Vol. 156, No. 3 · Research article

Exploring Children's Sense of Place With Qualitative Spatial Methods

DIE ERDE

Journal of the Geographical Society of Berlin

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Manuscript submitted: 19 December 2024 / Accepted for publication: 24 October 2025 / Published online: 19 January 2026

Abstract

Children sense their environment differently than adults. Despite a growing number of studies on children's environmental perception, there is limited research on characterizing and methodologically addressing their perception and sense of place. The aim of this study is to characterize children's sense of place and identify key benefits and challenges of qualitative spatial methods for assessing children's sense of place. We explore children's sense of place in the context of active mobility based on a literature review and the authors' experiences of empirical case studies. Our findings highlight the influence of children's cognitive development on their spatial knowledge, often oriented on landmarks. Children's spatial stories are rooted in past experiences in space. Their perceptions originate from multisensory experiences. Children develop their own place meanings, partly independent of the intended purposes of those places. In addition, place attachment, shaped by memories and encounters, develops particularly through interaction with the environment independent of parents. This knowledge is important for geographical research, but also for urban planning, environmental education, and health promotion.

Keywords children, sense of place, perception, walking interview, mental map

Schicketanz, J., Kabisch, S., & Lakes, T. (2025). Exploring children's sense of place with qualitative spatial methods. *DIE ERDE*, *156*(3), xx–xx.

https://doi.org/10.12854/erde-2025-764

1. Introduction

In recent years, a growing body of research has explored the influence of environmental perception on various aspects of human behavior and well-being. Studies on children's behavior in space, such as active mobility, consider both perceived and objective environmental factors (De Meester et al., 2014; Ikeda et al., 2018; Remmers et al., 2014; Veitch et al., 2020). Research has shown that children's perception of their environment significantly impacts their physical, cognitive, and emotional development (Chawla, 2016; Nordström, 2010). At the same time, primary school-aged children are still developing cognitively and possess varying levels of spatial knowledge (Appleyard, 2017; Montello, 2001).

Although children's mobility and spatial practices have increasingly gained attention, less focus has been placed on how to meaningfully access their spatial perceptions and experiences through appropriate methods. Existing approaches often overlook the sensory, emotional, and imaginative ways in which children engage with space. To address this gap, this paper focuses on the methodological question of how children's sense of place can be explored using qualitative spatial methods. Therefore, this study asks: How can qualitative spatial methods be used to access children's sense of place, and what are their benefits and challenges?

To answer this question, the article first outlines the theoretical background of the sense of place concept, particularly in relation to children's spatial experience and development. It then presents three qualitative case studies that apply different spatial methods—mental mapping, guided walks, and go-along interviews—to explore children's environmental perceptions. These case studies serve as a basis for methodological reflection on the potential and limitations of qualitative spatial methods—the main focus of the paper. The aim is to derive methodological insights that can inform future child-centered urban geography research and participatory planning processes.

2. Theoretical Background: Place Meaning and Place Attachment as Constituents of Children's Sense of Place and Children's Geographies

To understand children's environmental perceptions as a cognitive process of directly perceiving and interpreting sensory information (Lloyd, 1997), this study builds on the sense of place concept. It refers to the connectedness to a place and the feeling of *belonging to* and *being rooted in* (Tuan, 1977). The concept originates from environmental psychology and is also used in perceptual geography and environmental and social sciences with slightly different meanings, for example, rootedness, place affiliation, place identity, place dependency, and place bonding (Kudryavtsev et al., 2012; Nelson et al., 2020). In this study, we follow Stedman's (2008) definition of sense of place, which has two dimensions: First, the individual cognitive association with a place, named *place meaning*. The other is the affective connection between a person and a place, called *place attachment* (Altman & Low, 1992). For example, the place meaning of an urban green space can vary from "it is a place of recreation" to "an abandoned place where I fear danger." The former can lead to a high place attachment, perceiving the forest as a "second home," the latter to no particular attachment to the place.

The sense of place develops through bodily encounters, social interaction, and appropriation during childhood (Christensen & O'Brien, 2002; Ulloa et al., 2021). It is not a finished but a dynamic process and is constantly modified in later life (Lim & Barton, 2010). However, the development of a sense of place depends on the extent to which the spaces themselves offer opportunities for interaction and on whether children are given the opportunity to interact with their spaces (Olds, 1979). Lim and Barton (2010) differentiated children's sense of place, beyond the affective connection with space, into environmental understanding (e. g., contextualized, comprehensive, critical understanding of a place) and environmental competence (e. g., knowing how to navigate and engage in a place). This illustrates that a sense of place does not only mean a good orientation and distinct knowledge about space. It is also reflected in children's understanding of their physical and social environments in their own contexts, describing and evaluating them according to their experiences. A strong sense of place fosters pro-environmental behavior, well-being, and visions for improved spaces (Moskal, 2015; Williams, 2008).

Although research suggests that a stronger sense of place generally increases feelings of safety (Chataway, 2020), it is important to recognize that negative interactions between children and their environment, characterized by fear, violence, and exclusion, may not have the positive effects described above.

The study of children's spatial experiences builds on a long tradition of research in children's geographies and interdisciplinary childhood studies. Pioneering work by Muchow (Muchow & Muchow, 1935) highlighted how children's everyday geographies are deeply shaped by their social roles and spatial constraints. Ward (1990) later advocated for the recognition of children's autonomous spatial practices in their environments, calling for spaces that allow exploration and informal play. These early contributions resonate with later critiques of the increasing institutionalization and privatization of childhood spaces, particularly in urban contexts (Zeiher & Zeiher, 1994). Unregulated and self-directed spaces have become increasingly scarce, while adult surveillance has intensified. Recent research continues to underline these dynamics by analyzing the changing mobility patterns of children and their consequences for their independent mobility. Studies show how reduced freedom of movement due to safety concerns, traffic, and parental control significantly limits children's spatial range and learning (Mikkelsen & Christensen, 2009; Alparone & Pacilli, 2012).

