



## AFFORDANCES OF CHILDREN'S ENVIRONMENTS IN THE CONTEXT OF CITIES, SMALL TOWNS, SUBURBS AND RURAL VILLAGES IN FINLAND AND BELARUS

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### Abstract

Affordances which according to Gibson (1986/1979) refer to the functionally significant properties of the environment provide a psychologically relevant concept for the analysis of the evolving child-environment relationship. The affordance taxonomy of Heft (1988) was applied in a recent study on children's environments of varying degrees of urbanisation. Affordances for sociality were proposed as an addition to the taxonomy. The study was based on individual interviews with 8–9 year-old children in Finland ( $n=98$ ) and in Belarus ( $n=143$ ). The settings included urban, suburban, small town, and rural environments in both countries as well as a radioactively contaminated area in Belarus. Significant differences were found among the communities and between the countries in affordance availability, in the level of affordances (perceived, used and shaped) and in the distribution of affordances within the categories of the taxonomy. Also the location of the affordances, whether they were at home, in the yard, in immediate surroundings or somewhere further differed significantly in different communities. Further studies are suggested on the elaboration of the affordance taxonomy for different user groups and varying settings.

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### Introduction

Decades ago, Wohlwill (1973) noted the absence of the environment in environmental psychology. Recently Sime (1999) returned to the issue in his review of six textbooks on environment psychology. J.J. Gibson's (1979) ecological perceptual psychology offers one possibility to bring the environment back into environment-behaviour research.

In Gibson's view, people and animals do not *construct* the world that they live in, but are *attuned* to the invariants of information in the environment. (Gibson, 1979; Greeno, 1994). Affordances are the functionally significant properties of the environment that are perceived through the active detection of information. Affordances include properties from both the environment and the acting individual. Affordances are always unique and different for each individual and each specific group of people. Therefore, the concept is well suited for describing the psychologically essential qualities of children's environments.

Affordances can be regarded as a graded property rather than one which belongs to an either-or category (Greeno, 1994; see Figure 1). The different levels of affordances are: potential, perceived, utilized and shaped affordances. In an attempt to give a social dimension to affordances (Costall, 1995), Reed (1993; 1996) has distinguished between the fields of free or spontaneous (FFA) and promoted action (FPA). In the latter, social rules and practices regulate which affordances can be utilized or shaped, and when, where, and how this is done. On the other hand, it is also possible, that the social and cultural context restricts the utilisation and shaping of affordances. This I call the field of constrained action (FCA) (Kyttä, 2001; Ihanainen, 1991). For example, a little boy may independently perceive the potential affordance of climbing but before utilizing this possibility, his parents may either encourage him to be brave and climb, or tell him not to climb because he may spoil his clothes.

Heft (1988) conducted a meta-analysis of several observational studies on children's outdoor

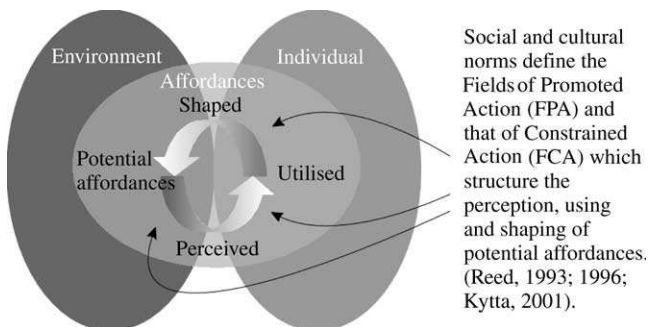


FIGURE 1. The different levels of affordances.

activities and formed an affordance taxonomy of children’s environments. The original taxonomy consisted of 10 functional categories. In this study on children’s outdoor environments this taxonomy is enlarged, as a first attempt, with environmental affordances that support social activities and play i.e. affordances for sociality (Kyttä, 1995; Gaver, 1996).

The aim of this paper is to present an analysis of the affordances of children’s outdoor environments in communities of varying degrees of urbanisation in two countries. The specific research questions dealt with here are:

1. Are there differences in the availability of affordances between the two countries, Finland and Belarus and in the neighbourhoods that represent varying degrees of urbanization?
2. How do the levels of affordances—potential, perceived, utilized and shaped—vary in the communities studied?
3. How are affordances distributed within the categories of the affordance taxonomy developed by Heft (1988) and Kyttä (1995)?
4. To what degree can affordances be found at home, in the yard, in the neighbourhood (within the children’s habitual range) or in

other significant places such as summer cottages?

5. Are there gender differences in questions 2–4?

### Methodology

#### Subjects

The study is based on individual interviews with 8–9-year-old children in Finland ( $n=98$ ) and in Belarus ( $n=143$ ). Before interviewing the children permission to undertake the study was sought from the parents. This was done while delivering questionnaires concerning independent mobility in a sealed envelope to the parents (independent mobility is not analysed here). 95 per cent of the children were allowed to take part in the interview. 2 per cent of the Finnish children were not interviewed because of insufficient Finnish language skills.

Table 1 shows the number of subjects, and the children’s age and gender in the different types of communities in Finland and Belarus. Unfortunately, in Finland the age was coded in months and in Belarus in years. All of the children were attending the same (second) grade.

#### Measures

Affordances of the environments were investigated by using semi-structured interviews. The interview was designed to determine what the environments under study offer children in a physical and social sense. The interview, comprising 40 questions and 36 different affordances, was developed on the basis of Heft’s (1988) functional taxonomy of children’s outdoor environments. Although the interview was an attempt to cover the most important affordance categories, an exhaustive listing of all environmental features is, of course, impossible. One new

TABLE 1  
Subjects of the study

Communities	Finland				Belarus				Total <i>n</i>
	Girls	Boys	Subtotal	Age, mean	Girls	Boys	Subtotal	Age, mean	
Rural village	9	11	20	8,7	14	14	28	8	48
Small town	16	14	30	8,5	21	9	30	8	60
Suburb	10	8	18	8,4	18	12	30	8	48
City	15	15	30	8,5	13	12	25	8	55
Contaminated area					18	12	30	8	30
Total	50	48	98	8,5	84	59	143	8	241

category was added to Heft's original 10 categories, namely affordances for sociality. This preliminary category of affordances for sociality was inspired by van Andel's (1984/1985) activity categories for children's outdoor play. Affordances for sociality included here possibilities to play rule and role plays, playing home or war, being noisy and finally, possibility to share or follow adults' businesses. One category was excluded (Aperture: affords locomotion from one place to another, affords looking and listening into adjacent place) because it was hard to operationalize.

