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Health Aspects Of Community-Engaged Natural Play Space Planning, Design, And Implementation

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HEALTH ASPECTS OF COMMUNITY-ENGAGED NATURAL PLAY SPACE PLANNING, DESIGN AND IMPLEMENTATION

by

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A Dissertation

Submitted to the Graduate Faculty of the University of North Dakota in partial fulfillment of the requirements for the degree of Doctor of Philosophy

Grand Forks, North Dakota
August 2018
This dissertation, submitted by Eric Elias Castle in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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Department
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Degree
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Eric Elias Castle
August 1, 2018
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ABSTRACT

Obesity, loss of social capital, and fewer connections to nature are three community health issues faced by many. A team of concerned individuals attempted to address the spectrum of these health issues by collaboratively engaging communities to plan, design, build and program natural play spaces located in public parks. This exploratory study, utilizing a grounded theory approach, conducted focus groups with community members who engaged in this process. The specific objectives of the study were twofold; 1) to generate theory regarding the perceived impact on social capital from the community-driven planning and construction process of the Connecting Children in Nature in Northwest Minnesota project and 2) to generate theory regarding the perceived impact of the natural play spaces themselves to provide a setting to improve community health. Once transcribed the data was analyzed using a hierarchical coding system, consisting of open, axial and focused codes. Methodical analysis of these discussions revealed relative themes including nature connection, government relations, persistence, engaging and recruiting, and social capital which can inform those interested in collaborative public engagement resulting in volunteer built works. Discussion of the relevance of this work to the existing body of knowledge revealed concordance with the work of others on the topics of children’s health and well-being, social capital, and the development of natural play spaces. Analysis of the data also provided a foundation of a grounded theory of nature play therapy that can inform further research. This theory posits that community-engaged natural play space creation and play in that space prompts therapeutic responses. The study limitations included focus group participants that were primarily white, female and interested in promoting active play among children.
CHAPTER I
INTRODUCTION

Obesity, loss of social capital, and fewer connections to nature are three community health issues faced by many. As entertainment becomes more isolated and electronically based, people are staying indoors more and interacting less within the community. Increased indoor time, especially among children, reduces physical activity and leads to health problems associated with obesity. Isolated entertainment results in less community interaction, which then reduces the depth of relationships between community members and thereby weakens community networks. Less time spent outdoors in nature decreases the understanding of and fosters apathy towards the functioning of the natural world. These three, seemingly unrelated topics have historically overlapped within the physical and social realm of city parks.

In contrast to traditional park play features, natural play spaces (NPS) are playground like elements of parks or schoolyards that are uniquely positioned to address many of the challenges associated with increasing obesity, loss of social capital, and fewer connections to nature. In 2010 public health officials, researchers and concerned citizen-organized the working group Connecting Children and Nature in Northwest Minnesota (CCNNM). This group set out to design and implement natural
play spaces in communities throughout Northwest Minnesota with dual goals of promoting an increased sense of community ownership and promoting healthy, active lifestyles to curb disparate obesity rates. The mechanism that this group used to accomplish these goals was a community-engaged planning, design, construction and use of natural play spaces.

Social capital is often defined as the ability of communities to work together to solve common problems (Putnam, 1995c). This concept is often viewed as trust between individuals or organizations. This trust is essential for many transactions, both economic and not. Believing that another can be trusted to do what they profess and the knowledge that others can be called upon in time of need are additional components of this resource. Social capital can provide benefits to individuals and communities (Woolcock & Narayan, 2000). Individuals are less likely to drop out of high school and more likely continue education after high school (Coleman, 1988). Physical health of individuals can also be impacted by social capital. Kawachi & Kennedy (1997) found that lower levels of social trust correlated with higher rates of major causes of death. Communities with rich social capital can more effectively deal with poverty (Moser, 1996), work together to capitalize on new opportunities (Isham, 1999), and settle conflicts (Varshney, 2000). With all the collective benefits of social capital, many are concerned that its levels are dramatically falling in the United States (Putnam, 1995c).
One striking difference that natural play spaces have, when compared to traditional playground equipment, is the use of natural materials. In addition to the low cost of these play materials, logs, branches, straw, soil, rocks, and sand offer a variety of opportunities for exposure, familiarity and education. Material composition of rocks and physical deformations can be used to teach natural history and geology. The recent geologic history of the study region of NW Minnesota is marked by retreating glaciers melting into a vast inland lake which drained leaving flat lake bottom of clay and sandy beach ridges. Many of the boulders used in the CCNNM projects had striations that tell the story of immense pressure and power of this region's glacial past. Local sand can stir visions of waves lapping the shores of vast ancient inland lakes. As the organic matter in logs and straw begin to decay, children playing in the space can directly observe and have contact with the organisms and processes of this essential ecosystem function. This decomposition contributes to soil carbon and feeds soil-building organisms. As the play functions of the natural materials decay along with the cell walls, there is opportunity for reinvention of the space; new opportunity to rebuild community connections to revitalize the play space and social capital.