In parallel, the field of children's geographies has undergone a conceptual shift from viewing children primarily as objects of protection towards recognizing them as agents in spatial production, capable of constructing place meanings, negotiating boundaries, and reshaping their surroundings (Woodyer, 2008; Kraftl, 2019). Socio-material approaches (Alberth et al., 2020; Spyrou et al., 2018) as well as posthumanist perspectives (Änggård, 2016) highlight the relational entanglement of children, material environments, and sensory experiences. These frameworks advocate for more participatory, multimodal, and situated research approaches, which take into account not only children's voices but also their embodied practices and affective responses. In the German context, current debates on childhood in the city (Kogler, 2015; Appel & Schreiber, 2024) further stress the need to rethink urban planning and public space from a child-centered perspective.

Researching children's sense of place requires understanding their cognitive development and spatial knowledge. Piaget's model suggests that primary school children rely on concrete experiences to develop spatial understanding (Piaget & Inhelder, 1956), though more recent studies show overlaps between developmental stages and greater cognitive abilities than previously assumed (Holloway & Valentine, 2000; Vogl, 2015). In addition to their orientation toward real-life experiences, children are also influenced by stories and images from media such as books and films (Vogl, 2015). It is the children's ability to verbalize and visualize spatial perception that develops later. Freemann (2006) emphasizes that children "have the most intimate knowledge" of their environment (p. 83), as they are in direct sensory contact with it—even infants get to know their environments through tasting and touching. Therefore, it is crucial to consider how children's environmental perception can be assessed in light of their spatial experiences. Clark's mosaic approach (2017) offers a useful framework for combining different modes of expression such as drawing, talking, photographing, or walking. It acknowledges the importance of multiple, child-appropriate forms of participation and expression. This perspective also underlies the methodological pluralism used in the present study. Place-based investigations address children's spatial knowledge, which is described as "the subjective or individual experiences and perceptions of space" and "imaginations, emotions and affective reactions related to space" (Löw & Knoblauch, 2019, p. 11). According to Siegel and White (1975), spatial knowledge develops in three successive stages. First, children develop *landmark knowledge* by perceiving and describing specific points. This is followed by *route knowledge*, in which landmarks are connected to paths through everyday movement in space. Lastly, *survey knowledge* develops, in which different places are related to each other at the same time, enabling one to, for example, estimate shortcuts and detours (Montello, 2001; Siegel & White, 1975). The spatial knowledge varies not only in terms of age and body size but also in terms of other contextual factors such as education, social status, and culture (Montello, 2001). It is influenced by the common mode of travel and is more pronounced in children who walk (Appleyard, 2017). Lim and Barton (2010) indicate that "children's interactions with the environment and the assimilation of environmental experiences would produce a feeling of competence and confidence" (p. 329). Growing spatial knowledge empowers children and allows them to

perceive themselves as independent beings (Brillante & Mankiw, 2015).

As our case studies indicate, children's spatial perceptions are strongly shaped by individual and social factors such as cultural background or past encounters. For example, children from different family contexts described the same location in contrasting ways. This supports Warren's (2020) observation that spatial meaning is always situated and diverse. Chawla et al. (2005) emphasize the need for innovative and flexible methods to involve children in research. Additionally, the child's position in social structures, particularly the child-adult relationship, requires critical consideration (Nordström & Wales, 2019).

To the authors' knowledge, only three studies in the last 10 years have addressed children's sense of place in relation to mobility using walking interviews or mapping techniques (Green, 2018; Wales et al., 2021; Webber et al., 2024). Webber et al. (2024) investigated the effect of a lack of mobility due to the pandemic on children's sense of place. Children's maps showed isolated houses and missing connections during lockdowns, and place meanings were derived from pre-pandemic sensory and social experiences of space. Wales et al. (2021) emphasized the importance of social interaction and free play in fostering a sense of place. Green (2018) observed children's use of forests for hide-and-seek and rule negotiation. The importance of "informal wild places" or "inbetween places" for children's free play and the development of the sense of place has been described in further studies (Cohen & Duggan, 2021, p. 221; Elsley, 2004, p. 158).

It is worthwhile to differentiate between "places for children" and "children's places" in qualitative studies (Rasmussen, 2004, p. 155). On the one hand, child-related urban planning can succeed in giving children space to move (places for children), meeting the requirements to be changeable, adaptable, and inviting to interactions (Ulloa et al., 2021; Wilson, 1997). On the other hand, open spaces can provide children with opportunities for free play and physical activity that were not originally designed for them (children's places; Burke, 2005). Children evaluate the attractiveness of places by asking, "What can I do here?", whereas adults tend to ask, "What does it look like?" (van Andel, 1990, p. 30). The most popular places are therefore places that encourage interaction and communication through the presence of other children and adults, that stimulate certain activities (e.g., places to hide), and that are diversely designed with natural features, as well as safe and exciting elements (van Andel, 1990; Wilson, 1997).

Children's sense of place can be studied through their descriptions, reflections, and interactions with space. Therefore, the phenomenon needs to be studied in its actual context and cannot be considered isolated. The sense of place can hardly be measured quantitatively. Only a few studies on place attachment have applied quantitative methods, such as the Place Attachment Scale, which uses a questionnaire to measure how pronounced young people's attachment to a place is (Magalhães & Calheiros, 2015). Urban planning is mainly done by adult experts and rarely focuses on children as urban stakeholders (Christensen & O'Brien, 2002; Hatzelhoffer, 2018; Heinrich et al., 2022). However, greater participation of children, which is also called for in the UN Child-Friendly Cities Initiative, is not possible by transferring knowledge and methods directly from adults (Child Friendly Cities Initiative, 1996; Nordström, 2010). In order to involve children more closely in research and planning, it is necessary to reflect on their particular perceptions of the environment and to adapt the methods used.

The above-presented theoretical perspectives—including cognitive-developmental approaches, perceptual geography, children's geographies, socio-material and affective geographies, as well as participatory frameworks—differ in their assumptions: While developmental approaches emphasize universal cognitive stages and the gradual acquisition of spatial knowledge, perceptual geography perspectives highlight the role of individual experiences, meaning-making, and situated knowledge. More recent socio-material and affective geographies, in contrast, focus on relational entanglements, multisensory experiences, and the agency of bodies and material environments. Rather than merging these frameworks into a single model, this study draws on them as complementary lenses to understand different aspects of children's sense of place.