Table 2 shows the affordances included in the interview. After some general questions on the children's outdoor activities, friends and the quality of the yard, the children were presented with a list of questions concerning environmental affordances. An example of an individual question is:

Now I'll ask you about different activities and whether there is a place where you can do these things or not. Is there, in your neighbourhood, a place for... - running?

- yes, do you do it often?
  - <sub>1</sub> no (there is a place but I don't do it often)
  - <sub>2</sub> yes, where do you do it?
    - in my home (inside)
    - in my home yard
    - somewhere in the neighbourhood (within walking distance)
    - somewhere else, where?— — —
  - <sub>3</sub> there wasn't a place for running but I (we) made such a place
- no

Different answers to the questions reflect varying levels of affordances, namely the perceived (marked with (1), used (2), and shaped (3) affordances).

### Procedure

The children were interviewed individually in local elementary schools during lessons. The interview lasted from 45 minutes to an hour. The Finnish children were interviewed by the author and the Belarusian children by local architect students. In the latter case the questionnaire was translated from English to Russian and the author primed the students for the interviews. The interviews were translated later to English. The Finnish data was collected between 1994 and 1999 and the Belarusian

one in 1997. To minimize the effects of varying seasonal and weather conditions, all of the interviews took place during the last two weeks of May.

### Communities

Communities from Finland and Belarus were chosen for study because the countries resemble each other geographically (a lot of fields, forests, rivers and lakes in relatively flat countryside) and the climate is quite similar. There are also some cultural similarities, for example a strong summer cottage tradition in both countries. Nevertheless, there are substantial political and economical differences.

In both countries the research settings included urban, suburban, small town and rural environments. One of the settings in Belarus was a town contaminated in the Chernobyl accident in 1986.

#### The Finnish communities.

The neighbourhood of Töölö in the centre of Helsinki (500,000 inhabitants) was selected to represent the most *urban* environment that can be found in Finland. Töölö is a densely built area intersected by three main roads with heavy traffic. Töölö has some 26,000 inhabitants and it can be characterized as an upper middle class area. Töölö was mainly built in the 1920s and the 1930s. The majority of the houses are six-storey buildings. Both commercial and public services in the area are diverse. Töölö is situated by the sea and there are several public parks in the area.

The Pihlajisto *suburb* of Helsinki has about 3,000 inhabitants. The area mainly dates from the 1970s. The inhabitants of Pihlajisto represent mostly lower middle class. Pihlajisto is situated on a high rocky hill surrounded by green valleys. The area's modern houses are 3 to 8 storeys high. Pihlajisto has a small shopping centre with a few stores, a kiosk and a restaurant. There is one big play park in the area and several smaller ones.

The town of Kitee in eastern Finland represents the *small town* environment in this study. Kitee is a typical Finnish rural town with about 11,000 inhabitants of which 6,000 live in the main village. There are no buildings in the centre of the town higher than three storeys. The town is located by a lake and there are many accessible green areas in the surroundings.

Two small villages, Harjankylä and Luomankylä in Kauhajoki in the western part of Finland, were chosen to represent the *rural environment* in this study. Harjankylä has about 740 inhabitants,

Table 2  
*A functional taxonomy of affordances used in the study (cf. Heft, 1988)*

Environmental qualities that support certain affordances	Affordances	Environmental opportunities for sociality	Affordances for sociality
Flat, relatively smooth surfaces	<ul style="list-style-type: none"> <li>● affords cycling</li> <li>● affords running</li> <li>● affords skipping</li> <li>● affords skating</li> <li>● affords playing hopscotch</li> <li>● affords skiing</li> <li>● affords playing (football, ice-hockey, tennis or badminton)</li> </ul>		<ul style="list-style-type: none"> <li>● affords role playing</li> <li>● affords playing rule games</li> <li>● affords playing home</li> <li>● affords playing war</li> <li>● affords being noisy</li> <li>● affords following/sharing adult's businesses</li> </ul>
Relatively smooth slopes	<ul style="list-style-type: none"> <li>● affords coasting down</li> <li>● affords skateboarding</li> </ul>		
Graspable/ detached objects	<ul style="list-style-type: none"> <li>● affords throwing</li> <li>● affords digging</li> <li>● affords building of structures</li> <li>● affords playing with animals</li> <li>● affords using plants in play</li> </ul>		
Attached objects	<ul style="list-style-type: none"> <li>● affords jumping-over</li> <li>● affords jumping-down-from</li> </ul>		
Non-rigid, attached object	<ul style="list-style-type: none"> <li>● affords swinging on</li> <li>● affords hanging</li> </ul>		
Climbable feature	<ul style="list-style-type: none"> <li>● affords climbing</li> <li>● affords looking out from</li> </ul>		
Shelter	<ul style="list-style-type: none"> <li>● affords hiding</li> <li>● affords being in peace and quiet</li> </ul>		
Mouldable material (dirt, sand, snow)	<ul style="list-style-type: none"> <li>● affords moulding something</li> <li>● affords building of snow</li> </ul>		
Water	<ul style="list-style-type: none"> <li>● affords swimming</li> <li>● affords fishing</li> <li>● affords playing with water</li> </ul>		

Luomankylä 430 inhabitants and the whole municipality, Kauhajoki, about 15,000. Each village has a small elementary school with 4 – 6 grades, but not many other services, not even a grocery store. The majority of dwellings are small wooden one-storey farmhouses. The density of the villages is very low and every house has a garden. There are many open fields, forests and quiet roads nearby. Both villages are intersected by a river. (Figure 2)

*The Belarusian communities.* The urban environment is a district of Minsk, the capital of Belarus (population 1,610,000). This district is an industrial area with a population of 120,000. Most of the people are workers. The public outdoor environment has little to offer to children—there are few play-

grounds and the schools are old and in bad condition. The houses of the area are mainly two or three storey buildings.

