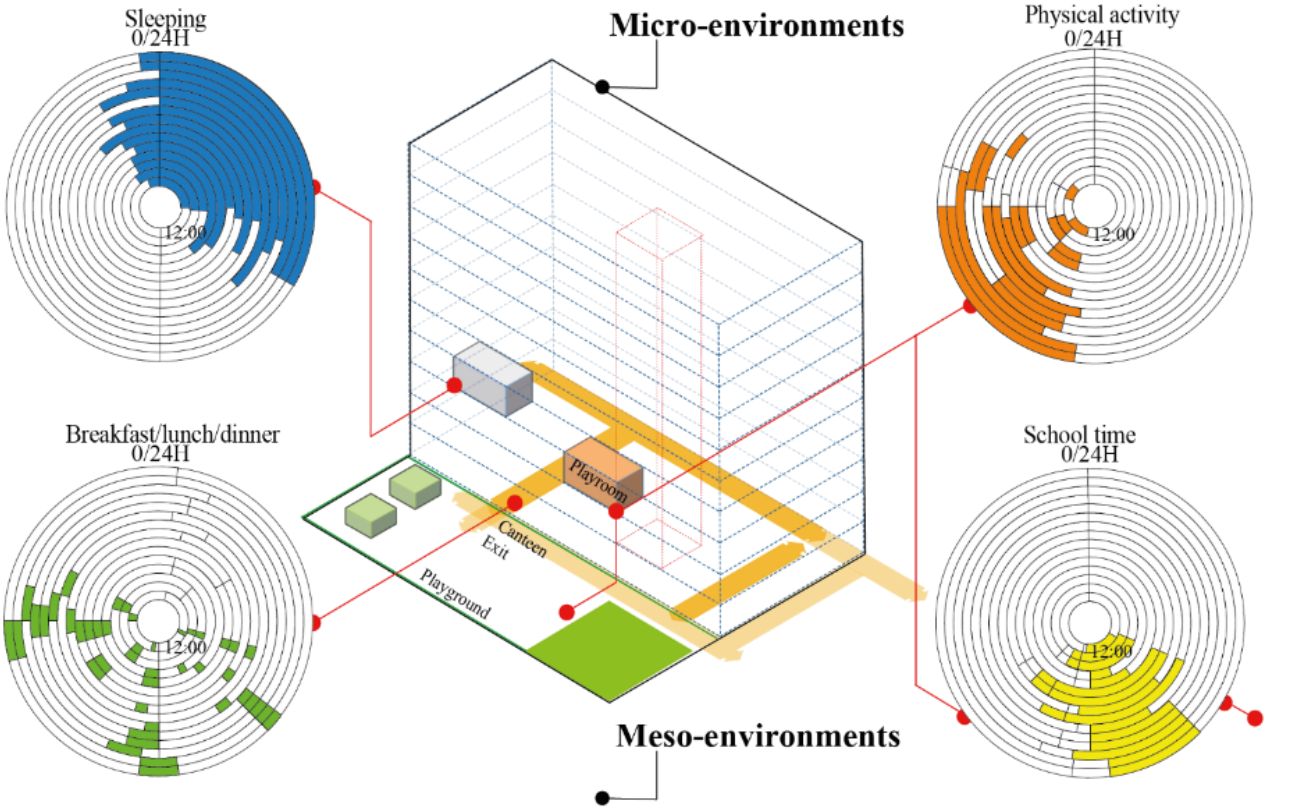


Figure 5.2.11 (a) family living unit example; (b) location diagram of internal and external PA spaces

Figure 5.2.12a from Chapter 4 illustrates from staff-report how their daily PA lives happen in this built environment. Figure 5.2.12bc explains and represents thoroughly how their everyday will be shaped by PA: children wake up between 7:00 to 7:30 in the morning, then go to the canteen for breakfast. Around 8:00, children walk or take a bus for school; those not enrolled in schools yet may go to internal PA space. School children go back around 13:00 to 14:00. There may be organised after-school PA programs, but children typically gather in internal and external PA spaces until dinnertime. Time spent after dinner is individual, and they usually go to bed between 22:00 to 24:00. Furthermore, in children and parents reports, none of them indicated a neighbourhood PA space (formal or informal) in their daily life as 'often go'.




Micro-environments
Sleeping
0/24H
12:00
Physical activity
0/24H
12:00
Breakfast/lunch/dinner
0/24H
12:00
School time
0/24H
12:00
Playroom
Canteen
Exit
Playground
Meso-environments

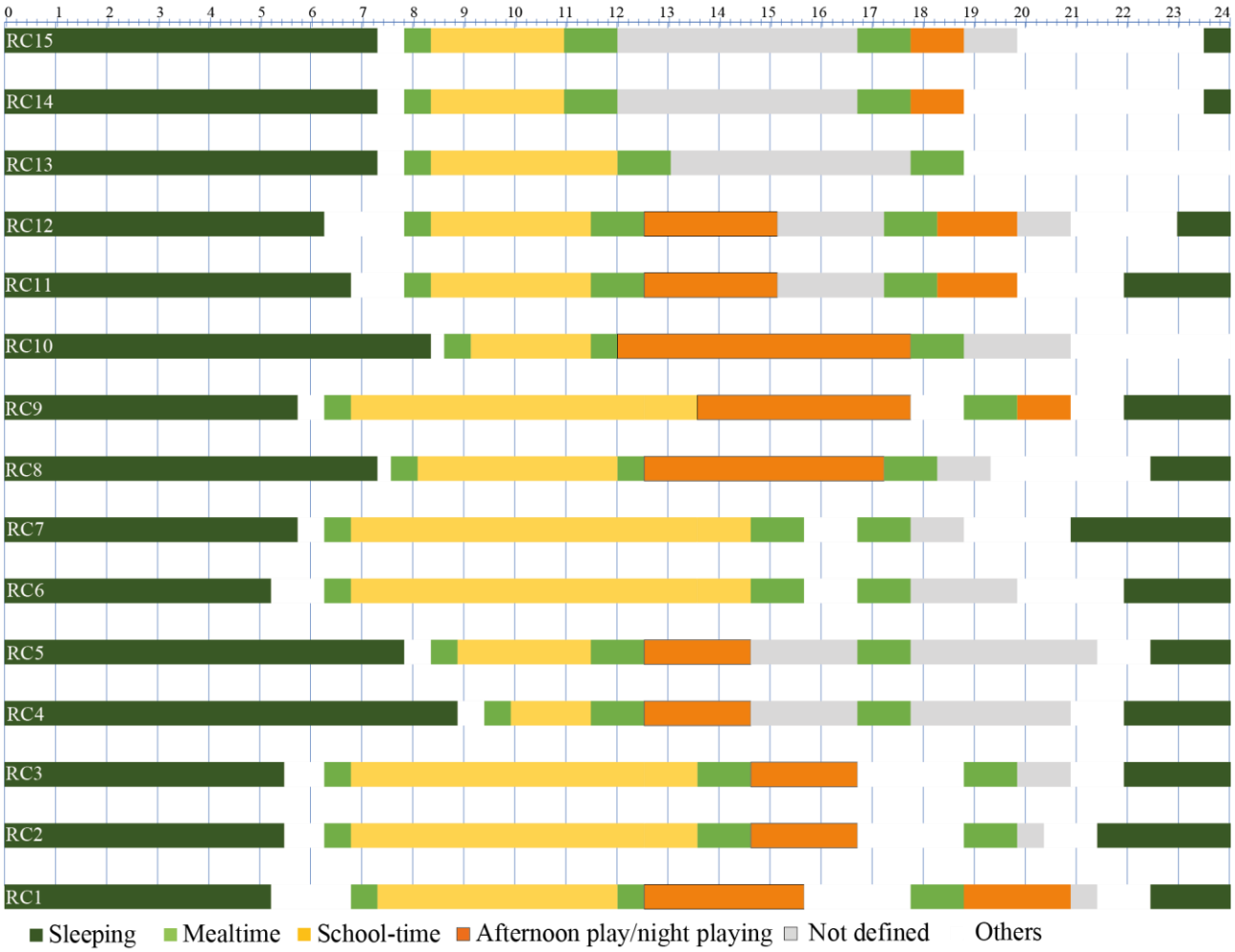

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
RC15
RC14
RC13
RC12
RC11
RC10
RC9
RC8
RC7
RC6
RC5
RC4
RC3
RC2
RC1
Sleeping
Mealtime
School-time
Afternoon play/night playing
Not defined
Others

Figure 5.2.12 (a) Opportunities of PA from the staff report;

(b) daily timelines of 15 refugee children from parents and children report;

(c) daily timelines of 15 refugee children represent by locations

Refugee children in accommodation A shared similar PA timelines since served meals and organised PA programs by schedules. The institutionalised locations for PA will always be their living units internal and external PA spaces. Furthermore, the comparable Figure 5.2.13ab of non-refugee children evidences PA spaces loss in-depth, even though refugee children from A, non-refugee children (Zeiher, 2003, Rasmussen, 2004), shared similar PA timeline patterns, there is a big difference that refugee children have limited resources/accessibility of PA spaces in general and all of children's reported PA happened in micro environments (Figure 5.2.12c and 5.2.13b)

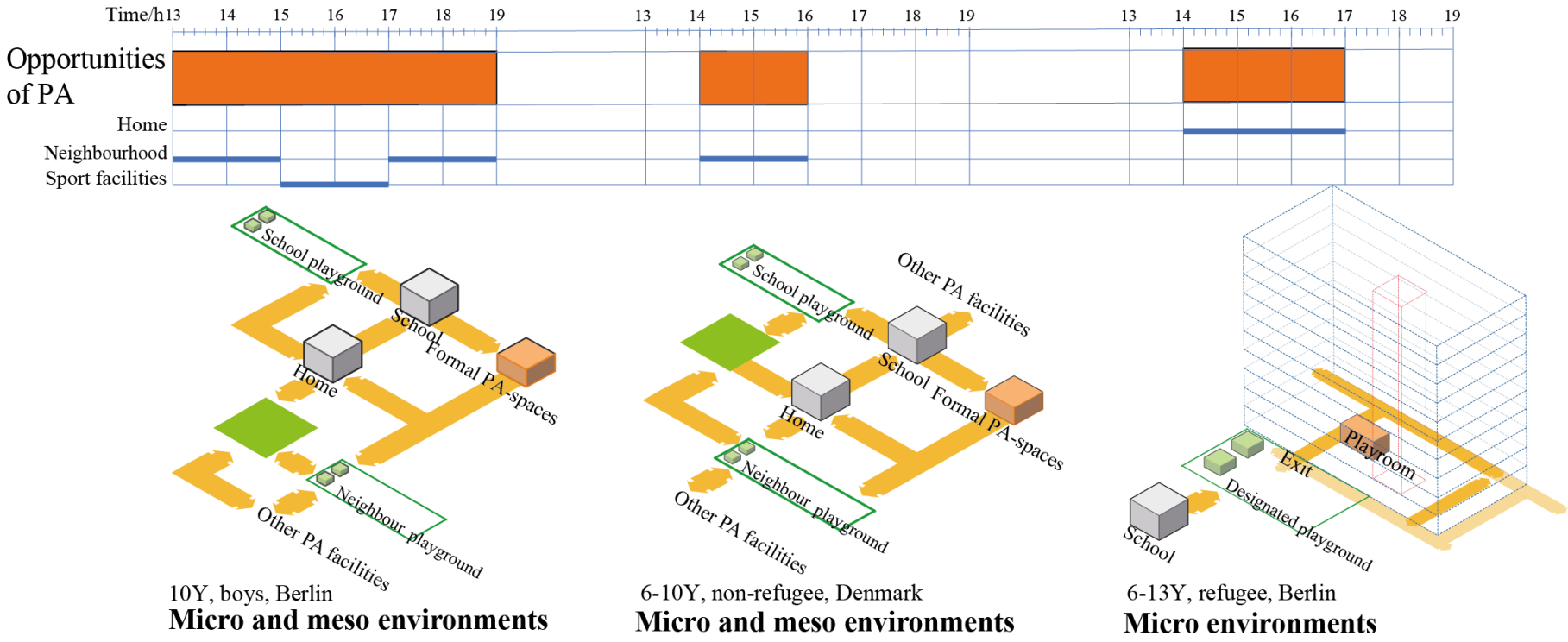


Figure 5.2.13 (a) comparable daily PA timelines of refugee and non-refugee children;

(b) institutionalised locations by timelines from Figure 5.2.13a

5.2.2 Active informal PA spaces for refugee children

3 of all 15 drawings illustrated their daily PA informal PA space (their designated playground) with PA equipment like a swing or slide (Figure 5.2.21a). Two children drew and said that there was no space for playing in their perceived neighbourhoods, and they needed to take transportation for outdoor playing (Figure 5.2.21b). Besides these five drawings, the left drawings sketched outdoor /greenspace/unstructured spaces for their daily playing as informal PA spaces. The drawings depicted a specific activity with a purpose (such as making a snowman, Figure 5.2.22a) but could also be more local and informal, such as enjoying nature (Figure 5.2.22c). There is no formal place for these sporting activities, for example, a pitch or playing field. Children described the activity as not governed by formal regulations but creative playful, such as 'Stone Jenga'(Figure 5.2.22b).

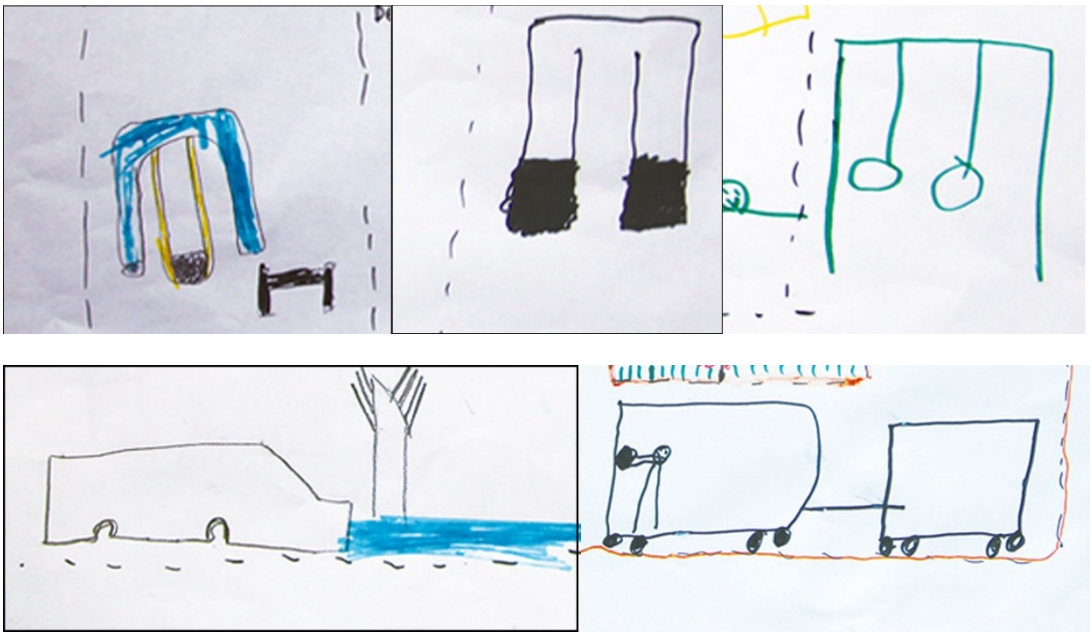


Figure 5.2.21(a) drawings of formal PA spaces with PA equipment;

(b) drawings showed that they need transportation for PA spaces

Figure 5.2.22 Drawings of informal PA space (a) make snowman; (b) Stone Jenga

(c) informal PA space as nature

As an overview in Figure 5.2.23, children had no impressions of 'formal PA spaces' in meso environments, and 2/15 children had no impressions of micro environments. For the rest who had impressions of micro environments, 9/15 children drew grasslands for their PA. Even in micro environments where they owed a designated playground, only one child drew a playground with a swing as their daily play space. In meso environments, 8/15 children had impressions of playing, and two of them identified swings as their play equipment. Five of the children drew grassland as their playfields. The above Figures provide qualitative evidence that refugee children had limited access and perceptions of formal PA spaces and impressions of informal PA spaces in micro and meso environments.

The author will investigate refugee children's perceptions and how they experience their daily PA in these built environments in the following photovoice.

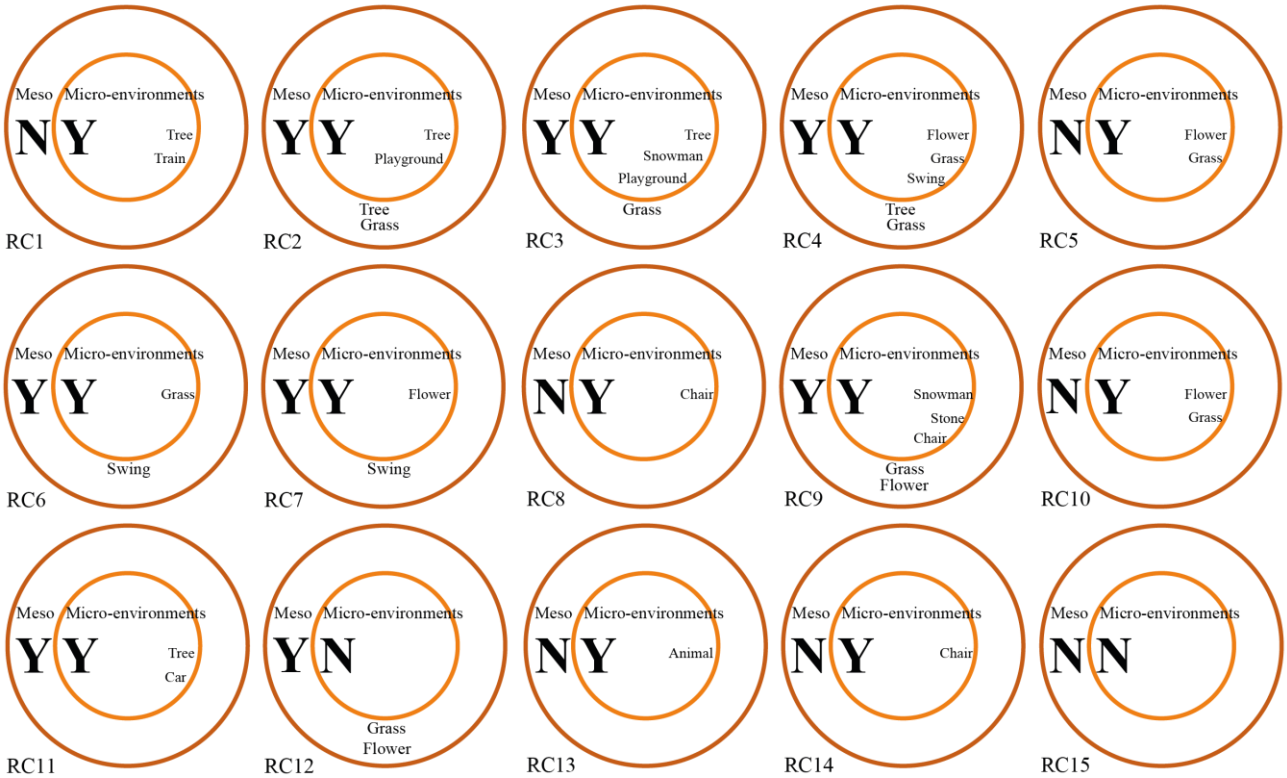


Figure 5.2.23 PA impressions of drawings of 15 refugee children from accommodation A

5.2.3 Parents perspectives of perceived environmental barriers and facilitators

Table 5.2.3 summarises ten parents' perspectives of existing micro and meso environments for their children's PA. In micro environments, three parents thought there was no accessible space for their

children to play in internal PA spaces (e.g., playroom), while four parents shared that there was not enough place. As for the external PA space (e.g., the playground), one parent marked it as no accessible space for children's playing; moreover, six parents thought the playground was too small. In summary, most parents thought there was no accessible space for playing in micro environments.

In meso environments, all but one parent thought there was no accessible space or limited spaces in the neighbourhood for their children's playing. Furthermore, two parents worried that the neighbourhood was unsafe, while seven parents were unsure if they belonged to a safe neighbourhood or not because they did not go out very often.

Four parents observed their children playing outside (in micro or meso environments) for less than one hour; two parents said it was 1 to 2 hours, three parents thought it was 2 to 3 hours, and one parent thought it was more than 3 hours. The findings feedback to results in Chapter 3 that refugee children from accommodation A spent 1.5 hours on daily PA.

Table 5.2.3 10 parents' perspectives of existing micro and meso environments for children's PA	
Micro-environments	
The space in this building for your children playing (e.g. playroom), you find that:	
No space	3/10
Too small	4/10
Enough space	3/10
Too big	0/10
The playground with the building for your children playing, you find that:	
No space	1/10
Too small	6/10
Enough space	2/10
Too big	0/10
Meso-environments	
The Parks /small playgrounds around the building for your children playing, you find that:	
No space	5/10
Too small	3/10
Enough space	1/10
Too big	0/10
Where (e.g. on the way to school) do your children like to stay in the neighbourhood?	
park nearby	2/10
Do you think the neighbourhood is safe?	
Yes	1/10
No	2/10
Not sure	7/10 (do not go out)
Do you think the neighbourhood is friendly?	
Yes	4/10
No	3/10
Not sure	3/10
Opportunities of PA	
How long do your children play outside every day?	
less than half an hour	0/10
less than one hour	1/10
1 to 2 hours	5/10
more	2/10

Moreover, an interesting theme that emerged from the questionnaire and others was that refugee parents paid less attention to the existing 'quality' of built environments (e.g., size, PA equipment); these might be formed differently from their countries of origin (Allport et al., 2019; Guest, 2013; MacMillan et al., 2015). They cared more about if the spaces (PA spaces, either formal or informal) were accessible for their children's playing purpose. This finding also leads to PA environments measurement directions in Chapter 4.