3. Case Studies of Children's Environmental Perception Using Qualitative Spatial Methods

3.1 Multiple Case Study Design

A multiple case study design was chosen to answer the research question: How can qualitative spatial methods be used to access children's sense of place, and what are their benefits and challenges? This approach is used to investigate a phenomenon in its natural, real-life context in depth (Crowe et al., 2011). Case studies are appropriate for *how* and *why* research questions about a current phenomenon over which the researcher has no control (Yin, 2018). We selected three case studies that serve as illustrative examples for applying qualitative spatial methods in child-centered research, with each case contributing specific insights.

We analyzed three case studies that investigated the physical activity spaces of primary school children and their environmental perception. The three studies were conducted in German cities between 2015 and 2020. The studies have in common that the children were between 8 and 10 years old and that the children themselves were interviewed about their built, natural, and social environments surrounding home and school. In each case, different qualitative spatial methods were used, which are presented in more detail in Table 1.

3.2 Case Study 1: Mental Maps of the School Environment in Berlin Schöneberg

The first study was conducted in June 2015 with 9–10-year-old third-grade children from a primary school in Berlin Schöneberg. The participating children came from a socio-economically and ethnically diverse, densely populated neighborhood. A focus group interview explored general physical activity patterns, including travel, sports, and play. Following this, the children created mental maps to visualize places they associated with physical activity and enjoyment (see Figure 1). As the study took place in a school setting, particular attention was paid to voluntary participation and informed consent, and it was ensured that children understood the purpose and process in age-appropriate ways (see also Christensen & James, 2008). Researchers had to remain attentive to power dynamics in child-adult interactions (Abebe & Bessell, 2014). Building on the reflections of Schreiber & Ghafoor-Zadeh (2022), ethical practice was treated as a process, not a one-time consent, with continuous dialogue during the focus group to ensure children's comfort and agency. (For detailed information about the study, see Schicketanz et al., 2018.)

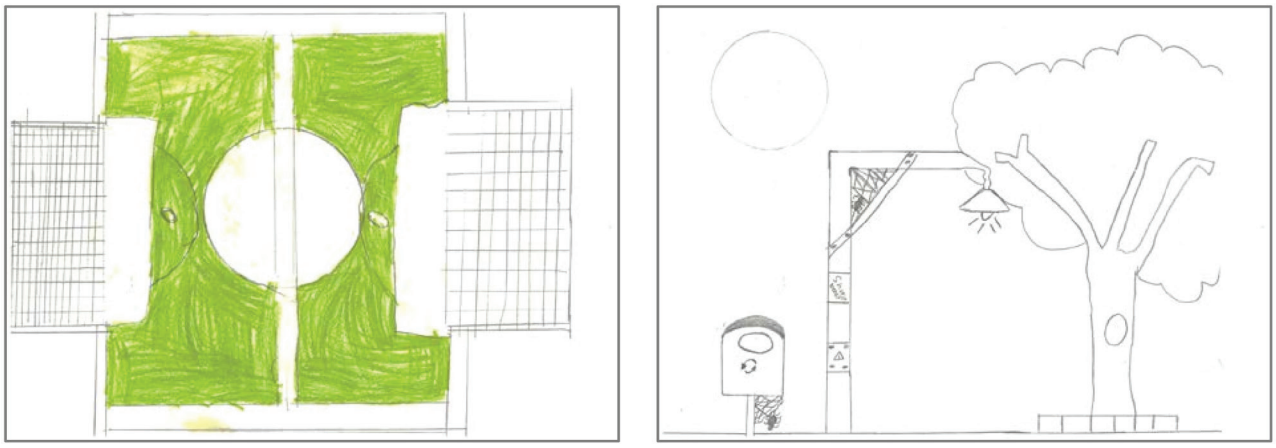
The first case study indicates that primary school children primarily associate activity-friendly places with play and sports and less with active travel. Individual elements of the mental maps could be aggregated to the neighborhood and quantified, demonstrating

Table 1 Case Study Overview

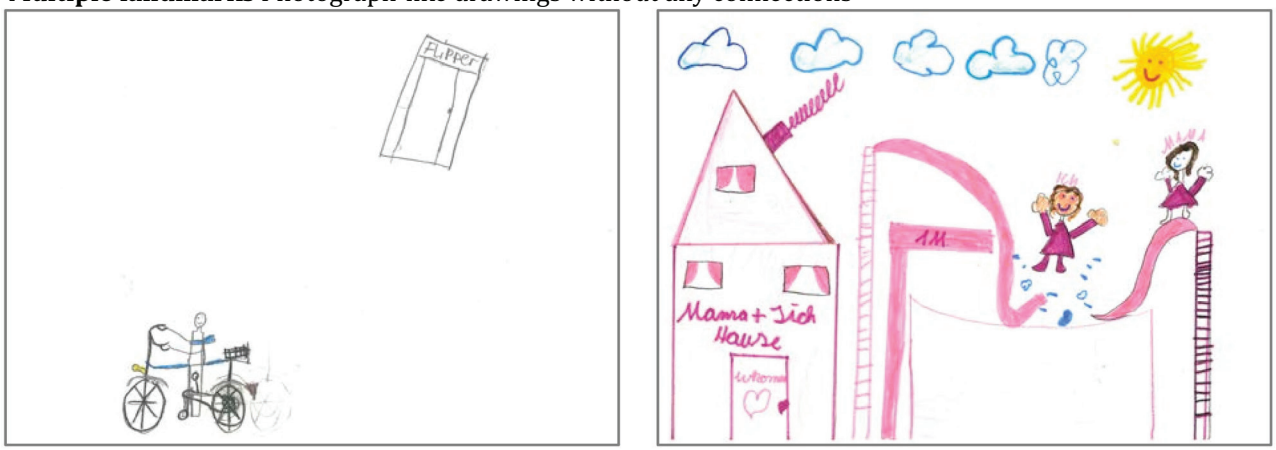
Case study	Interviews	Label of interviews	Thematic focus	Instructions (given to the children)	Location
1	1 *Focus group* with 18 children, 18 *mental maps*	A	Physical activity spaces in the school and home environment	*Describe and draw places where you like to be physically active*	*Berlin Schöneberg*
2	6 *Guided walks* with 4–5 children each	B–G	Environmental perception and evaluation of the school environment	*Describe, rate (positive, negative), and track your perception of the surroundings during the walk*	*Berlin Mitte*
3	14 *Go-along* interviews with 1–7 children and 1–2 parents each	H–U	Active independent travel along the journey to school	*Describe your journey to school verbally and with photos, highlighting what you like and dislike*	*Leipzig*

