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Community through the eyes of children: blending child-centered research and qualitative geovisulization

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Community is an ambiguous concept, and the meanings of community as a subject of study have received a great deal of attention across various disciplines. This paper discusses how children's diverse meanings of community *shape* and *are shaped* by the social, cultural, and physical environments of their everyday lives. To explore these meanings I combine principles of child-centered research and qualitative geovisualization into a research methodology. I demonstrate that this integration displays the transformative nature of qualitative analysis and visualization to support interpretive analysis of various forms of qualitative and spatial data together, and offers us a hybrid methodological framework for gaining insights into the diverse meanings of community held by the children. The main case study is drawn from a multi-year research collaboration called the Children's Urban Geography (ChUG), in which I participated along with children who lived in a relatively poor but emerging multi-cultural Hispanic neighborhood in Buffalo, NY.

Keywords: child-centered research; qualitative geovisualization; community; meanings of community; mixed-methods research

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1. Introduction

The meanings of community as a subject of study have received a great deal of attention across disciplines including sociology, anthropology, psychology, planning, and geography. Trying to figure out the essence of community is like trying to scoop up Jell-O with one's fingers. One can get a hold of some, but there is always more slipping away. Community is an ambiguous concept, and researchers have produced neither consensus nor unqualified definitions. What makes urban geographers and planners particularly interested in this concept is that it often implies not only physical, but also social, cultural, political, and psychological aspects of urban environment. This paper does not bravely attempt to come up with a singular definition of community. Rather, it focuses on the process of defining community from children's perspectives, where what 'constitutes' community is more important than what 'is' community. It also approaches this question using a child-centered approach which highlights the specific ways in which children construct their meanings of community in everyday life. In keeping with this focus, this paper holds three goals: developing an understanding of children's meanings of

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community, developing a child-centered research methodology, and exploring the potential for integrating qualitative geovisualization into this.

The first goal of this paper is to explore the diverse way in which children conceptualize community. In academic literature, community is often considered a 'container' in which children exist, rather than a space co-produced through children's agencies (Christensen and Levinson 2003). Much of the existing research about children's community is one dimensional, in that it only observes how children's (physical) communities *shape* their lives and impose outcomes on them. Few studies focus on how children's meanings of community are shaped not only by their environments, but also by the children themselves. Throughout this paper I try not to treat children's understandings of community in a binary way, for example, by asking whether children perceive the community as good or bad, dangerous or safe (Pain and Francis 2004; Rasmussen and Smidt 2003). Instead, I have posed the question of community quite open-endedly, so that children can freely and comfortably talk about their thoughts. To facilitate this process, my second goal is to apply a child-centered approach. Toward this goal, I emphasize the importance of qualitative research in understanding children's perspectives, and I include children in the design of portions of my project's final methodology. A third goal of this paper is to demonstrate the potential benefits of integrating qualitative geovisualization with child-centered research. Qualitative geovisualization is the visual representation of qualitative forms of individuals' spatial knowledge and of their experiences of spatial relationships. It also refers to a process and a production of visualization that better represents people's interpretive and experiential knowledge of geographic spaces. A qualitative geovisualization approach provides new ways to collect, analyze, and represent not only quantitative data but also qualitative interpretive data and research as a process (Cieri 2003; Cope and Elwood 2009; Jung 2011; Knigge and Cope 2006; Kwan 2002; Pain et al. 2006; Pavlovskaya 2006). Furthermore, the blending of qualitative geovisualization and child-centered research helps us to better research and learn about children's meanings of community, and its emphasis on visual meaning-making, in particular, provides additional insights into children's understandings of community.

The following section begins with a brief review of three bodies of theoretical and methodological literature: children's meanings of community, child-centered research, and qualitative geovisualization. Then, I describe the process and findings of research with children. These sections draw upon a case study developed from a multi-year research collaboration called the Children's Urban Geography (ChUG)[1] project that I participated in as a student, a graduate research assistant, and a researcher between 2003 and 2006. Participating children were of ages 6–13 and mostly lived in the relatively poor but emerging multi-cultural Hispanic Lower-Westside neighborhood in Buffalo, NY. The study included a diverse set of research methods including arts and crafts, field trips, mapping activities, video and audio recording, and GIS (Geographic Information Systems), which are all part of creating qualitative, geographic visualizations of children's meanings of community. In Section 3, I unfold how school and experiential knowledge become intertwined, specifically focusing on the difference between the meanings of community that children learn at school and the meanings that they construct during their everyday experiences. Section 4 describes the research process and offers examples of how to weave qualitative geovisualization and child-centered research together. This research process reveals the heterogeneous ways in which children conceptualize community, and I argue that many of these conceptualizations would have remained hidden had we not designed this research as child-centered or had we not implemented qualitative geovisualization. The final section concludes by discussing and reflecting on the potential of qualitative geovisualization in child-oriented research for the study of community.

