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YOUTH PARTICIPATION IN PLANNING: ASSESSING THE SIMILARITIES & DIFFERENCES IN COGNITIVE MAPPING AMONG URBAN & RURAL YOUTH

presented by

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has been accepted towards fulfillment
of the requirements for the

MURP degree in URBAN & REGIONAL PLANNING

Major Professor's Signature

AUGUST 14, 2009

Date

YOUTH PARTICIPATION IN PLANNING: ASSESSING THE SIMILARITIES & DIFFERENCES IN COGNITIVE MAPPING AMONG URBAN & RURAL YOUTH

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF URBAN & REGIONAL PLANNING

URBAN & REGIONAL PLANNING

2009

ABSTRACT

YOUTH PARTICIPATION IN PLANNING: ASSESSING THE SIMILARITIES & DIFFERENCES IN COGNITIVE MAPPING AMONG URBAN & RURAL YOUTH

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This study assessed the similarities and differences between cognitive maps of youth from two different environments in Michigan. The participants were children between the ages of eight to thirteen years old, from a rural Michigan community in Lenawee County, and an urban Michigan community in Ingham County. Both groups were asked to create a map, which explained the route from their home to school. Having children produce cognitive maps and interpreting the contents of these cognitive maps may assist planners and educators in better understanding how children can more effectively participate in the planning process. Using principal component analysis, the cognitive maps were analyzed. The Urban Component 1 had three images: stores, active recreation, and unidentified structures. Currently the because of the ever growing popularity of mixed-use design these nodes of activities would be relevant to planners who are interested in defining nodes of activity among the community. While Rural Component 1 had, three images which included city, other houses, and school. This may indicate that children are less likely to consider common elements of their environment too common to be interesting or important, such as their school, and other houses along their route from school to home. Additionally, developing a planning curriculum, including qualitative observation notes, the cognitive maps, and the schematic diagrams generate further hypotheses regarding children's participation in planning, and thus push forward the questions for how to engage youth effectively in planning.

To Amadeo L. Alaniz, my pride and joy who has been my source of motivation in everything I have done and will do, and my mother whom I am indebted to, thank you for all of your continuous support and sacrifices you have made to ensure I am able to live out my goals and dreams to the best of my ability.

ACKNOWLEDGEMENTS

I would like to thank the Boys & Girls Club of Lansing, and the youth participants of Blissfield, Michigan for volunteering their time and enthusiasm to this project. A special thanks to my Committee Chairperson, Dr. Patricia Machemer for all of her time, advice, and knowledge and Committee members, Dr. Pat Crawford, Dr.Zenia Kotval, Dr. Igor Vojnovic for their time and enthusiasm. I would also like to acknowledge, Dr. Karen Klomparens, Dean of The Graduate School, a special thanks and appreciation for offering me the opportunity to go to graduate school, pursue my research interests, and accomplish my educational goals.

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INTRODUCTION

The future of cities relies on the relationships between people, sustainability, and connectivity with the environment. The environments in which we live are products of designers and planning regulations (Halseth and Doddridge (2000), and should seek to identify the needs and aspirations of the clients, the property owners, and the potential users of these spaces. Often these spaces do not include children (Simpson, 1997; Halseth and Doddridge, 2000). Both the profession and community would benefit from educating its youth on the various principles from which the city was built. While youth participation in planning is not always practiced (Knowles-Yanez, 2005), it is a very important way of engaging future decision makers. When youth are involved, their knowledge and fresh perspective add "sense of community" to the decision making process (Quon Huber, Frommeyer, Weisenbach, & Sazma, 2003). In addition, when the community invests in youth development, this not only benefits the youth by decreasing isolation from the community (Calabrese & Schumer, 1986; Zimmerman, 1990; Zimmerman & Rapport, 1988), the community benefits as well (Beker, et al., 1987; Zeldin, McDaniel, Topitzes, & Calvert, 2000).

While literature on children's participation, and neighborhood preferences based on the cognitive map have been explored, research which focuses on spatial knowledge and preference between children who live in an urban environment versus a rural environment are less developed. This paper is explores the nature of participation in planning, youth participation in planning, cognitive mapping methods in participatory planning, and the similarities and differences found between urban and rural youth based

on the cognitive map. Finally, based on the results from the maps, potential implications for further research with respect to youth participation in planning utilizing the cognitive mapping method are explored.

CHAPTER 1

PARTICIPATION IN PLANNING

Participation means different things to different people (Kumar, 2002; Chawla and Heft, 2002). The approach and manner in which participation occurs differs. Deviations among participation conceptualization have led to the formation of three familiar participatory typologies, developed by Arnstein (1969) Hart (1992), and Pretty (1994). A common message each typology proposes is that participation methods have evolved from the individual manipulated to the individual being self-motivated. The following discussion will focus on the meaning of participation, barriers, and/or limitations, benefits, common misconceptions, and methods among children's participation.

Arnstein (1969) described the progression of participation through the "ladder of participation". The rungs are manipulation, therapy, informing, consultation, placation, partnership, delegated power, and citizen control. Manipulation and therapy are the two lowest rungs on the ladder and are labeled as non-participation. Non-participation is described as being a proxy for authentic participation. The three highest rungs are citizen control, delegated weight, and partnership. In these rungs, the sequence of participation is more advanced, and the individual maintains full control and management of the process in which decisions are made. Hart (1992) constructed a similar ladder of participation, which focuses on levels of children's participation. On the low end of participation in Arnstein's ladder, the three lowest rungs include manipulation, therapy, and informing (Arnstein, 1969). Informing is a form of 'tokenism'. Hart (1992)

describes 'tokenism' as *"those instances in which children are apparently given a voice, but in fact have little or no choice about the subject or the style of communicating it, and little or no opportunity to formulate their own."* The lowest levels of participation on either ladder describe participation as a mere 'feel good' result, not really benefiting or involving those who are affected. Pretty (1995) described the lowest rung as being passive participation, where information is disseminated by external people either on what is going to happen or what already has.

According to Arnstein (1969) and Hart (1992), true participation occurs when individuals hold assigned roles in their community, and are clearly informed about goals, and the decision-making process. Although according to Checkoway, Pothucki, & Finn (1995) this level of participation is rarely practiced. They argue that planning agencies often underrepresented minority groups (i.e. children) in the community, and overrepresented executives and high economic stakeholders in land use decisions. However, according to Francis and Lorenzo (2002), participation in city design had become increasingly popular.

Youth Participation in Planning

Francis and Lorenzo (2002) suggest that children's participation in city design has become increasingly popular over the past 30 years based on an increased interest among policy makers, designers, and researchers. These groups believe cities are best planned with direct involvement of children in planning. They share the message of Arnstein (1969), Hart (1992), and Pretty (1995), who argue that participation occurs at varying levels of inclusion, and is significant in decision making among the planning process.