Figure 1 Selected Mental Maps from Case Study 1

Single landmarks (Arial) Photograph-like drawings



Multiple landmarks Photograph-like drawings without any connections



Landmarks and areas connectect with routes Map-like drawings with fictive elements

Note. Source: Own elaboration.

which places are preferred for being physically active. As a visual tool, mental maps allow children to express experiential spatial knowledge. However, their reliance on memory and abstract representation may limit capturing actual movement or connectivity. Still, they offer insight into place meanings and activity-related perceptions from a child's perspective.

3.3 Case Study 2: Guided Walks Through the School Environment in Berlin Mitte

The second study was conducted in June 2017 with 9–10-year-old children of a third-grade class at a primary school in Berlin (Schicketanz, 2024). Participants came from socio-economically and ethnically diverse

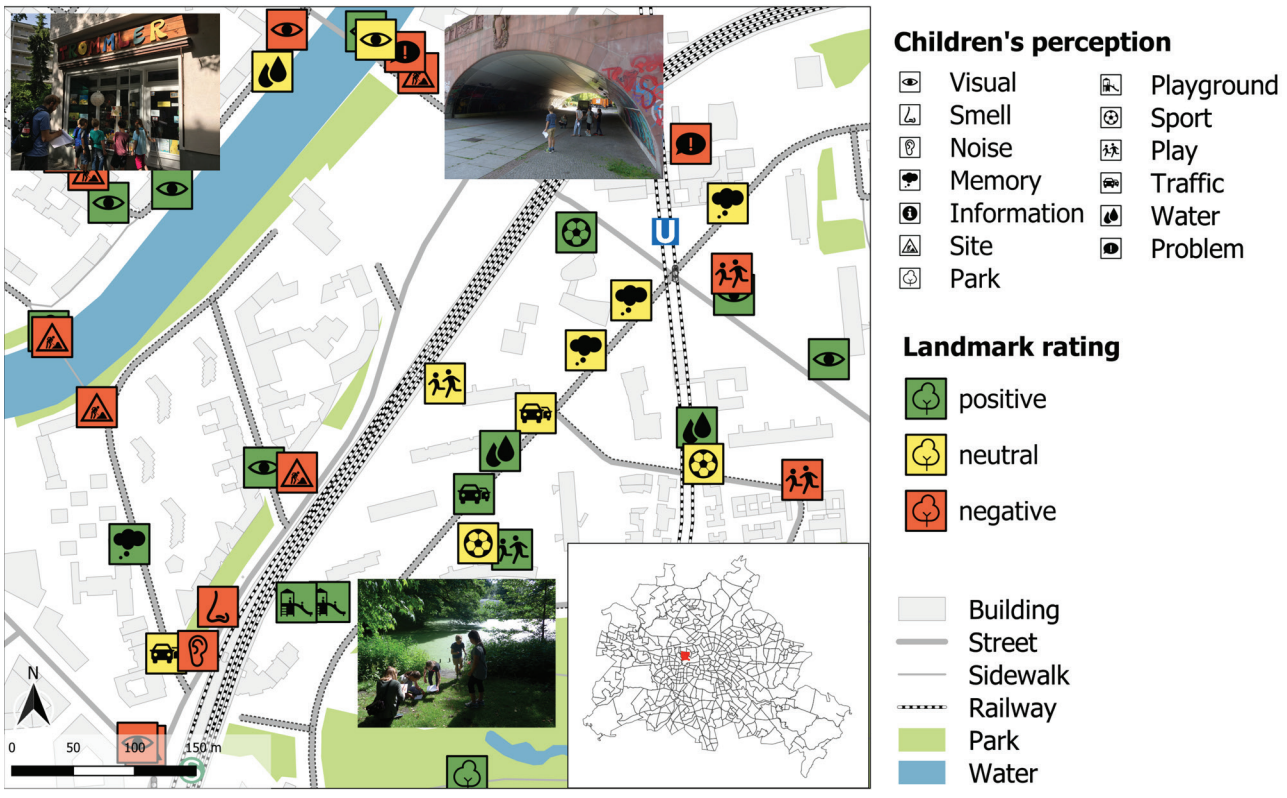
neighborhoods. Similar to Case Study 1, voluntary participation because of the school setting and ensuring that children understood the purpose and process was key to the research. In addition, walking with children in public spaces required careful consideration of privacy, safety, and the visibility of the children. Following Skelton (2008), continuous reflexivity was needed to balance children's freedom to choose places with the responsibility to protect them during the walks. The study aimed to map children's perceptions of their school environment and categorize places they liked or disliked during researcher-led guided walks (Kusenbach, 2003; Sommer & Töppel, 2021).

During the walks, 136 landmarks were identified and described through on-site field notes. The landmarks were then evaluated by a group of children using a traffic light system (green: "We like this place," yellow: "We can't decide," and red: "We don't like this place"). The descriptions were then further summarized and classified into 13 categories, including memories, visual aspects, sounds, smells, play places, and traffic. The study generated a qualitative GIS that visualized both children's spatial knowledge and place meanings in relation to their embodied experience (see Figure 2). The method allowed for direct interaction with space and enabled the documentation of multi-sensory, affective, and contextual impressions. The presence of peer groups supported collective reflection during the walk but limited the identification of highly individual perceptions. The use of simplified symbols in a perception map, displayed at school, offered children feedback and helped to anchor the generated spatial knowledge. As a method, guided walks thus provide insight into how children evaluate space in action and in context—bridging experience, memory, and evaluation.