2. Literature review

2.1. *Children's meanings of community*

Conceptualizations of community have mainly focused on social interaction, social formation, and the connections within individual social networks (Amit 2002; Barke and MacFarlane 2001; Christensen and Levinson 2003; Forrest and Kearns 2001; Guzzo 2002; Hopper 2003; Keller 2003; Mcmillan and Chavis 1986; Minar and Greer 1969; Nisbet 1970; Putnam 2000). In an important shift, community studies now emphasize community as a symbolic or imagined entity (Anderson 1991; Cohen 1985; Hummon 1990). As Cohen put it (1985, 20), 'community serves as a symbolic resource, repository and referent for a variety of identities and its triumph is to encompass these by a common symbolic boundary'. It draws attention to the fact that community has become less a matter of social practice and more a symbolic framework for conveying social and cultural differences. Community is also often used interchangeably with the term 'neighborhood' because it has long been associated with a spatial dimension, such as a discrete boundary or identifiable territory (Bell and Newby 1978; Loebach and Gilliland 2010; Martin 2003; Massey 1998; Warren 1978). Social and spatial factors are indispensable elements of defining and constructing community, and it is critical that we remember how social, spatial, cultural, environmental, and even imaginative aspects of community are all intricately related to one another.

Even though increasing numbers of researchers have devoted their attention to understanding how community impacts people's lives, relatively few studies have focused on children or on children's meanings of community/neighborhood. Morrow (2003), for example, criticizes Putnam's (2000) seminal work on community for displaying an ignorance of children's social networks, and she illustrates how one might consider children's views of community and their levels of community identity. Early pioneering attempts by geographers to study children's community focused on children's spatial cognition of space as evidenced by Lynch's (1960) 'the image of city', Blaut and Stea's (1971) 'place perception', and Bunge's (1977) 'geographical expedition' work. However, these do not sufficiently account for the ways in which children fully conceptualize or give meanings to both the social and the physical elements of communities.

The growing body of literature on children's urban geographies has started taking into account both children's perceptions of community and also their negotiations with community as active agents (Breitbart 1998; Chawla and Malone 2003; Cope 2009; Hart 1997; Holloway and Valentine 2000; Leventhal and Brooks-Gunn 2000; Matthews 2003; Skelton 2000). This literature recognizes that children's perceptions of communities are not necessarily correlated with adults' perspectives, and it makes an effort to position children as agents who are equally as important as adults. These insights remind us of the long historical exclusion of children's voices from community research, and of the importance of recognizing children's directly lived experiences as important for the understanding of embedded meanings of community. I strongly agree with Cope (2008b) that we can achieve a better understanding of children's conceptualization of urban space (community) by considering the many social, political, cultural, and economic relations and performances that constitute a child-conscious concept of community/neighborhood. Children's conceptualizations of community should not be categorized by Cartesian or fixed space, but need to be understood as fluid and contingent. We should focus on the *process of defining* children's community rather than trying to have one ultimate definition. What *constitutes community* is more important question than *what community is*. Asking about meanings of community is one way of learning about how social and spatial environments such as neighborhood conditions, streets, race, class, gender, and ethnicity intermingle and influence children's conceptualization of community.

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However, there is still a great need to discuss *how* to ask about and to represent children's negotiated meanings of community in a better form. Various innovative research methods have been considered in order to better reflect upon children's involvements and ideas (e.g. artworks, photos, audio and video recording, mapping, etc.). I extend this conversation by not only suggesting a new method, but also building a 'hybrid methodological framework' with children that effectively solicits children's views of community, their voices, and their lived experiences. This methodological framework is effective at studying children's meanings of community because it appreciates children's divergent understanding of community, and because it allows them to better elicit and represent their understandings through a collaborative and visual meaning-making process.

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2.2. *Child-centered research*

Child-centered research is designed to give greater power to children, to allow them to produce their knowledge, and to allow them to express their ideas as active 'agents' in the research process (Aitken 2001; Brannen and O'Brien 1996; Chawla 2002; Christensen and O'Brien 2003; Cope 2008b, 2009; Holloway and Valentine 2000; James, Jenks, and Prout 1998; Katz 2004; Qvortrup et al. 1994; Skelton and Valentine 1998). Children may be keener observers than adults because they are more likely to be closer to the ground with their smaller statuses, and they may reveal their own preferred community spaces regardless of adults' formulations of space (Jones 2000; O'Brien 2003). Also, children can provide completely new vantage points for the study of social relations of production and reproduction, and the blurred line between work and play (Katz 2004). These accounts all recognize the need to work 'with' rather than 'on' children (James, Jenks, and Prout 1998). By self-reflecting on her work with children, Cope (2008a, 430) recalled that the most important thing that she has learned is that 'I cannot *speak for* the children involved in the project but I can *speak up* for them.'

Many child-centered research projects also embrace innovative research methods, such as visual techniques like photographs and videos, mappings, games, and even participatory GIS, to encourage children's involvement in the research process (Cope 2008b; Driskell 2002; Elwood and Mitchell 2013; Holloway and Valentine 2000; Islam 2012; Loebach and Gilliland 2010; Matthews 2003; Mitchell and Elwood 2013; Skelton 2013; Tinkler 2013). Providing better mediums to reflect on children's ideas is an effective way to redirect our research to be more child-centered. The qualitative geovisualization process that I discuss in the following section is my own response to these emerging innovative efforts. Regardless of the methods we apply, the most important component in a child-centered approach is to be 'with' children until we build good rapport[2] with them. Researchers should play, work, and spend time with children before they jump to asking questions. Building rapport is an indispensable way to reduce the gaps between researchers and participating children. This philosophy has grounded my three years of experience working with children, and it has guided my efforts to dismantle the 'authoritative' role I might have occupied throughout the research process.