From a long-term perspective, play in nature can impact environmental health. Experience in nature is significant in forming an affinity towards the environment in children (J. C. H. Cheng & Monroe, 2012) adolescents (Müller, Kals, & Pansa, 2009) 59-69) and adults (Chawla, 2006). Socialization in nature, direct unstructured contact with nature, and volunteering in nature were experiences that natural history professionals
had in common (James, Bixler, & Vadala, 2010). Hence the more connections to nature as a youth, the more likely adults may be to make pro-environment choices.

Play in nature has many benefits like improved motor skills (Fjortoft, 2004) and encourages more physical activity (Hinkley et al., 2008; Wheeler et al., 2010), which reduces the likelihood of significant increases in body mass index (BMI) (Wolch et al., 2011). Exposure to and even mere viewings of nature increase manageability of childhood Attention Deficit Disorder and increases self-discipline and self-control (Taylor, Kuo, & Sullivan, 2001). As children’s home ranges have diminished (Karsten, 2005), the importance of locating nature closer to where children live through building of natural play spaces in local parks can increase opportunities for interactions in nature, which are critical during middle childhood (Kellert, 2005). Location of the play spaces can have secondary impacts on encouraging physical activity. When play spaces are located near or connected to trail networks or undeveloped natural areas they can entice users to the vicinity of these other adjacent recreational amenities (Figure 1). This can introduce natural areas that are unknown to today’s children. Throughout the CCNNM project, it was common for community volunteers, many in advanced stages of life, to comment on how the adjacent woods provided countless hours of entertainment
and play and how they were excited at the prospect of helping children today have similar experiences.

This study generates theory regarding the impacts that the NPS’s have on two aspects of health, which are: community and physical. To accomplish this, this study conducted focus groups that assessed the collaborative process between academic, local government, and community stakeholders in the planning, design, implementation and use of six natural play spaces in rural Northwest Minnesota and explored the ability

Figure 1 - Castle Park natural play space located in proximity of naturally managed open space. (2013) Data source: USDA, all other data created by Eric Castle
of both (1) the process used to plan and construct these spaces and (2) the spaces themselves to provide a setting to improve community health. The objectives of this study are to:

1) Generate theory regarding the perceived impact on social capital from the community-driven planning and construction process of the CCNNM. Assess reasons for and/or variables for future study on causes of these perceived impacts.

2) Generate theory regarding the perceived impact of the natural play spaces themselves to provide a setting to improve community health.

The objectives are based on the following premises:

1) It is suspected that the community-engaged process helped foster social capital by establishing or reestablishing a general sense of trust between community members.

2) It is also suspected that participants in the project feel an increased sense of community and ownership directly toward the natural play spaces due to their participation in the project.