5.3 Results of photovoice

For privacy and research purpose, all interviewees' names were anonymous: one was a ten years old girl Charlotte (Iraq), living with her nine years old brother Mariano (Iraq), another one was a ten years old girl Nicola (Iran). All their families hold temporary residence permits (one year or less, individually) and lived in Germany for less than six months, settling in the same initial reception (accommodation A) in Berlin. The research was finished during their summer vacations.

Charlotte (10) and Mariano (9)[11]

The father of these two children did English-Arabic translations and supervision during the whole unstructured interview process. It is worth mentioning that he took a few photos under the children's requests to show their PA status. In total, Charlotte talked about 22 compelling photos out of 29 taken photos. Mariano explained 18 out of 26 photos.

Nicola (10)[12]

Nicola joined the research with her little sister together. Her sister quit the research due to the damaged camera. Nevertheless, they accompanied each other during the whole process. Nicola communicated to the author with understandable German and a little English; she has an open and agreeable personality with vivid body language expression. She talked 21 photos out of 22.

5.3.1 Daily PA timeline

Charlotte and Mariano

Charlotte and Mariano get up quite early in the morning; families usually walk together after breakfast. Usually, they need to take a train to play since there is nothing but a dangerous highway to pedestrians (Figure I) in the neighbourhood. The two siblings chase each other on the grass ground (Figure IIab), taking photos of flowers or animals. They need to watch time for leaving or even go back earlier so that they can catch the served lunch just in time. The siblings prefer to have a sweet nap after lunch and stay inside their rooms with toys in the afternoon (Figure III). Charlotte would like to hear book stories from their parents when they have time. Mariano prefers to stay in bed for mobile games or sometimes play with Charlotte on the balcony. Most children gather together in the playground after dinner, and that is the period when Nicola also appears (Figure IVab). There seems to be no stable friend's circle among the children, but most of them do get on well with each other. The temporal pattern of their evening is correspondingly simple: stay in their room. And Charlotte shows us the end of the day with a photo of the moon.

Additionally, parents sometimes bring them to the city centres; they enjoy the long train journeys and taking videos simultaneously. After getting off the train, children find that open areas under the train bridge could be a playing square for chasing birds (Figure Vab). While at the city square in

[11]. Photo taking and video recording conducted 26th to 28th June 2019; Interview conducted 1st July 2019.
[12]. Photo taking and video recording conducted 2nd to 4th July 2019; Interview conducted 8th July 2019.

Alexander Platz, Charlotte joins the dancing group in the open space (Figure VI), and Mariano is attracted by all kinds of street painting (Figure VII). Charlotte takes a photo of happy kids on the way back home on the advertising board to show us her imagination of the ideal PA mode (Figure VIII).

Nicola

Nicola always gets up just in time for breakfast. After that, she plays with her sister while her parents are busy with their things[13]; she may stay in the playground (Figure IX), take responsibility for younger residents (Figure X), or do nothing for the whole morning. She prefers to have tea after lunch. Like Charlotte and Mariano, Nicola spends her afternoon in her room too. Sometimes she plays with toys or plays on the balcony with her sister (Figure XI). She often does not go to the canteen in the evening for she prefers sweet light snacks for dinner.

In line with Charlotte, Nicola also finds flowers are attractive when she plays outside, but the idea of the scary neighbourhood stops her to play around (Figure XII, XIII); her families also take transportation, like a train, if they want to find somewhere to play outside their accommodation.

5.3.2 Environmental perception of PA space

Figure 5.3.2 illustrates the discrete photography spaces of micro, meso, and macro environments, indicating direct spatial perceptions of these children in different environments; the majority of their PA lives happen in micro and meso environments.

The micro environment is the layer closest to the child, where they spent most of their daily PA and took most of the photos. Moreover, even though the children felt happy when they played in external PA space, they spent most of their daily lives inside their living units with insufficient space and non-satisfied mood. They used positive words for PA behaviour but negative words to define their existing micro environments. They felt fewer relations and interactions with this layer in this research.

The diagram also indicates that refugee children negatively perceive their meso environments. They took only a few photos, and most of their descriptions were negative. These two families preferred to go to macro environments instead of meso environments. Moreover, the meso environments in this research showed no connections between other layers.

The macro environment may be considered unfamiliar for these children. They took abstract and highly generalised photos or videos and used mainly natural expressions for this environment since they were unfamiliar with it.

[13] The photography period was overlap for the parents' visa submissions

Figure 5.3.2 Spatial perceptions of 3 refugee children in micro, meso, and macro environments

5.3.3 PA patterns

Charlotte and Mariano

The abandoned railway impressed Mariano very much since they passed it for outdoor playing all the time. They needed to go across this first and then took public transportation. The father told the author that there was no immediate play area around this neighbourhood, as far as they knew.

Figure I Charlotte and Mariano needed to go across this abandoned railway for play outside

Even going outside, there seemed to be no formal play areas. They took a series of photos of how they played or interacted with the grassland. They told the author that they liked chasing birds or chasing each other on the grass ground.

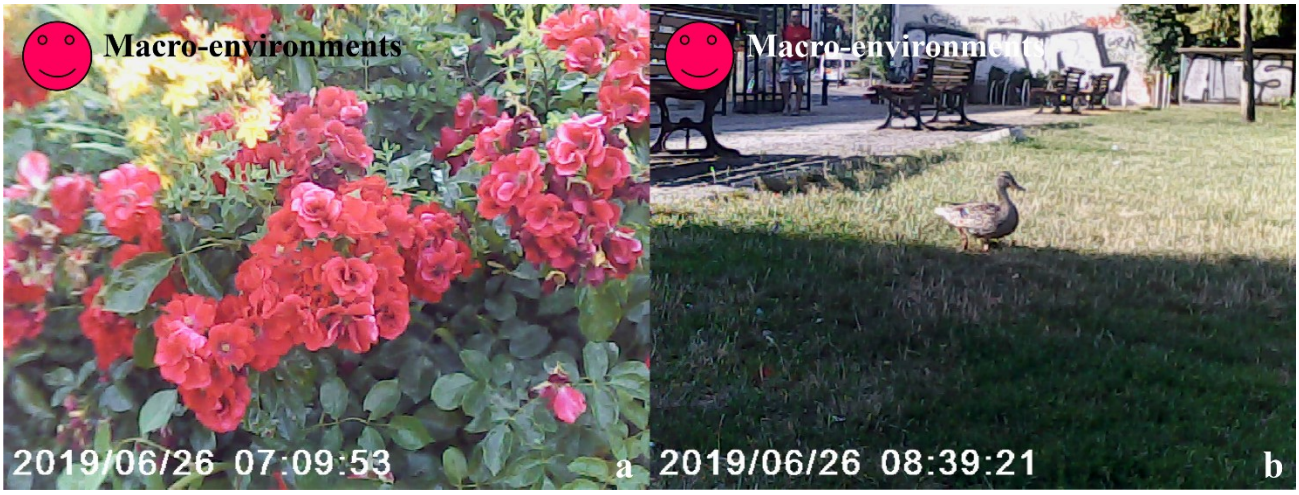


Figure II The grass ground for children's playing (a) by Charlotte; (b) by Mariano

The conversation became attractive to these two siblings when we talked about playing with toys (FigureIII); two children liked to play characters while running inside their living unit. The father also preferred them to stay inside their room; he allowed them to play only under his or their mother's supervision or in internal PA spaces supervised by adults.

> Charlotte (translated by her father): "I like superwoman, but no place to play with her." and she put the sort of mood tags with the photo
>
> Mariano (translated by his father): "I like the toy," but he still put the sad mood tag, "he is too lonely," he asked the author for a pen to draw another muscle man beside the photo "I want them to play together."

Figure III Charlotte and Mariano play inside their living unit with their toys (taken by the father)

Most children went to the playground around dinner time; they used multi-languages to communicate with each other since they were all from different countries of origin (Figure IVab). We asked the children if they had a stable friend circle or time to play:

> Charlotte (translated by her father): "No, Mariano or my father move the swing for me, sometimes I play with Nicola and her sister (they speak the same language), but I don't know their room number."
>
> Mariano (translated by his father): "No, I play with Charlotte. I think the things in the playground is too childish."

Figure IV Children play in the designated playground (a) by Charlotte; (b) by Mariano

Charlotte and Mariano also mentioned that they liked to chase birds in the open space under a train bridge. Charlotte liked this play very much, but Mariano said his parents did not like this because it was dangerous (Figure Vab).

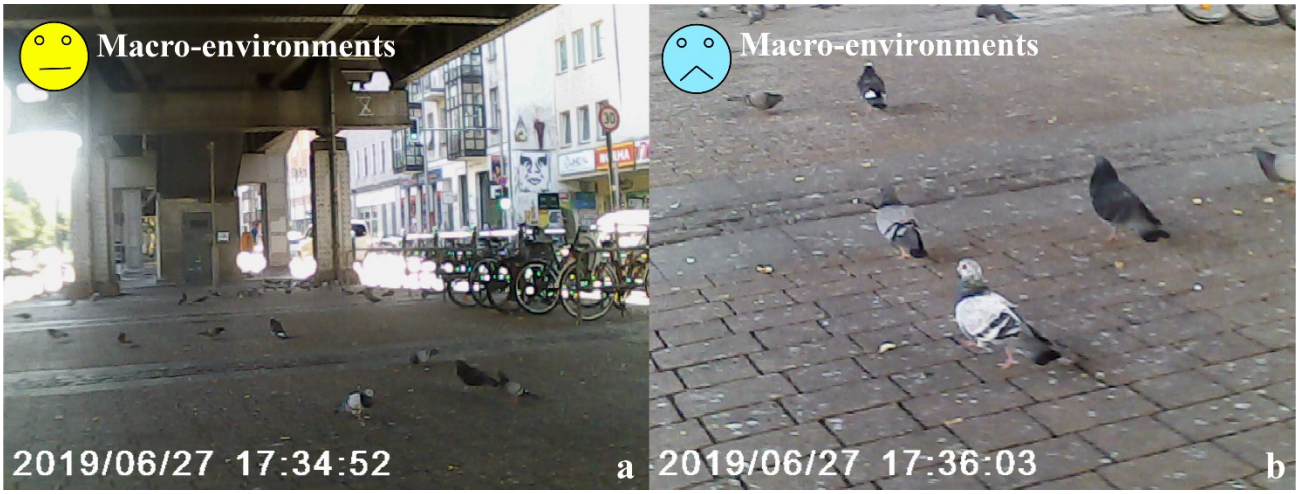


Figure V Open space for playing under train bridge (a) photo by Charlotte; (b) photo by Mariano

Charlotte became very excited when she talked about Figure VI; she also mentioned she wanted the accommodation to have a similar schedule activity:

> Charlotte (translated by her father): “They dance, many people together, for a long time… I want to join them, but I’m shy, and the (other) man he plays bucket as drums!” she imitated the behaviour.

Figure VI Charlotte is dancing with other people

Mariano felt calm when he talked about Figure VII:

> He put a *sad* mood tag on the photo "I found nothing to play in the square, but I like the painting. I feel sad for the people" Mariano also handed up (to imitate the people) and snaked his head "sad, not happy the people," his father used a hand gesture to stop the author here from the further question.

Figure VII The painting Marianne finds attractive in the square

We asked if there was anything they wanted to add; Mariano snaked his head, and Charlotte pointed Figure VIII to the author. She took this photo to illustrate her imagination for ideal playing.

She loved flowers and trees; she would like to have more free space; she wanted a bigger playground and more close friends except for her brother Mariano. She would like to have a more friendly neighbourhood.

Figure VIII Charlotte's ideal imagination for playing

Nicola

Nicola showed us her creative, informal activity in Figure IX by playing cans; her parents had no time for supervision, which meant she could only play inside the accommodation or immediate neighbourhood on foot:

> "My (little) sister is (was) a gymnast in Iran", they showed the author ", I'm also good at sport, I have good balance, we don't have many things to play… (The swing and sand playground) are for small children… (she pointed to the photo). I made these myself" she put a *happy* mood tag on the photo.

Figure IX Nicola's creative activity of playing cans (photo by her sister)

Sometimes, Nicola or other girls needed to take care of younger kids in playing time, which might reduce her PA levels (Figure X). She also led playing among children by negotiating in fights and arguments:

> "it's okay" she pointed at the photo "he is cute, I have to (take care of the children), I'm older here."

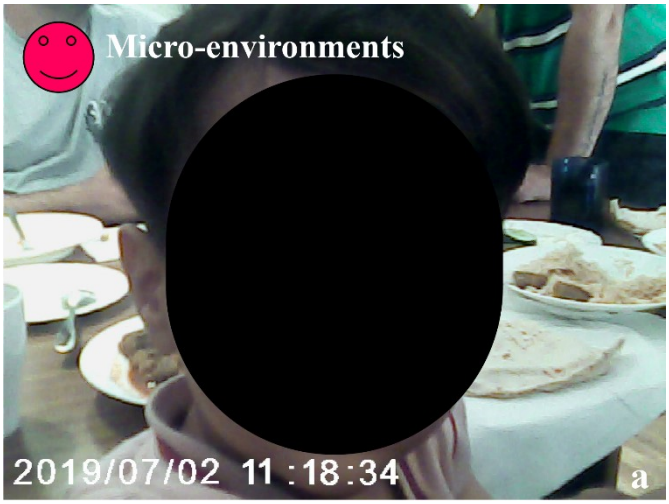


Figure X Nicola is taking care of another younger resident

Nicola showed the author her favourite toys, but she was not interested anymore by the interview time. Recently, her favourite indoor activity was role play with her sister based on the movie or cartoon she watched (Figure XI):

> "I used to like them, but now they belong to my (younger) sister now
>
> "We played like the movie; yes, 007, we imagined we are spies, so interesting, we chase each other in the room!"

Figure XI Nicola is role-playing with her sister in their living unit

Nicola photographed several things which made her unhappy for playing around the neighbourhood, e.g., too many cars; she stood on a narrow road with an unhappy face, she liked to explore the neighbourhood, but she was not satisfied with existing ones (Figure XII):

> Nicola: "the scary trees," she imitated a monster "the neighbourhood is cold…I smiled at other children (neighbourhood children); they don't (smile back), no other playground around here."

Figure XII Nicola takes a photo of her feeling for meso environments

Nicola ended the interview with Figure XIII:

> "Dangerous, no place to play" she drew a *panic* mood tag and put it on the photo, "I asked my father to take the photo, but funny (to play on the train rail), I want somewhere else around here (to play)."

Figure XIII Nicola asks his father to take a photo of them playing on the abandoned railway

One thing worth mentioning is the PA program for refugee children: e.g., Cabuwazi Berlin (Figure XIV), a circus group that provides vivid play programs for children. In fact, refugee children could hardly benefit from this since it happened in a precise location far away from their accommodation and often cancelled.

Figure XIV Cabuwazi organised activity for children

5.4 Summary of results

Figure 5.4 presents the key finding from parents' questionnaires, children workshops and photovoice. Most parents thought there were neither enough internal PA spaces nor external PA spaces in micro environments. Moreover, the time children spent on PA was limited. Only 3 of 15 children draw (identified) external PA space as a designated playground with a swing as their daily play space. Children's workshops and photovoice indicated that most of their PA happened in micro environments due to parents' worrying or supervision. They liked to gather in external PA space and had creative, informal activities raised by opportunities with temporal rules. Both parents and children identified refugee accommodation as the centre of their daily PA lives. Therefore, external and internal PA spaces are very important for refugee children.

In meso environments, all but one parent thought there were no/not enough PA spaces, either formal or informal, which supported quantitative analysis from Chapter 4. They worried about neighbourhood safety or felt unsafe. 10 of the 15 children drew informal PA space (as grassland) for their play space in meso environments; two children sketched that there was no space for PA in meso environments and could only reach the outside PA space by transportation. Results from Photovoice were similar in that there was no PA space for them in meso environments where they also felt unsafe. Children also indicated informal space (e.g., open space, grassland) as their play spaces and regarded informal PA spaces as equalled to formal.

An interesting theme emerged from the material gathered: parents paid less attention to the existing 'quality' of built environments (e.g., size, PA equipment); these might be formed differently in their countries of origin. They cared more about if the environments (PA spaces, either formal or informal) were accessible for their children's playing purpose. Results also underscored the relations between refugee children's perceived environmental barriers/facilitators and spatial characteristics in micro and meso environments. These findings will be further discussed in Chapter 6.

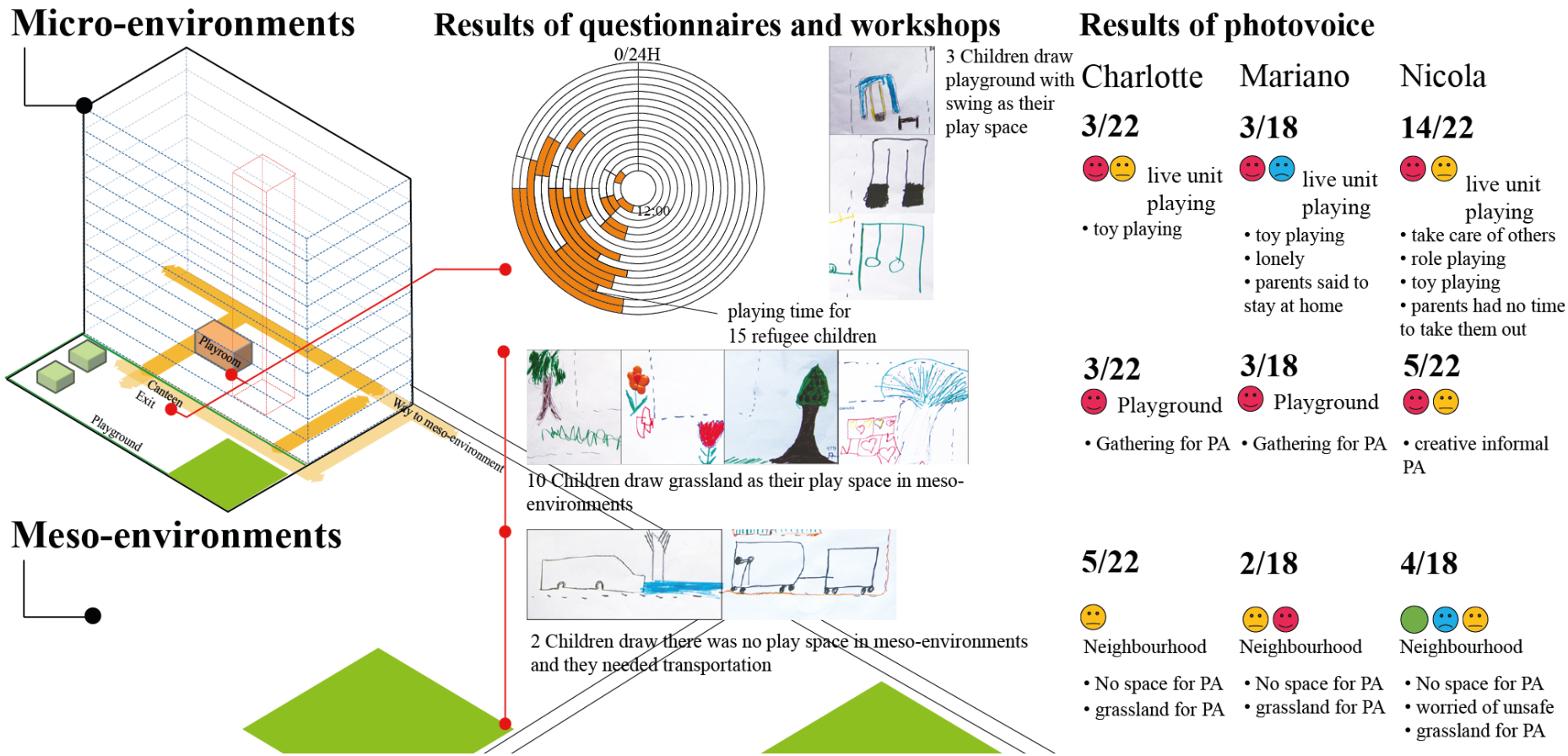


Figure 5.4 Findings of parents' questionnaires, children workshop and photovoice

Chapter 6. Discussion

6.1 Micro spatial characteristics and refugee children's PA

In addition to the already discussed six study sites, four more sites, namely accommodation AD1 to AD4, are chosen for further analysis. This sample serves to deepen the typology and qualitative comparison in micro environments.

6.1.1 Living unit space

Six refugee accommodations are potential for living unit PA as AD4, C, AD3, E, B and A (Figure 6.1.1). It was also evident in Chapter 5 that three of the interviewed children took photos of their indoor playing in their living unit of accommodation A, which indicated that refugee children identified living units as their playing spaces if there were enough spaces.