2.3. *Qualitative geovisualization*

Geographers have long referred to the visualization of spatial data and the spatialization of geographic data (e.g. GIS mapping) under the name 'geovisualization'. Geovisualization allows us to see the visualized material more closely and personally, with a great deal of context (Dykes, MacEachren, and Kraak 2005; MacEachren 1994). For example, in community-based planning processes, GIS-based geovisualization has been used to represent local residents' ideas in a visual form, and eventually to empower them (Al-Kodmany 1999; Elwood 2001, 2011; Harris

and Weiner 1998; Jung 2011; Sieber 2006). However, questions still remain about how effectively geovisualization can represent local knowledge, how the process of geovisualization may influence the formation of local knowledge, and how participants are involved in this process as co-producers. Another important dimension of *geo*visualization is the linking of multi-format data, such as text, imagery, audio, and video, with spatial data; that is, the process of connecting qualitative and spatial data together. To fully understand the significance of this, we need to look closely at how these linked qualitative data are collected, analyzed, and visualized as a form of geovisualization.

Previously, accounts of qualitative GIS and participatory GIS (Burns and Skupin 2013; Cope and Elwood 2009; Grasseni 2012; Knigge and Cope 2006; Kwan 2004; Pain et al. 2006; Pavlovskaya 2006; Young and Gilmore 2013) have considered ways to incorporate GIS with qualitative data and research within a mixed-methods research. As a result, these scholars have developed various ways of integrating GIS and qualitative data and research, from quantifying qualitative data, to hyperlinking multimedia data with spatial objects, to modifying GIS software (Jung and Elwood 2010). Qualitative geovisualization supports the idea that the visualized data should not be limited to numerical value, but could be multi-format qualitative media. However, the focus should not only be on the 'visualization', but also on the qualitative analysis of visualized data. I envision qualitative geovisualization as a process which supports interpretive analysis of qualitative, quantitative, and spatial data. I have written about the technical design of the system elsewhere,[3] and here I focus on qualitative geovisualization as an interpretive process rather than specifically on the software platform. The emphasis is on the qualitative visual meaning-making process with participating children.

The first step toward thinking about the possibilities of qualitative geovisualization is understanding what the term 'qualitative' means. Qualitative data are those forms of information that provide well-grounded, richly contextual descriptions of everyday life and spaces. Specifically, the qualitative data we use for geovisualization should be a representation of the experiential knowledge of individuals, and the interpretations and contextual meanings they associate with these representations (Crampton and Krygier 2006; kanarinka 2006; Rose 2001). Qualitative geovisualization lies in thinking about 'geovisualization' both as a product and process that might be qualitative. Another key aspect is that visualization is not always arbitrary, but involves the attempt to clearly show and communicate with concrete materials. It is important to acknowledge that visuals could be 'objects' showing the evidence of the existence of a particular entity as well as 'texts', which have multiple contextual meanings. In order to fully explore various meanings associated with visuals, we may need to provide a better medium so that both producers and users of geovisualization can freely encode and co-produce visualization that better represent their interpretive and experiential knowledge of particular spaces. In addition, it is important that all participants in the research be part of 'producing' geovisualization. If children remain research subjects in the traditional research setting, they cannot fully explore the power of geovisualization. We want to provide a framework not only for showing what children know about community, but also one which allows them to develop new insights into their meanings of community during the process of making visualizations together.

3. School knowledge and experiential knowledge about community

There are differences between how children learn about community and the meanings adults try to teach them about community. Adults often teach what they think children should know about community, and they are often limited to formal and tangible forms of spatial knowledge (Christensen and O'Brien 2003). However, children also learn about their community through experiences in their everyday lives. As a result, there are differences between the meanings of

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community children learn in school curricula and the notion based on their experience: 'school knowledge' and 'experiential knowledge'.

'Schooling' is often referred to as a site of control through which adults, especially those in institutional settings, attempt to *control* children. As a result, it often makes children *remember* and then *tests* their knowledge. Aitken (1994) and Fielding (2000) criticize how the current school system was designed to emphasize efficiency without considering children's needs and show that children are often part of a system which is constructed by adults' viewpoints.

I first studied the Social Science Studies curriculum in the K-12 school system in New York State[4] in order to find out the influence of a formal school system on children's meanings of communities, and then I conducted child-centered research using qualitative research methods. Before I started to ask questions about community, I spent time familiarizing myself with children in their after-school club by playing and helping them with their homework. After I heard their initial thoughts about community, I asked further related questions, especially about community education in their school curriculum. At the same time, I was cautious not to rely just on children's verbal and spatial abilities, but to also look into their insights about community using different methods. I offered various methods for children to choose, which are woven together throughout the child-centered research environment. Figure 1 summarizes multiple practices and experiences that I had with the children, where I could observe them exploring their ideas about community. Exploring the Social Studies curriculum in K-12 school system drew several interesting outcomes.

First of all, the children's educational curriculum seemed to be mediated by institutional purposes, which often took a simple and generalized form and did not consider children's own experiential knowledge. For example, community is concisely defined in the school curriculum as 'a place where people live, work and play together'. I often observed participating children reciting this memorized sentence whenever I asked them about community. The following is an example of a school exam question that I saw when one child approached me to ask a question:

(Question) A community is best defined as a _____
A. Place where people live, work, and play together.
B. Continent with the same climate
C. Type of map that lists the populations of a country
D. Nation with one culture

The correct answer was choice A, and most children memorized only the right answer to get a point. However, these school-embedded meanings do not leave any room for imagining other possibilities and meanings of community. Aliah[5] insisted that she picked the choice D because 'Puerto Rico' is her community, and it is the most meaningful factor defining her community.