A *suburban* environment, Uruchia, is located in the eastern part of Minsk. Uruchia has about 19,000 inhabitants. Most of the area was built up in the late 1980's, but construction works are still going on here. Traffic in the area is very heavy because of the proximity to the main road between Moscow and Minsk. The building density is high, the majority of houses are nine-storey buildings.

*The contaminated community,* Kalinkovichy, is in the south-western part of Belarus. The town has a population of about 45,000. Architecturally, Kalinkovichy has both village and town features. Next to a small wooden house you can find a big modern



FIGURE 2. (a) The Finnish city, Töölö. (b) The Finnish suburb, Pihlajisto. (c) The Finnish small town, Kitee. (d) The Finnish rural village, Luomankylä.

apartment building. At the outskirts of town there is a large park with playgrounds, but few yards have playgrounds for children. In the spring of 1986, after Chernobyl accident, Belarus received 70 per cent of all radioactive fall-out of the accident, contaminating 23 per cent of the land area. Kalinkovichy is

part of the affected area (zone V), where the accident caused a social, economic and environmental crisis. The level of contamination at Kalinkovichy is not among the highest recorded, being 1 to 15 Ci/km<sup>2</sup> of Cesium 137. This level of contamination allowed inhabitants to continue living in the area

without mandatory relocation as in the most severely contaminated areas. (Klimova, 1996).

The *small town* environment in Belarus, Niasviz, has about 15,000 inhabitants. The town is located 112 km south-west of Minsk. Niasviz is one of the historical and cultural centres of Belarus. The town is divided into two parts by a river: north-west (historical) and south-east, where most of the housing is situated. The majority of the dwellings are one-storey detached houses, all of them built in the last 50 years. There is an old palace with a park nearby.

The *rural village*, Ilya is situated near Vileika, about 60 km from Minsk. Ilya has about 2,000 inhabitants, who mostly work in agriculture. The village is situated on a hill, with a small river running through it. The dwellings are mainly small, one-storey private wooden houses surrounded by gardens. There is a big school in the village, attended also by children from other small villages. There are sports grounds close to the school. (See Figure 3.)

#### *Statistical analysis*

All computations were made using the SPSS program, version 10.0. To construct a scale for neighbourhood affordances, factorial analysis was used, applying the principal axis factoring method and varimax rotation. Analysis of variance (ANOVA) was used for comparisons among the communities and independent-samples *t*-test to compare the two countries. ANOVA-results were further analysed by using Tukey's test.

## **Results**

#### *Neighbourhood affordance availability*

A scale was constructed, based on all the questions (35 in total) relating to the affordances included in the study, to describe the degree of availability of them in different communities. The dimensions of the scale was analysed by applying factor analysis, which revealed that the loadings of one factor solutions ranged from 0.17 to 0.63. The variables with loadings less than 0.30 were excluded from the scale. A total of six variables were excluded<sup>1</sup>. The Cronbach's alpha of the scale with 29 items=0.85

The constructed scale describes the affordance availability of the neighbourhood (yard and the immediate surrounding)<sup>2</sup>. The comparison of the average values of the scale in different communities revealed that the highest neighbourhood affordance

availability was found in the Finnish rural village, and the lowest in the Belarus suburb. The children living in the Finnish rural village found an average of 23.8 affordances in their neighbourhood out of a total of 29 in the scale (82%), while the children in the Belarus suburb found on average only 10.3 affordances (36%). (See Figure 4.) On average, the availability of affordances in the Finnish communities exceeded significantly that of the affordance availability in the communities in Belarus. ( $t=16.2$ ,  $df=239$ ,  $p=0.000$ ). The Finnish children found an average of 69 per cent (20.1/29) of the affordances included in the study in their neighbourhood, while the children in Belarus identified only 39 per cent (11.3/29) of the affordances as available.

The differences among the Finnish communities in the affordance availability of the neighbourhoods were mainly significant (ANOVA:  $F=11.1$ ,  $df=97$ ,  $p=0.000$ ). Only the differences between communities closest in the number of available affordances were not significant. For instance, the difference between the country village and the suburb was not significant, but the differences between the country village and the other types of communities were significant (Tukey's test: rural village/small town  $p=0.002$ , rural village/city  $p=0.000$ , suburb/city  $p=0.003$ ). Among the Belarusian communities, the small town differed significantly from the three communities with the lowest availability of affordances (ANOVA:  $F=3.9$ ,  $df=142$ ,  $p=0.005$ ). The following levels of significance were in Tukey's test: between the small town and the suburb  $p=0.005$ , between the small town and the contaminated area  $p=0.02$  and between the small town and the city  $p=0.04$ .

To compare the shares of the different levels of affordances in the two countries, the utilized and shaped affordances were grouped into one group under the heading of active affordances. This was necessary as it was not possible to gain information on the share of shaped affordances from the Belarusian data. The Finnish communities had more active affordances than the Belarusian communities ( $t=13.8$ ,  $df=239$ ,  $p=0.000$ ). Of the affordances listed in the scale, in Finland 58 per cent (16.8/29) were actively used or shaped. In Belarus, the proportion of active affordances was 29 per cent (8.5/29). The difference in perceived affordances in the two countries was not significant ( $t=0.95$ ,  $df=239$ ,  $p=0.35$ ).

The comparison of the share of different levels of affordances between the communities revealed the following significant differences. (See Figure 4 and Table 3.) The share of *perceived* affordances in the Finnish suburb was larger than in the city



FIGURE 3. (a) The Belarushian city, Minsk. (b) The Belarushian suburb, Uruchia. (c) The Belarushian contaminated area, Kalinkovichy. (d) The Belarushian small town, Niasviz. (e) The Belarushian rural village, Ilya.