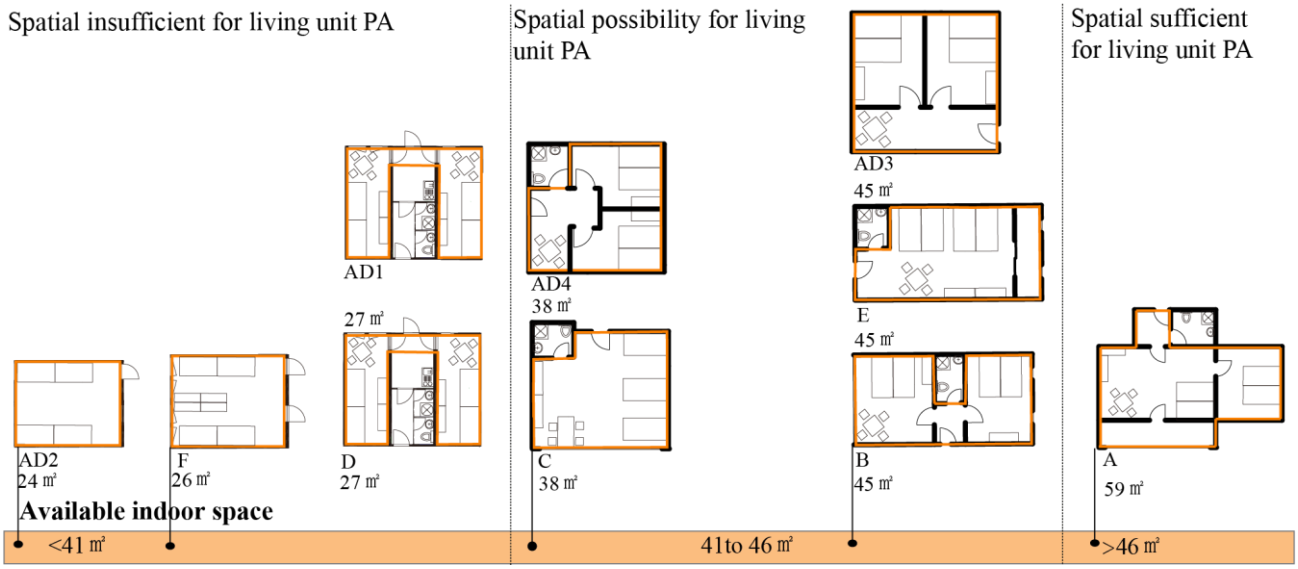


Figure 6.1.1 Living units size for PA comparison

6.1.2 Internal and external PA spaces

Numerical ratings between investigated accommodations could not be developed due to current evidence and available research. However, a qualitative comparison could be provided with available samples, where four refugee accommodations are rated as 'simple ', including two MUFs, three as 'middle ' and three as 'complex' based on their typology. From an architectural view, the last two categories could be merged into one and referred to as 'requires improvement' in future measures.

Figure 6.1.2 provides a comparison between the abovementioned values with visual patterns. Accommodations with simple spatial characteristics (1 to 3 floors, accommodation D, AD1 and F) are general newly-built residential containers with the highest integration values, lowest step depth to external and no internal PA spaces (or limited internal PA space in F as four containers). Simple layouts have clear and accessible corridors that connect living units directly with external PA spaces or through corridors. MUF (AD4, 6F, AD3, 5F) are high-quality buildings constructed from prefabricated concrete modules. This design provides an internal PA space as a playing room on each floor; technically, refugee children can reach the internal PA space by crossing the corridor in 2

steps. They also provide integrated, clear and accessible corridors for every living unit. Simple and MUF are newly-built modular buildings with lower step depth to internal and external PA spaces and higher global integration.

Accommodations with middle spatial characteristics (5 floors, B and E) are former healthy/social apartments with big and simple accessible corridors that connect living units directly. They have accessible stair-elevator cores that separate the building into parts. They also provide the most significant internal PA spaces among all ten investigated cases. Middle layouts provide balanced investigated spatial measures values in the middle positions.

Accommodation A and C with the most complex spatial characteristics and higher floors (10F and 11F) or AD2 (5F) as former office provides extremely low spatial measures as least integrated and has most step depth to internal and external PA spaces. The complex spatial characteristics have separate and inaccessible corridors, dividing living units with the lowest connectivity values. Since internal PA spaces are living units in these accommodations, it is hard for children from other living units to reach internal PA spaces. It is also difficult for children from higher floors to get to external PA spaces.

Lower integration pointed to a lower correlation of global integration. Examples from the dataset for low integration refugee accommodations were AD3, AD2, A and C. They had separated corridors. In the cases of most integrated D and AD1, they both had open space in front of living units, while integration identified the outdoor corridors connected to other living units or external PA spaces. E also provided an access corridor that bonded living units and PA spaces with the third-highest integration value as a senior retirement house. These findings can be linked to the importance of having accessible corridors to built environments for refugee children’s PA.

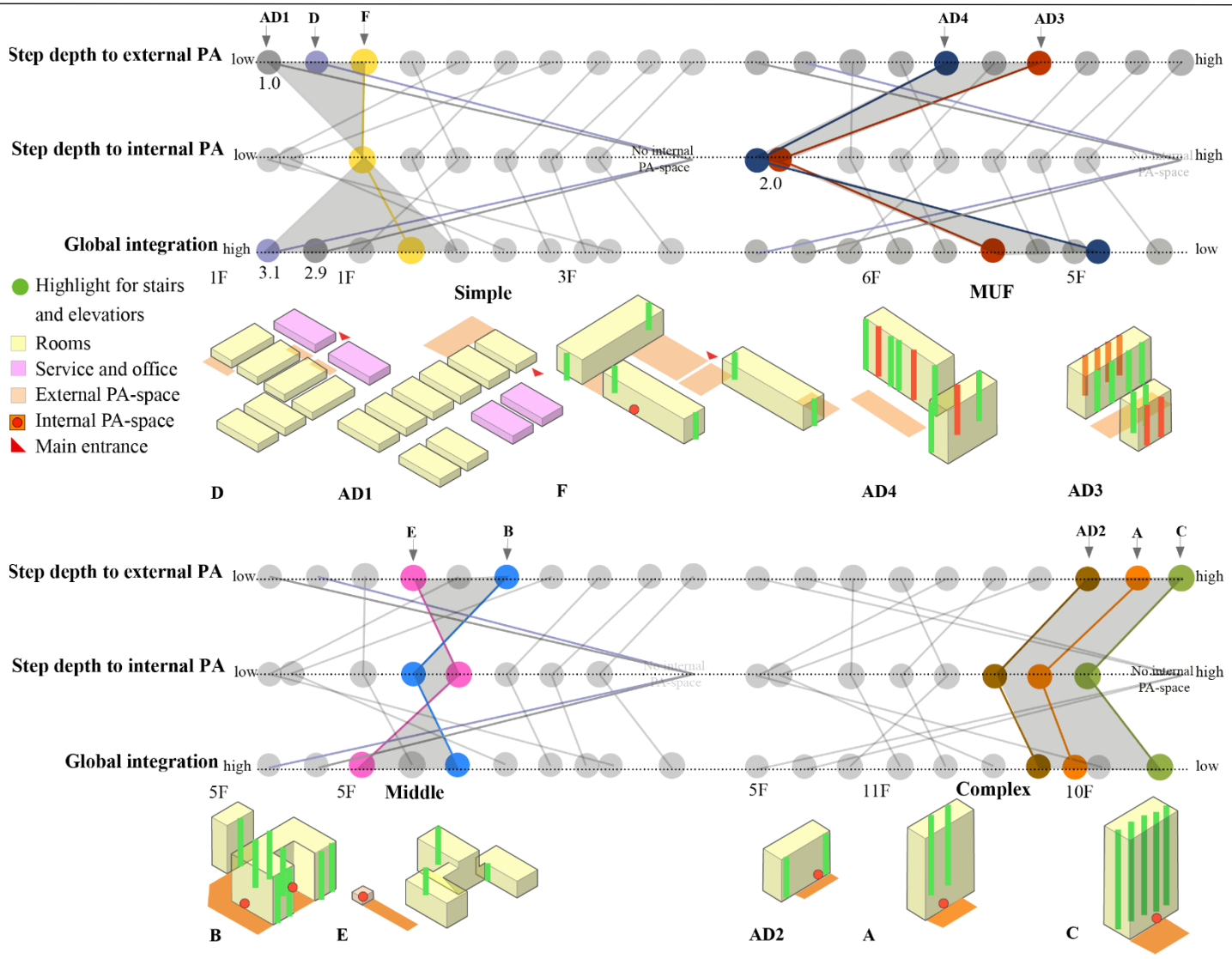


Figure 6.1.2 Summary of ten study sites' spatial characteristics for refugee children's PA: (a) simple layout; (b) MUF; (c) middle layout; (d) complex layout

6.2 Meso spatial characteristics and refugee children's PA

6.2.1 The presence of informal PA space

A neighbourhood image research among minority children showed that unstructured natural environments (grass) affected children's mobility (Maurer & Baxter, 1972). Coates & Bussard (1974) also mentioned that urban children seemed to seek out undeveloped, unplanned open space for playing. Berg and Medrich (1980) then identified the presence of "unmanaged" open space for children's playing. After growing up, they might still remember informal activity spaces as their playing experience (Henniger, 1994).

The playing resource for refugee children was rarely investigated, and the research agenda has not been established. It was identified in the review that there are two types of activity space relevant to refugee children's PA. This dissertation further investigated these space features quantitatively and qualitatively. Staff reports in Chapter 4 indicated that neighbourhood playing spaces for children were formal (parks) and informal (grassland); the quantitative analysis from GIS data also indicated the potentiality for informal PA spaces as a supplement for children's playing.

Further, in chapter 5, children and their parents expressed that since formal PA spaces might be formed differently from their countries of origin (e.g., size, PA equipment), they paid more attention to PA spaces accessibility for them/their children's playing purpose, either formal or informal. This theme could be raised from existing research like natural undeveloped spaces may be a more familiar playfield to refugee children as newcomers since the global similarity of nature (Dhillon et al., 2020). Alternatively, children will make the best of the limited nature access that they had, like describing the games that they played, noting details such as mouse tracks in the snow and a large tree overhanging the property and the placement of the neighbour's trash in their play space (Hordyk et al., 2015). Children indicated from workshops and photovoice that they identified informal spaces as their playing spaces and the importance of informal PA space for their daily PA. This dissertation has identified the importance of informal spaces for refugee children's PA from different aspects. Future studies should recognise these informal PA spaces and investigate their spatial features in detail.

6.2.2 Neighbourhood forms for active PA spaces

A comprehensive pattern could be found with a broad sample plus 12 additional study sites (Figure 6.2.2). For neighbourhoods with more active PA spaces, a consistent conclusion could be found that they are located in residential areas and with no highways/railways go across in 500m radius circle and more investigated road segments. Moreover, refugee neighbourhoods with fewer active PA spaces in meso environments generally stay in undefined areas, with highways/railways going across in 500m or 1km and fewer investigated road segments. More details are shown in Appendices Table 6.2.2 Descriptive statistics spatial variables for 18 study sites, ordered by active PA spaces from high to low. Moreover, given this research's content, the author could not find any research regarding space syntax's role in existing built environment evaluation for refugee children's PA. It seems to be a new window to begin such research.

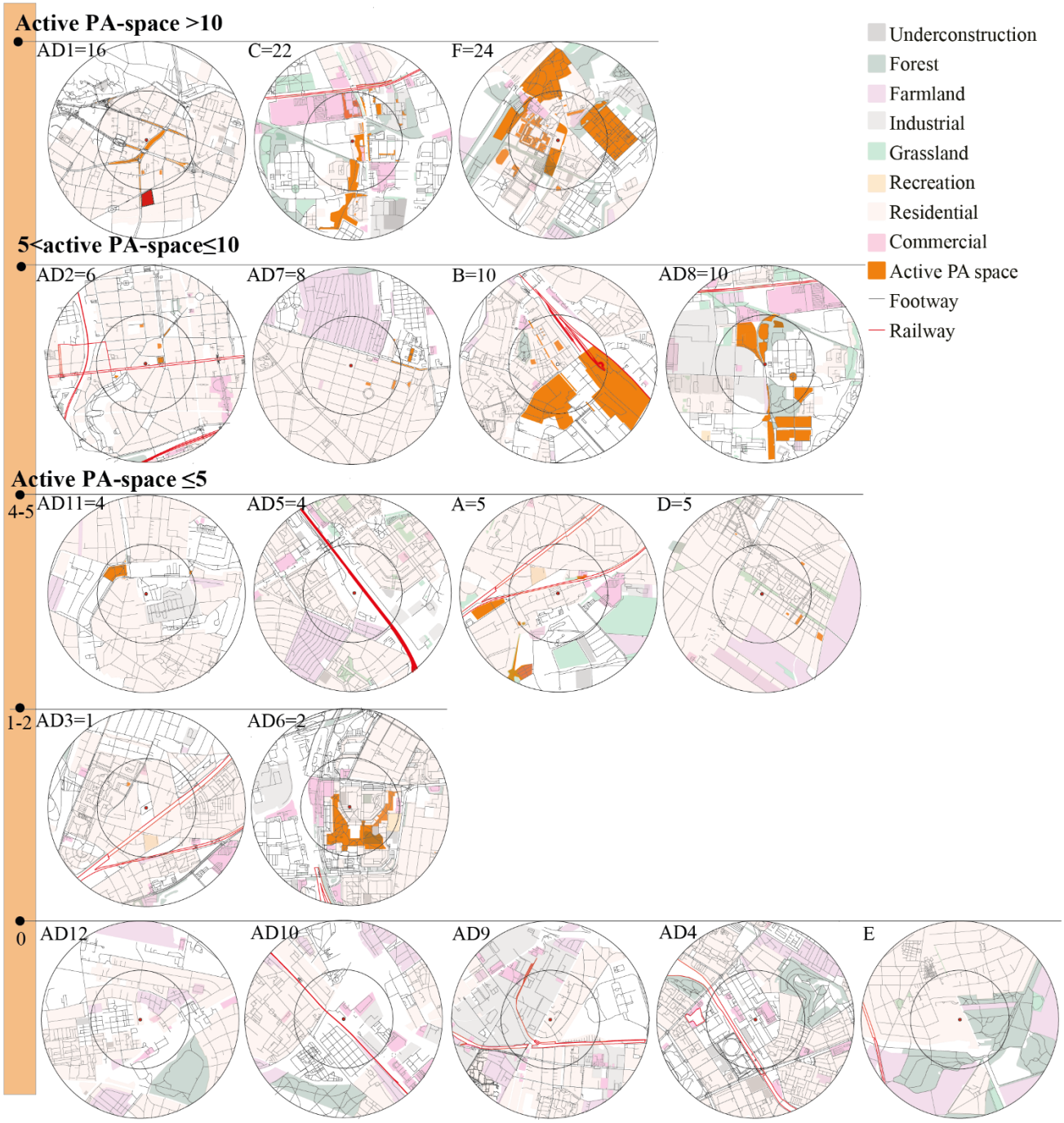


Figure 6.2.2 Results summary for the spatial characteristics and meso environments for refugee children's PA in 18 study sites

6.3 Perceived environmental barriers and facilitators related to refugee children's PA

6.3.1 Formal vs informal spaces for refugee children's PA

In line with Rasmussen (2004), this dissertation also indicated that formal PA spaces in micro environments such as recreational facilities are designated by professionals. The places are institutionalised to the extent that architects and planners intend them to be "special" places for children; however, these spaces may fail to satisfy refugee children's needs or be recognised by children as play spaces. Refugee children may have limited resources of official or specific facilities

for PA or not motivated to go to these spaces in meso environments for many reasons: they may live in disadvantaged neighbourhoods with limited PA-related facilities initially (Montgomery, 2002; Allport et al., 2019), the neighbourhood may be regarded as unsafely or unfriendly for children to get to these PA spaces (Anderson, 2001) or the facilities may already be 'occupied' by local children (Anderson, 2001). For those facilities with existing PA programs for children, the activity programs may not be affordable for refugee children and their families (Fanning et al., 2001; Hordyk et al., 2015; Arcan et al., 2018; Dhillon et al., 2020),

Some studies also exposed that it is difficult for children and their parents who live in short-term accommodations to make plans or take advantage of these formal PA spaces regarding they will not even have a stable living situation for the long-term but the immediate future (Dunkerley et al., 2006; Montgomery, 2002; Vitus, 2010).

Besides, refugee children and their parents may have different 'formal PA spaces' images based on their countries of origin. For example, gaps in an outdoor variety of playing equipment compared to countries of origin (Allport et al., 2019; Hordyk et al., 2015); or children did not articulate a desire for sports/play that they played in their home countries to be offered (Vengris, 2006). Most children talked about the comfortable, playful PA environment they had come from (Candappa & Egharevba, 2003). Moreover, these 'formal PA spaces' may present lower cultural sensitivity. For instance, Somali parents may ban girls from club PA programs because clothing revealing is impropriated (Arcan et al., 2018), or Muslim mothers do not like the idea of having their children exposed to nudity in change rooms or no gender-separated changing room for children (Vengris, 2006). One study mentioned the hidden logic behind this cultural sensitivity that the role these children had fulfilled and the skills they had developed were now incongruous with the expectations of children in the host culture (Davies & Webb, 2000).

For all of those barriers, informal spaces for PA become very important for refugee children as a hidden agenda, where 'sport as a free play happens in a no formal place'. The theme can already be raised or abstracted from much existing research and chapter 4 and 5: like refugee children like to create their own rules in the games, become leaders on the 'space' where no limitation as a specific formal space for PA (Wieland et al., 2015), they preferred to being active in 'informal gathering spaces' with friends rather than engaging in formal sport (Wieland et al., 2015). Refugee children have spontaneous sports outside schools and sports clubs, and there is no proper place for these sporting activities, for example, a pitch or playing field (Hertting & Karlefors, 2013). Similarly, children living in a densely populated refugee camp in Palestine made use of potential features of external space, e.g. balconies and swimming pools, to help them be physically active directly outdoors (MacMillan et al., 2015). Alternatively, a free-play adaptation was created entirely by refugee children, and the only equipment was an improvised ball and stones to mark the field (Guest, 2013). Unlike community-based PA, natural unformed spaces may be a more familiar playfield to refugee children as newcomers since the global similarity of nature (Dhillon et al., 2020). Children will make the best of the limited nature access that they had, like describing the games that they played, noting details such as mouse tracks in the snow and a large tree overhanging the property and the placement of the neighbour's trash in their play space (Hordyk et al., 2015).

Qualitative studies reviewed and results reported the importance of informal space for refugee children to engage in physical activity (Allport et al., 2019; Wieland et al., 2015; Williams et al., 2020). However, this may reflect the lack of opportunities for them to take part in sports and exercise. Given that it can be challenging to organise sports in refugee settings, it is vital that there is at least an informal space such as open spaces where children can be active with friends during leisure time. It is thus conceivable that diverse opportunities (both formal and informal spaces) are essential for refugee children's PA. Considering that participation in sports activities involves

physical activity and social interactions, providing refugee children with such opportunities will likely have multiple benefits (Guest, 2013). Future studies can assess the effect and feasibility of sports and other activity programs targeting refugee children and investigate their benefits.

Furthermore, the findings from this study can be used to explain some of the results of the research conducted by Hertting and Karlefors (2013). Refugee children enjoy sporting activities in informal places since activity could be agreed upon by rules from participants but not governed by formal regulations.

6.3.2 Neighbourhood perceived safety

The topic of neighbourhood perceived safety is recognised by existing literature, indicated by staff and parent reports and mentioned in children's workshops but was not aimed at and under-researched by this particular study. Still, an extended theme could be raised by the research: refugee children need to adapt to new, unfamiliar environments when they come to their host country. Since they may have escaped from war situations or have experienced military occupation (Veronese et al., 2020), they may be more cautious and sensitive about safety issues than non-refugees (MacMillan et al., 2015). Such concerns by their parents are particularly salient, as children can play typically dictated by their parents (Allport et al., 2019). A similar attitude toward playing was also found in our research from all six investigated refugee accommodations that children's playing must happen under adults' supervision. Two of six interviewed staff from children care departments indicated that meso environments are unsafe: it was located in an undefined urban area faced a big forest with no neighbours and (E), or their accommodation located in the centre of an almost abandoned park, with heave surrounding traffic (F). It was also mentioned in interviews several times by staff that children's neighbourhood scope were depended on their parents' mobility. Children's photovoice gave additional evidence that Nicola only took photos of the immediate neighbourhood without leaving their refugee accommodation since her parents were busy with their visa and had no time to take her outside. Future research needs to pay particular attention to how refugee children and parents perceive danger in meso environments. Moreover, if it is different from non-refugee children and parents.

6.3.3 Gender differences

Previous studies have shown that refugee girls and boys are likely to play differently (Almqvist & Hwang, 1999; Davies & Webb, 2000; Candappa & Egharevba, 2003b) and have different preferences for places where they would like to play (Vengris, 2006; Hertting & Karlefors, 2013; Guest, 2013). One study investigated gender differences in the review (King et al., 2015). It found that more girls participating in vigorous physical activity were observed after park renovation. In detail, two girls participants showed similar interests and used similar vocabulary to explain photos, while the boy showed the opposite. Moreover, the older girl participant needed to take care of a younger relative as an older girl's obligation, which might reduce her PA levels. There were studies examining refugee children by gender in the review chapter (Arcan et al., 2018; Guest, 2013; Hertting & Karlefors, 2013; King et al., 2015; MacMillan et al., 2015; Wieland et al., 2015), but they did not document whether there were between gender differences in environmental correlates of PA. Further studies need to investigate gender-specific associations between refugee children's PA and environmental attributes.