Secondly, the notion of community is often taught as a geographical term. At school, children often learn community by its size. Not surprisingly, the spatial relationships among different communities are mainly described by direction, distance, and their physical sizes. In this perspective, all communities are mappable. One of the exam questions asked about the largest community. The choices were Buffalo, New York, Globe, and USA, and the right answer was 'Globe'.

Thirdly, children's experiential knowledge of community is often different from school knowledge. When I was helping with her homework, Isabella seemed confused about an exam question:

(Question) How can you improve our community?
A. Listening to teacher's words
B. Cleaning streets
C. Participating in community activities
D. Increasing the number of immigrants

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Purpose	Techniques/Methods	Efforts
Rapport Building	- Being in the club - Playing games or sports - Cleaning club space - Helping homework - Being part of conversations - Wearing non-professional-looking clothes familiar to children's favor (e.g. Jean, T-shirt)	- Beginning conversations over subjects familiar to children (e.g. hip-hop artists and songs, Buffalo Bills) - Letting them know I am not an authoritative adult! (e.g. No disciplinary work or act) - Smiling and be friendly - Be natural
Expressing Children's Experiential Knowledge	- Talking - Writing - Drawing sketches and painting - Art Project - Taking photos - Role playing - Video recording - Audio recording - Narrating their own art and media works	- Respect their ideas and embrace different ways of expressing their opinion - Let children decide what they want to do! - Don't give them any pressure to continue on project - Try to read the insights expressed, regardless of their artistic, verbal or writing skills/abilities
Collecting Data	- Participant Observation - Taking pictures - Photo narratives - Informal/Formal Interview - Focus Group	- Writing a field note whenever I visit club - Documenting field notes in computer promptly - Ask parents' and children's permission first before conducting any project. - No leading questions. - Not trying too much to record children's work, but be part of their project
Discussion /Reflection	- Discussions about children's initial ideas of community - Discussions about school curriculum and exams - Conversations about their understanding of communities	- Recursive conversation - Try not to have any preconception - Protect children's privacy and identity - Role change (e.g. let children ask me a question)

Figure 1. Various techniques and methods used.

Isabella thought 'D' was a correct choice, but her teacher said that only 'C' was the right answer. Because she grew up in the Hispanic Westside neighborhood where most of her neighbors are immigrants from Dominican Republic or Puerto Rico, Isabella strongly believed her community would be better off if more immigrants could come to her neighborhoods. Other children also mentioned key components of their communities which were not included in the community discussions at school: friends, neighbors, problems, crimes, fears, ethnic foods, cars, buildings, downtown, and distinctively colored houses referring to diverse ethnic groups. These findings demonstrate how children's meanings of community emerge from their own experiences, and how these meanings are often mutually influenced by both adults' views and children's own lived experiences. The point is not to identify which one is right or wrong, but that children are often compelled to grapple with both sets of meanings of community,[6] and how to represent

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them. Children may continue negotiating and experiencing a tension between the institutional side of adult politics and children's free expression of self. Children are agents who can create and produce their own perception and knowledge (Porter, Townsend, and Hampshire 2012); however, they are obligated to follow the school curriculum at the same time. They are standing at the border between an adult-created world and their own world.

4. Working with qualitative geovisualization

Following a child-centered philosophy designed to highlight children's own meanings of community, I introduced the qualitative geovisualization approach. Specifically, I implemented it in five different stages.

In Stage 1, I explained the basic structure and process of qualitative geovisualization. All participating children were excited, especially by knowing that they could use various digital technologies such as laptops,[7] disposable cameras, and video and audio recorders. Children showed their fascination with new technologies, and new technology became their main motivation to join the project. During Stage 2, which was similar to the prior research (e.g. school knowledge vs. experiential knowledge) without qualitative geovisualization, I let children express their meanings of community in any form. Most children picked up a disposable camera[8] to take community photos, and some others chose to write about or sketch their communities. If they chose to take photos, I also asked them to write narratives, for instance, of what they photographed, where they took a photo, who was in the photo, and especially why they took these as community photos. This process helped refine contextual and personalized accounts of the community photos. Providing cameras, taking community photos, and writing their own accounts of the photos greatly increased children's power to express their understanding of community in ways that might be hard expressed in a regular conversation. They kept their camera until they had enough time to take the community photos that they thought were important.[9] We also had an unexpected fun project. One day, I printed out a Google Map[10] of Inner City Buffalo, and asked children to mark and write about their most and least desirable places to go in their communities. Instead of drawing on the map, John started to place round-shaped smiley-face stickers on the map as unique representations of his feelings about particular locations. Everybody loved it, and it became a popular 'Smiley-Sticker Project'. Each smiley face has a special meaning, and it became the children's own symbols for visualizing their emotions toward particular places in the city. The smiley-face sticker project demonstrates how children can make and change the project as they fully participate in it, and how a project can become something they can enjoy. Their creativity and imagination give us a new opportunity to see their insights. Children can be fully immersed in the research, especially when researchers are more reflexive, which will eventually lead to better child-centered research.