3.4 Case Study 3: Go-Alongs in Leipzig

The third study was conducted from February to July 2020 with 8–10-year-old children at primary schools in three contrasting neighborhoods in Leipzig (Schicketanz et al., 2024). The neighborhoods differed in terms of centrality, population density, and socioeconomic structure. Slightly more girls than boys attended. The aim of the study was to identify factors for

Figure 2 Qualitative GIS With Children's Perceptions from Case Study 2



Note. Source: Own elaboration.

active and independent school travel and to investigate the perception of the route environment. For this purpose, 14 children and their parents were accompanied along their way to school and interviewed while walking or driving. A semi-structured interview guide was used. During the go-along interviews, the voice and GPS track were recorded. In addition, the children were asked to take pictures of important points along their routes. The interviews were transcribed and then coded. Interview segments on landmarks (148), codes, and photographs were geocoded and visualized together with the GPS tracks in QGIS (see Figure 3). This qualitative GIS approach allowed for locating and comparing the route perceptions of children and parents. In addition to the age-specific communication of aims and methods, the go-along interviews raised specific ethical challenges, as children's routes often included personal routines and semi-private shortcuts that were accounted for during the entire research process, for example, also in publishing anonymized maps of the results (see Figure 3). Similar to the other case studies, it was necessary to reflect continuously on power dynamics and ensure the children's comfort and agency throughout the walks.

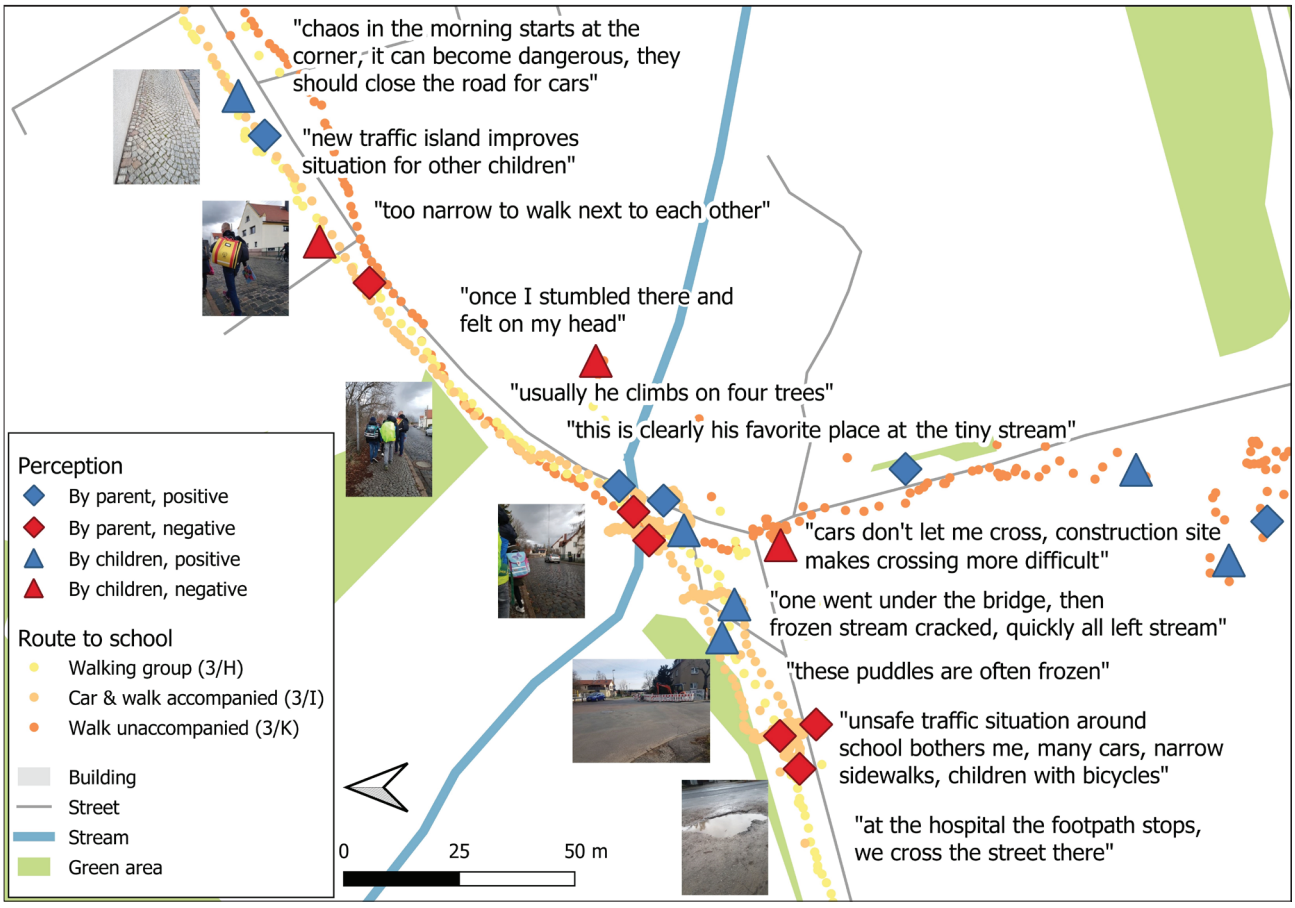
Interview participants used varying modes of transport and group compositions, ranging from unaccompanied walkers to walking groups, public transport users, and children driven by car. The method generated rich data by combining spatial traces with verbal and visual narratives. Go-alongs allowed researchers to access spatial knowledge embedded in routines and embodied experiences.