6.3.4 Refugee children vs non-refugee children

In earlier reviews, the author found that built environmental barriers and facilitators to physical activity for refugee children, i.e., access to physical activity facilities and neighbourhood safety,

were similar to those identified for non-refugee children's PA. However, the findings do not necessarily mean that refugee and non-refugee children have equal access to physical activity facilities. Chapter 5.2.1 documented the similar PA timelines of refugee and non-refugee children, but there were differences 'where' PA happened, while non-refugee children's PA happens in both micro- and meso-environments. However, refugee children's PA happens mostly in micro-environments Future research needs to compare refugee and non-refugee children in terms of how active they are, where they engage in PA, and how accessible activity spaces are. Such research would highlight the PA levels and disparities between refugee and non-refugee children. With regard to safety concerns, they are often about road safety or local crime for non-refugee children (Ding et al., 2011). Future research needs to pay particular attention to how refugee children and parents perceive danger in surrounding environments and to what extent it is different from non-refugee children and parents. This review did not find studies that examined the role of *macroenvironment* in refugee children's PA, although it was found to be related to non-refugee children's PA (Sandercock et al., 2010). Considering that the location of refugee accommodation is a matter for the discretion of local authorities, future research on this topic is needed to inform where best to build refugee facilities to enhance refugee children's activity, health and safety.

6.4 Strengths and limitations

In Chapter 1, although the author tried to apply for a systematic review, only peer-reviewed English-language articles inclusion may have excluded studies conducted in non-English speaking countries with relevant information. For example, much research on refugee children in Germany is reported in German (Berthold, 2014; Lewek & Naber, 2017). This review focused on the built environment of places where refugee children lived. However, there may be policies and regulations (e.g., organised PA program) (Arcan et al., 2018; Wieland et al., 2015) within refugee accommodations, which may be strong determinants of how active children can be. Future reviews may need to consider how policy and environmental factors may be related (independently and jointly). A narrative review was conducted, reflecting a few studies identified and an early research stage on this topic. It is expected that more fruitful literature reviews will be conducted in the future in light of an increasing interest in refugees' health and well-being in international contexts.

In study sites chapters, there were several limitations due to the explorative nature. Lack of PA measures is a major limitation. Moreover, only six primary study sites were applied, which is a small sample size to conduct any statistical analysis and investigate the relationships between variables. The associations found in refugee accommodations in Berlin may not be applicable to those in different cities/countries. The author was aware of this initiative and tried to access more quantitative data analysis through additional study sites.

Nevertheless, the sample sizes were still small, and there was a limitation for the volume of data collection since there was only one researcher. Also, it was a rather tricky task as the author got lower than 1/3 response for all interview requests. The abovementioned study sites were not random sampling, but accommodations were willing to collaborate and participate in this research. The author also pre-filtered accommodations while sending an interview request. This may raise the issue of whether these cases were truly representative. However, this study aimed to provide insights into the relationship between spatial characteristics, perceived environmental barriers/facilitators and refugee children's PA. Hence, what is generalisable from this study is more of analysis than the direct results.

Next, only small participants participated in the study on environmental perceptions (Chapter 5), stage 1, all living in the same accommodation. They shared the same schedules for planned PA programs and daily lives (e.g., meals), restricting diversity. There might have language barriers, and

the author is a non-Arabic/English/German native speaker. In this context, a limited command of a language may lead one to say what one's command allows rather than what one wants to say (Svensson et al., 2009). Even though parents got similar questions regarding built environments for children's PA to staff questionnaires, they had many problems understanding or expressing their feelings. However, this is also considered a significant finding which contributes to the overall understanding of refugee parents' perspective of a built environment for refugee children's PA.

In stage 2, in line with previous research (McBrien & Day, 2012; Svensson et al., 2009), photovoice was applied as a valuable tool for establishing and deepening PA life structures for refugee children. Along with Seggern and colleagues (2009), we review and deepen the photovoice served with more empirical materials in their daily physical activity structure. Moreover, our research revolved around children's photos: they chose the photos they wanted to discuss to learn more about their perceptions. There may be an argument raised from this children-pretend research design: on the one hand, the photos helped them express their PA's details at different environmental levels that the adult researcher may ignore. On the other hand, children may become more aware of their environments and daily PA. Instead of a PA recording object, the camera may work as a PA catalyst, which drives families to become move physically active compared to their daily standards. They may be motivated to take more vivid photos, which may influence research results. All of the children performed the task with significant commitment; they performed and represented the photographs as experts on children's living ways.

Moreover, the staff surveys of built environments for refugee children's PA presented may have low reliability since there was a lack of (1) a commonly accepted definition of PA environment quality for refugee children; or (2) methods as a questionnaire temple that can be used for its rapid quantitative/qualitative assessment; More precision analysis and accuracy results should be investigated in future studies.

Besides, it should be mentioned that it was challenging to convince accommodation staff, refugee children and their parents to participate in this research in general. Participants were less willing to collaborate and participate, and one of the issues was the language barrier. Even though the author used controlled designs or local language versions objects to communicate with participants, there was a precise language expression order as staff> refugee parents> refugee children. In general, this is a cross-sectional study. To confirm if environmental design influences PA, a longitudinal or experimental study should be developed in the future. One possibility is to track PA before and after transitions to refugee accommodation as a quasi-experimental study.

6.4.1 Issues for PA measures

The research had a subjective measurement for PA; It is evident that self-report measures contain errors and bias in capturing physical activity (Welk, 2002); the staff and parents' questionnaire in Chapter 3 and 5 presenting refugee children's PA timeline and built environments for refugee children's PA at overall levels. However, the 'opportunities of PA' was very limited; it only represented the overall time range refugee children spent on PA but could not be sub-divided to time spent on 'organised activity', 'free play under adults' supervision' and precise locations could not be tagged due to the limited research design of subjective measurement for PA. Objective measurement design is unsuitable and could not be achieved in the current social context due to legal, privacy, and refugee specific terms and the research country. The qualitative studies included in this dissertation used self-, parent-, and carer-reports measures of PA, but these were, by their nature, descriptive and subjective. It is essential that further studies employ objectively derived (e.g., accumulator) measures or validated self-report measures of relevant PA. Future studies should learn from existing studies targeting non-refugee children, as they have developed a range of methods to assess PA

(Freedson et al., 2005). Particular attention may be given to specific attributes of PA levels (sedentary, moderately, vigorously) in different refugee children's PA spaces (formal and informal).

Additionally, since there was limited access to refugee children and their parents from each accommodation[14], the author had to apply surveys with staff from specific children care departments instead. In this context, the author assumed that children care departments staff were experts of refugee children's daily lives whom they were supervising. However, most of the investigated refugee accommodation faced frequent staff turnover situations, and some of the staff surveys might be finished by several interviewees.

Moreover, besides identifying informal PA spaces, this work and most previous work on refugee children's play in informal spaces also provides few quantifiable details. What proportion of refugee children used informal PA spaces, and how often did they use them? While scholars have reported a wide variety of play activities and how non-refugee children value these informal PA spaces (Elsley, 2004; Franck & Stevens, 2006; Jorgensen & Keenan, 2012), it is unclear which the quantifiable details among refugee children.

6.4.2 Issues for environmental measures

One limitation is that the study did not examine the quality aspects of play areas. For example, the presence of play equipment, lighting, maintenance can be related to the use of spaces. The researcher defined spatial measures had the potential to work as a forward predictor of built environments for refugee children's PA; however, this is still an early stage problem and not enough material from research fields to justify or support parts of the researcher's views.

In-meso environments, there was a limitation of including only grassland as informal PA spaces in this dissertation. Other space features (e.g., open public space) could not be added due to existing provided map features by GIS. More spaces should be included and investigated with other methods (e.g., observation) in further research. In summary, the research field still lacks a commonly accepted definition of informal PA spaces and a method that can be used for its rapid quantitative assessment. Furthermore, the author investigated footway road segments but failed to include 'Qualitative' design measures related to walkability, for example, sidewalk width, ground floor usage and transparency of facades or trees. Even though this dissertation tries to give a concept, we still lack a commonly accepted definition of informal PA space. Rupprecht & Byrne had (2014) developed a measurement of informal green spaces with potential for global application; however, it was still different from informal spaces that could be applied for PA.

[14] More detail, Chapter 2,2,4

Chapter 7. Implications for Research and Practice

7.1 Future research directions

This study identified gaps in the literature and evidenced current spatial characteristics in micro and meso environments and perceived environmental barriers/facilitators associated with school-aged (6-13) refugee children' PA. Overall, this research field requires more quantitative studies to understand better environmental features conducive to refugee children's PA. Future research studies should consider in-depth data collection on a large environmental scale (e.g., macro), more quantitative studies with PA measures, larger sample sizes and environmental scale. Below are specific research topics that deserve detailed investigations (Figure 7.1):

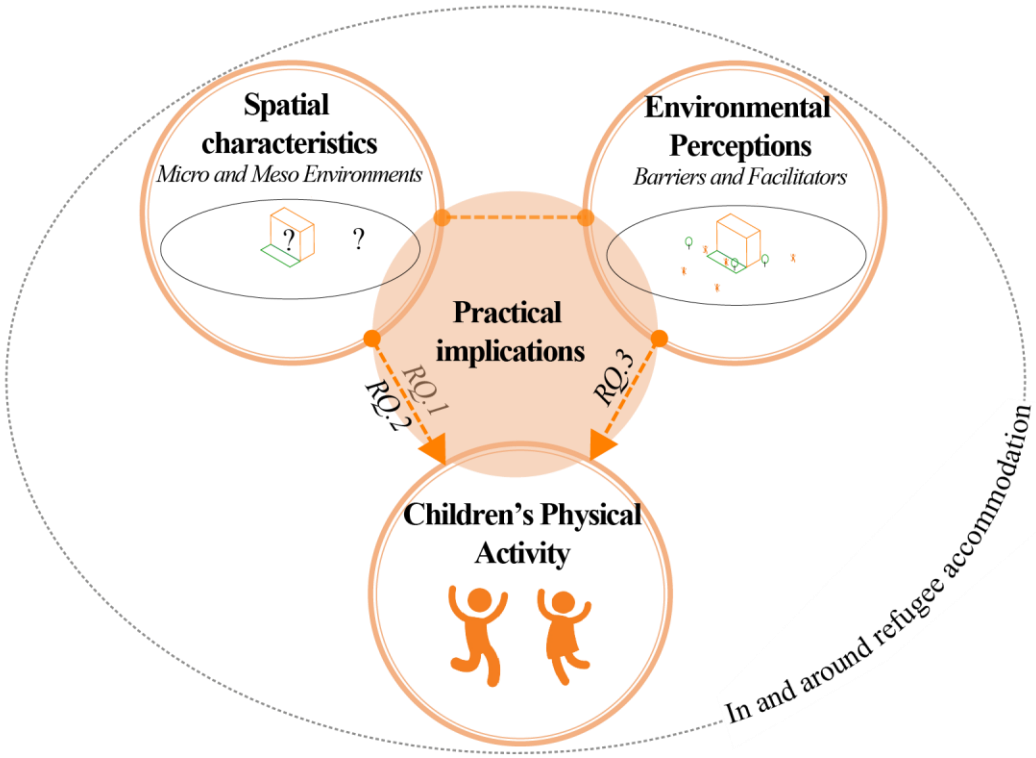


Figure 7.1 A diagram showing practical implications raised from three research questions concerning refugee children's PA discussed in the chapter

- Studies with refugee accommodations with similar spatial characteristics and sizes but different types to better understand the spatial typology and the relations of PA spaces sizes.
- Future studies should include objective measures of the built environment. Future studies should examine objective environmental measures, particularly PA spaces in meso environments (distance, size, and features) and safety (crime statistics); future studies should better understand environmental attributes contributing to lack of safety.

- More spatial measures (e.g., PA space size; equipment types) should be investigated and evaluated. A measurement (e.g., mathematical calculation) should be established with more empirical material and available research in micro environments.
- The qualitative comparison develops from this dissertation has the potentiality to develop to a new research topic as analyse options during the design processes/location choices of new refugee accommodations and recommend alternatives that promise higher collaboration and thus optimise for outcomes;
- The qualitative comparison summarised in this dissertation could also be further tested and refined with more detailed post-occupancy research, including interviews with staff and refugee parents, workshops with refugee children, and practical evaluation of refugee children's PA;
- Besides micro and meso environments, further studies should understand the role of macro environments in refugee children's PA (e.g., transportation system connectivity is relevant to non-refugee children's PA);
- Investigate whether there is a mismatch between perceived and objective measures of the built environment and understand if they are independently or jointly associated with refugee children's PA;
- Compare environmental correlates of non-refugee and refugee children's PA in a single study to understand whether the previous findings on non-refugee children can apply to refugee children;
- Conduct longitudinal studies that track refugee children's PA lives when they relocate from a temporary refugee facility to long term accommodations;
- This dissertation has indicated the similarity of refugee girls' PA patterns into individual with qualitative studies; further studies should investigate environmental correlates of refugee boys' and girls' PA separately to produce gender-specific design recommendations;
- Future research should relate spatial layouts typology (e.g., simple, middle and complex) to investigate if these spatial characteristics could influence refugee children's daily PA in detail or into individual (e.g., visibility).

7.2 Recommendations for refugee accommodations operators

The operators of refugee accommodations should be a stable force between the objective and local authorities, contributing to the gap of existing refugee accommodations spatial limitations and

potentialities in reality. The interviewed home managers and staff in this dissertation expressed their specific concerns and worries about refugee children's daily PA; more professional advice summarised from research and empirical materials should be passed to refugee accommodations operators to support their daily work for improving refugee children's daily PA:

- Refugee accommodations should provide more internal PA space (e.g., playroom) and external PA space (e.g., playground) to support refugee children's daily PA. For those refugee accommodations with limited resources for organised activity, free playing under supervision should be considered a regular daily schedule for refugee children;
- Since refugee children and their parents have specific perceptions about neighbourhood safety, refugee accommodations operators could take their role in leading refugee children to explore active and safe PA spaces in their neighbourhoods. PA programs such as neighbourhood tours or co-playing in the neighbourhoods could be developed on this basis;
- Refugee accommodations could provide more 'easy to reach' internal and external PA spaces; refugee accommodations operators can indicate from the beginning the importance of accessible playgrounds with existing buildings or building accessible playgrounds with newly-built refugee accommodations;
- Refugee accommodations should have an active network with neighbourhood formal PA spaces operators; for those refugee accommodations with limited external PA spaces, supplementary PA programs run by immediate neighbourhoods' PA spaces in meso environments should be provided to refugee children.

7.3 Recommendations for architects and urban planners

This dissertation has emerged many messages about what related predictors should do to help refugee children be physically active. Urban planners and architects have a natural role in serving as caring, objective professionals who connect to both the participants and refugee children themselves since these professionals play vital roles in promoting built environments for refugee children's PA. It is essential that architects and urban planners promote design strategies that support refugee children's daily lives PA.

In micro environments:

- Urban planners and architects should suggest that refugee accommodations be admitted to existing buildings with easy access to PA spaces, which means clear, open and accessible corridors with fewer floors. High-rise buildings have been identified in this dissertation as a barrier to refugee children's active playing, thus should be carefully considered in refugee accommodation choice.

- It is suggested that open and straightforward spatial characteristics could contribute to built environments for refugee children's PA, such as MUF. Furthermore, the highlighted spatial characteristics associated with refugee children's PA could be considered as necessary indexes during a new refugee accommodation's design process;
- Internal PA space is vital for refugee children's PA. In most investigated cases, internal PA spaces as regular living units, providing limited opportunities for refugee children's PA. The utility of internal PA spaces should be considered in detail and meet the flexibility and multi-options of refugee children's PA (e.g., gender-specific playroom). It is particularly pertinent with new community planning models being developed in Germany as MUF, which attempts to provide internal PA space on each floor of the refugee accommodation; the findings of this dissertation supported the necessity of doing so.

In meso environments:

- Urban planners and architects as professionals in neighbourhood contexts can be available as surrounding boards to help participants evaluate refugee children's specific needs to promote active playing; more active advocates in meso environments should be provided from this part.
- Urban planners and architects can advocate for including active built environment for refugee children's PA at the beginning of location choices; suitable locations should be in residential areas with no railways or highway go across; moreover, consider building refugee accommodation right next to a park of sports ground so that refugee children can take advantage of the vicinity.
- Urban planners and architects should consider "immediate physical safe spaces for playing" in refugee accommodation neighbourhoods as their potential task and how refugee children and their parents are concerned with neighbourhood safety.

7.4 Recommendations for refugee policies

- local agencies, particularly those with a coordinating role in area regeneration, need to incorporate methods for securing refugee children's participation in their everyday practice. It should include the spectrum of participatory activities from seeking and providing information to full engagement in the more formal structures of the organisations, using methods that promote inclusion. National agencies with a remit for regeneration should include monitoring children's participation as part of their evaluation of the efficacy of community participation and providing guidance and information on successful models of

involving children and young people. This is particularly pertinent to new community planning models being developed in Germany, such as MUF 2.0 and Tempohomes.

- ‘Active built environments for refugee children’s PA’ should be considered a primary measure for the related decisions of refugee accommodations, such as choosing the locations of refugee accommodations. PA environments evaluation should be considered a primary measure when reconstructing the buildings with those refugee accommodations set in existing buildings. For those newly-built refugee accommodations, an active built environment for refugee children’s PA in a micro environment should be considered a benchmark in the design process of the buildings.
- Create and maintain playground, park, and green spaces within communities and the means to access them safely. Prioritise resources to refugee accommodations neighbourhoods to ensure that all children have access to safe and desirable opportunities for play and active lifestyles. Funding should also be prioritised to support specific evidence-based goals, such as developing specific PA programs for refugee children in neighbourhood formal PA spaces.
- It should be included considering refugee children’s changing spatial needs in their ‘transit period,’ responding to the diversity of their circumstances and taking on board their ideas for improving their local areas. Moreover, policymakers should ensure that public policy is influenced by the views and experiences of refugee children and their parents so that resources and initiatives meet the real, and not simply the perceived, needs of refugee children. Ultimately the participation of refugee children should be regarded as a prerequisite by policymakers for ensuring high-quality policy decisions and delivery.
- Eyes should be opened to the developments and optimisations of neighbourhoods’ informal PA spaces. Local agencies should identify potential open spaces, public spaces and grassland in the neighbourhoods of refugee accommodations and transform them into places that work better for refugee children’s active playing.

Chapter 8. Conclusion

8.1 Synthesis of key points

This study investigated the relationship between spatial characteristics (micro and meso) and perceived environmental barriers/facilitators of refugee children's PA. Six refugee accommodations and their neighbourhoods in Berlin, including three initial receptions (EAE), one Tempohomes and two community accommodations (GAE), were selected as primary study sites in micro and meso environments. Moreover, four additional cases in micro environments and 12 additional cases in meso environments were also investigated as supplementary material.

Despite the differences between refugee accommodation types and sizes, some similarities in the spatial properties and refugee children's PA were found across all study sites. The corridor and floor numbers of the refugee accommodations played an essential role in linking living units to PA spaces, which functioned as a transitional space and a station to bring refugee children to the external and internal PA spaces in micro environments. The results also highlighted four spatial layouts with similar spatial measure patterns that could influence refugee children's PA. In meso environments, sites located in residential areas with no highways or railways went across, and more investigated road segments trended to provide more active PA space formally and informally. Moreover, the importance of informal PA spaces and how refugee children recognise them as play areas. There were still ongoing topics about the importance of neighbourhood safety, formal and informal PA spaces (meso), and PA space sizes (micro). Finally, it was found that internal and external PA space size was not related to refugee children's PA by current study sites.

Different refugee accommodation typologies based on diagrammatic corridor shapes were not aimed at this study because few examples represent different typologies. As argued earlier, such an oversimplification of layouts does not capture fundamental differences between the same typologies. However, of interest was defining floorplan and building spatial characteristics typologies more nuancedly using syntactic patterns as a basis. As shown in Chapter 3, same corridor typologies had similarities in spatial measure values and ways to reach PA spaces. This finding could also be supported with additional study sites. However, by investigating only ten study sites in micro environments, the relationship between other spatial-related factors of refugee children PA could not be evident. For example, results highlighted that space and equipment variety of external PA spaces might influence children's PA, which could not be summarised and analysed with current research methods; furthermore, it needed further investigation. These findings could assist the existing building choices and the design of refugee accommodations concerning refugee children's active playing.

In meso environments, this dissertation outlined a structured approach to evaluate PA environments for refugee children in seating refugee accommodations in urban contexts. It was demonstrated the accessibility of PA spaces, formal and informal. Abovementioned highlighted that accessibility played a significant role in built environments for refugee children's PA.