During Stage 3, children began to scan their developed community photos, and to digitize[11] them in the computer. The children's community photo narratives were typed into the properties of each digitized photo, and eventually this was included in the qualitative geovisualization database. This could be a redundant process because the children had to re-type what they had already written manually on the back of each photo. However, it also reconfirmed children's interest, and their familiarity with technology boosted their participation in the project. The participating children quickly learned all of the processes that I showcased, and immediately scanned, documented, and saved each of their community photos in the computer. In fact, they spent more time in front of the computer thinking about and writing their narratives than I had originally expected. Typing in the computer could be a very boring chore, but it seemed to be a fun project for the children.

After digitizing the community photos narratives, Stage 4 gave each child an opportunity to create his/her own Imagined Grids. The Imagined Grid is a special layer which integrates

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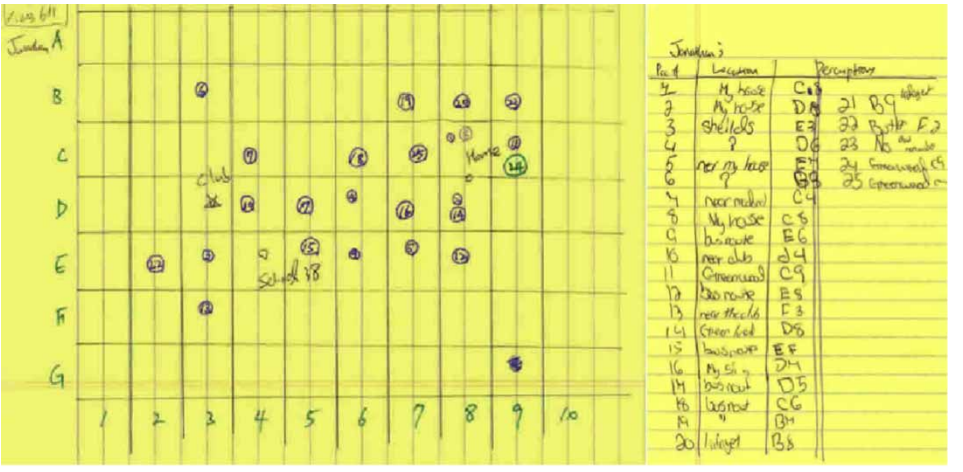

Figure 2. The Imagined Grid on paper.

qualitative multimedia data with GIS. In this way the qualitative data can be visualized geographically, and it is a key structure in the qualitative geovisualization process. Before creating it in the computer, each child was asked to make a paper version of their Imagined Grid and to locate their qualitative information, such as community photos, within the relevant grids (Figure 2).

The paper version guides us to create a computer-based Imagined Grid, which later becomes part of the qualitative geovisualization in GIS. The Network View is another important component, which is a powerful visualization aid for examining and defining the relationship among data and codes.[12] Based on each child's Imagined Grid and Network View, a qualitative geovisualization was digitally and individually created on the computer.

As a final stage of research, Stage 5, children reflected on the whole process. They talked and recorded comments about their community photos, the experience of creating qualitative geovisualization, and what they had learned throughout the process. They playfully interviewed each other, and even asked me questions, for example, about my own meanings of community. This was the moment when I felt that the children were truly part of the research, and that I was part of their communities.

5. Children's meanings of community with qualitative geovisualization

5.1. *People community*

Children's meanings of community are often associated with people special to them, but not with everybody. As Abi puts it:

> A big cake with a candle [describing a cake she saw in her aunt's wedding in New Jersey], nice wedding and many people there. People who can share a wedding cake together are community, someone I wanted to have a cake.[13]

Regarding Abi's case, she repeatedly said, 'castle is a community' and 'a big cake with a candle is a community'. 'Castle' or 'A Big Cake' is a metaphor for her referring to the places and events to which only specific people in her community can come. So, I included and linked the codes of 'community' to the code of 'castle', 'people', and 'dog' in the Network View. One day, I asked her where she would build her castle. Without any hesitation, she said

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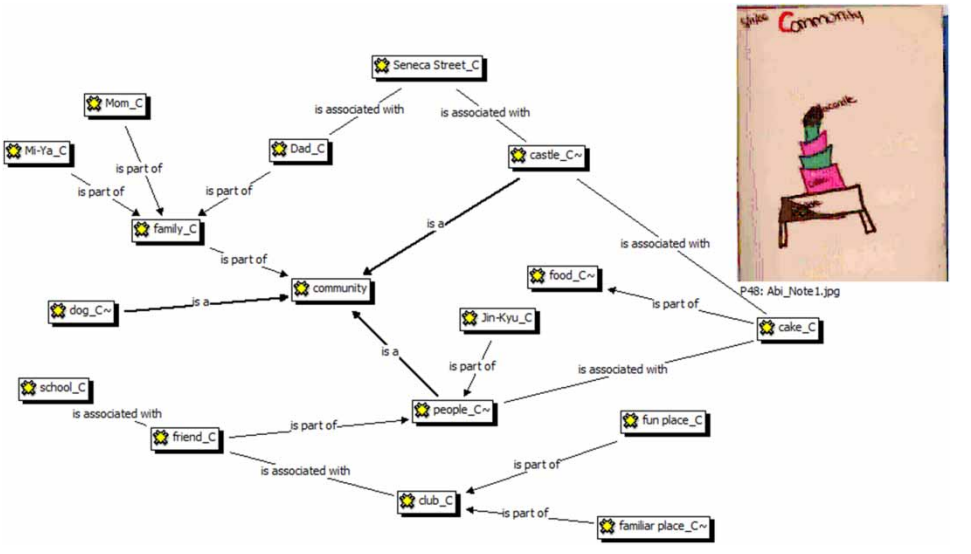

Figure 3. Abi's community in Network View.