Francis and Lorenzo (2002) suggest that children's participation occurs among seven realms that have progressed over time. These realms are romantic, advocacy, needs, learning, rights, institutionalization, and proactive. However this is not just an issue on whether or not children have the right to participate (UNICEF, 2003), but according to the American Institute of Certified Planners, it becomes an ethical issue as well (AICP, 2005). Additionally, Knowles-Yanez (2005) suggests approaches of children's participation have included scholarly, educational, practice and rights-based. Academic researchers often lead scholarly approaches and the outcome does not directly realty to an outcome in professional planning practice, whereas the educational approached leads to more informed methods for educating children in land use planning. The practice approach advances children's participation in land use planning among three different realms, which include public agency, planning consultation, and not-for-profit. The rights-based approach argues for the inclusion of children to participate in planning and include them in making decisions that affect their lives. It is common for these approaches to provide results for more effective and ethical ways of including children in land use decision making.

As members of AICP, planners are upheld to the AICP Code of Ethics (2005) that holds planners an overall responsibility to the public to seek justice by working to expand choice and opportunity for all persons, recognizing an exclusive responsibility to plan for the needs of the disadvantaged and to promote racial and economic integration, which includes children. Members are also held responsible in ensuring participation is open enough to include those who lack formal organization or influence (AICP, 2005). Not only is it a responsibility upheld by the AICP Code of Ethics, children's participation is

recognized by the Convention on the Rights of the Child for children to participate in decision making processes that affect their lives, in accordance with their capabilities (UNICEF, 2003). While progress has been made by including children in the planning process through scholarly approaches (Talen & Coffindaffer, 1999; Dierkx, 2003), and educational approaches (Peirce, 2001), planners often lack promoting youth participation in community planning (Knowles-Yanez, 2005).

Challenges of Youth Participation in Planning

Planners often may not promote youth participation in planning based on a few common misconceptions. These common misunderstandings may be attributed to: assumptions about interests in planning, historical concepts in planning, zoning that has compartmentalized cities in which many urban spaces are viewed as adult spaces, and the exclusion of children from the idea of public participation (Simpson, 1997). Moreover, children are not expected to participate effectively in planning because they may lack understanding, proficiency, and the mind-set beneficial to planning issues (Checkoway, Pothucki, and Finn, 1995).

Benefits of Youth Participation in Planning

Hart (1995) argues that competency and responsible participation evolve when children learn how to look at their community in a critical way. There is also evidence that participation can strengthen academic achievement in the classroom and increase problem-solving capacity in the community (Checkoway & Cahill, 1981; Crabbe, 1989; Conrad& Hedin, 1991; Knowles-Yanez, 2005). Additionally, there is an unrealistic expectation for a 16, 18, or even 21 year old to suddenly become a responsible

participating adult without prior experience (Hart, 1992). Participation must be implemented through innovative progressions, which relate to children's capacities (Simpson, 1997).

Methods of Youth Participation in Planning

Participation occurs in varying contexts and began as a public relations approach during time of urban renewal where social elites were asked by city housing officials to serve on Citizen Advisory Committees (CAC's) (Arnstein, 1969). Youth organizations are another example where planning participation occurs through given opportunity for youth to organize and express their views to the mayor and local council (Simpson, 1997). Chawla and Heft (2002) suggest that children eight year of age and older tend to be the focus of participatory programs where participation is found through both formal and informal settings. Golledge, et.al (1992) chose subjects between the ages of nine and 12 years old based on life span and developmental theories that suggest the capacity for youth to understand routes should be established by the "preteen years". Another example where formal participation occurs among youth is found when children gather with their peers to socialize, observe, and try out roles in public spaces (Chawla & Heft, 2002). In addition, informal participation may occur through the utilization of the cognitive map, which seeks to explore spatial dimensions of people's realities (Kumar, 2002). Kevin Lynch (1977) has established a repertoire utilizing cognitive mapping to find out how people identify the form of a city. By using the cognitive map, Lynch (1977) sought to identify cities that have good quality form, making them not only memorable, but easy to navigate as well. Today, his research serves as a model for research among urban areas, and neighborhoods. Employing this participatory tool is

important since results from interviewing planners in the U.S. and Australia showed that planners do not have a strong sense of familiarity about planning methods that could involve youth, and consistently do not address their needs through the planning process (Knowles-Yanez, 2005). Furthermore, Hart (1995, 5) states, "in order for children to critically evaluate the quality of their environment, they need to be given the opportunity to make comparisons among other community members perspectives". There is an insufficient amount of research and discussion in how effective the cognitive map is in children's participation, and whether and how utilizing cognitive maps allows planners to effectively include children in the decision making process.

Space Related Methods to Participatory Planning

According to Kumar (2002), space-related Participatory Reflection and Action (PRA) methods are "useful for exploring the spatial dimension of people's reality". Maps that are used in space-related methods include social maps, resource maps, mobility maps, service and opportunity maps, and transect maps. The social map is considered the most commonly used, and the most different in many significant ways. As described by Kumar (2002), the social map is significant because the local people and not experts draw it, which gives the perspective of the community through its citizen's eyes. Another significant difference is the map is not drawn to scale, therefore it depicts what community members believe is relevant and important to them (Kumar, 2002). The focus is to first understand how people perceive and relate to their space, rather than just the physical aspects. Not only does this enhance the understanding about the perception of the environment according to the youth, but enhances the community's perception as a whole (Kumar, 2002).

There is growing support and recognition of youth involvement in the planning process among geographers. Halseth and Doddridge (2000) argue that cognitive maps are not just "mental representations of the world around us", but also a tool in which we can discover "the different ways people construct and understand places". Ruddick (1998) argues in support of incorporating youth views more effectively into planning work. Cognitive mapping, as Halseth and Doddridge (2000, 579) suggest is a "flexible and affordable tool [which] gains insight into how children interact with their neighborhood environments". However, children's cognitive mapping abilities have been highly debated, and the argument on when spatial cognition occurs varies among researchers.

Blaut (1987) argues, "We know very little about the acquisition process which young children learn and cognitively map the environment". Based on findings from the Place Perception Project, results concluded that five-to-seven year olds could both recognize and utilize aerial photographs without ever having seen the earth's surface (Blaut, 1987). The objective in this study was to begin to understand "macro-environmental learning in several of its dimensions". The Place Perception Project attempted to cover, "how, why, and at what age or stage do children attain a cognitive mapping ability". In other research, Golledge, et.al (1992) discovered in a sketch mapping activity, strong evidence supported the notion that a "key element of spatial knowledge acquisition is the identification of particular locations whether they are choice points or landmarks." In theory, they ask whether the capability of children to perform these tasks is a result of development or something related to the process of spatial reasoning and route learning as a facet of the reasoning process. Golledge et.al (1992)

posed a key question that launched behavioral research in geography by asking, "What processes underlie the selection of certain environmental features?" They found that the components of routes could be developed sparingly. The development depends on both the experience, and environment which learning takes place.