With identified four combined spatial measures, it was shown in Chapters 6.4 that more integrated, accessible PA spaces layouts resulted in more time refugee children spent on PA; moreover, getting higher rates from staff surveys. Different syntactic measures might be more appropriate to identify those differences and redefine typologies that could be investigated in future work. It was still unclear if more spatial characteristics of refugee accommodations influence refugee children's PA.

8.2 Contribution

This dissertation aimed to bridge the gap between three interrelated topics: spatial characteristics in micro and meso environments, perceived environmental barriers/facilitators and refugee children's PA. This empirical material and analysis produced by this process generated insights into refugee children's daily PA lives. Moreover, it accurately described and depicted the role of spatial characteristics in shaping their daily PA because it decides accessibilities to PA spaces. The results also revealed that in meso environments, the importance of informal PA spaces for refugee children's PA. They could be functional as children's playfields if formal PA spaces were insufficient. Finally, this dissertation discussed what contributed to built environments for refugee children's PA by integrating quantitative and qualitative analysis. The analysis can benchmark design strategies for spatial characteristics in micro environments in planning, evaluate PA environments of existing buildings potentialities as refugee accommodations, and work for location choices in meso environments.

This analysis speaks the language of related practitioners and allows them to assess likelihoods of evaluating PA environments with a floor plan or scale map inputs. This analysis will make it possible to lead informed discussion among related practitioners about the impact of their design solutions and hopefully give evidence-based designs a new direction.

Linking these topics to refugee children's PA was crucial because it highlighted the spatial properties of built environments for refugee children's PA and indicated spatial characteristics could also have a direct or indirect effect. Policymakers have multi-location choices or building types for refugee accommodations constructions/settings; architects showed their favour of specific refugee accommodations typologies based on multi-reasons; however, their effect on built environments for refugee children's PA was under-researched before. This dissertation clarifies the relationship that could be used to assess evaluation schemes better. For example, designers now have evidence for designing refugee accommodations' built environments concerning children's PA. Finally, with a better understanding of how the themes link together, researchers now have more empirical material and detailed directions to further investigate the logic behind the relationship between refugee accommodation spatial properties and built environments for refugee children's PA.

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Publication

This thesis contains material published from the following peer-reviewed list. According to the thesis chapter, the material is used directly; it is cited, adapted, and integrated.

Chen, S., Carver, A., Sugiyama, T., & Knöll, M. (2021). Built-environment attributes associated with refugee children's physical activity: A narrative review and research agenda. Conflict and Health, 15(1), 55. https://doi.org/10.1186/s13031-021-00393-2

Appendices

Tables and Figures

Table 1.2.4 Overview of investigated refugee accommodations and their neighbourhoods

Refugee accommodation	Former use	Accommodation type	Existing period	Investigated levels		
				Micro-environments	Meso-environments	Staff-surveys
Accommodation A	Hotel	EAE	12.2015-current*	o	o	o
Accommodation B	Sanitary facility	EAE	09.2014-08.2019	o	o	o
Accommodation C	Residential block	EAE	02.2012-current*	o	o	o
Accommodation D	Temporary containers	Tempohomes	12.2016-07.2019	o	o	o
Accommodation E	Retirement home	GAE	07.2015-10.2020	o	o	o
Accommodation F	Temporary containers	GAE	04.2015-09.2020	o	o	o
Accommodation AD1	Temporary containers	Tempohomes	08.2017-current*^	o	o	x
Accommodation AD2	Official building	EAE	10.2015-current*	o	o	x
Accommodation AD3	Newly built, MUF	GAE	08.2018-current*	o	o	x
Accommodation AD4	Newly built, MUF 2.0	GAE	10.2020- current*	o	o	x
Accommodation AD5	Hotel	EAE	07.2015-current*	x	o	x
Accommodation AD6	Hotel	EAE	12.2013-08.2018	x	o	x
Accommodation AD7	Hospital	EAE	03.2015-current*	x	o	x
Accommodation AD8	Detached flat block	NUK	10.2015-01.2018	x	o	x
Accommodation	Health facility	BAE	04.2013-2019	x	o	x

AD9						
Accommodation AD10	Residential block	EAE	02.2012-2016	x	o	x
Accommodation AD11	Store hall	EAE	10.2012-03.2018	x	o	x
Accommodation AD12	Student apartment/MUF	GAE	09.2010-10.2016/Currently nderconstruction	x	o	x

*By 10.2021; EAE, erstaufnahmeeinrichtung = initial reception; GAE, gemeinschaftsunterkunft = community accommodation; BAE, besonderes aufnahmeeinrichtung = special accommodation; MUF, Modulare Unterkünfte = Modular accommodations; NUK, Notunterkunft = emergency accommodation; ^, planned as communal accommodation (GU), initially still used as a NUK.

AT 1.4.1 Search strategies and coding

Database	Search coding	Advanced Filters	Search field
PubMed	((refugee[Text Word]) OR (asylum seek*[Text Word])) AND ((child*[Text Word]) OR (school age*[Text Word]) OR (minor*[Text Word])) AND ((physical activit*[Text Word]) OR (exercise*[Text Word]) OR (play[Text Word]) OR (sport*[Text Word]) OR (leisure[Text Word]) OR (recreation*[Text Word])) AND ((environment[Text Word]) OR (neighborhood*[Text Word]) OR (neighbourhood*[Text Word]) OR (open space[Text Word]) OR (open spaces[Text Word]) OR (green space[Text Word]) OR (green spaces[Text Word]) OR (park[Text Word]) OR (parks[Text Word]) OR (playland[Text Word]) OR (playlands[Text Word]) OR (playground[Text Word]) OR (playgrounds[Text Word]) OR (sport field[Text Word]) OR (play fields[Text Word]) OR (sport ground[Text Word]) OR (sport grounds[Text Word]) OR (facility[Text Word]) OR (facilities[Text Word]) OR (gym[Text Word]) OR (gyms[Text Word]))	1996-2020, Humans, English	full text
Web of Science	((AB = "physical* activit*") OR (AB="vigorous* activit*") OR (AB= exercise) OR (AB="active transport*") OR (AB=play) OR (AB=walking) OR (AB=sport*) OR (AB=fitness) OR (AB="energy expenditure") OR (AB=leisure) OR (AB=outdoor) OR (AB=recreation*)) AND ((AB=refugee*) OR (AB=asylum seek*)) AND ((AB=child*) OR (AB=minor*) OR (AB=school age*)) AND ((AB=environment*) OR (AB=neighbo$rhood) OR (AB=open space*) OR (AB="green space") OR (AB="green spaces") OR (AB=park*) OR (AB=parkland) OR (AB=playground*) OR (AB=playtime) OR (AB=sport* field) OR (AB=sport* ground) OR (AB=facilit*) OR (AB=gym*))	1996-2020, English, peer-reviewed	abstract
SPORT Discus	TX/AB (refugee OR asylum seek*) AND TX (child* OR minor OR school age*) AND TX (physical activit* OR exercise OR play OR sport OR leisure OR recreation*) AND TX (environment OR neighborhood OR neighbourhood OR open space OR park OR playland OR playground OR sport field OR play field OR sport ground OR facilit OR gym)	1996-2020, English, peer-reviewed Search modes - Boolean/Phrase	abstract and full text
ERIC	(ab(refugee*) OR ti(refugee*) OR ab(asylum seek*) OR ti(asylum seek*)) AND (ab(child*) OR ti(child*) OR ab(minor*) OR ti(minor*) OR ab(school age*) OR ti(school age*)) AND (ab(physical activit*) OR ti(physical activit*) OR ab(exercise) OR ti(exercise) OR ab(play) OR ti(play) OR ab(sport*) OR ti(sport*) OR ab(leisure) OR ti(leisure) OR ab(recreation*) OR ti(recreation*)) AND (ab(environment*) OR ti(environment*) OR ab(neighborhood*) OR ti(neighborhood*) OR ab(neighbourhood*) OR ti(neighbourhood*) OR ab(open space*) OR ti(open space*) OR ab(park*) OR ti(park*) OR ab(playland*) OR ti(playland*) OR ab(playground*) OR ti(playground*) OR ab(sport* field*) OR ti(sport* field*) OR ab(play field*) OR ti(play field*) OR ab(sport ground*) OR ti(sport ground*) OR ab(facilit*) OR ti(facilit*) OR ab(gym*) OR ti(gym*)) AND (pubyear:1996-2020) AND (LA(English))	Peer-reviewed	title and abstract

ScienceDirect	FT(refugee OR asylum seek) AND (child OR minor OR school age) AND TX (physical activit OR exercise OR play OR sport OR leisure OR recreation) AND (environment OR neighborhood OR neighbourhood OR open space/ OR park OR playland OR playground/ OR sport field OR play field OR sport ground/ OR facilit OR gym)	1996-2020, peer reviewed	title and abstract and full text
SpringerLink	(refugee OR asylum seek*) AND (child* OR minor OR school age*) AND (physical activit OR vigorous activit OR exercise OR active transport OR play OR walking OR sport OR fitness OR energy expenditure OR leisure OR outdoor OR recreation) AND (environment OR neighborhood OR neighbourhood OR open space OR park OR playland OR playground OR playtime OR sport field OR play field OR sport ground OR facilit OR gym)	1996-2020, English	full-text
Journal of Refugee studies	FT (child* OR minor OR school age*) AND (physical activit OR exercise OR play OR sport OR leisure OR recreation) AND (environment OR neighborhood OR neighbourhood OR open space OR park OR playland OR playground OR sport field OR play field OR sport ground OR facilit OR gym)	1996-2020	full text and any field

AT 1.5.11 Overview of quantitative study

No.	Authors and locations	Environment-levels	Countries of origin	Sample	PA Intervention/ Exposure variable	Study design and PA measurement	Data analysis methods and PA levels	Findings associated with PA
1	**King et al., 2015, USA**	meso (neighbourhood)	Ethnic minority	(2010, N= 1530, 2012, N=1946), under 12 years	Undeveloped green space transformed into a recreational park	Prospective non-randomised design using System of Observing Play and Recreation in Communities (SOPARC). Activity levels were categorised as sedentary (lying down, sitting or standing), moderate (casual walking) and vigorous (expending more energy than casual walking). PA codes were converted to energy expenditure (kcal/kg/min). Total energy expenditure (EE) scores in different park areas were calculated by multiplying totals observed in sedentary, moderate, or vigorous activity by 0.051	T-tests or tests of medians (when appropriate) were used to compare pre- and post-construction changes in use of non-park and park zones for PA by age-group and gender.	• More female children engaged in vigorous activity • A increase in total energy expended inside the park boundaries among boys and girls • A decline in total energy expended on adjacent streets, alleys and surrounding parking lots

						kcal/kg/min; 0.096 kcal/kg/min; or 0.144 kcal/kg/min, respectively.		

AT 1.5.12 Overview of qualitative studies

No.	Authors and locations	Environment-levels	Countries of origin	Sample	Objectives of study	Study design/PA report methods	Data analysis methods and PA types	Findings - factors influencing PA
2	**Allport et al., 2019, UK**	micro (home), meso (neighbourhood)	Somali	(N= 6), mothers (the mothers were 6-8 years when they left their countries of origin)	To explore the geography of childhood from the perspective of Somali mothers who have resettled in Bristol.	Semi-structured interviews	Interpretative phenomenological approach, **play related to space**	A decline in **accessible outdoor public space** and **fears about traffic** in UK compared with Somalia may reduce opportunities for free play. Mothers felt that their children's play was constrained by **living in tower blocks (social housing) with few communal facilities**.
3	**Arcan et al., 2018, USA**	micro (home), meso (neighbourhood)	Somali, Latino, Hmong	(N= 67) parents of children aged 3-12 years	To identify perceptions of childhood bodyweight and approaches to raising healthy children	10 focus groups	Thematic analysis with CBPR principles, **PA**	Parents thought interventions (**e.g., safe places to be active**) could help them with children's Physical inactivity
4	**Guest, 2013, USA**	meso (neighbourhood)	No specific, multi-ethnic	(N= 380, Concrete Park:141, M 8.96 years, SD 1.86, Pena: 239, M 9.61 years, SD 1.75s), 6-12 years. Only the children in Pena were refugees.	To investigate the meanings of informal sport and play to childhood	Direct observations, interviews and ethnographic anecdotes	ethnographic methodology, **informal sports and play**	The important of **informal space** for refugee children's PA
5	**Hertting & Karlefors, 2013,**	meso (neighbourhood)	No specific, multi-	(N= 20) 10-13 years	To explore images and experiences that refugee children	Drawings and oral comments	phenomenology, **sport experience**	• Taking advantage of **informal space** could promote refugee

	Sweden		ethnic		have about sport in their country of origin, and challenges that can arise in processes of integration through sport			children's PA. • **Formal sports facilities** in their former home countries were associated with more serious organised sports and more pressure to perform well.
6	**MacMillan et al., 2015, Australia**	meso (neighbourhood)	Iran, Indonesia, Pakistan, Malaysia, Kenya, Uganda	(N= 19, M 8.5 years SD 6.4 months) 8-10 years old	To explore how refugee children engaged in play pre-migration and post-migration to Australia.	Drawings and interviews	Drawings were coded and analysed using cross-tabulation to compare pre- and post-migration **play**	• Through their drawings, significantly fewer children reported playing pre- versus post-migration (58% vs 95%, $P < 0.03$). • Girls had more significant relative changes in play with migration (pre: 25% vs post: 87%). **Almost all play was outdoors** (pre: 91%; post: 94.4%). • Perceived **lack of safety** was reported as a barrier to pre-migration play.
7	**Veronese et al., 2020, Palestine**	micro (refugee camp), meso (school, neighbourhood)	Palestine	(N= 29) 7-13 years (3 children of 7 years old, 3 of 8 years old, 7 of 9 years old, 9 of 10 years old, 3 of 11 years old, 2 of 12 years old, 2 of 13 years old).	To explore the sources of spatial agency that children draw on to counteract the harmful consequences of ongoing exposure to trauma	Drawings and walk-along interviews	place-based method, **play**	• internal spaces as a **safe place f**or growing and developing **•community spaces are places where children have fun and play an active role, inhabiting the camp's outdoor spaces** despite environmental dangers and the occupation.
8	**Wieland et al., 2015, USA**	micro (home), meso (neighbourhood)	Cambodia, Mexico, Somali, Sudan	(N= 127) adults and children 11-18 years old	To explore the reason that immigrants and refugees to the	16 gender and age-stratified focus groups	Thematic analysis, **PA**	**Lack of familiarity with and comfort in the environment** that hinder the taking the first steps

		(unclear how many of each)	United States exhibit relatively low levels of physical activity	towards being physically active were the most significant barriers to PA. There is little reference to the built environment except for lack of transport to exercise facilities and lack of spaces for groups to gather for affordable PA opportunities.

AT 2.3.1 Map feature and coding for spatial characteristics

category	feature type	coding
footway	highway	footway; give_way; living_street; passing_place; path; pedestrian; raceway; residential; rest_area; road
	route	service; services; steps; tertiary; tertiary_link; track; unclassfied; running
railway; highway	highway	primary; primary_link
	landuse	railway
farmland	landuse	allotments; farmland; farmyard
Underconstruction	landuse	construction
forest	landuse	forest; orchard
industrial	landuse	industrial
recreation	landuse	recreation_ground
commercial	landuse	retail
residential	landuse	residential

AT 2.3.3 Map feature and coding for formal and informal PA-space

PA-space	category	feature type	coding
Formal PA-space	**Sport facility**	leisure	sports_centre; fitness_station

	Park	leisure	park; water_park; dog_park; garden; beach_resort
		amenity	biergarten
	Playground	sport	american_football; astralian_football; baseball; basketball;
		leisure	playground
informal PA-space	**grassland**	nature	grassland; wood
		landuse	grass; greenfield; meadow; village_green

AT.2.4.1 Refugee parent participants (RP)

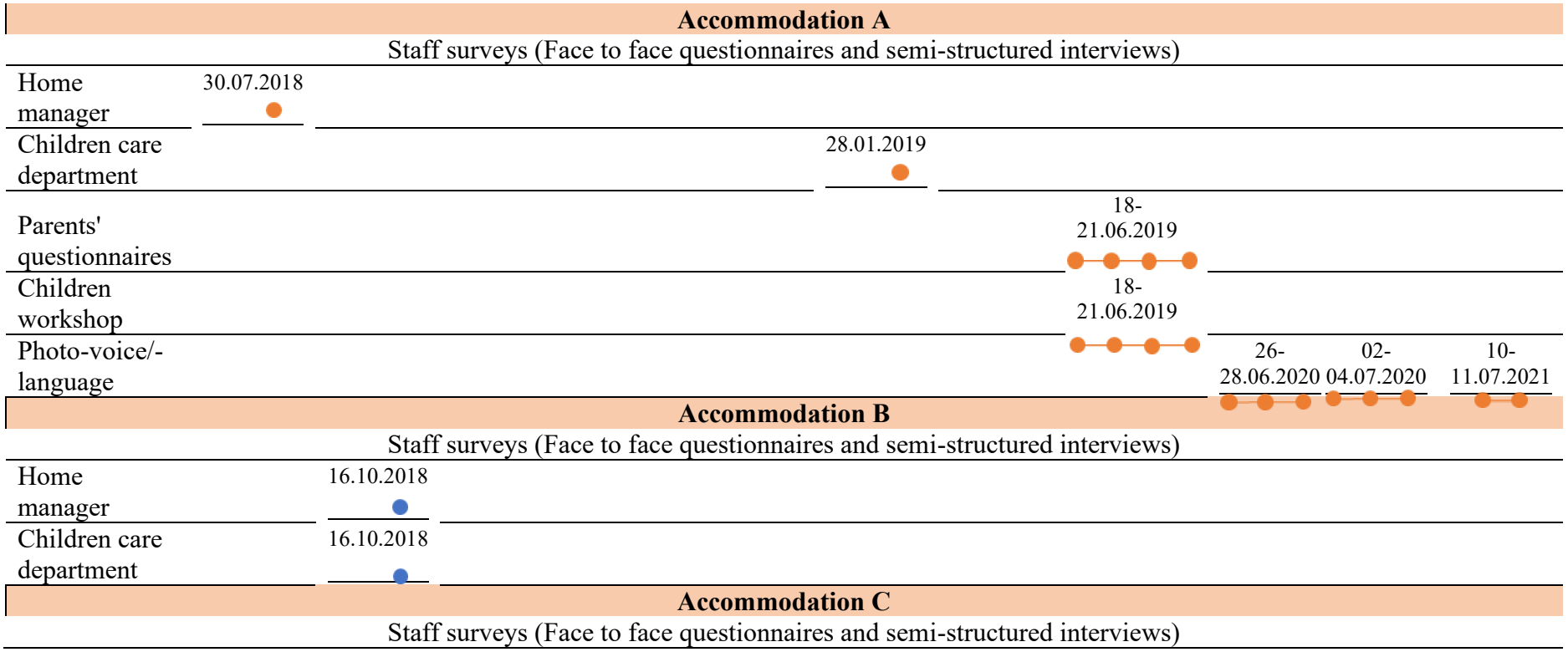
Reference number	Countries of origin	Questionnaire language	Gender	Children's number	Interview date
RP1	Moldova	Russian	F	1	18/06/2019
RP2	Iran	Persian/German	F	2	18/06/2019
RP3	Moldova	Russian	M	2	19/06/2019
RP4	Iran	Arabic	F	2	19/06/2019
RP5	Iraq	Arabic	M	1	19/06/2019
RP6	Iran	Persian	F	1	19/06/2019
RP7	Moldova	Russian	F	1	20/06/2019
RP8	Azerbaijan	Azerbaijani	F	2	20/06/2019
RP9	Moldova	Russian	F	1	21/06/2019
RP10	Iraq	Arabic	M	2	21/06/2019

AT 2.4.3 Refugee children participants (RC)

Number	Countries of origin	Age	Gender	Interview date	Parent (AT.2.4.1)
RC1	Moldova	6	M	18/06/2019	RP1
RC2	Iran	10	F	18/06/2019	RP2
RC3	Iran	8	F	18/06/2019	RP2
RC4	Moldova	6	F	19/06/2019	RP3
RC5	Moldova	6	F	19/06/2019	RP3
RC6	Iran	6	F	19/06/2019	RP4
RC7	Iran	9	M	19/06/2019	RP4

RC8	Iraq	6	M	19/06/2019	RP5
RC9	Iran	11	M	19/06/2019	RP6
RC10	Moldova	6	F	20/06/2019	RP7
RC11	Azerbaijan	11	M	20/06/2019	RP8
RC12	Azerbaijan	13	F	20/06/2019	RP8
RC13	Moldova	7	M	21/06/2019	RP9
RC14	Iraq	7	F	21/06/2019	RP10
RC15	Iraq	9	M	21/06/2019	RP10

AT 2.5 Detailed timeline of data collection dates



Home manager	23.10.2018
Children care department	23.10.2018
Accommodation D	
Staff surveys (Face to face questionnaires and semi-structured interviews)	
Home manager	14.02.2019
Children care department	14.02.2019
Accommodation E	
Staff surveys (Face to face questionnaires and semi-structured interviews)	
Home manager	30.11.2018
Children care department	30.11.2018
Accommodation F	
Staff surveys (Face to face questionnaires and semi-structured interviews)	
Home manager	23.01.2019
Children care department	22.12.2018

AT 3.3.3 A comparison of spatial measure including average connectivity, average integration and average step depth for accommodations