( $p=0.01$ ), in the small town ( $p=0.000$ ) and in the rural village ( $p=0.000$ ). The differences between the Finnish communities for *utilized* affordances were significant in three cases: in the small town ( $p=0.02$ ) and the rural village ( $p=0.000$ ) the utilized affordances exceeded significantly those in the city, and similarly utilized affordances in the

rural village exceeded significantly those in the suburb ( $p=0.004$ ). In the Finnish rural village children *shaped* affordances more than children in all other communities ( $p\leq 0.001$ ). The Belarushian communities did not show any significant differences in the proportions of perceived or utilized affordances.

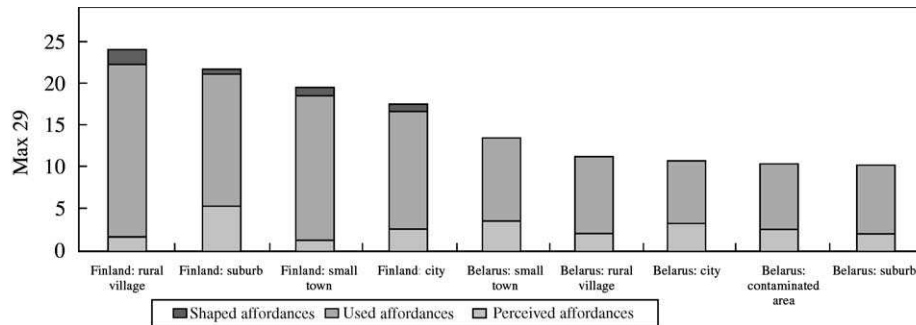


FIGURE 4. The means of the total scores of the affordance scale for neighbourhoods: Perceived, used and shaped\* neighbourhood affordances in different communities. Note: \*classification available only in Finnish data.

TABLE 3  
The availability of different levels of neighbourhood affordances in the nine communities

		Finland: rural village (N=20)	Finland: suburb (N=18)	Finland: small town (N=30)	Finland: city (N=30)	Belarus: small town (N=30)	Belarus: rural village (N=28)	Belarus: city (N=25)	Belarus: contami- nated area (N=30)	Belarus: suburb (N=30)
Mean	Not perceived	5,1 (2,6)	7,3 (2,4)	8,1(3,4)	11,4 (4,7)	15,2 (2,9)	17,9 (3,6)	18,2 (3,8)	18,4 (4,0)	18,6 (3,5)
(SD)	Perceived	1,5 (1,6)	5,2 (2,9)	1,2 (1,2)	2,6 (2,5)	3,6 (3,0)	2,1 (1,6)	3,4 (4,0)	2,7 (2,2)	2,1 (1,9)
	Used	20,8 (2,7)	16,1 (3,7)	17,5 (4,6)	14,3 (4,2)	10,0 (3,9)	9,0 (3,4)	7,4 (3,4)	7,9 (3,0)	8,2 (3,6)
	Shaped	1,5 (1,6)	0,3 (0,7)	0,7 (1,1)	0,4 (0,8)	—	—	—	—	—

Note: The share of the shaped affordances was nor available in the Belarusian data.

Boys found slightly more affordances in the neighbourhood than girls. This difference wasn't significant ( $t = 1.2$ ,  $df = 239$ ,  $p = 0.54$ ), nor did gender affect the share of perceived, utilized or shaped affordances.

#### *The distribution of active neighbourhood affordances within the categories of the affordance taxonomy*

In order to look more closely at the nature of the various affordances, the affordances were examined according to the affordance taxonomy categories in Table 2. A sum score was created for each category by summing the individual affordances in each category. Each score describes the degree of availability of certain kind of affordances. All 35 affordances were used in order to ensure that the classification of categories complied with Heft's (1988) original taxonomy and the new version prepared here, and to ensure that each affordance category contained no less than two variables.

Significant differences were found in the scores of eight categories between the different communities in Finland (ANOVA:  $1.2 \leq F \leq 30.9$ ,  $df = 97$ ,  $p \leq .03$ ). The non-differing categories were smooth slopes

and non-rigid attached objects. Significant differences between the communities in Belarus were found in three categories: non-rigid attached objects, graspable detached objects, and water games (ANOVA:  $4.0 \leq F \leq 6.0$ ,  $df = 142$ ,  $p \leq 0.004$ ). Comparisons between the two countries showed differences in all categories except for the category of attached objects ( $2.2 \leq t \leq 11.1$ ,  $p \leq 0.03$ ).

Figures 5 and 6 list active neighbourhood affordances of the Finnish and Belarusian communities categorised according to the affordance taxonomy. The bar chart discloses the average scores of each category. The maximum scores are expressed in percentages in order to enable comparisons among categories. The bars have been arranged in a descending order so that the category with the highest average score (nonrigid, attached objects) is presented first, and the category with the lowest average score (water) is last. The communities are also arranged in a descending order according to the average score.

The Finnish rural village out-performed other communities in affordance availability in almost all categories (cf. Figure 5). The affordance availability of the rural village was greater in three



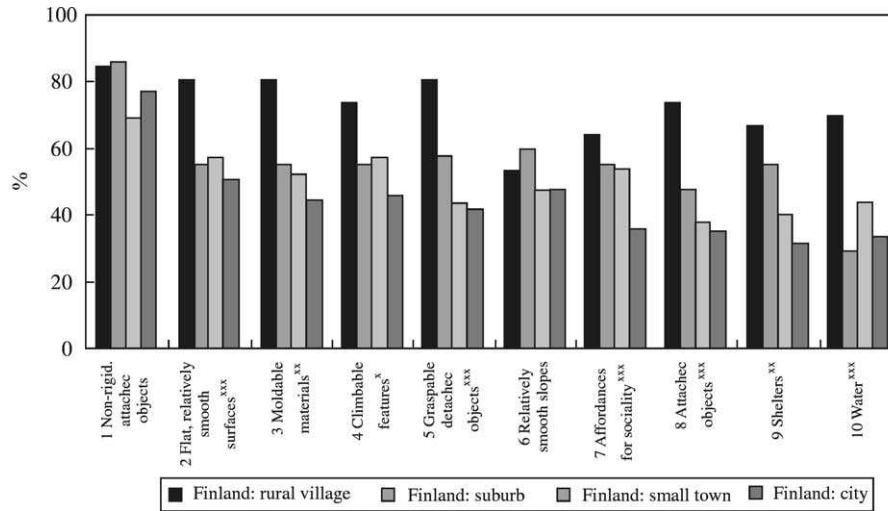


FIGURE 5. The percentages of the scores of affordance availability in the Finnish communities categorized according to the affordance taxonomy. Significant differences among the communities were found in categories marked with X.