4. Results and Discussion

4.1 Qualitative Methods to Assess Children's Sense of Place

This section presents key findings from three case studies illustrating how qualitative spatial methods can capture children's sense of place in diverse and multifaceted ways. The data show that children's spa-

Figure 3 Qualitative GIS Including Interview Quotes From Parents and Children and Children's Photographs from Case Study 3



Note. Source: Own elaboration.

tial perceptions are closely tied to specific, often multisensory, experiences and are shaped by their stage of cognitive development. Place attachment emerged across all case studies through concrete landmarks, past experiences, and emotionally charged interactions, whether positive or negative. Informal and appropriated spaces played a crucial role in how children related to their environment, alongside formally assigned play areas. Children's sensory perceptions, particularly of sound, smell, and visual impressions, were also a recurring theme. Furthermore, the degree of independent mobility was found to significantly impact children's sense of orientation, autonomy, and emotional connection to place. While these findings are not presented as a typology, they do demonstrate how different qualitative spatial methods, such as mental maps, guided walks, and go-alongs, can provide insight into the spatial experiences of children. This highlights the importance of considering imagination, agency, and embodiment in research with children.

The case studies illustrate the importance of spatial experiences for children's cognitive development. In Case Study 3, the children stated that they enjoy walking and being outside (Case Study 3/interview I [3/I]; 3/M). The joy of being able to do something on their own and independence was described (3/P). With one exception, children in the mental map study drew outdoor activity places with which they associated positive experiences. Both show the inner need of children to get in touch with their environment and the preference to move around independently and actively (Egli et al., 2019; Wilson, 1997). These interactions and encounters can become part of a "positive interactive cycle" leading to growing spatial knowledge and geo-literacy skills, which in turn results in a growing motivation to explore the environment (Chawla, 2007, p. 155).

The painted, verbalized, and photographed environmental perceptions in all three case studies are shaped by the phase of concrete-operational thinking (Piaget, 1963) and children's landmark knowledge (Montello, 2001). Predominantly, point-like perceptions linked to particular experiences were described. For example, in Case Study 1, the children drew mental maps of sports and playgrounds, as well as swimming pools, which they had recently visited. Only 4 of the 18 maps actually had paths or streets drawn on them. The children recall the memory of individual places but hardly link them spatially on their maps or in their descriptions. This may also reflect the framing of interview prompts, which often encouraged point-based descriptions. Still, combining walking with real-time documentation (e.g., in guided walks) helped link spatial elements with situated meaning.

The children in Case Study 3 partly expressed their knowledge about routes to school and certain connections of places. However, they showed difficulties in assessing different route options. For example, a walking group chose a "secret route," which was described as shorter, but in reality was somewhat longer (3/R). Hart (1979) also emphasized the importance of self-chosen shortcuts, even if they are actually truly long cuts. So, if children in this age are to participate in urban planning, it can be worthwhile to discuss individual points with the help of concrete options for action considering their current stage of cognitive development.

Children who regularly walked unaccompanied demonstrated more detailed spatial knowledge. One child's route description, naming multiple intersections and landmarks (3/K), exemplified how independent movement fosters geo-literacy and navigation skills (Brillante & Mankiw, 2015; Holt, 2013; Lim & Barton, 2010).

Past experiences and perceptions played an important role in all three case studies. For example, children drew mental maps of outdoor swimming pools that they visited together with family and friends during the summer. In Case Study 3, one child described walking a detour in winter to sled on a frozen lake (3/S). Experiences with friends were described positively in the majority of the interviews. But places of encounter can also be perceived as negative in the long term. For example, in Case Study 2, children described a meeting place of drug users or homeless people as places they avoided (2/D). In Case Study 3, a child described a place near a playground as threatening because a stranger had approached the children there (3/U). In some cases, memories blurred with imagination, such as depictions of sharks or horror clowns, pointing to the fusion of real and fictional elements in spatial perception (Vogl, 2015).

Our data show that children's place associations often draw on both real experiences and imagined narratives. In Case Study 1, children included sharks and other fantasy dangers in their mental maps. These examples reflect what Lukashok & Lynch (1956) and

Vogl (2015) describe as the interplay between direct sensory perception and imaginative engagement with space. Therefore, imagination and fiction need to be considered to a certain degree when including children's perspectives in urban planning processes. Qualitative spatial methods, such as walking interviews, facilitate the differentiation of past experiences, fictional elements, and the actual state, as real places are visited and described.

All three case studies show that sensory perceptions shape children's sense of place. The primary school children described not only visual aspects but also sounds and smells. In the second case study, numerous places were named where annoying smells or noises were perceived. For example, a group of children described a homeless meeting place along a walkway by the river as smelling strongly and wished for less rubbish (2/F).

In our studies, smell and noise were mainly perceived negatively: vehicle emissions along busy roads, petrol stations described as stinky, dog excrement and litter, as well as noisy construction sites and traffic. These observations align with Bourke's (2017) findings from a photo-elicitation study in Dublin, in which he described the *sensory dimension* of the sense of place.

Contrary to Van Andel's thesis (1990) that it is mainly adults who wonder what a place looks like, the children also mentioned visual aspects in the interviews. Above all, the natural environment (trees, flowers) was described as "beautiful," but also as buildings or monuments. Litter, traffic, and graffiti were considered aesthetically disturbing. Children perceive their environments through all sensory dimensions, including tactile sensing, which is more relevant for infants (Freeman, 2006).

The three case studies show that children attach individual associations and meanings to their environment. On the one hand, places explicitly designed for children were named and mapped: playgrounds with a variety of equipment for play, football fields for sports, and a smooth asphalted path for cycling and skating. Even though a majority of the children attributed very similar and positive meanings to these places, a few children also expressed divergent opinions. For example, playgrounds seemed rather boring to some children because the playground equipment was designed for younger children, a playground bench was repurposed as a flea market, or some girls were not interested at all in public football fields. Even when planning inherently child-friendly spaces like playgrounds and sports fields, it is important to incorporate the diverse perceptions and needs of children differing, for example, by age and gender.

On the other hand, the children described places that they appropriated and used in their own ways. For example, in the second case study, children played on the stairs of an apartment complex and slid down the railings, or they playfully refreshed themselves at a public water pump. In the third case study, a child climbed on trees along his way to school during the interview and floated nutshells on a stream that was crossed (3/I). These examples show that children ascribe their own individual meanings to places and appropriate them in the form of informal free play. The case studies thus underline the importance of "wild" or "unprogrammed places" (Elsley, 2004, p. 158; Gülgönen & Corona, 2015, p. 221), in which the natural environment plays a crucial role (Shabak et al., 2015; Webber et al., 2024). Particularly, water areas and trees seem to attract children's free play.

