

An index for assessing activity-friendly urban environments for children – insights from a case study in Berlin

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Abstract

The urban environment strongly affects physical activities of the urban population. While spatially explicit walkability indices have been developed to assess the walkability for adults, such approaches are missing for children. The aim of this paper is to present an index for activity-friendly urban environments for children. We develop the index from interviews and apply it to the city of Berlin.

Keywords: walkability, children, neighbourhood, urban health, qualitative approach, spatial index

1 Introduction

The environment, besides other individual and societal factors, is known to influence physical activity of individuals in urban settings. While the concept of walkability is frequently applied to assess walking-friendliness of cities for adults, there is still a lack of consistent studies analyzing urban environments particularly for children. Existing studies rely on mainly quantitative methods measuring to what extent the environment supports physical activity of children such as accelerometer-based data combined with spatial data [1], statistic correlations of social and built environment and the weight [2] or combining subjectively measured physical activity and environmental variables in a spatial index [3]. However, comparable and transparent methods are missing [4, 5] as well as specific knowledge on environmental activity-influencing factors in German urban areas [2].

This study therefore aims to identify factors that describe activity-friendly urban environments for children. Based on these factors an index is developed that allows for area-wide estimations.

2 Material and Methods

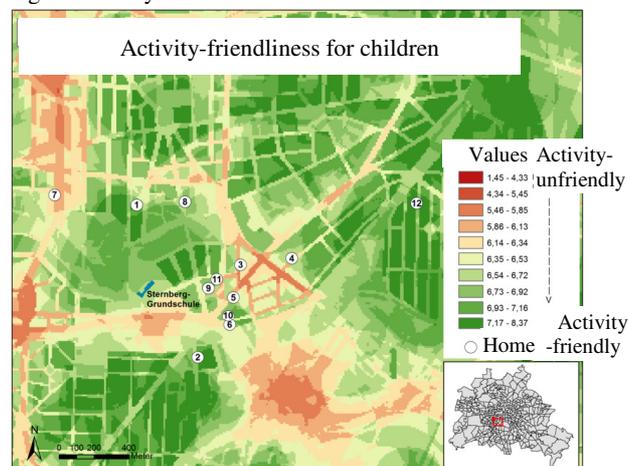
We chose a case study in Berlin. We conducted guided qualitative interviews with twelve parents and eighteen 9- to 10-years old children at one school in Berlin to identify activity factors. In this age children are expected both to play outside and to move actively without the dependence on their parents. By using a map of their living environment, parents were asked to describe the activity behavior of their children. The group of children reported activity-inhibiting factors and illustrated their ideal activity-friendly environment. The derived subjectively perceived factors from qualitative interviews were combined with additional factors from a

literature review. As a result spatial indicators for the following categories were identified: access to activity and recreational destinations, land use planning, traffic and road safety and the social environment. Only those indicators were selected for developing the spatial index that were spatially explicit, consistent, possible to quantify and last but not least, available in data.

Certain indicators were excluded because of missing data, such as traffic density and traffic light cycles or temporary meeting points of youth, homeless persons, alcoholics or drug addicts. Some indicators were addressed by proxies such as the perceived road safety by the density of pedestrian involved accidents.

Data was acquired from different sources for calculating and mapping these indicators. Data preprocessing included calculating several distance, density and diversity measurements. Lastly, the different indicators were combined and weighted in an aggregated spatial index of activity-friendliness and a map of activity-friendliness for the whole city of Berlin was generated.

Fig. 1: Activity-friendliness of urban areas for children



3 Results and Discussion

The final index consists of the following activity-friendly indicators derived from the interviews and literature: short distances to parks, playgrounds, public sports fields, public swimming pools, fountains, gardens and courtyards; high population density, mixed land use and low connection density; short distances to play streets and traffic calmed streets, low density of pedestrian involved accidents, long distance to main roads; and a high proportion of children, low density of casinos, night clubs and sex shops and a high bin density. In a weighting procedure the different factors were weighted according to their importance based on the literature review and the interviews [4, 6]. The visualization of this spatial index allows for quantitative evaluation of activity-friendliness of an urban neighborhood for children.

4 Outlook

The systematic and transparent nature of the available index may enable future applications in other cities and settings. We propose to test the index for transferability in a next step and to then systematically test and compare the activity-friendliness of different urban areas.

References

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