Halseth and Doddridge (2000) examined cognitive maps from a project called KIDSMAP, where children were asked to draw cognitive maps and compared them to Kevin Lynch's typology of urban elements. By examining the paths, edges, districts, nodes, and landmarks, Halseth and Doddridge (2000) were able to examine the children's cognitive maps and explore what components of the maps were more prominent and where they occurred. One finding relative to planners was the "overwhelming influence of automobiles" among the maps. Halseth and Doddridge (2000) ask, "How easily the concept of walk-ability would be introduced to a generation who has seen urban spaces from an automobile?" This type of information would allow planners to make effective choices among land use and public policy decisions (Halseth & Doddridge, 2000).

Urban versus Rural Considerations

Research that has included comparison between urban and rural children environmental perspectives, differences were discovered (Ward, 1978, 1988; Lynch, 1977; Robertson & Walford, 2000). As others found that urban and rural children value the same qualities about their environment (Chawla 2002). In a study which also included suburban children, Bogner and Wiseman (1997, 111) found no difference between responses of rural, suburban, and urban groups regarding environmental perspective and behavior. The Land Use- U.K. Project for the U.K. Geographical

Association conducted a study where schoolchildren were asked to conduct a ground survey of samples within the urban and rural area grids, and to indicate their hopes and visions for the areas (Robertson & Walford, 2000). The results show that among both group's children desired for a cleaner and varied landscape in the future with more space and greater provision for well-planned low-density housing, and recreational facilities. Pessimism was most notable among the views for urban locations, where in rural locations there was a higher expectation that things will remain more or less the same in 20 years time. Robertson and Walford (2000) concluded the pessimism and optimism perspectives might well transpire into actual landscape developments. As decision makers of the future, we can do well to listen to their descriptions and consider their perceptions as potential actions that shape the landscapes of all citizens.

Machemer et.al (2008) compared rural and urban youth perceptions of an ideal community and focused on identifying children's ideal community elements and determining if there are any differences in rural and urban children's perceptions. Their findings from the spatial diagrams indicate there is a difference between rural and urban models. The spatial diagrams suggest the rural participant's social community may be distinct and separate from the individual setting, whereas the urban participants their ideal community is more cohesive and connected. They conclude that increasing planning knowledge and skills enables the children to enhance the planning process and allows them to develop the basis of planning understanding, as they become our land use decision makers of tomorrow.

We know that children have the capacity to comprehend urban planning concepts; provide a voice with hopes and visions for the future of their area; provide insight to the

elements of their ideal community; and build models of their ideal community or a space in their community. The application of participation may produce a variety of settings through social action, community planning and education, public advocacy, and local services and development. While we know then direct benefits of involving children in the planning process, we do not know if engaging them in an "education" endeavor or a "real world" planning scenario will result in them being a better designer or planner.

Having children produce cognitive maps and interpreting the contents of these cognitive maps may assist planners and educators in better understanding how children can more effectively participate in the planning process. Additionally, developing a planning curriculum for children and testing that curriculum will provide insight into how to engage and empower children in community planning. The products of the curriculum, including qualitative observation notes, the cognitive maps, and the schematic diagrams will generate further hypotheses regarding children's participation in planning, and thus push forward the questions for how to engage youth effectively in planning.

The cognitive maps combine rural and urban youth participation and assess similarities and differences in the cognitive maps based on their knowledge of the route from their home to school. The results provide hypotheses that may be tested in future investigations. Furthermore, the results emphasize an effective method that planners and educators may use to take the necessary steps in outreach initiatives in an academic setting. An important aspect of these maps is that they are the perspective of the youth before discussion of planning concepts. The results of the cognitive maps will assist planners, and educators in investigating what methods work for youth participating in

planning, how they can engage and empower the youth in their community and take the necessary steps towards outreach initiatives in an academic setting. Long term may provide a basis for a study on a student who participates in an urban planning curriculum if they become a better planner, designer, or decision maker.

CHAPTER 2

METHODS

Participants

The participants were children between the ages of eight to thirteen years old, from a rural Michigan community in Lenawee County, and an urban Michigan community in Ingham County. For this research, the terms rural and urban describe the village of Blissfield, and the City of Lansing. Blissfield is a small village at the intersection of two roads (one state highway and one county road) covers nine city blocks and surrounded by agricultural fields. The 30 children who participated from this community are from migrant farm working families. The Blissfield program ran in conjunction with the Migrant Summer School Program in Lenawee County. Lansing is the sixth largest city in Michigan and the urban area covers approximately 136 square miles. The children who participated (based on 23 participants) in the Urban Design Program were predominantly African-American. Based on the 2008 American Society for Landscape Architecture (ASLA) Graduating Students Study, a majority of the respondents were Caucasian (81%), 5% were Hispanic, and only 2% were Black. Therefore, the majority of the children participants from both Blissfield and Lansing represent minority groups, and may be considered underrepresented in the landscape planning process.

Procedure

The Boys & Girls Club of Lansing welcomes volunteers to come in and work with the youth. The Urban Design Explorers program took the youth through a variety of

hands-on activities that would allow them to experience a variety of concepts within the Landscape Planning profession. The cognitive mapping activity was introduced to the Boys & Girls Club group during the first week of the program. Each child was asked to draw a map of the route from their home to school. The Blissfield participants were migrant children enrolled in the Lenawee Migrant Summer School Program. Their participation in this planning project happened in one half-day session, scheduled in the final weeks of their summer curriculum. In both the urban and rural communities, the youth were given a 9" x 11" white sheet of paper, drawing utensils, a triangle, and a basic definition of what a cognitive map means, and what is found on a map (i.e. legend, scale, north arrow). The urban group was asked to draw a map of the route from their house to the Boys & Girls Club, while the rural group was asked to draw a map of the route from their house to their school in a design charrette process. Charrettes are short intense design sessions. The design charrette allowed student participants to draw their cognitive maps in hour-long hands on design session.