Regular and independent experiences of place along the school journey led to a higher place attachment. In Case Study 3, the school journey was not perceived as annoying but as a place of experiences and space for imagination.

> Yes, but I think the longer route is cool, because she [my mom] also asked me if I prefer the short or the long route. Because of the long journey, I also have more time to fantasize. That's why I always need an hour when I walk. (3/S)

Traveling without an adult requires children to engage more with their environment and make autonomous choices. Developing a sense of independence and awareness of one's own abilities significantly contributes to place attachment (Brillante & Mankiw, 2015; Lim & Barton, 2010). However, as all studies were conducted by adult researchers, the responses may have been influenced by the child-adult dynamic. Reflecting on this relationship and addressing potential barriers is crucial in such research (Nordström & Wales, 2019).

The third case study confirms that place attachment depends on the travel mode (Appleyard, 2017). Unaccompanied children, whether walking alone or in groups, exhibited a stronger place attachment. For

instance, in one interview, children repeatedly mentioned a shortcut and hiding place (3/H): a hedge providing privacy alongside a wall where they enjoyed spending time. This space was often used to hide from adults, highlighting how children appropriated it as their own secret place.

This example emphasizes the role of place attachment in fostering independence (Furneaux & Manaugh, 2019). By independently seeking and claiming such spaces, children express self-efficacy and self-awareness (Gülgönen & Corona, 2015; van Andel, 1990). Such insights into secret or informal places would likely remain hidden in conventional interviews but were prompted by the embodied context of the go-along method.

The school environment is perceived not only as a space to be traversed but also as a place for social interaction, as shown by examples from Case Studies 2 and 3. In Case Study 2, where children explored partially unfamiliar places and paths, they still showed a stronger attachment to locations tied to personal experiences, such as a park where a family picnic took place or the house where friends were visited (2/D; 2/F). In Case Study 3, two children described a place where they occasionally visited their friend but also played ringing random doorbells and running away (3/L). Another child mentioned that he continued to take a longer route to school because he used to pick up a friend along the route who had already moved away (3/K). This attachment to the route demonstrates how personal interactions and memories shape a child's connection to a place. Place attachment is thus not only influenced by the built and natural environment but also by *social places*—spaces where interactions and social activities occur (Hart, 1979). The sense of place concept helps to reveal these invisible social bonds, making them more tangible and therefore more accessible to urban planning (Wales et al., 2021).

4.2 Benefits and Challenges of the Qualitative Spatial Methods Approaches Used

This section summarizes key methodological reflections from the three case studies. Each approach offered different ways of accessing children's sense of place, shaped by their developmental stage and the research setting. While some methods captured children's sensory impressions, preferences, and place meanings, others enabled more direct, in-situ interactions. At the same time, the case studies reveal specific challenges, such as the cognitive demands of map-drawing tasks, the complexity of walking interviews, and the need for careful attention to power relations and participation. Taken together, the findings show that qualitative spatial methods, if adapted to children's needs, can provide valuable insights into their environmental perceptions but also require ethical sensitivity, flexibility, and contextual awareness.

While go-alongs and guided walks collect verbal on-site associations, mental maps offer a more visual representation of children's spatial perceptions. However, the effectiveness of mental maps heavily depends on children's cognitive development. Limited spatial knowledge can make drawing maps particularly challenging, as demonstrated in the first case study, where children predominantly drew individual places without connecting routes. Additionally, children's drawings often rely on memory, which may not accurately reflect the current state or reality of the environment.

By contrast, walking interviews, including go-alongs and guided walks, enable the collection of diverse data, from verbal expressions to non-verbal practices and ascribed place meanings. As a result, the comparison of the sense of place and real-world elements of proximity-distance relationships, as well as gaps and misunderstandings, becomes visible (Kreher et al., 2019; Sommer & Töppel, 2021). However, walking interviews also present challenges. The survey process is complex, requiring multitasking from both researchers and children. Moreover, some children find it difficult to articulate their spatial knowledge, as everyday actions like school travel are often perceived as routine and taken for granted (Löw, 2016).

All three case studies place children at the center of the research, employing qualitative spatial methods to access their environmental perceptions and provide valuable insights for participatory planning processes. However, there is potential to further enhance children's involvement. While the studies focused on children's perspectives, higher levels of participation could be achieved, such as including children in formulating the research questions or analyzing the data. For instance, in Case Study 2, allowing children to select the routes themselves could have uncovered entirely new places and paths, offering even deeper insights into their spatial experiences.
Case Study 1, conducted as a seated interview, re-

quires a certain level of abstraction. However, this creative task stimulates the children's imagination, often revealing not only their actual spatial knowledge but also fictional elements. These fictional aspects, while not directly representative of the real environment, offer valuable insights into children's desires and preferences, which can inform how place meanings are interpreted and translated into planning contexts.

Although Case Study 2 contains researcher-led walks, it enables on-site interactions with the space and shows embodied spatial knowledge. In addition, the group constellation allows direct reflection on the perceptions and their categorization. Nevertheless, in a group of children, the possibility of analyzing individual perceptions in their specific context is lacking. The immediate feedback from a perception map with simplifying symbols hung up in the school building visualizes the spatial knowledge generated and the sense of place clearly for the children. In this way, not only does the research learn from the children, but the children also learn about the research.

In the third case study, children were effectively engaged as local experts and research partners, providing rich insights into their everyday world and perceptions. By combining visual and verbal spatial methods, the study captured a comprehensive picture of children's sense of place, accounting for their developmental stage, which often shapes their limited yet diverse experiences, worldviews, and vocabulary (Punch, 2002). However, it is crucial to not view children as "little adults," but to tailor research approaches to their developmental and communicative capacities. Clark's mosaic approach (2017) offers a valuable framework for this. It integrates techniques such as drawing, photography, and mapping to piece together a holistic view of children's experiences and perceptions. These reflections provide answers to our research question, highlighting the benefits and challenges of using qualitative spatial methods to explore children's sense of place.