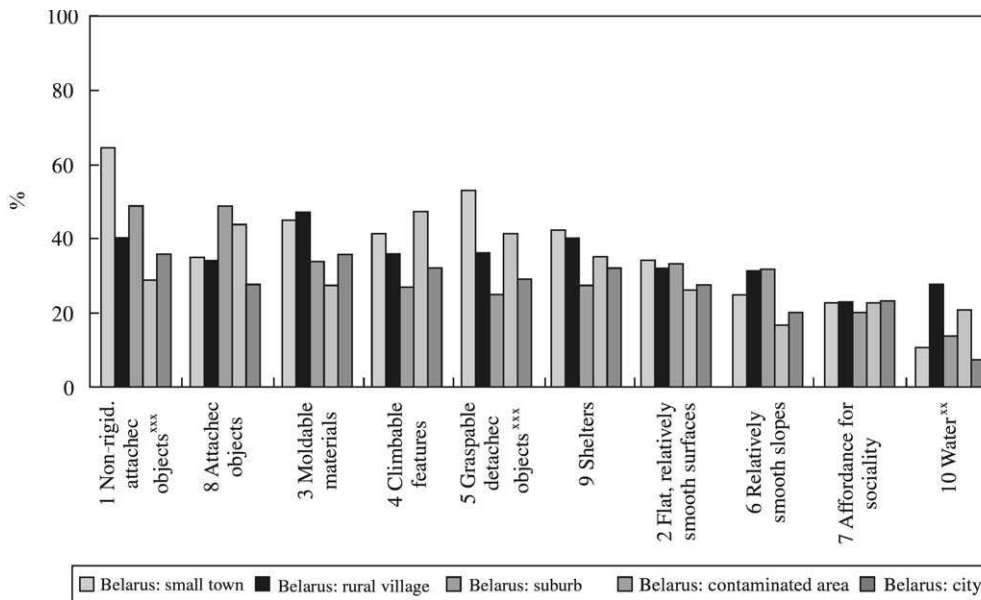


FIGURE 6. The percentages of the scores of affordance availability in the Belarushian communities categorized according to the affordance taxonomy. Note: The number of the categories refer to the order of the categories in the Finnish data.

categories (categories 2, 5 and 10, Tukey:  $p \leq 0.03$ ) than in all the other communities. It was also greater in the remaining five categories (3, 4, 7, 8 and 9, Tukey:  $p \leq 0.04$ ) than in the city and in the small town. Nevertheless, this general rule did not apply for flat, relatively smooth slopes, a category in which the rural village did not score highest. The differences between communities in this category were, however, not significant. The differences be-

tween the other communities were significant only in affordances for sociality where the affordance availability of the city undercut all other communities (Tukey:  $p \leq 0.02$ ). The score levels of the city environment were on the low side also in the other categories. On average, the categories of nonrigid, attached objects and flat, relatively smooth surfaces received the highest scores, over 60 per cent of the maximal ones. These categories can be called

‘strong’ affordance categories. The strongest category, nonrigid, attached objects that afford swinging and hanging scored over 80 per cent of the maximal score. The lowest average scores were in the categories of water, shelter, and attached objects. These categories can be called ‘weak’ since the average was 48 per cent of the maximal score. Particularly weak categories—those which scored 30 per cent or less—were water games in the suburb and sheltered places in the city.

Figure 6 shows that the differences between the Belarushian communities in different affordance categories were smaller than in the Finnish data. In two categories, namely non-rigid, attached objects and graspable detached objects, the scores in the small town were significantly higher than in the city and in the suburb (Tukey:  $p \leq 0.04$ ). In the category of water games, the affordance availability of the rural village exceeded that of the small town and the city (Tukey:  $p \leq 0.03$ ). The ‘strongest’ and the ‘weakest’ categories were the same than in Finland, but otherwise the order of the categories varied somewhat.

Gender differences were disclosed in two categories. Boys found a greater amount of affordances connected to relatively smooth slopes ( $t = 2.0$ ,  $df = 239$ ,  $p = 0.05$ ) as well as affordances for sociality ( $t = 1.9$ ,  $df = 239$ ,  $p = 0.05$ ) than girls.

*Where are affordances found?*

*Where in the neighbourhood are affordances found?*

The exact location of the active affordances (utilized or shaped) on the yard or elsewhere in the immediate surrounding is indicated in Figure 7. The figure also includes the affordances found in the home environment. This analysis incorporates references to multiple places, and thus the method differs from the analysis outlined in Figure 4. The availability of affordances in the communities may

seem to differ in these two analyses. This ‘problem’ is particularly noticeable in the case involving the two communities with a particularly high level of references to multiple places. In the Finnish suburb and in the Belarussian contaminated area, an unusual high number of affordances were found both in the yard as well as elsewhere in the immediate surroundings. In both communities, these affordances accounted for 11 per cent of the active affordances in the neighbourhood. In the Finnish suburb the number of affordances found in multiple places exceeded (ANOVA:  $F = 4.7$ ,  $df = 97$ ,  $p = 0.004$ ) those recorded in the small town (Tukey:  $p = 0.03$ ) and in the city (Tukey:  $p = 0.008$ ). Similarly, the Belarushian contaminated area differed in this respect from all other communities in Belarus (ANOVA:  $F = 13.2$ ,  $df = 142$ ,  $p = 0.000$ , Tukey:  $p = 0.000$ ).

Here, affordances of the yard refer to affordances in the home yard. The class ‘other immediate surroundings’ include affordances in the school yard, play grounds, friends’ home yards, sports grounds, nature environments and affordances along roads and other traffic routes. Unfortunately, no information was available on the specific distribution of affordances between these subclasses.