**Literature Review**

**Declining Health**

Health problems associated with affluence are common among developed countries (Flegal, Carroll, Ogden, & Curtin, 2010; Ogden, Carroll, Kit, & Flegal, 2012).
Access to overabundant food along with increases in sedentary lifestyles have led to a suite of health problems associated with obesity: high blood pressure, high cholesterol, and diabetes. In the United States, rates of obesity and severe obesity, particularly from 2000-2010, have skyrocketed among all age groups and ethnicities (Sturm & Hattori, 2012). Children have historically been less prone to being overweight; however, children today are now also suffering from the results of excessive caloric intake and reduced physical activity (Ogden et al., 2012). This trend is being experienced by adults and children alike, primarily in developed and developing countries that are more affluent (Flegal et al., 2010). The daily activities of recent generations of children have also changed dramatically. The ability of children to choose the kind of play and self-direct during that play has dramatically reduced. This has largely been replaced by adult structured and organized play that consists primarily indoor organized activities (such as music lessons, sports teams) and media centered entertainment (Clements, 2004; Hofferth & Sandberg, 2001; Karsten, 2005). Indoor time for children is different than outdoor time in developmentally important ways. For children, indoor time has characteristics of private, physical shelter, and adult control. Outdoor spaces are places to explore and interact with nature and culture (R. Moore & Young, 1978).

Social Capital and Community Health

Social capital, which is “connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them” (p. 19) is in dramatic decline in the U.S. (Putnam, 1995c). Social capital is also defined as “a resource for
action” in communities that is created through “changes in the relations among persons that facilitate action” (p. 100) (Coleman, 1988). Communities and governments function much more efficiently, providing better services to people, when there are more civic institutions with people actively engaged with those institutions (Putnam, Leonardi, & Nanetti, 1994). The U.S. has a unique and long history of civic engagement and has served as a model of democracy. De Tocqueville (2003), noted that in the U.S. in the 1830’s, citizens were abnormally engaged in forming and being active members of associations. This longstanding tradition has declined starting around the 1960’s for a number of possible reasons. Increased indoor activities have decreased opportunities for community connections. Trust is “belief that someone or something is reliable, good, honest, effective, etc.” (p. 1) (Merriam-Webster, 2016). Trust is also an important characteristic of a healthy community and an important component of social capital (Subramanian, Kim, & Kawachi, 2002). Loss of community networks, norms and trust weakens community resilience (Kadetz, 2018). Trust, in the sense of its relationship to social capital, consists of “acceptance of risk and vulnerability deriving from the action of others and an expectation that the other will not exploit this vulnerability” (p. 219-217) (Humphrey, 1998). Trust is a vital factor in political and economic transactions. Trust, especially in relationships between communities and their leaders, is a vital component of social capital (Purdue, 2001). Purdue found that when community leaders were unable to gain community trust, governmental initiatives were less successful. Other factors have also contributed to losses of community trust,
including television viewing, the aging civic generation (born 1926-1940), increases in women’s labor force, and rising income inequality are suspect reasons for the decline of social capital (Costa & Kahn, 2001; Putnam, 1995b).

With the decline of physical social networks, there has been a recent increase of online social networks. The ratio of connections with others and layered structure of online social networks has similar form to those in the offline world (Dunbar, Arnaboldi, Conti, & Passarella, 2015). One benefit of online social networks is that they can be larger than offline social networks (Dunbar, 2016). Increased use of the popular social networking site, Facebook, was shown to be a positive predictor of increased social capital, however, the relationship was not strong enough to justify its increased use as a solution to youth disengagement in civic and democratic pursuits (Valenzuela, Park, & Kee, 2009). Interestingly Lönnqvist & große Deters (2016) found that large Facebook friend networks did not correlate with an increased sense of well-being or increased perceptions of social support.

In addition to social capital being in decline, sense of community is also in decline (Bonaiuto, Fornara, & Bonnes, 2003; Scopelliti & Giuliani, 2004). Sense of community, an important component of social capital, is defined as “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (p. 9) (McMillan & Chavis, 1986). A combined definition of social capital and sense of community contains the concepts of trust in a social network that is used
to achieve needs of members. From this sense I will use the terms interchangeably. Increasing sense of community involves many factors including: providing quality open space, involvement in neighborhood organizations, perceived safety, more trees and green vegetation, and the presence of shared community spaces (Chavis & Wandersman, 1990; J. Francis, Giles-Corti, Wood, & Knuiman, 2012; Kim & Kaplan, 2004; Kuo, Sullivan, Coley, & Brunson, 1998; Lund, 2002; Mesch & Manor, 1998; Wood, Frank, & Giles-Corti, 2010). In addition, having a larger social network, and a stronger sense of community increases involvement in neighborhood activities (Warde, Tampubolon, & Savage, 2005). There are, however, situations where a strong sense of community can be detrimental to children in particular, especially in neighborhoods with low socioeconomic status (SES)(Caughy, O’Campo, & Muntaner, 2003). Caughy and colleagues found that in certain neighborhoods with the lowest SES the more neighborhood connections that parents had, the more likely the children would have behavior problems in school. They also found that in these same neighborhoods children whose parents had fewer neighborhood connections were less likely to have behavior problems in school. The specific mechanisms contributing to these observations is not completely understood; however, it is important to note that increasing social capital in a community can have negative impacts on members of that community. Therefore, depending on the characteristics of the neighborhoods increased parental connections with the community could have negative impacts on
their children and should be considered when attempting to increase social capital within the community.