Refugee accommodation	Average connectivity	Average Step depth		Average integration
		Step depth to external PA-space	Step depth to internal PA-space	
Accommodation A	2.3	8.6	10.1	0.8
Accommodation B	2.7	5.5	4.8	0.9
Accommodation C	2.2	10.4		0.7
Accommodation D	4.5	1.1	no internal PA-space	3.1

Accommodation E	2.0	5.3		1.4
Accommodation F	2.1	5.1	3.5	1.1

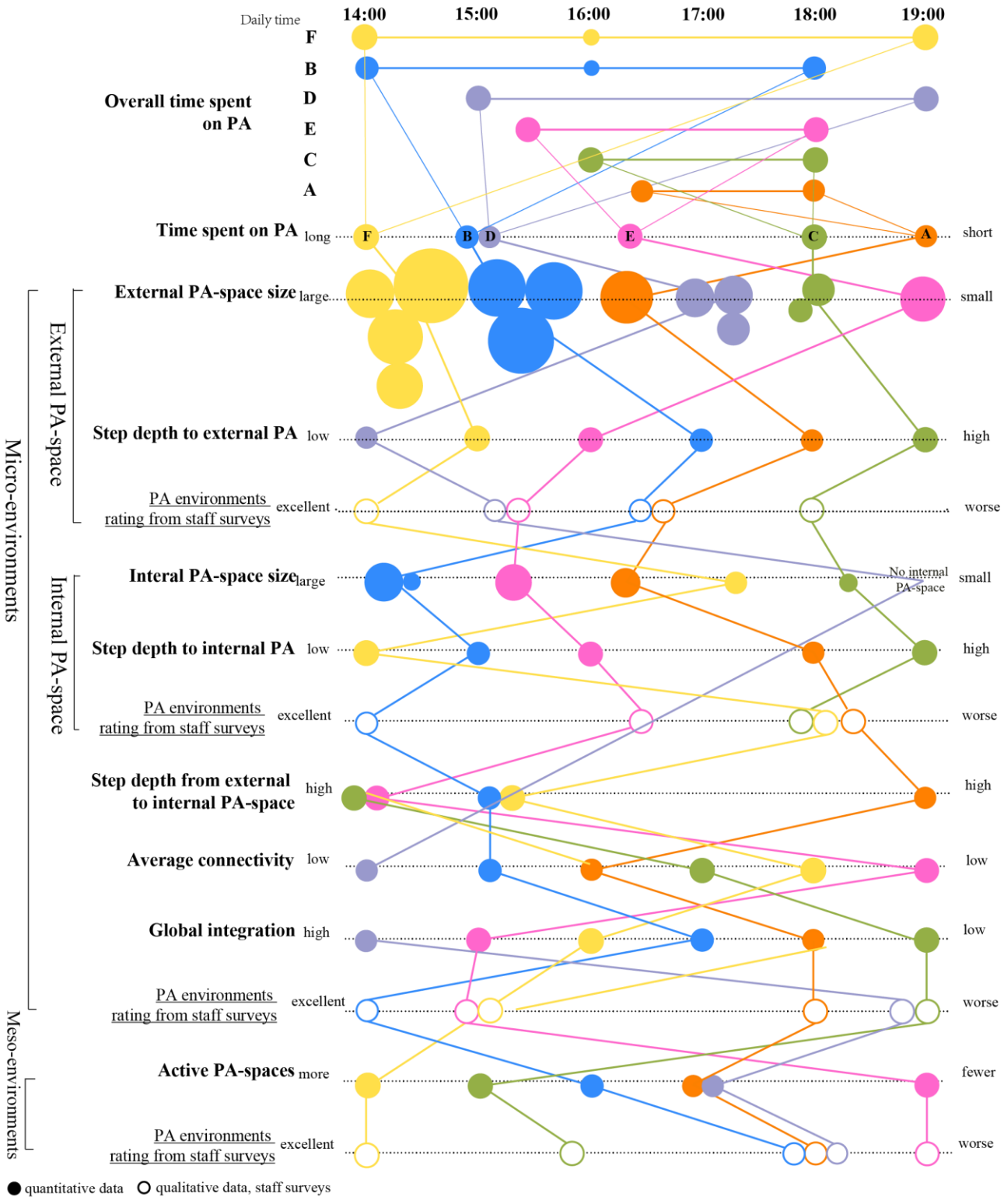
* One value means external and internal PA-space connected directly together

AT6.2.2 Descriptive statistics spatial variables for 18 case studies, ordered by active PA spaces from high to low

Refugee accommodation	Road segments	Accommodation Location	Highway/railway (500m)	Active formal PA-space (500|1000)	Active informal PA-space (500|1000)	Available formal PA-space (500|1000)	Available informal PA-space (500|1000)	Potential formal PA-space	Potential informal PA-space	Active PA spaces
Accommodation F	3025	Residential area	x	8|7	8|1	8|14	9|3	25	15	24
Accommodation C	2821	Residential area	x	0	10|12	0|3	12|30	9	59	22
Accommodation AD1	4437	Residential area	x	1|0	12|3	13|7	14|9	119	135	16
Accommodation B	2508	Industrical/Grassland	x	3|1	5|1	3|8	5|9	23	51	10
Accommodation AD8	3200	Residential area	o	2|0	5|3	2|3	5|5	28	51	10
Accommodation AD7	2432	Residential area	x	1|0	4|3	1|3	4|5	16	24	8
Accommodation AD2	2469	Residential area	o	0|5	0|1	0|6	0|4	43	13	6
Accommodation A	1576	Residential area	o	0|2	0|3	0|2	0|3	20	27	5
Accommodation D	2020	Residential area	x	0	5|0	1|3	5|5	5	13	5
Accommodation AD5	3223	Residential area	o	2|1	0|1	2|3	0|7	38	51	4
Accommodation AD11	1765	Residential /Industrial	x	1|3	0	1|4	0|2	25	12	4
Accommodation AD6	4602	Residential area	o	2|0	0	2|3	0	29	67	2

Accommodation AD3	3448	Undefined	o	0|1	0	0|2	0|3	33	68	1
Accommodation E	1662	Undefined	x	0	0	0|0	0|1	9	8	0
Accommodation AD4	4819	Undefined	o	0	0	0|2	3|0	63	57	0
Accommodation AD9	3526	Industrial	o	0	0	0|1	0	28	93	0
Accommodation AD10	2520	Undefined	o	0	0	0	0	23	35	0
Accommodation AD12	1712	Residential area	x	0	0	0|1	0	17	32	0

AF 6.4 Children care department staff surveys ratings



Supplementary documents

AQ2.2.21D A questionnaire temple for home managers (German version)

Fragebogen für die Heimleitung (Unterkunftsnamen, Typ)
Die täglichen körperlichen Aktivitäten bei Grundschülern in Flüchtlingsunterkünften (6-12 Jahre)

Die demographische Situation

1. **Wie viele Personen wohnen momentan in diesem Heim?**
2. **Wie viele der in 1 aufgeführten Personen sind Kinder zwischen 6 und 12 Jahre?**

Für den Fall, dass 6-12 Jahre Kinder in diesem Heim nicht gesondert erfasst werden, so schätzen Sie bitte deren Anzahl/Anteil.:

Personen: Prozent: (Geschätzt)

3. **Wie viele der in 2 aufgeführten Personen sind Neukommern (ab 2019)?**

4. **Wie viele Kinder hat jede Familie im Durchschnitt?**

5. **Woher kommen die Kinder (die Ursprungsländer)?**

6. **Auf welche Schulen gehen die Kinder momentan (Multi-Optionen)?**

☐Beschulung in der Unterkunft

☐Regelunterricht in Schulen

☐Willkommensklassen in Schulen

☐Ausschließlich Sprachunterricht in der Unterkunft

☐Integrationskurs

☐Keine Beschulung

☐Andere:

7. **Wie lange werde jede Familie im durchschnittlich bleiben in diesem Heim?**

8. **(Nur für Gemeinschaftsunterkunft, Notunterkunft) Wo werde jede Familie leben, nachdem sie ausgezogen sind?**
9. **(Nur für Gemeinschaftsunterkunft) Wie geht es den Familien, die aus dem Heim ausgezogen sind (z.B. Sind sie in Berlin angesiedelt)?**

Die Grundsituation der Unterkunft

10. **Welcher Typ ist diese Unterkunft? Wie viele Stockwerke? Was war der frühere Gebrauch?**

11. **Wie viele Zimmer hat das Heim?**

12. **Welche Zimmertypen hat das Heim (Multi-Optionen)?**

☐Einzelzimmer / Familienwohnungen

☐WG für Familien

☐Zimmer für zwei Personen

☐Zimmer für drei Personen

☐Zimmer für vier Personen

☐Andere (bitte benennen oder beschreiben):

13. **Wie viele Mitarbeiter*innenteam arbeiten in diesem Heim? Und für die Kinderbetreuung?**

Die Umgebung der Unterkunft

14. **Wie viele <u>Kinderspielzimmer</u> hat das Heim? Wann steht es Kindern zur Verfügung (Bitte auf der Karte eintragen)?**

15. **Wie viele <u>Spielplatz für Kinder</u> hat das Heim (Bitte auf der Karte eintragen)?**

16. **Gibt es <u>Parks / kleinen Spielplätze rund um das Heim</u> zugänglich für die Kinder (Bitte auf der Karte eintragen)?**

☐Ja ☐Nein

Bitte beschreiben Sie es, wenn möglich:

17. **Gibt es eine Zugangskontrolle? Wann dürfen die Kinder draußen zuspielen?**

☐Ja ☐Nein

Bitte beschreiben Sie es, wenn möglich:

18. **Wie häufig spielen die Kinder draußen?**

☐Regelmäßig ☐ Ab und zu ☐ Nie

19. **Gibt es eine Chance für die Kinder, mit den Kindern in der Nachbarschaft Kontakt aufzunehmen?**

☐Ja ☐Nein ☐Nicht sicher

20. **Wie viele Fernseher hat das Heim? Woher?**

21. **Wie häufig sehen die Kinder fern?**

☐Regelmäßig ☐ Ab und zu ☐ Nie ☐ Weiß nicht ☐ Individuelle

22. **Gibt es eine sichere Nachbarschaft für die Kinder?**

☐Ja ☐Nein ☐Nicht sicher

23. **Gibt es eine freundliche Nachbarschaft für die Kinder?**

☐Ja ☐Nein ☐Nicht sicher

24. **Sind wichtige Punkte zur täglichen körperlichen Aktivitäten bei Kinder noch nicht angesprochen worden, oder möchten Sie sonstige Anmerkungen machen?**

Vielen Dank!

AQ2.2.21E A questionnaire temple for home managers (English version)

1. Questionnaires for home managers (accommodation name, type) Daily physical activity of refugee children in their accommodation (6-12 Y)

*the original language of this questionnaire is German

the demographic Situation

1. **Currently, how many people are there in this accommodation?**
2. **How many of them listed in 1 are children between 6 and 12 years old?**
   In case 6-12 years children are not recorded separately in this accommodation, so please estimate the number/proportion:
   Number: Percent: (Estimated)
3. **How many of them listed in 2 are newcomers (from 2019)?**
4. **How many children have each family on average?**
5. **From where come the children(the countries of origin)?**
6. **Which classes are the children currently attending (multiple options)?**
   ☐Beschulung in der Accommodation
   ☐regular class in school
   ☐Welcome class in school
   ☐ Only language lessons in the accommodation
   ☐Integration class
   ☐No education
   ☐Others:
7. **How long will each family stay in this accommodation on average?**
8. **(Only for community accommodation, emergency accommodation) Where will the family live after they move out**
9. **(Only for community accommodation) How are the families who moved out of the home (e.g., based in Berlin)?**

The basic situation of this accommodation

10. **What type is this Accommodation? How many floors? What was the former use?**
11. **How many rooms does this accommodation have?**
12. **Which kinds of rooms does this accommodation have (multiple options)?**
    ☐Apartment
    ☐Shared room for families
    ☐Room for two Persons
    ☐Room for three Persons
    ☐Room for four persons

☐Others (Please name it or describe it):

13. **How many staff are at this accommodation? And for the children care department?**

The built environment of the accommodation

14. **How many <u>Children's rooms</u> does the accommodation have? When is/are it/them available for the children (Please show on the map)?**

15. **How many <u>playgrounds</u> does the accommodation have (Please show on the map)?**

16. **Are there <u>parks / small playgrounds around the accommodations</u> for the children (Please show on the map)?**

☐Yes ☐No

Please describe it if possible:

17. **Is there an access control? When are the children allowed to play outside**

☐Yes ☐No

Please describe it if possible:

18. **How often do the children play outside**

☐Regularly ☐ From time to time ☐ Never

19. **Is there a chance for the children in this accommodation to contact the children around?**

☐Yes ☐No ☐Not sure

20. **How many TV are there in the accommodation? Where?**

21. **How often do the children watch TV?**

☐Regularly ☐ From time to time ☐ Never ☐ Do not know ☐ Individual

22. **Is there a safe neighbourhood for the children?**

☐Yes ☐No ☐Not sure

23. **Is there a friendly neighbourhood for the children?**

☐Yes ☐No ☐Not sure

24. **Is there something else you would like to share about the daily physical activity for refugee children?**

Thank you for helping! * The researcher will also show the map and photos of the surroundings to help the interviewees better explain.

2. Fragebogen für die Kinderbetreuung (Unterkunftsnamen, Typ)
Die täglichen körperlichen Aktivitäten bei Grundschülern in Flüchtlingsunterkünften (6-12 Jahre)

Die Grundsituation der Unterkunft

1. Gibt es in diesem Haus ein Sport- / Aktivprogramm für Kinder?

☐Ja ☐Nein

Wenn ja, bitte beschreiben Sie es, wenn möglich:

2. **Leben in Ihrem Heim die Kinder mit frühen traumatischen Erfahrungen (z. B. PTBS. Narbe der Kriege)?**

☐Ja ☐Nein

Wenn Ja, Wie kann dieser frühen traumatischen Erfahrungen die tägliche körperliche Aktivität bei Kindern beeinflussen?

☐ Sehr negativ ☐ Eher negativ ☐ Wenig Einfluss ☐ Es gab keinen Einfluss ☐ Individuelle

3. Mit wem spielen die Kinder normalerweise wollen (Multi-Optionen)?

☐Peers (andere Flüchtlingskinder)

☐Geschwister

☐Eltern

☐Kinderbetreuung und Freiwillige

☐Andere:

4. **Die Platz für Kinder <u>in Zimmern</u> zu spielen, wo es sie gibt (Bitte auf der Karte eintragen) :**

☐Kein Platz ☐ Zu wenig ☐ Genug Platz

5. **Die Platz für Kinder <u>in diesem Haus (z.B. Spielzimmer)</u> zu spielen, wo es sie gibt (Bitte auf der Karte eintragen) :**

☐Kein Platz ☐ Zu wenig ☐ Genug Platz

6. **Die <u>Spielplatz für Kinder draußen zu spielen</u>, wo es sie gibt (Bitte auf der Karte eintragen):**

☐Kein Platz ☐ Zu wenig ☐ Genug Platz

7. **Die <u>Parks / kleine Spielplätze für Kinder um das Heim</u>, wo es sie gibt (Bitte auf der Karte eintragen):**

☐Kein Platz ☐ Zu wenig ☐ Genug Platz

8. Wie häufig spielen die Kinder draußen?

☐Regelmäßig ☐ Ab und zu ☐ Nie

1. **Gibt es eine Chance für die Kinder, mit den Kindern in der Nachbarschaft Kontakt aufzunehmen?**

☐Ja ☐Nein ☐Nicht sicher

2. **Wie häufig sehen die Kinder fern?**

☐Regelmäßig ☐ Ab und zu ☐ Nie ☐ Weiß nicht ☐ Individuelle

3. Gibt es eine sichere Nachbarschaft für die Kinder?

☐Ja ☐Nein ☐Nicht sicher

4. Gibt es eine freundliche Nachbarschaft für die Kinder?

☐Ja ☐Nein ☐Nicht sicher

Die Bedingungen des Alltags

9. Was werden die Kinder in ihrer Freizeit normalerweise tun (Multi-Optionen)?

☐ Hausarbeit (z. B. kümmern sich um jüngere Brüder / Schwestern, ordentlich eigenes Schlafzimmer)

☐ Spielen mit Andere

☐ Sports (z.B. Fußball)

☐ Workshops

☐ Mit Handy

☐ Fernsehen

☐ Draußen auf dem Spielplatz spielen

☐ Mit ihren Eltern ausgehen

☐ Hausaufgaben Machen

10. Was machen die Kinder mit Handy?

☐ Games

☐ Fernsehprogramme ansehen

☐ Kontakt mit anderen aufnehmen

☐ Sozialen Medien

☐ Andere:

11. Wie lange benutzen die Kinder das Handy jeden Tag?

☐ Weniger als 30 Minuten

☐ 30 Minuten bis 1 Stunde

☐ 1 bis 2 Stunden

☐ 2 bis 3 Stunden

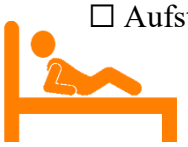
☐ Andere:

12. **Denken Sie, dass Kinder verbringen zu viel Zeit am Handy ein Problem wäre?**

☐Ja ☐Nein ☐Nicht sicher

Einen normalen Tag dieser Flüchtlingskinder

Können Sie mir helfen, um einen normalen Tag dieser Flüchtlingskinder zu beschreiben (Bitte füllen Sie den Zeitbereich aus)

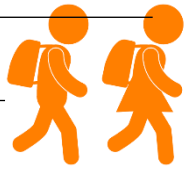


☐ Aufstehen _____

☐ Frühstück _____

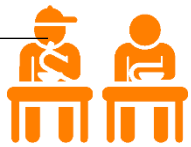
☐Morgen

Spielen _____



☐ Schulzeit _____

☐ Mittagessen _____



☐ Nachmittagsspielen _____

☐ Nachmittagstee _____

☐ Workshop _____

☐Abendessen _____

☐ Abendspielen _____

☐ Handyzeit _____

☐Hausarbeiten _____

☐ Hausaufgaben _____

☐ Fernsehen _____

☐ Schlafen _____

☐ Andere _____

13. Sind wichtige Punkte zur täglichen körperlichen Aktivitäten bei Kinder noch nicht angesprochen worden, oder möchten Sie sonstige Anmerkungen machen?

Vielen Dank!

Q2.2.22E A questionnaires temple for children care departments (German version)

2. Questionnaires for children care department (accommodation name, type) Daily physical activity of refugee children in their accommodation (6-12 Y)

*the original language of this questionnaire is German

The basic situation of this accommodation

1. **Are there sport- / activity programs in this accommodation for children?**
   ☐Yes ☐No
   When Yes, please describe them if possible:
2. **Are there children with traumatic experiences in this accommodation (e.g., PTSD, war scar)?**
   ☐Yes ☐No
   When Yes, How can this traumatic experience affect daily physical activity in children?
   ☐ Very negative ☐ a little bit negative ☐ Small influence ☐ No influence ☐ Individual
3. **With whom are the children willing to play (multiple options)?**
   ☐Peers (other refugee children)
   ☐Sister and brother
   ☐Parents
   ☐Staff
   ☐Others:
4. **Space for children to play in the accommodation (e.g., playroom), where/how are they (Please show on the map) :**
   ☐Worse ☐ Bad ☐ OK ☐ Good ☐ Excellent
5. **Playgrounds for children outside to play, where/how are they (Please show on the map):**
   ☐Worse ☐ Bad ☐ OK ☐ Good ☐ Excellent
6. **The parks / small playgrounds for children around the accommodation, where/how are they (Please show on the map):**
   ☐Worse ☐ Bad ☐ OK ☐ Good ☐ Excellent
7. **How often do the children play outside?**
   ☐Regularly ☐ From time to time ☐ Never
8. **Is there a chance for the children in this accommodation to contact the children around?**
   ☐Yes ☐No ☐Not sure
9. **How often do the children watch TV?**
   ☐Regelmäßig ☐ From time to time ☐ Never ☐ Do not know
   ☐ Individual
10. **Is there a safe neighbourhood for the children?**
    ☐Yes ☐No ☐Not sure
11. **Is there a friendly neighbourhood for the children?**
    ☐Yes ☐No ☐Not sure

Everyday conditions

12. **What do children usually do in their free time (Multiple-options)?**
    ☐ Housework (e.g., take care of younger brothers/sisters)
    ☐ Play with others
    ☐ Sports (e.g., football)
    ☐ Workshops
    ☐ with cell phone

☐ TV
☐ Play outside in the playgrounds
☐ with the parents
☐ Homework

13. What do children do with cell phone?

☐ Games
☐ TV programs
☐ Contact with others
☐ Social media
☐ Others:

14. How long do children with the cell phone every day

☐ Not more than 30 minutes
☐ 30 minutes to 1 hour
☐ 1 to 2 hours
☐ 2 to 3 hours
☐ Others:

15. **In your opinion, is too much time for cell phones a problem for the children?**

☐Yes ☐No ☐Not sure

A typical day of the children

16. **Could you help me to describe the timeline of your children every day (Please fill it with the time range number)**

☐ **Wake up** _____

☐ **Breakfast** _____

☐ **School** _____

☐ **Lunch** _____

☐ **Afternoon playing** _____

☐ **Afternoon tea** _____

_____

☐ **Workshop**

☐**Dinner** _____

☐ **Evening playing** _____

☐ **Phone time** _____

☐**Homework** _____

☐ **Housework** _____

☐ **TV** _____

☐ **Go to bed** _____

17. Is there something else you would like to share about the daily physical activity for refugee children?

Thank you!