The Finnish communities differed significantly in the number of affordances in the home yard (ANOVA:  $F = 13.4$ ,  $df = 0.97$ ,  $p = 0.000$ ). There were more affordances in the yard in the Finnish rural village than in any other Finnish community included. (Tukey’s test: village/ town  $p = 0.000$ , village/city  $p = 0.000$ , village/suburb  $p = 0.007$ ). The children in the rural village identified an average of 13.1 affordances out of 29 (45%) in their home yard. The city enjoyed the lowest number of affordances in the home yard, accounting for an average of 20 per cent of the maximum number of affordances (5.9/29). (See Figure 7)

The Belarussian communities differed from one another both in the number of home affordances

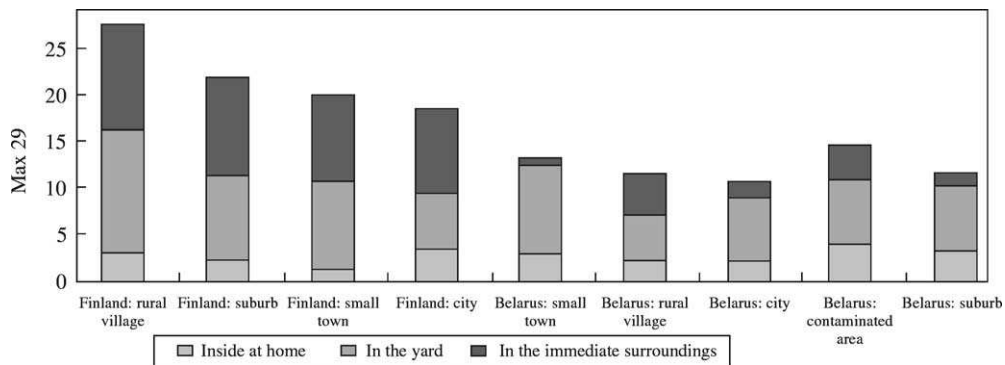


FIGURE 7. The location of active neighbourhood affordances.

(ANOVA:  $F=4.7$ ,  $df=142$ ,  $p=0.001$ ) the affordances of the yard (ANOVA:  $F=7.9$ ,  $df=142$ ,  $p=0.000$ ), and affordances of immediate surroundings (ANOVA:  $F=13.3$ ,  $df=142$ ,  $p=0.000$ ). As to affordances in the home, the contaminated area in Belarus stood out by providing an unusually high number, 12 per cent (3.5/29) of affordances identified in the home environment. The differences between the contaminated area and the rural village (Tukey's test:  $p=0.003$ ) and the city (Tukey's test:  $p=0.003$ ) were significant. The small town stood out from other Belarusian communities by the large number of home yard affordances, with 32 per cent of affordances found in the yards (9.3/29). The differences between the small town and other types of communities were significant (Tukey:  $p\leq 0.03$ ). The number of affordances was lowest in the rural village yards (16%, 4.5/29), and the difference significant with the other communities in Belarus (Tukey:  $p\leq 0.04$ ), with the exception of the city yards. The communities in Belarus differed in that the number of affordances in the child's immediate surroundings was highest in the rural village (16%, 4.5/29) and in the contaminated community (12%, 3.5/29). These communities differed significantly from all other types of communities, but did not differ significantly in comparison with each other (Tukey:  $p\leq 0.03$ ).

Differences were noted between the two countries both in respect to affordance availability in the home yards ( $t=2.9$ ,  $df=239$ ,  $p=0.004$ ) and affordances in the immediate surroundings ( $t=15.7$ ,  $df=239$ ,  $p=0.000$ ). An average 29 per cent (8.4/29) of affordances were found in Finnish home yards, respectively in Belarus 24 per cent (6.9/29). In the case of immediate surroundings, the difference was even more pronounced. The Finnish immediate surroundings provided on average 33 per cent (9.5/29)

of affordances, and the Belarusian surroundings only 8 per cent (2.3/29). As to affordances in the home environment, no differences were noted between the two countries.

There were also significant gender differences in the location of the active affordances. Girls found more affordances in the home environment ( $t=4.8$ ,  $df=239$ ,  $p=0.000$ ) and in the home yards ( $t=2.9$ ,  $df=239$ ,  $p=0.004$ ) than boys. Boys, on the other hand, found more affordances in the immediate surroundings ( $t=-2.2$ ,  $df=239$ ,  $p=0.03$ ).

#### *An example of the geographical distribution of affordances*

Figure 8 presents the geographical distribution of active neighbourhood affordances in one community, namely the Finnish suburb. The affordance map shows that the majority of active affordances are located within the built area of the suburb. The affordances are concentrated in the home yards, in the school and the nursery yard, as well as in the playground of the park. There are few affordances in the surrounding large green areas of the suburb.

#### *Can the neighbourhood affordances be supplemented?*

The following section will analyse the extent to which children indicated active affordances in places outside their immediate neighbourhood. Generally, attempts to supplement the affordances were few, and most of the affordances were located in the immediate neighbourhood of the home. The Finnish city children and the Belarusian children living in the contaminated area were the only exception to this. A significant part of the affordances found by these children were in areas outside their

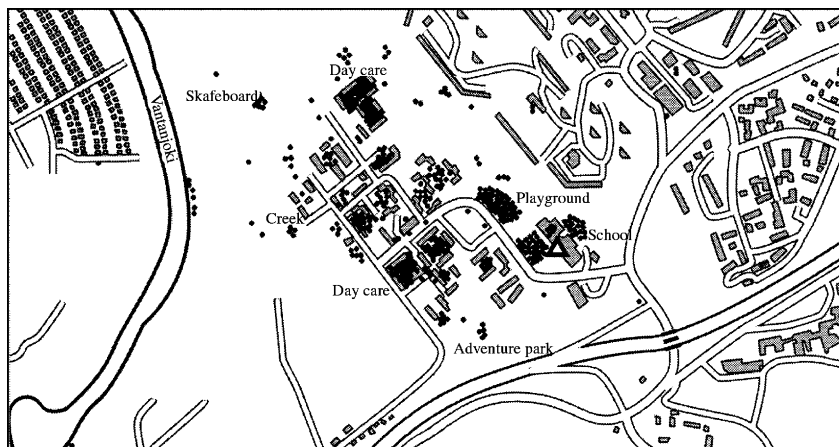


FIGURE 8. The distribution of active neighbourhood affordances in the Finnish suburb.

neighbourhood (see the next section). On average, Finnish children mentioned affordances outside their immediate neighbourhood in 13 per cent of the cases (3.9/29), and the Belarusian children in 12 per cent of the cases (3.4/29). The small difference between the two countries wasn't significant. However, differences were found between the individual communities in both Finland (ANOVA:  $F=19.2$ ,  $df=97$ ,  $p=0.00$ ) and Belarus (ANOVA:  $F=11.6$ ,  $df=142$ ,  $p=0.000$ ).