Method of Analysis

Qualitative data was gathered through cognitive maps that allow exploration among spatial dimensions based on the individuals' perception. Edward C. Tolman (1948) first introduced the concept of the cognitive map in 1948, and described the inner psychological account of environmental information. These references to environmental information may include; route identification, location, distance, and direction. (Downs & Stea, 1973) The principal intention of cognitive mapping is to allow individuals to make choices linked to the spatial environment (Mondschein, Blumenberg, & Taylor, 2005) and variation occurs between individuals and groups due to varying opportunities

of access. Jean Piaget, a psychologist, found that environmental perception and cognition are different between children and adults (Downs & Stea, 1973). Due to the nature of cognitive mapping in which the primary focus is on route or path information, travel throughout the environment occurs in systematic processes of movement that are influenced by "choice points" (Mondschein, Blumenberg, & Taylor, 2005). Halseth and Doddridge (2000) argue, "The routes to school, to the park, or to a friend's house, are important in a child's daily experience, as are the boundaries to these experiences". Psychologist Jean Piaget found that environmental perception and cognition are different in children from adults (Mondschein, Blumenberg, & Taylor, 2005).

Quantitative analyses using multivariate statistics were used to identify cognitive map elements (houses, streets, trees, etc.) and determine where differences occur, what elements are considered related, and which are significant. This technique allows both interpretations of multiple variables as well as a reduction of dimensions linked to those variables. Given the vague nature of cognitive mapping, any element could be drawn. The varied elements were aggregated into categories of physical elements for multivariate analysis using principal component analysis (PCA).

The PCA examines the relationships among the ratings instead of looking at the magnitude of the ratings (Kaplan, 1985). The method allows categorization of the data and determines the number of dimensions that represent the entire data set. This analysis reveals hidden patterns of preference, which may not reveal these patterns by looking at images included on the maps. While the dimension takes into account all the images contained, finding identifying hidden patterns of preference or certain images by looking at the connection between the images contained in each dimension improves provides

further linkages. This will identify what features of the youth's environment are significantly different among all the maps combined. As stated earlier, in the context of the social map, Kumar (2002) argued the significance in this type of map lies in the perspective of the local people and not experts, which in turn presents the perspective of the community through its citizen's eyes.

Eigenvalues represent the strength of the dimension. These values are calculated in relation to the principal components by order of rank. The largest of eigenvalues represents the largest proportion of the variance that can be explained, and is related to the first principal component. If this eigenvalue is greater than or equal to one, it is considered significant (Burley & Brown, 1995). The condition for a strong association was a minimum load of 0.4 on no more than one eigenvector. Eigenvector coefficients greater than or equal to 0.4 are identified as being strongly associated with the dimension. Because this dimension is based on a group of images, each component will be considered independent from each other. Some of these dimensions may show preferential groupings of images. This preference means that if one image is present, another image was likely to be present. If the value was negative, then the image was not likely to be present. This was indicated by the same coefficient value (either positive or negative).

While the PCA multivariate statistical method was used to generate quantitative findings, understanding these findings required qualitative data. Qualitative data was obtained using field observations of the children in the cognitive mapping exercise and for the urban participants, the other seven Urban Explorers sessions. The other sessions included activities such as construct your favorite space, design space for Boys and Girls

Club, neighborhood analysis, construct ideal neighborhood, and construct ideal design for commercial use lot. The activities were designed to explore various levels of spatial scale, and covered a variety of land use planning concepts along the way.

The first session focused on the youth constructing their favorite space. This was to get an idea about what kinds of spaces when given the opportunity to construct a model, what they would come up with before any discussion of land use or architecture design was discussed.

The second session that week focused on the youth's identity and their familiarity with their neighborhood environment, which is when the cognitive mapping exercise was conducted. The third session focused on designing a small space for the Boys and Girls Club, where a majority of the design ideas included either a pool or an outdoor basketball court. The designs were voted on from peers outside the program and due to the overwhelming response from those playing basketball, the outdoor basketball court one. The voting session was included to take the children through both a mock voting session in which the design either is approved or disapproved by the planning commission, as well as a design charrette where the community members may vote on a particular design for their community.

The neighborhood analysis session included a discussion about the different types of residential architecture seen among the neighborhood. The children were given a sheet with different architectural styles of houses, and were asked to identify the architectural styles they observed during the walk. The walk also included discussion about the different types of streetscape elements found among the neighborhood to include

identification of trees, and other common plant material as well as what they consider to be a safe neighborhood. A follow up activity that week included construct your ideal neighborhood, where the children were given foam core modeling materials and images of various types of land uses, housing types.

The final sequence of activities took the youth through a redesign of a Brownfield commercial property, where the children were asked to come up with ideas for this space. The youth were given information about the site by looking at small site plans and site pictures to familiarize themselves with the space. Discussion about the current use of the site included an M&M activity where the youth were asked to analyze the site. The different M&M colors were coded to describe the various types of land uses found on a land use map. For example, red M&M's represented commercial use, while brown M&M's represented parking. Based on the information they were given about the site and considering the uses currently, the children were then taken through a brainstorming session where they were asked to come up with uses for this site. To generate ideas questions that were asked included "what do you want to (see, hear, smell, taste, and do) in this space? At the end of the brainstorming activity, the children were asked to come up with a concept, which became the name of the project. One child suggested "Motown Square", and the rest agreed.

Based on the ideas brought up in the brainstorming, session foam-core pieces containing images from all their ideas each of the ideas were provided and "Motown Square" model was constructed. The youth divided amongst themselves who would do what according to the type of use and purpose. The program and curriculum concluded when the youth presented their "Motown Square" model to the City of Lansing Planning

Director, where the youth were able to share their ideas and ask questions about planning to the Planning Director. Observation notes on conversations and dialog between youth participants were collected, collated, and codified. These data were used to inform the discussion.

CHAPTER 3

RESULTS AND FINDINGS

The cognitive mapping activity produced 37 maps, which were quantified to create a database suitable for statistical analysis. While 23 participants were part of the Urban Design Explorers program, on the day the cognitive mapping activity was introduced only 16 participants were present that day and produced 15 of the maps. This was due to the nature of the program, which allows the children to choose whether they attend the program, they had signed up for, or not. Additionally, children were permitted to dissent from participation from any activity. The rural children created 22 of the cognitive maps produced. Using the Principal Component Analysis (PCA) the database allowed to exploration of hidden patterns of preference for specific images among all the maps for each group.

Given the number of individual elements (eighty-one) identified in all the cognitive maps and the research gap (youth preferences in cognitive mapping), PCA allows us to simplify and categorize data using statistical measures rather than subjective interpretations of data. By categorizing the data and determining the number of dimensions, the variance in the map data set is determined. The 81 individual elements were aggregated into 21 categories. The categories determined among all maps were; home, city, bridge, animal/pet, other houses, green elements, stores, park elements, water features, active recreation, waterslide park, school, various roads, bikes/sidewalks, other commercial, ice-cream shop, farm/cows, public buildings, structural amenities, unidentified structures, and other states. From the 81 elements identified among the

cognitive maps, 16 categories were represented in the urban maps, and 22 categories were represented for the rural maps. The urban maps did not include city, animal/pet, park elements, water slide, ice-cream shop, farm/cows, and other states. The rural maps did not include the woods, school, or attached residential.