AI2.2.23D Information sheet & declaration on data protection (staff, German version)

Projekt.1

TECHNISCHE UNIVERSITÄT DARMSTADT

Aufklärungsbogen & Erklärung zum Datenschutz

Aufklärungsbogen

Die Richtlinien der Deutschen Forschungsgemeinschaft (DFG) sehen vor, dass sich die Teilnehmer_innen an empirischen Studien mit ihrer Unterschrift explizit und nachvollziehbar einverstanden erklären, dass sie freiwillig an unserer Forschung teilnehmen.

Aus diesem Grund möchten wir Sie bitten, die nachfolgenden Erläuterungen zum Inhalt der Studie zu lesen und untenstehende Einverständniserklärung zu unterzeichnen, sofern Sie damit einverstanden sind.

Gegenstand der Studie

Projekt: Socio-spatial Interaction (SSI): Designstrategien zur Förderung des Wohlbefindens geflüchteter Kinder im Grundschulalter in Berlin

Ablauf der Studie

Zu diesem Projekt Zweck möchten wir ein Strukturelles Interview durchführen, indem die Teilnehmer_innen aus der Heimleitung oder Kinderbetreuung verschiedene Bereiche dieser Erstaufnahmeeinrichtung bewerten können. Das Interview dauert ca. 30 Minuten. Zunächst beschreiben die Teilnehmer_innen relevante Bereiche, bewerten die Erstaufnahmeeinrichtung und dokumentieren ihre Eindrücke durch einen Fragenbogen und eine Karte. Dann bewegen die Teilnehmer_innen sich rund die Erstaufnahmeeinrichtung zu Kinderspielräume. Gleichzeitig mache die Forscherin eine foto-basierte Tagesroutenuntersuchung, um den täglichen körperliche Aktivität von Flüchtlingskindern in ihren Unterkünften tiefgehend zu beschreiben und zu skizzieren. Die Folgeerhebung wird ca. 30 Minuten in Anspruch nehmen. Der gesamte Vorgang dauert bis zu 60 Minuten.

Dauer und Aufwandsentschädigung
Die Teilnahme an der Studie wird voraussichtlich 60 Minuten in Anspruch nehmen.

Möglicher Nutzen der Studie
Ziel unserer Forschung ist es, den Einfluss der gebauten Umwelt auf die körperliche Aktivität und das Wohlbefinden von geflüchteten Kindern (6-12 Jahre) besser zu verstehen und in die Planung von Erstaufnahmeeinrichtungen einzubringen. In diesem Projekt geht es darum, dass sich Kinder

und ihre Eltern an der Bewertung und Planung ihrer Erstaufnahmeeinrichtungen beteiligen können.
Die wichtigsten Fragestellungen sind:

- Welche Elemente und Bereiche einer Erstaufnahmeeinrichtung werden von Kindern als Mängel / Potentiale wahrgenommen?
- Wie können sich Kindern besser an Planungs- und Zertifizierungsprozessen von gesundheitsfördernden (zum Beispiel förderlich für körperliche Aktivität) Erstaufnahmeeinrichtungen beteiligen?
- Welche konkreten Schlüsse lassen sich für die Planung von gesundheitsfördernden Erstaufnahmeeinrichtungen ziehen?

Mit der Teilnahme verbundene Erfahrungen/Risiken
Die Teilnehmerinnen an dieser Studie werden keinem Risiko ausgesetzt, das über die Risiken des alltäglichen Lebens hinausgeht.

Erklärung zum Datenschutz
Die Datenverarbeitung dieser Studie geschieht nach datenschutzrechtlichen Bestimmungen der Datenschutzgrundverordnung (DSGVO) sowie des Hessischen Datenschutz- und Informationsfreiheitsgesetzes (HDSIG) und Berlinischen Datenschutzgesetz - BlnDSG (2018). Die Daten werden ausschließlich für die im Aufklärungsbogen beschriebenen Zwecke verwendet.

Im Rahmen dieser Studie werden folgende Daten erhoben:
Fragebogen zum Thema bestehenden bebauten Umgebung für geflüchteter Kinder im Grundschulalter

Als personenbezogene Daten werden erhoben:
Alter (ggf. geclustert), Geschlecht

Vertraulichkeit
Alle im Rahmen dieser Studie erhobenen Daten sind selbstverständlich vertraulich und werden nur in anonymisierter Form genutzt. Demographische Angaben wie Alter oder Geschlecht lassen keinen eindeutigen Schluss auf Ihre Person zu. Zu keinem Zeitpunkt im Rahmen der jeweiligen Untersuchung werden wir Sie bitten, Ihren Namen oder andere eindeutige Informationen zu nennen.

Aufbewahrung
Die mit dieser Studie erhobenen Daten werden in die abgeschlossene Einrichtung in der Abteilung Architektur, Forschungsgruppe Urban Health Games gespeichert und nach das Ende diese Projekt (2020-2021) gelöscht. Die Speicherung erfolgt in einer Form, die keinen Rückschluss auf Ihre Person zulässt, das heißt die Daten werden pseudonymisiert (ggf. Mina/Raman für Kinder). Diese Einverständniserklärung wird getrennt von den anderen Versuchsmaterialien und Unterlagen aufbewahrt und nach Ablauf dieser Frist vernichtet.

Freiwilligkeit & Rechte der Versuchspersonen
Ihre Teilnahme an dieser Untersuchung ist freiwillig. Es steht Ihnen zu jedem Zeitpunkt dieser Studie frei, Ihre Teilnahme abzubrechen und damit diese Einwilligung zurückziehen (Widerruf),

ohne dass Ihnen daraus Nachteile entstehen. Wenn Sie die Teilnahme abbrechen, werden keine Daten von Ihnen gespeichert und alle bisher vorliegenden Daten zu Ihrer Person vernichtet.
Sie haben das Recht, Auskunft über die Sie betreffenden personenbezogenen Daten zu erhalten sowie ggf. deren Berichtigung oder Löschung zu verlangen. In Streitfällen haben Sie das Recht, sich beim Hessischen Datenschutzbeauftragten zu beschweren (Adresse s.u.), oder Berlinischen Datenschutzbeauftragten zu beschweren (Adresse s.u.).

Einverständnis

Ich habe die Erläuterungen zur Studie gelesen und bin damit einverstanden, an der genannten Studie teilzunehmen.

Ich erkläre mich einverstanden, dass die im Rahmen der Studie erhobenen Daten zu wissenschaftlichen Zwecken ausgewertet und in pseudonymisierter Form gespeichert werden. Ich bin mir darüber bewusst, dass meine Teilnahme freiwillig erfolgt und ich den Versuch jederzeit und ohne die Angabe von Gründen abbrechen kann.

Ich bin damit einverstanden, dass im Zuge der Studie Sprachaufnahmen von mir angefertigt werden und diese für die genannten Zwecke eingesetzt werden. Ich nehme zur Kenntnis, dass diese Zustimmung jederzeit ohne Angabe von Gründen widerrufen werden kann.

_____ _____ _____

Datum Name (in Druckschrift) Unterschrift

Bei Fragen, Anregungen oder **Beschwerden** können Sie sich gerne an den Versuchsleiter wenden:

Prof. Dr.-Ing. Martin Knöll
Fachbereich Architektur
Tel.: +49 6151 16 – 22167
Email: knoell@stadt.tu-darmstadt.de

Verantwortliche Person für die Datenverarbeitung dieser Studie:

M.A. Siqi Chen
siqi.chen@stud.tu-darmstadt.de

Bei Fragen zum Datenschutz kann auch der Datenschutzbeauftragte der TU Darmstadt kontaktiert werden:
Gerhard Schmitt
Email: datenschutz@tu-darmstadt.de

Kontaktadresse des Hessischen Datenschutzbeauftragten:
Email: poststelle@datenschutz.hessen.de

Kontaktadresse des Berlinischen Datenschutzbeauftragten:
Email: mailbox@datenschutz-berlin.de

AQ 2.4.21E/O A questionnaire temple for parents of daily PA of their children (English, Persian, Azerbaijani, Russian, German and Arabic)

The questionnaire for parents (Name, Accommodation type)
Daily physical activity for children (6-12 years old)

((There are also German, Persian, Arabic, Azerbaijani, and Russian language versions for this questionnaire)

The demographic situation

1. **How many children do you have?**
2. **Who do you think your children are willing to play with (possible for more than one option)?**
   - ☐ peers (other children in the facility)
   - ☐ Sisters or brothers
   - ☐ Children care department or other volunteers

The existing environment of the accommodation

3. **The space in <u>the building</u> for your children playing <u>(e.g. playroom)</u>, you find that (Please show it on the map):**
   ☐ no space ☐ too small ☐ either too big or too small ☐ enough space ☐ too big
4. **<u>The playground with the building</u> for your children playing, you find that (Please show it on the map):**
   ☐ no space ☐ too small ☐ either too big or too small ☐ enough space ☐ too big
5. **The <u>Parks /small playgrounds around the building</u> for your children playing, you find that (Please show it on the map):**
   ☐ no space ☐ too small ☐ either too big or too small ☐ enough space ☐ too big
6. **How long do your children play outside every day?**
   ☐less than half an hour ☐less than one hour ☐ 1 to 2 hours ☐ more

The neighbourhood

7. **Where (e.g. on the way to school) do your children like to stay in the neighbourhood? (Please show it on the map)?**
8. **Do you think the neighbourhood is safe?**
   ☐Yes ☐No ☐Not sure
9. **Do you think the neighbourhood is friendly?**
   ☐Yes ☐No ☐Not sure

Everyday life conditions

10. **What do your children do with the phone?**
    - ☐ Games
    - ☐ TV programs
    - ☐ connect with others

☐ Social media

11. **How many hours are you children playing with their phone everyday?**
    - ☐ less than 1 hour
    - ☐ 1 to 2 hour
    - ☐ 2 to 3hours
    - ☐ More
12. **Do you think that "too much time on the phone" is a problem for your children?**

    ☐yes ☐no ☐not sure

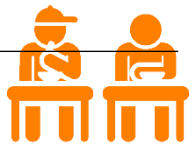
A normal day of your children

13. **Could you help me to describe the timeline of your children everyday(Please fill it with the time range number, for example, 10 to 10:30)**

☐ Wake up _____

☐ Breakfast _____

☐ School _____



☐ Lunch _____

☐ Afternoon  **playing** _____

☐ Afternoon tea _____

☐ Workshop _____

☐Dinner _____

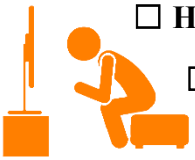
☐ Evening playing _____

☐ Phone time _____

☐Homework _____

_____

☐ Housework



☐ TV _____

☐ Go to bed _____

Thank you so much for helping!

Persian

3. پرسشنامه برای والدین

فعالیت بدنی روزانه برای کودکان (6-12 سال)

وضعیت جمعیتی

1. چند فرزند دارید؟

2. بچه شما چند ساله است ؟

3. شما فکر می کنید که فرزندان شما مایل به بازی هستند (برای بیش از یک گزینه ممکن است)؟

☐ همسالان (بچه های دیگر در مرکز)

☐ خواهر یا برادر

☐ بخش مراقبت از کودکان یا داوطلبان دیگر

محیط موجود در محل اقامت

4. **فضای این ساختمان برای کودکان شما (مثلا اتاق بازی)، این را پیدا کنید:**

☐ جای خالی وجود ندارد ☐خیلی کوچک ☐ فضای کافی ☐خیلی بزرگ است

5. زمین بازی با ساختمان برای بازی کردن کودکان شما، این را پیدا کنید:

☐ جای خالی وجود ندارد ☐خیلی کوچک ☐ فضای کافی ☐خیلی بزرگ است

6. پارک ها / زمین های بازی کوچک در اطراف ساختمان برای بازی کردن کودکان شما، این را پیدا کنید:

☐ جای خالی وجود ندارد ☐خیلی کوچک ☐ فضای کافی ☐خیلی بزرگ است

7. چه مدت فرزندانتان در خارج از خانه بازی می کنن ؟

☐ کمتر از نیم ساعت ☐کمتر از یک ساعت ☐ 1 تا 2 ساعت ☐ بیشتر

همسایه

8. از کجا (به عنوان مثال در راه مدرسه) آیا کودکان شما دوست دارند در محله سکونت کنند؟

9. فکر میکنی محله ایمنی است؟

☐بله ☐نه ☐ مطمئن نیستم

10. آیا فکر می کنید محله دوستانه است؟

☐بله ☐نه ☐ مطمئن نیستم

شرایط زندگی روزمره

11. کودکان شما با تلفن چه کار میکنند ؟

☐ بازی ها

برنامه های

☐ تلویزیونی

☐ با دیگران ارتباط برقرار کنید

☐ رسانه های اجتماعی

12. چند ساعت شما بچه ها با تلفن خود هر روز بازی می کنید ؟

☐ کمتر از یک ساعت

☐1 تا 2 ساعت

☐2 تا 3 ساعت

☐بیشتر

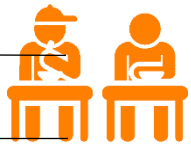
13. آیا شما فکر می کنید که "زمان زیادی در گوشی" برای فرزندان شما مشکل است ؟

☐بله ☐نه ☐ مطمئن نیستم

یک روز عادی از فرزندان شما

14. **آیا می توانید به من کمک کنید تا هر روز جدول زمان بندی فرزندانتان را توصیف کنید (لطفا با شماره محدوده زمانی آن را پر کنید، مثلا از ساعت 6:30 تا 7:30 بیدار شوید)**

☐ از خواب بیدار شوید _____



☐ صبحانه _____

☐مدرسه _____

☐ ناهار _____

☐بعد از ظهر بازی _____

☐کارگاه _____

☐ شام _____

☐بازی شبانه _____

☐زمان تلفن همراه _____

☐ مشق شب _____

☐کار های خانه _____

☐ تلویزیون _____

☐برو بخواب _____

از کمک شما بسیار سپاسگزارم!

Azerbaijani

3. Valideynlər üçün sorğu
Uşaqlar üçün gündəlik fiziki fəaliyyət (6-12 yaş)

Demoqrafik vəziyyət

1. **Neçə uşaq var?**

2. **Çocuğunuzun yaşı necədir?**

3. **Sizin uşaqlarınızla oynamaq istəyən kimdir (birdən çox seçimi mümkündür)?**
   - ☐ həmyaşıdlar (müəssisənin digər uşaqları)
   - ☐ Bacılar və ya qardaşlar
   - ☐ Uşaq baxım şöbəsi və ya digər könüllülər

Mövcud yaşayış mühiti

4. **<u>Uşaqlarınızın oynadığı binada (məsələn, oyun otağı)</u> olan məkanı aşağıdakıları tapırsınız:**
   ☐ yer yoxdur ☐ çox kiçik ☐ kifayət qədər yer ☐ çox böyük
5. **Bu binada oynayan uşaqlarınız <u>üçün oyun</u> meydançasını tapırsınız:**
   ☐ yer yoxdur ☐ çox kiçik ☐ kifayət qədər yer ☐ çox böyük
6. **Uşaqlarınızı oynayan bu bina ətr<u>afındakı Parklar / kiçik</u> oyun meydançaları belədir:**
   ☐ yer yoxdur ☐ çox kiçik ☐ kifayət qədər yer ☐ çox böyük
7. **Uşaqlarınız hər gün xaricində nə qədər oynayır?**
   ☐ yarım saatdan azdır ☐ bir saatdan azdır ☐ 1 ilə 2 saat ☐ daha çox

Qonşuluq

8. **Harada (məsələn, məktəbə gedərkən) uşaqlar qonşuluqda qalmağı xoşlayırsınız?**

9. **Qonşuluq təhlükəsizliyi düşünürsənmi?**
   ☐ bəli ☐ yox ☐ əmin deyiləm
10. **Qonşuluq dostluq olduğunu düşünürsənmi?**

☐ bəli ☐ yox ☐ əmin deyiləm

Gündəlik həyat şərtləri

11. **Uşaqlarınız telefonla nə işləyir?**
    - ☐ Oyunlar
    - ☐ TV proqramları
    - ☐ başqaları ilə əlaqə saxlayın
    - ☐ Sosial Mediya
12. **Hər gün telefonla neçə saat oynayan uşaqlarsınız?**
    - ☐ 1 saatdan az
    - ☐ 1 ilə 2 saat
    - ☐ 2 ilə 3 saat arasında
    - ☐ Daha çox
13. **"Telefonda çox vaxt" uşaqlarınız üçün problemdir?**
    ☐ bəli ☐ yox ☐ əmin deyiləm

<u>Uşaqlarınızın normal günüdür</u>

14. **Hər gün uşaqlarınızın qrafiki xarakterizə etmək üçün mənə kömək edə bilər (Xahiş olunur, məsələn, 6: 30-dan 07: 30-a qədər yuxarıya doğru)**

☐ **Uyan** _____

☐ **Səhər yeməyi** _____

☐ **Məktəbə** _____

☐ **Nahar** _____

☐  **Günortadan sonra oynayırıq** _____

☐ **Çalıştay** _____

☐ **axşam yeməyi** _____

☐ **Axşam oynayır** _____

☐ **mobil telefonun vaxtı** _____

☐ **Ev tapşırığı** _____

☐ **Ev işi** _____

☐ **TV** _____

☐ **Yatağa get** _____

Çox kömək üçün təşəkkür edirik!

Russian

3. Анкета для родителей
Ежедневная физическая активность для детей (6-12 лет)

Демографическая ситуация

1. **Сколько у вас детей?**
2. **Сколько лет вашему ребенку?**
3. **С кем, по вашему мнению, хотят играть ваши дети (возможно более одного варианта)?**
   - ☐сверстники (другие дети в учреждении)
   - ☐Сестры или братья
   - ☐Отдел по уходу за детьми или другие волонтеры

Существующая среда проживания

4. Пространство в этом здании для ваших детей, играющих (например, игровая комната), вы обнаружите, что:
   ☐Нет места ☐Недостаточно пространства ☐достаточно места ☐слишком большой
5. На игровой площадке со зданием для ваших детей вы обнаружите, что:
   ☐Нет места ☐Недостаточно пространства ☐достаточно места ☐слишком большой
6. Парки / маленькие игровые площадки вокруг здания для ваших детей играют, вы обнаружите, что:
   ☐Нет места ☐Недостаточно пространства ☐достаточно места ☐слишком большой
7. Как долго ваши дети играют на улице каждый день?
   ☐менее чем за полчаса ☐меньше часа ☐ 1-2 часа ☐Больше

Окрестности

8. **Где (например, по дороге в школу) вам, детям, нравится жить по соседству?**
9. **Как вы думаете, окрестности безопасны?**
   ☐да ☐нет ☐Точно сказать не могу
10. **Как вы думаете, район дружелюбный?**
    ☐да ☐нет ☐Точно сказать не могу

Бытовые условия

11. **Что ваши дети делают с телефоном?**
    - ☐Игры
    - ☐телевизионные программы
    - ☐связаться с другими
    - ☐Социальные медиа
12. **Сколько часов вы, дети, играете со своим телефоном каждый день?**
    - ☐Менее 1 часа
    - ☐1-2 часа
    - ☐От 2 до 3 часов
    - ☐Больше
13. **Считаете ли вы, что «слишком много времени на телефоне» является проблемой для**

ваших детей?

☐да ☐нет ☐Точно сказать не могу

Нормальный день твоих детей

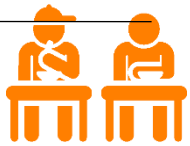
1. Не могли бы вы помочь мне описать график ваших детей каждый день (пожалуйста, заполните номер временного диапазона, Например: вставай с 6:30 до 7:30)

☐Просыпайся _____

☐Завтрак _____

☐Школа _____

☐Обед _____



☐Игра во второй половине дня _____

_____

☐мастерская

☐Обед _____

☐Вечерняя игра _____

☐время мобильного телефона _____

☐Домашнее задание _____

☐Работа по дому _____

☐ ТВ _____

☐Пойти спать _____

Большое спасибо за помощь!