One sign of robust social capital is people engaged in civic organizations and community groups (Putnam, 1995a). A way to build social capital is through participatory community development (Dale & Onyx, 2005). Landscape architects have a long history of engaging communities to actively participate in the design and planning process and are often equipped with the training and ability to translate community desires into shaping of local spaces (Hester, 1975; Lawson, 2007). These designs can enable communities to quickly take control of the shape of local spaces. This collaborative design process also builds within communities the knowledge, community networks, and trust necessary to address future design and planning issues. However, with completed designs in hand, communities are often left without the resources or knowledge to implement the planned works (Lawson, 2007). To address this issue, community designed open spaces are often self-maintaining, low energy landscape, small-scale, low cost, locally controlled and reflect values of the community (M. Francis, 1984). Expression of community values in local spaces allows community members to incorporate aspects into the space that are important to them, rather than ideas imposed by an outside designer that may or may not have significance to the community, or even run the risk of being offensive. When community members spend their resources engaging in planning community spaces, whether those resources be time or money, cognitive dissonance theory indicates that they will likely feel an
increased sense of value for the space as a result of their efforts and feel more user satisfaction (M. Francis, 1984; Sommer, Learey, Summit, & Tirrell, 1994). Through the collaborative engagement process, landscape architects can guide communities to shape local spaces in ways that build on social capital.

Increased isolation among community members is increasing across the United States. This isolation impacts a wide variety of components of community life from increasing inefficiency of local government to the decreased ability of community members to rely on each other when needed. Community engagement in planning local spaces, through the participatory design process has potential to reverse this trend and increase social capital.

**Play in Nature and Health**

One activity, common to past generations of children, that engages the body and stimulates the mind, is free play in nature. Health benefits associated with unstructured play in parks, woodlots and fields are being discovered (Hinkley, Crawford, Salmon, Okely, & Hesketh, 2008; Kimbro, Brooks-Gunn, & McLanahan, 2011; Wheeler, Cooper, Page, & Jago, 2010; Wolch et al., 2011), while at the same time this type of play is experienced less and less by children today. One study found that 70% of mothers played outside every day as children, where only 31% of their children play outside on a daily basis (Clements, 2004). Parental concerns about dangers of crime, abduction, injury, and diseases perceivably associated with unstructured free play in nature
combined with greater parental time constraints are primary reasons for this decline (Timperio, Crawford, Telford, & Salmon, 2004; Valentine & McKendrick, 1997; Veitch, Bagley, Ball, & Salmon, 2006). One way to increase the amount of nature play for children is through community shaping and involvement in local spaces. Community shaping that involves gardening has shown to be therapeutic, especially for at-risk populations on the margins of society who’s therapeutic re-connection can produce individual and societal benefits (Pudup, 2008).

**Parks, Health and Social Capital**

Parks provide a setting for enhancing community health. Parks are parcels of land developed with lighter touches, consisting of open space with grass, ponds and wooded fields within cities that have afforded access to nature to residents of densely populated areas, access that historically was only available to the wealthy and powerful. Early proponents of these parks recognized the deep need that people have to be connected to nature and capitalized on this fact to create momentum for the establishment of these civic landmarks (Pregill & Volkman, 1999). Easily observed in parks is the engagement of physical activity, including walking, running, cycling, and a wide variety of individual and team sports. In addition to the active uses of parks, they also provide settings for spiritual connections. A day spent in the energy-intensive whirlwind of any large city juxtaposes the mental rejuvenation experienced in nature filled landscapes. When maintained well, parks can serve as middle ground between communities and generations, connecting diverse neighborhoods, and fostering social
capital. Parks are often designed to appeal to a variety of age groups, including children through the inclusion of playgrounds.