'Seneca Street' where her dad lives. As we see in the top center of Figure 3, the code name of 'Seneca Street_C' is also linked to the code of 'community_C'. Other children also often included people who are close to them as their communities: mom, dad, friends in school, people sharing the computer together, and people reading and working together. Abi and I continued our discussion over her Imagined Grid. Most of her community photos were taken and placed either near her school or at the club. However, surprisingly, there was no photo taken at her house even though she said that family is an important part of her community. Abi explained this with two specific reasons. First, she wanted to take photos at her house, but could not because her parents usually came home too late after she went to bed. Second, she added that the club and the school were more familiar places than her home.

5.2. *Cultural and ethnic community*

Culture and ethnicity are often linked to the children's meanings of community. The participating children often drew the flag of the Dominican Republic or of Puerto Rico as images of their community (Figure 4). Yizel drew the flag of the Dominican Republic and explained that the flag is part of her community. She also made an interesting comparison between the community in the Dominican Republic (where she used to live during her childhood) and the Buffalo Westside neighborhood (where she lives). She said she often saw Whites, Blacks, and Asians in Buffalo, and could see more diverse racial and ethnic groups in the Dominican Republic. She considered different races and ethnicities as a 'similarity' rather than a 'difference' between Buffalo and Dominican Republic communities. In other words, the presence of multi-racial and multi-ethnic groups is indispensable for defining a community. Yizel also introduced an intriguing way to elicit meaning within her community photos, which I named 'Community in Color'. She used different colors to write the descriptions of community photos she took. According to her, the photos with 'red' are 'hot' and 'smoking' because they are *positively* related to her meanings of community (e.g. ethnic corner store). On the other hand, the ones with 'blue' color are 'cold' because they are not so much about community, but still have some elements of community in them (e.g. auto repair shop).

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Figure 4. Sketches of community with ethnic flags.

Ethnic foods are often mentioned in the children's accounts of community as well. Many children often went to the local corner store near the club just because they could get ethnic food and treats such as plátano-chicken,[14] homemade ice-cream, and Dominican Salami and Cheese.

5.3. *Community in space: club community, kind of part of my community, and spatial community*

Children also often understand community as a spatial entity. I found that the notion of mappable community helped children not only to represent their conceptualization of community, but also to think about what factors make up their community. Even children who did not show any interest in this project greatly changed their attitude once they were introduced to the process of constructing their community in a spatial form. The following two examples demonstrate the importance of 'space' in children's meanings of community and the additional insights children may gain from the qualitative geovisualization process.

Chela was the most timid participant in the group, and she was the only one who had no interest in computers or any type of technology. Many of her community photos display the houses and stores around the club that she named as *club community.* When I asked her the reason behind it, she quietly answered, 'Because those houses are "close" to the club.'[15] The notion of Chela's club community clearly references the neighborhood 'physically located near the club'. 'Proximity' makes the houses in the nearby neighborhood a part of her community. The spatial dimension of community is also associated with another in one of her concepts of community, *kind of part of community.* Because of her no interests in technology, I thought Chela might not want to work with Imagined-Grid activity. However, she enthusiastically participated in it and made her own (Figure 5).

Most of Chela's community photos are gathered around the club (near the 'star' symbol), either inside or outside of the club. Two pictures are near her school location, and those were taken inside the school bus while she traveled between school and the club. Because most

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Figure 5. Chela's Imagined Grid.

photos were taken inside or near the club, they are supposed to all be stacked in the same grid on the map where the club is located. However, I noticed that she did not consider the exact location of the pictures taken, but seemed to randomly spread them around the club. The precise location where she took the photo or the location that her photo is indicating did not matter much as long as they are placed closer to the club. I identified a few familiar faces of her club friends in the grid and asked her whether friends in the club are her community.[16] Her answer surprisingly was 'No', and it was because they were 'kind of part of community'. Her vague answer intrigued me, and I asked her a follow-up question hoping to hear more explanation. She said she did not want to include her friends in the club as her community because 'they do not live near my house'. Chela holds multiple concepts of community (club community/home community), and spatial location/proximity to the club or home is differently significant to her concept of community. 'Social proximity' is an important part of defining 'community' to her (e.g. her friends at the club although they may live far away); however, spatial proximity (e.g. closeness to her home) still matters a lot in her definition of 'home community'. 'Kind of part of community' and 'club community' signify the importance of both spatial and social proximity, as well as how children's negotiation of both influences their conceptualization of community.

Jona was another quiet, but bright, child. His definition of community was very clear and fixed, and he repeated his own version over and over: 'Community means peace, house, and people!' He refused any further questions from me, and he did not want to continue participating in the research. In fact, he was brave enough to express his boredom with the project, and he told me one day, 'community is just too confusing and boring!' However, his attitude and involvement changed dramatically once we started working together with the Imagined Grid. Jona was the fastest learner of the technology, and he proved that new insights could be discovered from

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iterative analyses of multiple, integrated forms of qualitative and spatial data through qualitative geovisualization. His understanding of community was very location-specific, and, in fact, his community resided in space (Figure 6).