The urban youth map analysis revealed seven components as significant dimension given that their eigenvalues were greater than 1.0. (See Table 1, pg. 23) The first seven eigenvalues explain 83 percent of the variance. The first component has the strongest explanatory weight and accounts for 21 percent of the variance. The first component contains three images that meet the conditions and each has a positive value ranging from .811 to .837. (See Table 1, pg. 23) The last image has a negative value of -.566, indicating that students who included the two other images were not likely to include the other (negative value) image and vice versa. Components 1 to 4 all have at least two images with a significant value. While PCA reveals that seven images are important and provide explanation, eight images are not prevalent. These eight images account for 17 percent of the variance and the statistical analysis reveals little about these images (Table 1, pg. 23).

	1	2	3	4	5	6	7
home	-0.566	0.722	-0.162	0.140	0.098	0.020	0.054
woods	-0.191	0.179	-0.051	-0.054	0.039	-0.168	0.923
other houses	-0.072	-0.414	0.077	-0.199	0.651	-0.069	-0.081
attached residential	0.094	-0.797	0.258	0.068	0.291	0.124	-0.040
green elements	-0.480	0.052	0.794	0.250	-0.149	0.120	0.003
stores	0.832	0.074	0.061	0.226	-0.073	0.310	0.124
water features	-0.235	0.243	-0.167	-0.224	-0.053	0.556	-0.170
active recreation	0.837	0.281	0.252	0.061	0.152	0.294	0.097
school(B&G Club)	-0.206	-0.003	-0.084	0.651	0.488	0.475	0.162
roads etc.	0.712	0.444	0.000	0.303	0.227	-0.039	-0.051
vehicles	0.024	0.445	-0.178	0.339	0.315	-0.458	-0.361
bikes_sidewalks	-0.351	0.254	0.752	0.331	-0.227	-0.035	-0.125
other commercial	0.103	-0.578	-0.220	0.432	-0.431	0.119	0.026
public bldgs	0.113	-0.115	-0.483	0.561	-0.353	-0.099	-0.062
structural amenities	-0.307	0.254	-0.258	-0.316	-0.079	0.567	-0.140
unidentified structure	0.811	0.229	0.258	-0.373	-0.193	-0.070	-0.027

Table 1: Eigenvector coefficients, urban cognitive map eigenvalues

The rural youth map analysis revealed ten components as significant dimensions; given the eigenvalues were greater than 1.0. (See Table 2, pg. 24) These first ten eigenvalues explain 88 percent of the variance for Blissfield. The first component has the strongest explanatory weight and account for 16 percent of the variance. The first component has three images that meet the conditions with positive values ranging from .582 to .942. (See Table 2, pg. 24) Components 1 and 2 have three images with a significant value.

	1	2	3	4	5	6	7	8	9	10
home	0.082	-0.032	0.018	0.176	-0.060	0.304	0.414	0.617	-0.180	0.234
city	0.941	0.016	0.127	-0.129	-0.102	-0.173	-0.009	0.132	0.052	0.056
bridge	0.004	-0.277	-0.131	0.235	-0.090	0.380	-0.009	0.154	0.704	-0.188
animal_pet	-0.088	-0.446	-0.235	0.147	-0.017	0.038	0.040	0.012	-0.505	0.418
other houses	0.942	0.108	0.186	0.020	-0.017	0.087	-0.033	0.020	0.127	0.095
green elements	-0.067	0.615	-0.324	-0.277	-0.353	0.284	0.195	-0.060	-0.081	-0.120
stores	0.513	0.124	-0.186	0.150	0.669	-0.024	0.277	0.006	-0.007	0.068
park elements	-0.092	0.799	-0.177	0.064	0.214	0.170	-0.372	0.021	0.047	0.191
water features	-0.143	0.350	0.071	0.725	0.206	0.221	0.229	0.151	0.057	-0.001
active recreation	-0.339	-0.061	0.150	-0.657	0.050	0.010	0.024	0.542	-0.058	0.051
waterslide park	-0.237	0.315	0.381	0.338	-0.061	-0.392	-0.348	0.472	0.050	0.094
school_bg	0.582	-0.256	0.110	-0.171	-0.405	-0.430	0.185	0.203	0.046	-0.193
various roads	0.396	-0.269	0.406	0.045	0.135	0.567	-0.257	0.002	-0.239	-0.012
vehicles	-0.194	0.252	0.648	0.526	-0.301	-0.145	0.011	0.127	-0.031	-0.038
bikes_sidewalks	-0.010	-0.032	0.083	-0.042	0.593	0.014	0.267	0.243	-0.190	-0.647
other commercial	-0.111	-0.236	-0.517	0.177	0.120	-0.221	0.403	0.113	0.411	0.322
ice-cream shop	-0.058	-0.537	-0.138	-0.035	-0.201	0.463	-0.319	0.270	0.087	-0.039
farm/cows	-0.199	0.036	0.602	-0.504	-0.022	0.208	0.377	-0.090	0.197	0.262
public bldgs	0.833	0.441	-0.080	-0.109	-0.023	0.130	-0.079	0.054	0.007	0.121
structural amenities	-0.058	0.097	0.475	0.207	-0.338	0.236	0.492	-0.323	0.005	-0.038
unidentified structure	-0.249	0.172	0.450	-0.566	0.464	-0.021	-0.057	-0.003	0.247	0.166
other states	-0.144	0.545	-0.484	-0.298	-0.378	0.103	0.132	0.229	-0.067	-0.144

Table 2: Eigenvector coefficients, rural cognitive map eigenvalues

Component 8 has two images with a significant value, while Components 3 through 6 all have at least one image with a significant value. While 10 components are identified, Component 7 had no image with a loading value of greater than 0.4 that was not found in any other cluster. While the PCA reveals that ten dimensions are important and provide explanation, twelve images account for 12 percent of the variance, and statistical analysis reveals little about these images (Table 2).