German

3. Fragebogen für Eltern (Unterkunftsnamen, Typ)

Die täglichen körperlichen Aktivitäten bei Grundschülern in Flüchtlingsunterkünften (6-12 Jahre)

Die demographische Situation

1. **Wie viele Kinder haben Sie?**
2. **Wie alt ist Ihr Kind? Wie alt sind Ihre Kinder?**
   2.a) Welches Geschlecht? ☐Männlich ☐Weiblich ☐ Keine Angabe
3. **Gibt es die Kinder mit frühen traumatischen Erfahrungen (z. B. PTBS. Narbe der Kriege)?**
   ☐Ja ☐Nicht Sicher ☐Nein
   Wenn Ja, Wie kann dieser frühen traumatischen Erfahrungen die tägliche körperliche Aktivität bei Kindern beeinflussen?
   ☐ Sehr negativ ☐ Eher negativ ☐ Wenig Einfluss ☐ Es gab keinen Einfluss ☐ Individuelle
4. **Mit wem spielen ihre Kinder normalerweise wollen (Mehrere Nennungen möglich)?**
   ☐ Peers (andere Flüchtlingskinder)
   ☐ Geschwister
   ☐ Sie
   ☐ Kinderbetreuung und Freiwillige
   ☐ Andere:

Die bestehende Umgebung dieser Unterkunft

5. **Die Platz für ihre Kinder <u>in Zimmern</u> zu spielen, wo es sie gibt (Bitte auf der Karte eintragen) :**
   ☐Kein Platz ☐ Zu wenig ☐ Genug Platz
6. **Die Platz für ihre Kinder <u>in diesem Haus (z.B. Spielzimmer)</u> zu spielen, wo es sie gibt (Bitte auf der Karte eintragen) :**
   ☐Kein Platz ☐ Zu wenig ☐ Genug Platz
7. **Die <u>Spielplatz für ihre Kinder draußen zu spielen</u>, wo es sie gibt (Bitte auf der Karte eintragen):**
   ☐Kein Platz ☐ Zu wenig ☐ Genug Platz
8. **Die <u>Parks / kleine Spielplätze für ihre Kinder um das Heim</u>, wo es sie gibt (Bitte auf der Karte eintragen):**
   ☐Kein Platz ☐ Zu wenig ☐ Genug Platz
9. **Wie häufig spielen die Kinder draußen?**
   ☐Regelmäßig ☐ Ab und zu ☐ Nie

Die Nachbarschaft

10. **Wo in der Nachbarschaft (z.B. auf dem Weg zur Schule) hält sich Ihr Kind regelmäßig auf? (Bitte auf der Karte eintragen)?**

11. **Gibt es eine Chance für die Kinder, mit den Kindern in der Nachbarschaft Kontakt aufzunehmen?**

☐Ja ☐Nein ☐Nicht sicher

11.a) Wenn ja, wie ist der Kontakt zustande gekommen?

12. **Dass Sicherheit die Nachbarschaft, finde ich:**

☐Die Nachbarschaft ist sicher, weil.....

☐Die Nachbarschaft ist nicht sicher, weil.....

☐weiß nicht

13. **Dass Freundlichkeit die Nachbarschaft, finde ich**

☐Die Nachbarschaft ist freundliche, weil.....

☐Die Nachbarschaft ist nicht freundliche, weil.....

☐weiß nicht

Die Bedingungen des Alltags

14. **Was Ihre Kinder normalerweise tun in der Freizeit? (Mehrere Nennungen möglich)?**

☐ Hausarbeit (z. B. kümmern sich um jüngere Brüder / Schwestern, ordentlich eigenes Schlafzimmer)

☐ Spielen mit Andere

☐ Sports (z.B. Fußball)

☐ Workshops

☐ Mit Handy

☐ Fernsehen

☐ Draußen auf dem Spielplatz spielen

☐ Mit ihren Eltern ausgehen

☐ Hausaufgaben Machen

☐ Andere:

15. **Was machen Ihre Kinder mit dem Handy?**

☐ Games

☐ Fernsehprogramme ansehen

☐ Kontakt mit anderen aufnehmen

☐ Sozialen Medien

☐ Andere:

16. **Wie lange benutzen die Kinder das Handy jeden Tag?**

☐ Weniger als 30 Minuten

☐ 30 Minuten bis 1 Stunde

☐ 1 bis 2 Stunden

☐ 2 bis 3 Stunden

☐ 3 bis 4 Stunden

☐ Andere:

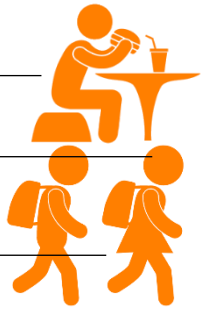
17. **Denken Sie, dass Kinder verbringen zu viel Zeit am Handy ein Problem wäre?**

☐Ja ☐Nein ☐Nicht sicher

Einen normalen Tag dieser Flüchtlingskinder

2. **Können Sie mir helfen, um einen normalen Tag ihrer Kinder zu beschreiben (Bitte füllen Sie den Zeitbereich aus)**

☐ **Aufstehen** _____

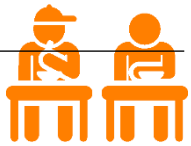


☐ **Frühstück** _____

☐**Morgen spielen** _____

☐ **Schulzeit**_____

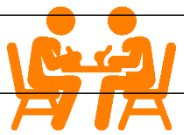
☐ **Mittagessen** _____



☐ **Nachmittagsspielen** _____

☐ **Nachmittagstee** _____

☐ **Workshop** _____



☐**Abendessen** _____

☐ **Abendspielen** _____

☐ **Handyzeit** _____

☐**Hausarbeiten** _____

☐ **Hausaufgaben** _____

☐ **Fernsehen** _____

_____

☐ **Schlafen**

☐ **Andere** _____

18. **Sind wichtige Punkte zur täglichen körperlichen Aktivitäten bei Kinder noch nicht angesprochen worden, oder möchten Sie sonstige Anmerkungen machen?**

vielen Dank für Ihre Hilfe!

Arabic

النشاط البدني اليومي للأطفال (6-12 سنة)

الوضع السكاني

1. كم طفلا لديك؟

2. كم عمر طفلك؟

3. من تعتقد أن أطفالك مستعدون للعب به (ممكن لأكثر من خيار واحد)؟

☐ الأقران (الأطفال الآخرون في المنشأة)

☐الأخوات أو الإخوة

☐ قسم رعاية الأطفال أو المتطوعين الآخرين

البيئة الحالية للسكن

4. **المساحة الموجودة في هذا المبنى التي يلعبها أطفالك (مثل غرفة اللعب) ، تجد ما يلي:**

☐مساحة كافية ☐مساحة غير كافية ☐ لا يوجد مساحة ☐كبير جدا

5. ملعب في هذا المبنى لأطفالك يلعبون ، تجد أن:

☐مساحة كافية ☐مساحة غير كافية ☐ لا يوجد مساحة ☐كبير جدا

6. الملاعب / الملاعب الصغيرة حول هذا المبنى لأطفالك يلعبون ، تجد أن:

☐مساحة كافية ☐مساحة غير كافية ☐ لا يوجد مساحة ☐كبير جدا

7. كم من الوقت يلعب أطفالك في الخارج كل يوم؟

☐ أقل من نصف ساعة ☐اقل من ساعة ☐ 1-2 ساعات ☐ أكثر من

الجوار

8. أين (على سبيل المثال في الطريق إلى المدرسة) هل تحب الأطفال البقاء في الحي؟

9. هل تعتقد أن الحي آمن؟

☐لا أدري، لا أعرف ☐لا ☐ نعم فعلا

10. هل تعتقد أن الحي ودود؟

☐لا أدري، لا أعرف ☐لا ☐ نعم فعلا

ظروف الحياة اليومية

11. ماذا يفعل أطفالك مع الهاتف؟

☐ اللعب

☐برامج التلفزيون

☐للاتصال بالآخرين

☐تواصل مع الآخرين

12. كم عدد الساعات التي يلعب فيها الأطفال مع هواتفهم كل يوم؟

☐ أقل من 1 ساعة

☐1-2 ساعات

☐2 إلى 3 ساعات

☐أكثر من

13. هل تعتقد أن "الكثير من الوقت على الهاتف" يمثل مشكلة لأطفالك؟

☐لا أدري، لا أعرف ☐لا ☐ نعم فعلا

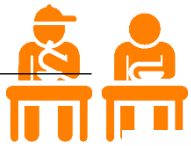
يوم من أطفالك

14. هل يمكنك مساعدتي في وصف الجدول الزمني لأطفالك كل يوم (يرجى ملؤه برقم النطاق الزمني على سبيل المثال , الحصول على ما يصل 6:30 حتي 7:30)

☐ استيقظ _____

☐ وجبة افطار _____

☐مدرسة _____



☐غداء _____

☐اللعب بعد الظهر _____

☐ ورشة عمل _____

☐ وجبة عشاء _____

☐مساء اللعب _____

☐وقت الهاتف _____

☐ واجب منزلي _____

☐الأعمال المنزلية _____

☐تلفزيون _____

☐اذهب إلى الفراش _____

شكرا

AI2.4.22D Information sheet & declaration on data protection (parents, German version)

Projekt.2

TECHNISCHE UNIVERSITÄT DARMSTADT

Aufklärungsbogen & Erklärung zum Datenschutz

Aufklärungsbogen

Die Richtlinien der Deutschen Forschungsgemeinschaft (DFG) sehen vor, dass sich die Teilnehmer_innen an empirischen Studien mit ihrer Unterschrift explizit und nachvollziehbar einverstanden erklären, dass sie freiwillig an unserer Forschung teilnehmen.

Aus diesem Grund möchten wir Sie bitten, die nachfolgenden Erläuterungen zum Inhalt der Studie zu lesen und untenstehende Einverständniserklärung zu unterzeichnen, sofern Sie damit einverstanden sind.

Gegenstand der Studie

Projekt: Projekt: Socio-spatial Interaction (SSI): Designstrategien zur Förderung des Wohlbefindens die grundschulalter Flüchtlingskinder im wartezustand in Berlin

Ablauf der Studie

Zu diesem Projekt Zweck möchten wir ein Strukturelles Interview durchführen, indem die Teilnehmer_innen und Ihre Kinder verschiedene Bereiche ihrer Erstaufnahmeeinrichtung bewerten können. Das Interview dauert ca. 30 Minuten. Zunächst bewegen Sie sich durch die Erstaufnahmeeinrichtung. Dann kehren Sie und Ihre Kinder in diesen Raum zurück, beschreiben und zeichnen relevante Bereiche, bewerten diese und dokumentieren ihre Eindrücke durch ein Bild und ihre Zeichnung. Gleichzeitig zeichnen die Kinder die Mental Maps der Erstaufnahmeeinrichtungen und der Umgebung auf. Die dafür benötigten Fragenböen und Materialien werden von uns zur Verfügung gestellt.

Alle Teilnehmer_innen (oder ihre Familienmitglieder) können Deutsch oder Englisch sprechen.

Dauer und Aufwandsentschädigung

Die Teilnahme an der Studie wird voraussichtlich 30 Minuten in Anspruch nehmen. (Als Aufwandsentschädigung erhält jeder Teilnehmer/in frei Nachmittagstee und Kekse / Snacks während des Workshops).

Möglicher Nutzen der Studie

Ziel unserer Forschung ist es, den Einfluss der gebauten Umwelt auf die körperliche Aktivität und das Wohlbefinden von geflüchteten Kindern (6-12 Jahre) besser zu verstehen und in die Planung von Erstaufnahmeeinrichtungen

einzubringen. In diesem Projekt geht es darum, dass sich Kinder und ihre Eltern an der Bewertung und Planung ihrer Erstaufnahmeeinrichtungen beteiligen können.

Die wichtigsten Fragestellungen sind:

- Welche Elemente und Bereiche einer Erstaufnahmeeinrichtung werden von Kindern als Mängel / Potentiale wahrgenommen?

- Wie können sich Kindern besser an Planungs- und Zertifizierungsprozessen von gesundheitsfördernden (zum Beispiel förderlich für körperliche Aktivität) Erstaufnahmeeinrichtungen beteiligen?

- Welche konkreten Schlüsse lassen sich für die Planung von gesundheitsfördernden Erstaufnahmeeinrichtungen ziehen?

Mit der Teilnahme verbundene Erfahrungen/Risiken

Die Teilnehmerinnen an dieser Studie werden keinem Risiko ausgesetzt, das über die Risiken des alltäglichen Lebens hinausgeht.

Erklärung zum Datenschutz

Die Datenverarbeitung dieser Studie geschieht nach datenschutzrechtlichen Bestimmungen der Datenschutzgrundverordnung (DSGVO) sowie des Hessischen Datenschutz- und Informationsfreiheitsgesetzes (HDSIG) und Berlinischen Datenschutzgesetz - BlnDSG (2018). Die Daten werden ausschließlich für die im Aufklärungsbogen beschriebenen Zwecke verwendet.

Im Rahmen dieser Studie werden folgende Daten erhoben:

Fragebogen zum Thema bestehenden bebauten Umgebung für geflüchteter Kinder im Grundschulalter

Als personenbezogene Daten werden erhoben:

Alter (ggf. geclustert), Geschlecht

Vertraulichkeit

Alle im Rahmen dieser Studie erhobenen Daten sind selbstverständlich vertraulich und werden nur in anonymisierter Form genutzt. Demographische Angaben wie Alter oder Geschlecht lassen keinen eindeutigen Schluss auf Ihre Person zu. Zu keinem Zeitpunkt im Rahmen der jeweiligen Untersuchung werden wir Sie bitten, Ihren Namen oder andere eindeutige Informationen zu nennen.

Aufbewahrung

Die mit dieser Studie erhobenen Daten werden in die abgeschlossene Einrichtung in der Abteilung Architektur, Forschungsgruppe Urban Health Games gespeichert und nach das Ende diese Projekt (2020-2021) gelöscht. Die Speicherung erfolgt in einer Form, die keinen Rückschluss auf Ihre Person zulässt, das heißt die Daten werden pseudonymisiert (ggf. Mina/Raman). Diese Einverständniserklärung wird getrennt von den anderen Versuchsmaterialien und Unterlagen aufbewahrt und nach Ablauf dieser Frist vernichtet.

Freiwilligkeit & Rechte der Versuchspersonen

Ihre Teilnahme an dieser Untersuchung ist freiwillig. Es steht Ihnen zu jedem Zeitpunkt dieser Studie frei, Ihre Teilnahme abzubrechen und damit diese Einwilligung zurückziehen (Widerruf), ohne dass Ihnen daraus Nachteile entstehen. Wenn Sie die Teilnahme abbrechen, werden keine Daten von Ihnen gespeichert und alle bisher vorliegenden Daten zu Ihrer Person vernichtet.

Sie haben das Recht, Auskunft über die Sie betreffenden personenbezogenen Daten zu erhalten sowie ggf. deren Berichtigung oder Löschung zu verlangen. In Streitfällen haben Sie das Recht, sich beim Hessischen Datenschutzbeauftragten zu beschweren (Adresse s.u.), oder Berlinischen Datenschutzbeauftragten zu beschweren (Adresse s.u.).

Einverständnis

Ich habe die Erläuterungen zur Studie gelesen und bin damit einverstanden, an der genannten Studie teilzunehmen.

Ich erkläre mich einverstanden, dass die im Rahmen der Studie erhobenen Daten zu wissenschaftlichen Zwecken ausgewertet und in pseudonymisierter Form gespeichert werden. Ich bin mir darüber bewusst, dass meine Teilnahme freiwillig erfolgt und ich den Versuch jederzeit und ohne die Angabe von Gründen abbrechen kann.

Ich bin damit einverstanden, dass im Zuge der Studie Sprachaufnahmen von mir angefertigt werden und diese für die genannten Zwecke eingesetzt werden. Ich nehme zur Kenntnis, dass diese Zustimmung jederzeit ohne Angabe von Gründen widerrufen werden kann.

_____	_____	_____
Datum	Name (in Druckschrift)	Unterschrift

Bei Fragen, Anregungen oder **Beschwerden** können Sie sich gerne an den Versuchsleiter wenden:

Prof. Dr.-Ing. Martin Knöll

Fachbereich Architektur

Tel.: +49 6151 16 – 22167

Email: knoell@stadt.tu-darmstadt.de

Verantwortliche Person für die Datenverarbeitung dieser Studie**:**

M.A. Siqi Chen

siqi.chen@stud.tu-darmstadt.de

Bei Fragen zum Datenschutz kann auch der Datenschutzbeauftragte der TU Darmstadt kontaktiert werden:

Gerhard Schmitt

Email: datenschutz@tu-darmstadt.de

Kontaktadresse des Hessischen Datenschutzbeauftragten:

Email: poststelle@datenschutz.hessen.de

Kontaktadresse des Berlinischen Datenschutzbeauftragten:

Email: mailbox@datenschutz-berlin.de

AQ 2.4.31 A questionnaire and open question temple for children's workshop (English version)

Questionnaire 2: Questionnaire for children (Name, Accommodation type)

1. Tell us yourself

1.1 Are you

☐ Girl

☐ Boy ☐ No idea

1.2 How old are you?

☐6 ☐7 ☐8 ☐9 ☐10 ☐11 ☐12

1.3 What is your favourite activity?

1.31. a) What is your favourite sport?

1.4 Whom do you like to play with (possibly more than one option)?)?

☐ Peers (other Flüchtlingskinder) ☐ my sisters or brothers

☐ Parents ☐ volunteer and children staff

☐ Others:

Your day (With o'clock game)

2.1 What are you doing? And where (put it on the clock)?

2.2 What do you usually do with your mobile☐ Games

☐ Games
☐ TV programs
☐ Connect with others
☐ Social media
☐ Others

2.2. a) Which app do you like on your phone?

2.2.b) What do you play with your mobile?

2.3 how long do you use the phone every day (draw it on the clock)?

AI2.4.4D Information sheet & declaration on data protection (parets/photovoice, German version)

Projekt.3

Aufklärungsbogen & Erklärung zum Datenschutz

Aufklärungsbogen

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Gegenstand der Studie

Projekt: Projekt: Socio-spatial Interaction (SSI): Designstrategien zur Förderung des Wohlbefindens die grundschulalter Flüchtlingskinder im wartezustand in Berlin

Ablauf der Studie

Es gibt auch englische, albanische, kurdische und russische Sprachversion für diesen Aufklärungsbogen.

Beobachtungen und vertiefende Interviews mit **zwei als prototypisch eingeschätzten Familien** durchgeführt (ein von jeder Unterkunft). Dieser Teil wird eine Video/foto-basierte Dialog- / Tagesroutenuntersuchung für die Flüchtlingskinder und ihre Familien sein. Diese Materialien werden in einem Kapitel der Dissertation des Forschers verwendet, um den täglichen körperliche Aktivität von Flüchtlingskindern in ihren Unterkünften tiefgehend zu beschreiben und zu skizzieren. Das gesamte Material wird pseudonymisiert und ohne die Gesichter von Kindern oder deren Familienmitgliedern.

Alle Teilnehmer_innen(oder ihre Familienmitglieder) können Deutsch oder Englisch sprechen

Dauer und Aufwandsentschädigung

Die Teilnahme an der Studie/an dem Experiment wird voraussichtlich halb Tag in Anspruch nehmen. (*Als Aufwandsentschädigung erhält jeder Teilnehmer/in 50 Euro oder gleichwertiger Gutschein).*

Möglicher Nutzen der Studie

Die zweite Empiriephase diente der Überprüfung und Vertiefung der Typenbildung.

Ziel unserer Forschung ist es, den Einfluss der gebauten Umwelt auf die körperliche Aktivität und das Wohlbefinden von geflüchteten Kindern (6-12 Jahre) besser zu verstehen und in die Planung von Erstaufnahmeeinrichtungen einzubringen. In diesem Projekt geht es darum, dass sich Kinder und ihre Eltern an der Bewertung und Planung ihrer Erstaufnahmeeinrichtungen beteiligen können.

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_____ _____ _____

Datum Name (in Druckschrift) Unterschrift

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Email: mailbox@datenschutz-berlin.de

TECHNISCHE UNIVERSITÄT DARMSTADT

Technische Universität Darmstadt | Karolinenplatz 5 | 64289 Darmstadt

[redacted]

Ihr Antrag EK 26/2019: Socio-Spatial Interaction (SSI): Design Strategies on promoting well-being of "Wartezustand" Elementary school-aged refugees in Berlin

Prof. Dr. Petra Gehring
Vorsitzende der Ethikkommission

Kontakt über:
Geschäftsstelle der Ethikkommission
Dr. Sebastian Hartmann

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Sehr geehrter Herr Professor Knöll,

haben Sie Dank für Ihren Antrag vom 21.06.2019.

Die Ethikkommission hat den neu eingereichten Antrag eingehend diskutiert. Die Ethikkommission hält fest, dass die geplanten Interviews ohne Zweifel mit einer extrem vulnerablen Zielgruppe geführt werden sollen.

Gleichwohl ist die Vorgehensweise angesichts des Projektziels, baulich-atmosphärische Verbesserungen in Erstaufnahmeeinrichtungen herbeizuführen und Verbesserungsmöglichkeiten partizipativ zu ermitteln, stimmig. Die (im Unterschied zu einem früheren Versuchsdesign) nun mehrsprachigen Aufklärungsbögen stellen eine angemessene Vorinformation der Beteiligten dar, die Möglichkeit zur Nichtteilnahme ist gegeben.

Problematisch wäre es allerdings, durch die Befragung in der Erstaufnahmeeinrichtung unrealistische Hoffnungen auf eine schnelle Verbesserung der Bedingungen in der Einrichtung zu wecken.

Die Ethikkommission regt daher an, den Aufklärungsbogen um einen Hinweis zu ergänzen, dass Verbesserungen erst mittelfristig zu erwarten sind und also künftigen Flüchtlingsfamilien zugutekommen werden. Ähnliches sollte den Befragten mündlich vermittelt werden.

Die Ethikkommission erteilt ein positives Votum mit dem genannten Hinweis.

Die Ethikkommission würde sich – dies ist nur eine Bitte – über eine Information zu den Ergebnissen des interessanten Projektes freuen.

Mit freundlichem Gruß

[redacted]

Prof. Dr. Petra Gehring
Vorsitzende der Ethikkommission

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