For the community photo narrative, Jona wrote down clues so that he could remember where he captured his community photos (e.g. noticeable landmark or street names). When he designed his Imagined Grid he thought back and carefully located each photo on the grid where he thought lay its exact location. He concentrated and spent many hours just to find the precise location of his community photos. He eventually wanted a finer neighborhood-level Imagined Grid, so that he could place his photos more precisely. He even suggested a better way to visualize community photos. He pointed out that there are more community images in one grid cell, but not all of his stacked community images are visible in the Imagined Grid (in two dimensions).[17] I was not sure if Jona fully understood the conceptual and technical aspects of the Imagined Grid; however, he seemed to know what he could and could not do with the Imagined Grid to visualize his community. I also witnessed how he became a more active participant in the project, how his meanings of community have been constituted with strong spatial characteristics, and how he constructs his community with qualitative visualization. Jona's example shows us that a child-centered geovisualization methodology opens the door to different and significant additional possibilities of technology. He indeed plays an active role in trying to shape the qualitative geovisualization at the level of technology and reimagines new possibilities of technology. He did not recode the Imagined-Grid interface per se; however, he offered critiques and specific suggestions that inspired me to adapt the interface so that it could accommodate his needs.

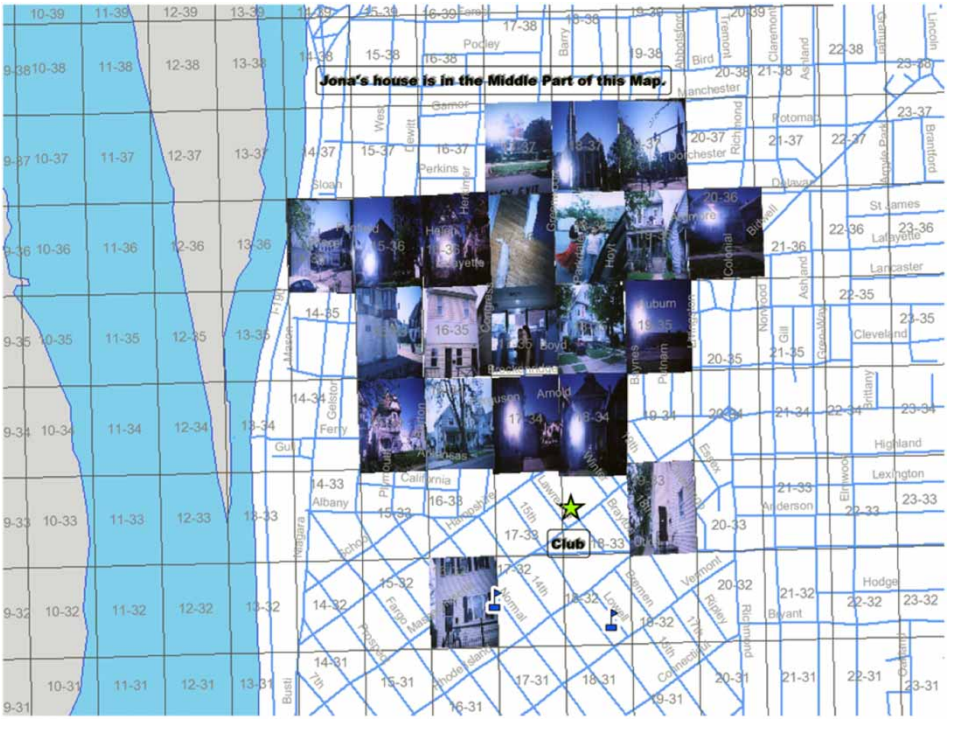

Figure 6. Jona's community in his Imagined Grid.

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6. Discussions

Children are sensitive, street savvy, and have keen eyes for eliciting their meanings of community, and re-making their meanings through constant negotiation. The combined effort to integrate child-centered research and qualitative geovisualization is effective for empowering children in the research process, for representing their perception, and for helping them to better 'construct' their meanings of community.

In relation to the first goal of this research, children's meanings of community, close friends at the club, ethnic food store, home and neighborhoods, and the proximity and location of important places are all part of their community. The findings clearly demonstrate a heterogeneous way of conceptualizing community for children, and how these conceptualizations include a range of different social, cultural and spatial elements. The process of defining the meanings of community evolved throughout the research process: participating children were indeed *doing* community. Abi's sketch of 'a big cake with a candle', Yizel's 'Community in Color', and the unexpected 'Smiling Sticker Project' are all unique and fun examples of *doing* community. I believe the central issue in the children's meanings of community during this project is not one of just representing how children understand the concepts of community, but is one of making them be a part of the research, and of helping them to come to understand what constitutes 'community'. The ambiguous nature of community might pressure participating children; however, their creative ways of approximating their conceptualization of community certainly captured the fluid meanings of community. This is certainly related to the second goal of this paper, creating a child-centered environment.