CHAPTER 4

DISCUSSION

Among the rural youth maps, the first ten yielded 22 components, and the urban youth maps yielded 15 components. Only components with initial eigenvalues greater than 1 are considered significant (Burley & Brown, 1995). Therefore, these will be the only components discussed. Eigenvalues greater than 1 were among the first 10 components among the rural youth maps, and among the first seven components with the urban youth cognitive maps. The components are individual dimensions; among these dimensions, and all of the images are related (Machemer, et.al, 2008). The relationships within each dimension were developed based on the component groupings. The relationships among the components and images are labeled based on the researcher and therefore are subjective and are open to debate and criticism. From these relationships, hypotheses are generated and are to be tested in future research. Although PCA is valuable for providing information in hidden patterns of preference, definitive results require using this analysis require hundreds of participants (Machemer, et.al, 2008)

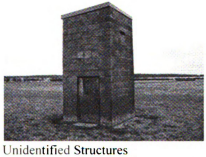
Urban Youth Maps

Component 1 has three images: stores, active recreation, and unidentified structures (See Figure 1, pg. 26) and accounts for the largest variance. This set of images has been labeled as *Active Public Spaces*. These sets of images are consistent with the findings of Talen & Coffindaffer (1999) which found that children equate commercial land uses with diversity and social interaction. The degree of diversity is interesting since the urban children were not asked about what they think is ideal, but rather what exists along their route. The presence of commercial land uses further supports Hart's

(1979) finding that children tend to emphasize the importance of places with the potential for social interaction, and commercial places for what could potentially be purchased or consumed. Currently the because of the ever growing popularity of mixed-use design these nodes of activities would be relevant to planners who are interested in defining nodes of activity among the community.

Active Recreation

Stores



Unidentified Structures

Figure 1: Urban Component 1: Active Public Spaces

In a review of research based on the cognitive map (Miller, 2003) the author mentions previous work conducted by Florence Ladd, who worked with children of the Mission Hill area in Boston. Miller (2003) mentions that Ladd had children draw maps of their neighborhood and found that "children only drew areas in which they are familiar

and comfortable with". Therefore, this cluster of images suggests that the children chose to include features of their environment based on what is familiar and important to them.

Understanding differences between the components is more likely to be achieved through additional discussion with the children about their maps. Encouraging communication through a variety of methods (Roe, 2006), provides a greater potential for understanding children's knowledge and preference in their environment (Machemer, et.al 2008). Using the cognitive map will provide planners with a greater potential of success and simple way of communicating with the youth about their visions and preferences of their community.

Component 2 has two images, home and vehicles (See Figure 2, pg. 28), and explains 15 percent of the variance. This cluster of images has been labeled as *Individual Spaces*. Other images that were included in this cluster but had negative coefficients were other houses, attached housing, and other commercial structures. Notably so, when the group of children were asked what do you consider a safe neighborhood? One child replied with "Neighborhoods where white people live". Moreover, the other children agreed. When asked to describe further, the child responded with "In the neighborhoods where white people live, it is quiet." This was very important to note since the group of children were of African-American descent. The lack in presence of other homes among their maps might indicate the youth do not identify or feel safe therefore did not include those houses in their neighborhood which is further informs the discussion.

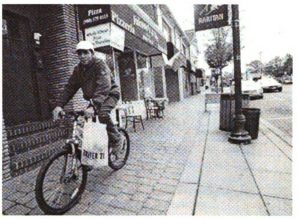
Home

Vehicle

Figure 2: Component 2: Individual Spaces

Component 3 has two images, green elements and bikes/sidewalks (See Figure 3, pg. 29), and explains 11 percent of the variance. These sets of images have been labeled as *Environment Amenities*. This cluster of images is inconsistent with the question posed by Halseth and Doddridge (2000) who ask, "How easily the concept of walk-ability would be introduced to a generation who has seen urban spaces from an automobile?" Observations based on discussion among the urban children during their summer program included one in which the children were asked during their final presentation about the inclusion of parking. The children agreed this would a walkable place, where people arrive by some other mode of transportation. One child in particular spoke up and said, "A lot of people are overweight and need to walk more these days".

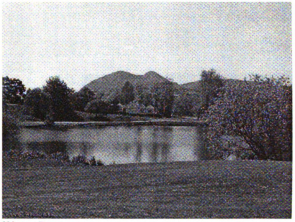
Green Elements



Bikes/Sidewalks

Figure 3: Urban Component 3: Environment Amenities.

Component 6 has two images, water features, and structural amenities (See Figure 4, pg. 30), and explains 8 percent of the variance. These sets of images have been labeled as *Streetscapes*. These images may indicate whether youth are able to identify their city among various types of land use maps or aerial photographs. The presence of water supports Lynch (1977, 44) finding that landscape features of the city, vegetation and water were often noted with care and pleasure. Additionally, water features may serve as a way-finding feature or landmark. Blaut (1999, page 514) states, "children learn and develop their cognitive mapping ability through their wayfinding". Additionally, Allen (1999) explored wayfinding with children and found that they remember routes in sequenced individual nodes within their everyday travel paths. A comparative study between built features and natural stand structures in relation to the significance of way finding identifiers may provide further discussion.



Water Features

Structural Amenities

Figure 4: Urban Component 6: Streetscapes.

Component 7 has one image, the woods (See Figure 5, pg. 31), and explains 6 percent of the variance. This component is labeled as the *Natural Environment*. The woods are an identifiable feature to a small percentage of the youth who may use the woods as a landmark. Roe (2006, 170) in their research found that trees were very important to the children for various reasons. When showed an image of a tree, the children revealed both an aesthetic and practical appreciation. While the woods image was present among the urban children maps, it was not illustrated among the rural youth maps and further supports the Bogner and Wiseman's (1997, 112) finding that urban residents are more concerned about their environment due to the greater exposure to environmental degradation. Furthermore, they found that rural residents have a more utilitarian perspective towards their environment, and the absence of wooded elements among the rural children maps supports this. Although in previous studies on urban and rural residence environmental preference have found no correlation between residency

and valuation of the environment (Arcury and Christenson, 1990; Howell and Laska, 1992).

The woods

Figure 5: Urban Component 7: Natural Environment.

Rural Youth Cognitive Maps

Component 1 accounts for the largest variance (16 percent) and shows the largest dimension range. There are three images included in this component: city, other houses, and school (See Figure 6, pg. 32). These sets of structured environments have been labeled *Destinations of the Built Environment.* One of the images included among this set was a school. Halseth and Doddridge (2000) found that while many of the suburban children included edges on their maps, many did not include fences. They concluded that the fence being a common element was perhaps too 'commonplace' to necessitate interest. Therefore, children are less likely to consider common elements of their environment too common to be interesting or important, such as their school, and other houses along their route from school to home.

City

Other houses

School

Figure 6: Rural Component 1: Destinations of the Built Environment.