Among the Finnish communities, the city children were most likely to mention affordances outside their immediate neighbourhood, and 26 per cent (7.6/29) of affordances in the city were found this way. In this respect the city children differed from children in all other communities (Tukey:  $p=0.000$ ). Children living in other communities rarely mentioned affordances outside their immediate neighbourhood (6% – 9% of all cases), and there were no significant differences between these communities. Children living in the contaminated area in Belarus also utilized affordances outside their immediate neighbourhood fairly frequently, and outside affordances accounted for 21 per cent (6.0/29) of all affordances mentioned by these children. In this respect, the contaminated area differed significantly from all other Belarusian communities (Tukey:  $p=0.000$ ), where affordances outside the immediate neighbourhood were mentioned in 6 per cent – 10 per cent of all cases.

A close analysis of where such outside affordances were to be found involved only the Finnish data as sufficiently detailed information was not obtained in the interviews conducted in Belarus. For the purpose of the analysis, the affordances were grouped into (1) affordances in the same community (but not in the immediate neighbourhood), (2) affordances at the summer cottage or at 'granny's house', and (3) affordances elsewhere in Finland and (4) abroad. Significant differences were found between communities in the case (1) (ANOVA:  $F=6.2$ ,  $df=970$ ,  $p=0.001$ ) and the case (2) (ANOVA:  $F=17.3$ ,  $df=97$ ,  $p=0.000$ ).

Affordances in the community outside the immediate neighbourhood were more often important to children living in the city (Tukey:  $p=0.000$ ) and in the suburb (Tukey:  $p=0.02$ ) than to children living in the small town. The city children found 5 per cent (1.4/29) and the suburban children 4 per cent (1.2/29) of the affordances this way. The city children mentioned often the summer cottage or 'granny's house', and 18 per cent of the affordances mentioned by these children (5.3/29) were located in these environments. The difference in comparison

with the other communities was significant (Tukey:  $p=0.000$ ). There were no significant differences between the communities in the few cases of the affordances in other parts of Finland (3) and abroad (4).

There were no gender differences in the attempts to supplement the affordances of the neighbourhood.

## Discussion

The first research question of the study was whether the availability of neighbourhood affordances differs in environments of varying degrees of urbanization. The degree of urbanisation was sufficiently connected to the availability of neighbourhood affordances to make it possible to acknowledge a relationship between the two. The neighbourhood was defined as the home yard and the immediate surroundings within the child's habitual range. In the Finnish data, the country village provided the largest number of actively available affordances and the city the lowest number. Correspondingly, in Belarus, the greatest number of affordances were noted in the small town and the lowest number in the city. The differences between the communities in Finland were mostly significant, while the differences between the communities in Belarus were marginal.

The superior amount of affordances provided by the rural environment in Finland may stem from the extent of accessible natural environment in rural villages. The natural environment has been shown to contain a rich set of affordances (Fjørtoft, 1997). The Finnish rural villages in the study have large green areas, forests, and fields where everyone is allowed to wander (the right of common access). The villages are also safe and children enjoy a lot of freedom to move around independently (Kyttä, 1997). These villages differ from the British rural villages described by Matthews *et al.* (2000) who interviewed rural children aged 9 – 16 in Britain. The authors found social places (outdoor public spaces where one could be seen by peers and be away from the 'adult gaze') to be more important to these rural children than the natural ones. The reason for this may be partly the fact that children's access to the natural environment is restricted by fencing off the private land and by parental fears.

The availability of neighbourhood affordances in Finland and Belarus differed significantly. On average, Finnish children identified 69 per cent of the affordances listed in the affordance-scale (Table 2). Fifty-eight per cent of the maximum possible affordances were active ones (utilized or shaped). The

Belarusian children identified in their neighbourhood only 39 per cent of the affordances listed in the scale. Twenty-nine per cent of the latter were considered active. The differences between the two countries are most conspicuous in the availability of the affordances in the immediate surroundings. The latter provide Finnish children on average 33 per cent of the affordances listed in the scale, while the corresponding figure for Belarus is only 8 per cent. This means that Finnish children can find more opportunities for different kinds of activities in their immediate surroundings than Belarusian children.

The difference between affordance availability in the Finnish and the Belarusian neighbourhoods can be explained by differences in the quality of publicly funded facilities in the two countries. In Finland, public funds are invested into projects such as playgrounds, sports facilities, parks, and the yards of nurseries and schools. In Belarus, few resources have been invested in outdoor recreational settings. In both countries the home yard seems to be an important source of affordances. The affordance map (Figure 6) of the Finnish suburb indicates that only few affordances are found in the natural environment that surrounds the neighbourhood.

The results stress the importance of the yard and the immediate surroundings as an important source of affordances for children. It is possible that the home yard acts as the first arena for finding affordances outdoors which can later extend to other environments. Correspondingly Prezza *et al.* (2001) found that the home yard acts as a springboard to independent activities for a child in Italy.