Participating children became 'agents' with their own wills in terms of expressing and constructing their meanings of community by involving various research activities with or even without working with qualitative geovisualization. They had the full power to decide whether they wanted to participate or not, and they chose their own medium to express their experiential knowledge of community, for example, photos with narratives. Participating children also seemed very excited and empowered by the prospect of creating qualitative geovisualization, in the children's own terms, by 'making photo collage in computer'. Producing community photos and re-making them in qualitative geovisualization shifted the balance of power, giving them more authority, freedom, and creativity. By allowing the children to select their own representational or meaning-making practices, I ended up with a multi-faceted qualitative data set. This diverse set of qualitative representations is part of what granted me insight into the various meanings of community held by children. This diversity of meanings, as we understand how school and experiential meanings become intertwined and often juxtaposed, would have remained hidden had I selected only one practice (e.g. writing), and forced all the children to do it. The smiley-face sticker project, which illustrated the affective/emotive aspects of certain spaces in community, would not have emerged in a researcher-directed method, either.

Responding to the last goal of this paper, qualitative geovisualization was an approach that I newly set up and implemented during this project; however, it was the children and their participation that 'completed' and showed the potential of it. Not all of the children wanted to participate in both the Imagined Grid and Network View activities, but interacted to different degrees. In fact, the child-centered design of this research provided the children with the agency, freedom, and space to guide the methodological practices on their own, which in turn produce a richer and more meaningful qualitative geovisualization. These differences in preference and involvement were reflected differently as well. Some children's meanings of community were more visible through the conceptual social network, while others' conceptualizations of community were spatially represented within the Imagined Grid. This epitomizes the different interests each child has in technology and in research methods, and it demonstrates the importance of research

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environments that could emphasize children's involvement and expression of their own ideas. Qualitative geovisualization also became not only a computer tool imposed upon children for exploring, analyzing, and visualizing various types of data associated with research, but also a means to partner with children in the mutual exploration of their experiential learning processes and their creative ways of re-inventing practices of qualitative geovisualization.[18]

Even though it is too early to confirm that the creation of a child-centered research environment and the implementation of qualitative geovisualization give children more insights into understanding the meanings of community than they had before, this study demonstrates how these methods can potentially provide a contextual framework for children to express and develop their own ideas as well as for researchers to more comprehensively explore children's meanings of community. Qualitative geovisualization as a child-centered research shows this evolving process, and it prompts and evokes further discussions about other related factors, relationships, and particular places that may constitute children's understandings of community and how these are contextualized. This also naturally makes it a form of participatory and mixed-methods research. Methodologically and historically, there have been requests and needs for using alternative research methods to examine children's perspectives on their communities (Porter 1995). Weaving qualitative geovisualization and child-centered research together provides us with a more powerful way to empower children and to research with them using a process in which they can play with, think about, and visualize their ideas.

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Notes

1. For more information about the ChUG project, see Cope (2008a, 2009) and Cope and Latcham (2009). This research was primarily conducted at one of the clubs offering an after-school program. A total of 50 children, 24 boys and 26 girls, participated in the research.
2. During the three years of research experience with children, the first year was truly dedicated to rapport building as a homework helper and club volunteer.
3. For more detailed discussions of the structure and functions of the system, see Jung (2009). Since the focus of this article is to provide a full account of children's conceptualizations of community, I do not fully illustrate the details of the qualitative geovisualization system I developed.
4. In the case of Buffalo, NY, the 'Community Studies' section is entirely included in 'Social Science Studies' curriculum. Social Studies curriculum data are based on New York State Education Department public curricula data. Additional information was provided by the New York Geography Alliance (NYGA) website (http://www.buffalo.state.edu/nyga/).
5. All participating children's names are pseudonyms to protect their identities.

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6. This might be considered to be an example of institutional racism in education where non-white students often have little control over public learning, and school knowledge is understood as a set of tasks to do separate from their localized cultural knowledge (Fine and Weis 2003; Kraftl, Horton, and Tucker 2012; Sleeter and Grant 1991; Silva 2012).
7. Laptops had a particular meaning to children. They have, in fact, a very different meaning from 'computer'. Abi especially has a 'fantasy' about laptops in her own words. She believed that a laptop never freezes, whereas a computer often does. This made me carry more laptops than I planned. This also demonstrates that this research was conducted prior to the era of mass ownership by this age group of digital devices such as iPads.
8. A single-use disposable camera was the most practical choice at the time of research.
9. I developed children's photos as soon as they gave to me. It was quite a palpable moment to look at the developed photos together, and also see their excitement to surprise in having had developed photos.
10. Google launched its web mapping service, Google Map in 2006.
11. Digitizing refers the process of converting an analog data into digital format in a computer.
12. I used ATLAS.ti, one of the most popular Computer-Aided Qualitative Data Analysis Software, to create the Network View for each child.
13. Interview with Abi on 11 May 2006. Abi's sketch of a big cake with a candle is included in Network View in Figure 3.
14. Children explained what 'plátano' is. They said it is something like a banana but smaller and its color is greener. Children showed a strong pride in their ethnic food.
15. Field note on 19 June 2006.
16. When I asked this question, of course, I assumed she would say, 'Yes'.
17. Not all stacked images are visible in the Imagined Grid because only one image is viewable in two-dimensional map. Jona picked and placed the most significant photo at the top.
18. Coding methods identified key categories and themes that emerged from all of the collected data, and the significance of their content is often illustrated by codes and the relationships among them. As a partial evidence of the potential effectiveness of qualitative geovisualization, the number and frequency of codes related to the meanings of community have been increased in the qualitative geovisualization stage compared to the prior stage.

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