Component 2 accounts for 11 percent of the variance and includes three images green elements, park elements, and other states. Animal/pet and ice cream shop were images that were unlikely to be included if the other three were present. These sets of natural related images have been labeled *Destinations of the Natural Environment* (See Figure 7, pg. 33). This set of images came as a surprise based on two findings. First, the youth did not commonly include green elements or park elements on their maps, which is a common characteristic of rural landscapes. Lynch (1977) who argues that landmarks need to have "singularity, or some aspect that is unique or memorable in further supports this

Green elements

Park elements

Other states

Figure 7: Rural Component 2: Destinations of the Natural Environment.

the context". Which may explain while green elements are a distinct character of rural landscapes, youth may not have recognized these as important because they are so common. Second, these set of images included "other states", which may reveal that 'home' is a relative term and while some may consider another state, their "home" this is still important for them to incorporate among their map. The rural children come from migrant working families and therefore while they are "living" in Michigan at the time, they may not consider Michigan their home. This posed both a problem and challenge within the study group. The fact that the "state" pictures where Texas, and Wisconsin, may have indicated that the illustration was of what they considered "their home". For future research, a survey should complement the cognitive maps based on age, location of

residence, gender, and socioeconomic status. There is a level of ambiguity with the term "home". This may be useful for planners not only in migrant farming communities, but also in many urban communities were children might change domicile. Questions for further research may include children of divorced parents, or children who live in shelters. Planners need to consider those alternative environments in which children may live in. Discussions such as this are relevant to planners who are interested in youth participation in the planning process.

Component 4 includes one image water features, and explains 10 percent of the variance. Images of water features (pool, river, beach, and pond). These images have been labeled as *Destination Amenities*. Water features was also present among the urban components and further supports the findings of previous studies in which urban and rural residence environmental preference had no correlation based on residency and valuation of the environment (Arcury and Christenson, 1990; Howell and Laska, 1992). This further supports Lynch's (1977) finding that landscape features of the city, vegetation, and water were often noted with care and pleasure. Because the landscape described here is not of the city, this further supports Bogner and Wiseman's (1997, 112) finding that both populations seem to contain identical environmental perspectives, while residency has continuously thought to have ambiguity. Planners in rural communities may further investigate what they need to provide to make their community image more vivid and memorable by providing visible and prominent features among the landscape.

Urban and Rural Spatial Diagrams

The diagrams presented in Figures 8 and Figure 9 represents the conceptual spatial maps in relation to the types of significant images that were found among all of the maps of either the urban or the rural youth. These diagrams are organized based on the results of the PCA and represented by circles that vary in size, layout, and strength. Each circle represents which component with an eigenvalue greater than 1. Larger circles represent larger eigenvalues. The linkages found among the circles represent components that share images. The linkages are "only shown if the image had a loading value greater than 0.4, but were not unique to one dimension" (Machemer, Bruch, & Kuipers, 2008). The images that were shared are indicated on the line between the components. The layout and size of the circles are subjective to the researcher, and therefore are open to discussion and criticism.

The spatial diagram for the urban youth cognitive maps (See Figure 8, pg. 36) is spatially configured in a more organized manner compared to the spatial diagram for the rural youth cognitive maps. The urban schematic diagram is configured in a linear connected path, while the rural schematic diagram shows a more interconnected path among the components. The urban spatial diagram does not contain any groupings that share any images other than the strongest connection that occurs between *Neighboring Spaces* and *Environment Amenities*. The connections between *Active Public Space, Individual Spaces, and Neighboring Spaces* further supports Derr's (2002) finding that a child's sense of place occurs at various scales from child-centered, to family to community. These connections may indicate the level of preferences among urban children, which start from the places they find most valuable or important.