Qualitative spatial methods, when applied carefully and context-sensitively, offer unique access to children's spatial experiences and meanings. However, they also require continuous ethical reflection. Children should be recognized as social actors with their own perspectives and agency (Christensen & James, 2008). This requires acknowledging power imbalances between adults and children, and age- and role-specific differences, such as communication styles and developmental stages (Esser & Sitter, 2018). Ethical symmetry is particularly important in go-along interviews, in which children are interviewed in public spaces and need to be protected, and at the same time, they should be treated as independent actors. Ethics in research with children is therefore not only a procedural step in research but an ongoing practice, acknowledging children's everyday lives and local contexts (Abebe & Bessel, 2014). Informed consent, in addition to necessary informed parental or guardian permission, should therefore be understood as a process, ensuring that children understand and affirmatively agree to the research and that reciprocity is built into the design (Morrow, 2009). Transparency in presenting and feeding back results, such as returning interview insights to the participating groups, strengthens trust and validates children's perspectives (Schreiber & Ghafoor-Zadeh, 2022). For example, in Case Study 2, children's contributions were reflected back to them through perception maps which were displayed in the school building. Research with children also means adopting methodological pluralism (Schreiber & Ghafoor-Zadeh, 2022). In Case Study 3, children expressed their spatial experiences not only verbally but also through gestures and photos.

5. Conclusion

This paper discusses the methodological challenges and potentials of qualitative spatial methods in researching children's sense of place. Drawing on three empirical examples, we have shown how such methods can capture the complexity of children's place attachment and spatial meaning-making. Our findings illustrate how children perceive and experience places and how specific qualitative spatial methods enable researchers to access these perspectives in situated, child-appropriate ways.

We highlight the following conclusions of our scientific approach:

1. Positive interactive cycle: Independent mobility strengthens children's spatial literacy and confidence. Repeated self-directed engagement, for example, on unaccompanied school routes, fosters both orientation skills and emotional place attachment.

2. Landmark-oriented perception: Children's environmental perception is largely based on landmark recognition and concrete personal experiences, but also shaped by imaginative and media-driven narratives. This dual influence highlights the need to balance real-world exploration with an awareness of external representations. Methods such as go-alongs support researchers in distinguishing between what is remembered, imagined, and physically experienced.

3. Places for children and children's places: While planned play areas are important, informal and self-appropriated spaces, like hedges, stairs, or streams, play a crucial role in children's spatial meaning-making, though they often remain invisible in adult-centric planning.

4. The sense of place is shaped by encounters: Social interactions, particularly specific experiences shared with peers and family, play a significant role in forming a sense of place. Children describe routes and places not only in terms of physical features but also in relation to shared routines, friendships, and memories.

5. Methodological diversity and reflection to access children's spatial perception**:** Qualitative spatial methods offer unique insights by capturing children's multisensory perceptions in real-world contexts. Yet these methods require critical reflection on participation, particularly regarding power relations in child-adult interactions. They must also be adapted to the children's developmental stages and diverse contexts. Our comparison of mental mapping, guided walks, and go-alongs shows that each method reveals different aspects of children's spatial knowledge and that combining them can shed light on overlooked details and contradictions.

The studies clearly show that regular, independent movement through the environment strengthens spatial literacy, confidence, and place attachment. Consequently, place-based environmental education is essential not only for fostering environmental awareness but also for recognizing children as valuable stakeholders in urban planning (Nordström & Wales, 2019). Against the backdrop of declining independent mobility, our findings suggest that even small-scale opportunities for autonomous movement and informal play help strengthen children's ability to explore and make places meaningful on their own terms. Encouraging children to choose their own routes or allowing time for breaks and exploratory play can further build their independence and deepen their connection to the environment. In the frame of child-friendly urban planning—places for children and children's places—play areas could integrate adaptable places with movable materials, whereas public spaces could invite children to play or be physically active, for example, through balance trails along footpaths.

When studying the sense of place, it is important to include children's levels of cognitive development and spatial knowledge. Children in primary school age are learning contextual knowledge, have, compared to adults, less life experience and vocabulary, and might distinguish less between reality and fantasy. Therefore, a survey situation must be different from that of adults, and researchers need to reflect on themselves as adults. It is about putting the child at the center, listening to their voice, accepting unexpected outcomes, and not working exclusively with verbal methods. Methodological diversity and mixed methods are necessary: from verbal to visual and place-based methods. The various spatial methods offer the possibility of making spatial knowledge visible for urban planning, providing conclusions about behavior and usage habits and helping to explain urban and socio-spatial developments.

The sense of place concept serves as a basis for environmental education in and out of school. The aim is to combine direct place experiences with knowledge transfer. Taking the children's own geographies as a starting point, it is possible to strengthen not only their personal well-being but also their sense of community, pro-environmental behavior, and active forms of mobility (Spencer, 2005; Witten et al., 2019). Our study approach demonstrates how qualitative spatial methods make children's place experiences visible and relevant for urban practice. At the same time, they underline that ethical reflection must accompany all stages of such research. Following calls for more relational and participatory ethics (Christensen & James, 2008; Abebe & Bessell, 2014; Schreiber & Ghafoor-Zadeh, 2022), we argue that working with children requires moving beyond formal consent procedures towards a continuous attentiveness to children's well-being, agency, and privacy. In our view, working with qualitative spatial methods does not only allow access to children's spatial experiences but actively shifts how we understand their role in cities. Rather than

viewing them as passive recipients of adult-designed spaces, our findings suggest that children continuously shape, interpret, and negotiate their everyday environments. These insights underline the need to engage children as knowledgeable actors in spatial research and planning. Investigating children's sense of place thus advances geographical knowledge and provides a basis for designing healthier, more inclusive, and participatory urban spaces.

Acknowledgments

We first thank all participants of our case studies, Berlin Mitte and Schöneberg, as well as Leipzig. Furthermore, we would like to thank Katja Janson and the geography students from HU Berlin for supporting the first case study. Finally, we thank Theresa Jung for the useful discussions and comments on the manuscript.

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