Another explanation for the difference between the affordance availability of Finnish and Belarusian neighbourhoods might be the restrictions of independent mobility in Belarus. In an earlier study with the same children, Kytta (1997) found that the Finnish children had a licence to move around quite freely. In a forthcoming study (Kytta 2002) the independent mobility of Belarusian children will be analysed in order to learn more about the relationship between the availability of affordances and independent mobility. In the Finnish sample, those children who enjoyed most freedom to move around, i.e. rural children, also found the greatest amount of affordances. The theoretical causality between affordance availability and independent mobility needs, however, further investigation.

The scarcity of affordances available in the Belarusian neighbourhoods is poorly supplemented by other environments. Most of the Finnish and Belar-

usian children found their affordances mainly in their immediate neighbourhood and only about 12 per cent of the listed affordances were discovered elsewhere. However, the polluted area in Belarus and the city environment in Finland were exceptional in that more than 20 per cent of affordances were identified in areas outside the immediate neighbourhood. According to the information provided by Finnish city children, this 'other' neighbourhood was usually the summer cottage or 'granny's house'. Like Finland, also Belarus has a strong tradition of summer cottages. It is possible that the Finnish city children's experience applies in Belarus as well. The city children interviewed in Finland came from well-to-do middle class families who can provide their children with the experiences of alternative environments. The reason for the high proportion of affordances found in the alternative environments to the contaminated areas of Belarus may stem from parental fears of the effects of pollution on the children. This might urge the parents to seek safer environments for children's outdoor play. The interpretation is supported by the fact that data from other Belarusian communities does not corroborate the result of the importance of alternative environments. Belarus has also many rehabilitation programs for children living in the radioactively contaminated areas. These programs include camps in safe areas in Belarus and abroad. (UNICEF, 1995). It is possible that the children in the study referred to these experiences.

It is possible that at least well-to-do city children create a so-called dual environmental identity (Kytta, 1995). This means that they identify with and commit themselves to more than one environment. Thus, the summer cottage, for instance, can be used to compensate for the shortcomings in a child's everyday environment. A similar phenomenon was identified by Jovero and Horelli (2000) among Finnish suburban young people who regarded the countryside as an important restorative place and a source of emotional and physical support. Also Nordström (2000) found that city children tend to be attracted by distant environments, often by the idealized countryside.

The second research question dealt with how the levels of affordances vary in different communities. The varying levels of affordances—potential, utilized and shaped—differed significantly in the Finnish data but not in the Belarusian data. Information about the shaped affordances was not available in Belarus. However, this does not affect the interpretation of the data since shaped affordances are, in effect, a special type of utilized

affordance. In Belarushian data shaped affordances are included in the classification of active and utilized affordances. The differences between the utilized affordances followed the general trend of the variability of affordance availability: in the nonurban Finnish communities (the rural village and the small town), utilized affordances were recorded more frequently than in the urban (the city and the suburb) communities of Finland. The number of passive affordances—perceived but not utilized—were particularly high in the suburb. The rural village, on the other hand, differed significantly from the other communities in the large number of shaped affordances.

The rural environment seems to encourage children to create their own affordances. The type of work done by parents—often agricultural work or animal husbandry—is likely to have an impact by providing the children many examples of how to manipulate their environment. Furthermore, the home environment provides a wealth of material which encourages, for instance, building of structures. The high number of passive affordances in the suburb can be explained by the fact that most of the used affordances were situated in the core area of the suburb, within the built area. The suburb is surrounded by green areas that provide attractive potential affordances, which, however, may not be utilized because of mobility restrictions.

The third question in the study concerned the variance of the distribution of affordances within the categories of the affordance taxonomy (Kyttä, 1995; Heft, 1988). The used taxonomy consisted of 10 different categories. Both in the Finnish and in the Belarushian data swinging and hanging opportunities were classified on average as the strongest affordances in every community. Water play was found to be on the average the weakest type of affordances. In the Finnish data, the affordance availability of the rural village outperformed all the other communities in almost all categories. Surprisingly enough, also affordances for sociality were strongest in the rural village and weakest in the city. The Finnish rural villages in the study were, however, so small that there were only few children of the same age and gender. The city environment, on the other hand, could be expected to compensate for the restricted availability of functional affordances by stronger social ones. That was not, however, the case in this study.

Boys found more affordances of smooth slopes and even affordances for sociality than girls. This result may be due to the gender differences found in the location of the affordances. Boys found more

affordances in the immediate surroundings, whereas girls found more opportunities in the home environment and in the yard. Thus, the availability of affordances located in the immediate surroundings may have been richer than that in the home and the yard.

Different categories of affordances seem to have different weights in varying environments. The totality of the weighted categories in one setting can be called an affordance profile of the setting. The Finnish suburb contained, for instance, water affordances that were weak and smooth slopes that represented strong affordances. Water affordances were hard to find also in the Belarushian suburb where the category of attached objects (that affords jumping over and jumping down) was easily available. These profiles, which reveal the weak and strong environmental aspects from the perspective of different user groups need further studies in diverse settings.

Good planning might enable to increase the amount and type of affordances by providing, for instance, safe facilities for water games and by creating hiding places and secret nooks, while avoiding a sense of social danger (cf. Appleton, 1984; Herzog & Chernick, 2000). It is probably more difficult to plan for improved affordances for sociality. Nevertheless, it is possible to create spaces where children can meet. Consideration should be given, in particular, to the creation of environments that support social interaction between children. Children's participation projects indicate that children are well aware of the weak points of their neighbourhood, especially when they are making plans for water play or designing sheltered places and sites for cross-generational meetings (Horelli, 2001). The basic affordance taxonomy applied here for affordances for sociality needs further elaboration in the future.

Affordances for sociality were not included in Heft's (1988) affordance taxonomy which was based on observational studies of the activities of children aged 7–12 years. The ages of the children and the quality of the settings in the original observational studies might have influenced the content of the taxonomy. Therefore, further studies are needed to find out the age-related and cultural impact on the core categories of affordances.

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### Notes

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<sup>1</sup>Excluded variables – water games, jumping down from, jumping over, looking out from, hiding, playing with animals.

<sup>2</sup>Note! The study takes into account that an affordance may be found both in the yard as well as in the immediate surroundings. This level of the analysis includes the affordance only once in the calculations, as the maximum number of affordances would otherwise be exceeded.

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