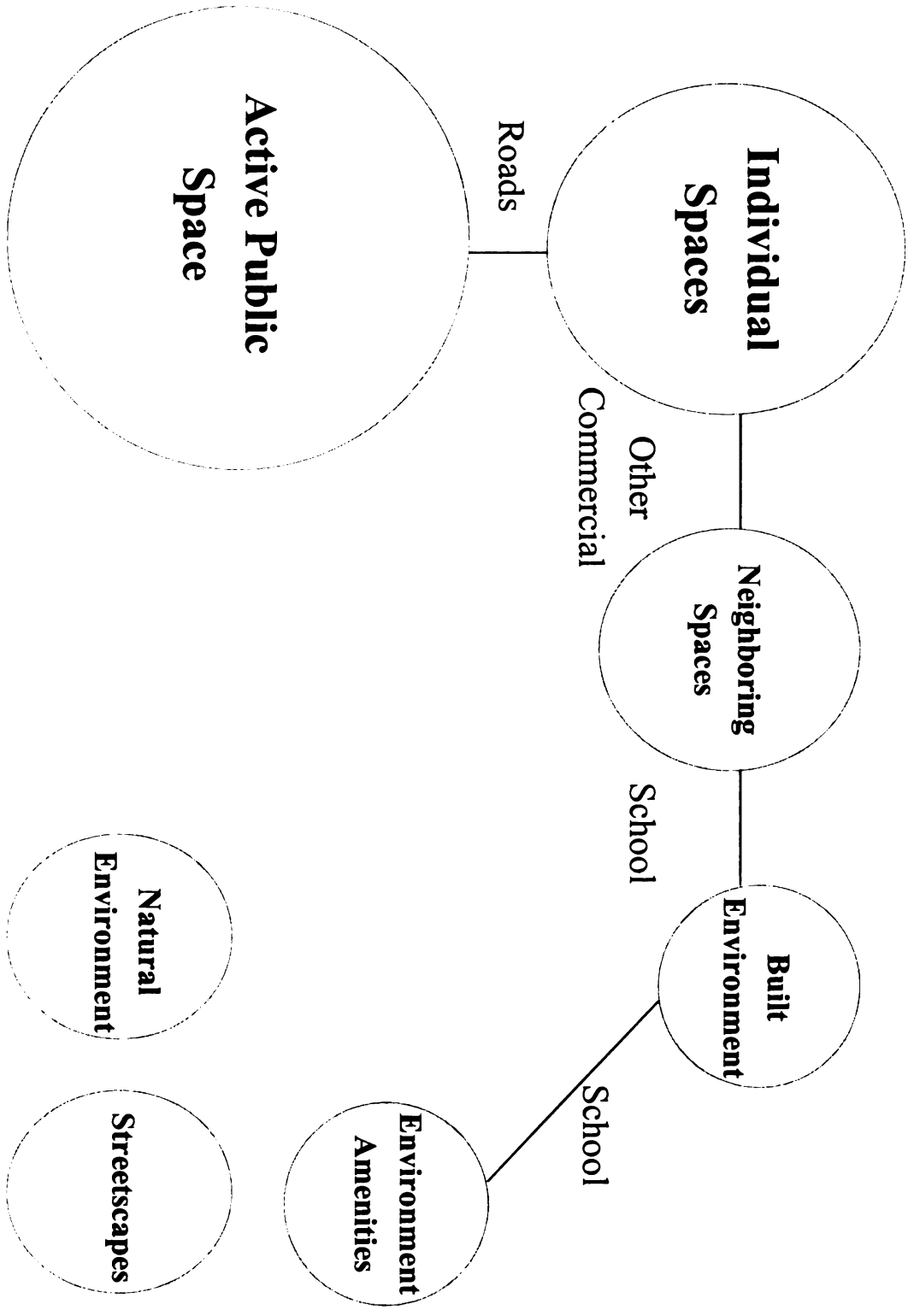


Figure 8: Conceptual Spatial Diagram of Urban Youth Cognitive Map Components

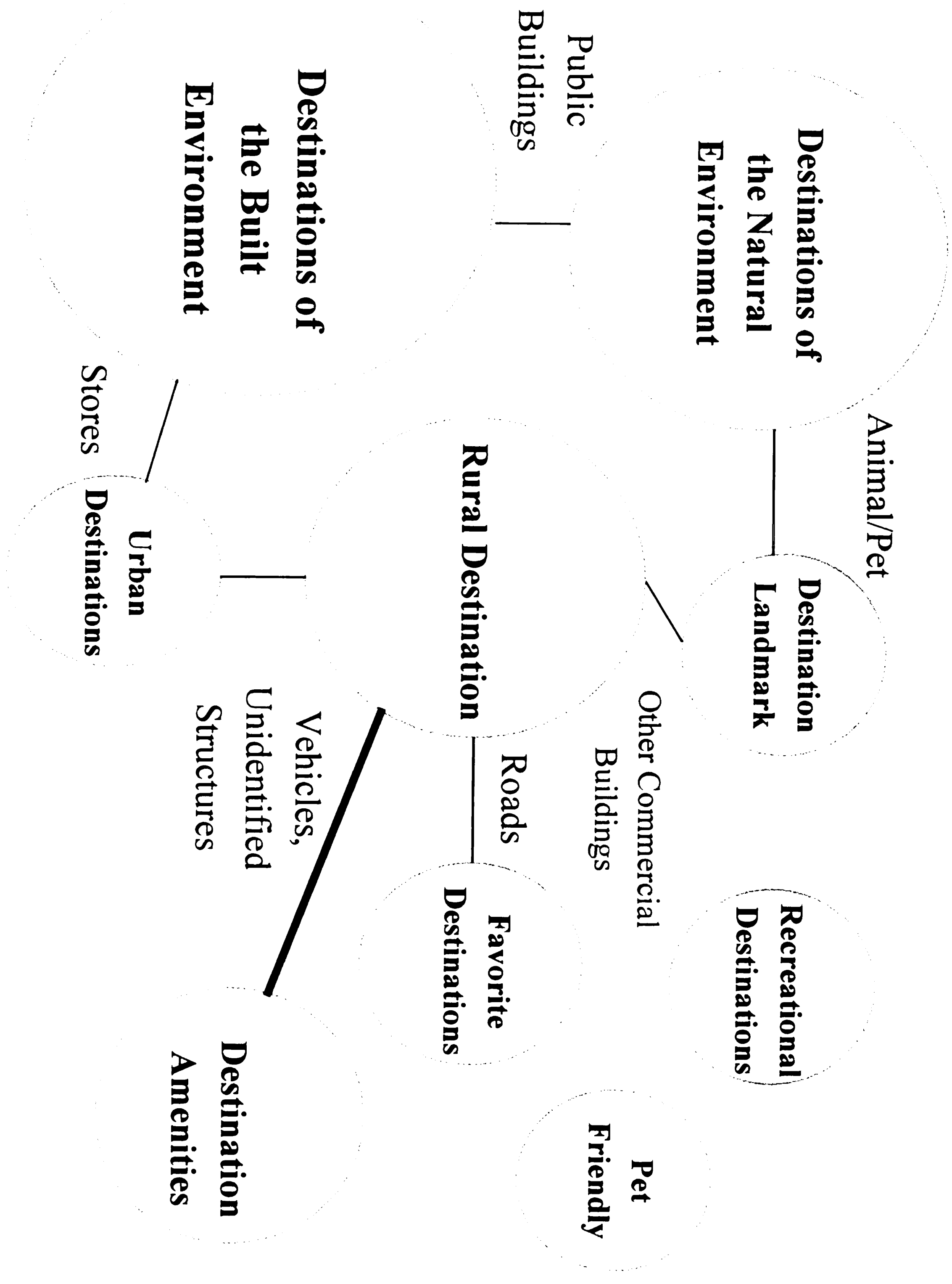


Figure 9: Conceptual Spatial Diagram of Rural Youth Cognitive Maps

The rural spatial diagram (Figure 9, pg. 36), shows a grouping of *Destinations of the Built Environment*, *Destinations of the Natural Environment*, *Destination Landmarks*, *Rural Destinations*, and *Urban Destinations* and but does not contain any shared images. The strongest link occurs between *Rural Destinations* and *Destination Amenities* and further supports Mondeschein, Blumberg, and Taylor's (2005) findings that navigation through the environment occurs through systematic process of movement along vectors defined by "choice points".

CHAPTER 5

CONCLUSION

Lynch's notion of imageability is defined as "the shape, color, or arrangement which facilitates the making of vividly identified, powerfully structured, highly useful mental images of the environment." Based on imageability, and the results of the schematic diagrams, either of these environments has imageability. But if in fact it is not, is it because these environments lack the level of visibility required to make an impression upon youth in the landscape? Or is it based on the mode of transportation along these routes where it is most likely a vehicle and uable to interact with otherwise visible and impressionable pieces of their landscape? How are these charactersitics of the childs environment going to influence the decisions they will make in land use decisions and policy? These are the types of questions community planners will need answers to in order to know where they need to focus on policy changes and land use planning which will indefintely shape the landscape of both rural and urban environments. Halseth and Doddridge (2000) support using cognitive mapping to learn from children about what is meaningful in their environment and various analysis will allow these to be effectively supported in land use policy and planning context. The cognitive map is a cheap, useful tool which informs planners about youth's aspirations, services needed, and safety. Planners may use the cognitive map to look further not only into why images were included, but also why certain images were not included and why. By finding out where youth are spending most of their time, this will in turn let planners know where certain services will be most effective or marketable.

Involving children in planning activities can be used as a platform to inform planners of the complex not always predictable perspective of children. Furthermore, this empowers and provides insight as to how planners can work to design for and create safer environments for children that are more capable of nourishing their development. Suggestions for further investigation among all components regarding significant features of the community according to the youth would benefit both planners and educators in recognizing and fulfilling the needs of the youth in both rural and urban environments. A longitudinal study would be useful in capturing if youth are engaged in an "education" endeavor and "real world planning scenario", will they become a better designer/planner? Other initiatives that utilize cognitive mapping and the measurement in the effectiveness and quality of participation also need to be examined further. Each investigation between youth and their environments will both let the youth know they are a part of their community as well as giving them far more credit in their capabilities to be involved with decisions that will affect them as well.

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