History and Design of Playgrounds in the United States

Playgrounds in the United States likely trace their history back to the first recorded spaces for school play in Germany. Concerned about the ill effects of a lack of physical exercise among city dwellers, designers sought to improve their physical and mental health through robust physical exercise. In 1812 these principles were applied to spaces for children through the Jahn gymnastic associations (Koch, 1908). This long connection between bodily activity and physical and mental health was likely brought to the United States (U.S.) by German immigrants in the many places they settled, but particularly in Massachusetts. The first recorded gymnasium in this state and in the U.S. was in Salem in 1821. Improvements to dedicated spaces for children’s physical exercise were made in 1825, by a former student of Jahn, Dr. Charles Beck (Mero, 1908). These gymnasiums intended to foster physical development of children and primarily used structural materials like metal, wood and rope. In the 1880’s the materials used in playgrounds grew to include large piles of sand (Playground and Recreation Association of America, 1915; Sapora & Mitchell, 1961). Along with this change of material, there was a change in the types of play this new material afforded, such as creative, constructive, and representational play likely (Hall, 1897). Along with this change, there was, even if unintentional, recognition that play could serve other beneficial purposes in addition to physical fitness.
During this same period in Germany in the 1800’s, another advocate of child well-being, Friedrich Froebel, promoted the idea that children’s play could be used to train children for future roles in society (Fröbel, 1885). Froebel’s ideal setting for play was nature itself. Within the setting of the natural world, children could build, cultivate, tend, observe and explore. Recognizing the lack of nature in many cities Froebel advocated for an educational system that mimicked nature and allowed children to benefit from the types of play nature afforded. This system was centered around play as the primary pedagogical medium and the learning space was located outdoors. Called “kindergartens”, they were supplied with loose parts that stimulated free play and spontaneity (Hughes, 1897, p 213). Through these schools, the ideals of Froebel where play was a primary vehicle of education, were brought to the U.S. (Blow, 1908).

This first connection between play and education remained primarily in the realm of early childhood education, which largely consists of children 5 years and younger. In the primary grades after kindergarten, the educational curriculum was largely devoid of play and focused on a more academic approach to learning (Frost, 1992). These initial findings connecting learning and play in children have been supported with a wide body of research that illustrates these strong connections (Bergen, 1988; Frost, Wortham, &Reifel, 2001; Rieber, 1996; Van Horn et al., 2014; Wood & Attfield, 2005). With the connection between play and learning firmly established, dedicated play spaces for children in educational settings were designed largely for preschool age children, a tradition that has remained until this day (Frost &
Kissinger, 1976). That isn’t to say that playgrounds don’t exist on school grounds for post-kindergarten age children, but that the use of those playgrounds is largely non-academic.

The second foundation of a dedicated children’s play space was founded on physical fitness, starting with the previously mentioned Jahn outdoor gymnasiu.ms. The history of play spaces dedicated to physical fitness followed a similar timeline and developmental path to Froebel’s education based play, developed in Germany and imported to the United States, specifically Boston. Eventually, in 1909, Massachusetts passed a law that mandated communities with populations of 10,000 or larger to create public playgrounds (Playground and Recreation Association of America, 1909). Due to the non-academic regard of play by schools, this history of public playgrounds is characterized by the types of equipment, comprising of three eras: Manufactured Apparatus Era, Novelty Era, and Modern Era (Frost, 1992). The form of the Manufactured Apparatus Era consisted of large structures dedicated to promoting physical fitness and movement. They were characteristically made of metal pipes and wood often rose to extreme heights and accommodated large numbers of children on the equipment at the same time. Examples of the play equipment include see-saws, swings, slides, merry-go-rounds, and giant strides (Curtis, 1913). For examples see
Figure 2.

Figure 2 - Examples of Early Era play equipment. 1- see-saw (Hood, S., 1934); 2- Merry-Go-Round (1930); 3- slide and swings (Bain News Service, 1911); 4- giant stride (City of Portland, 1946).

The Novelty Era occurred in the 1950s and 1960s, turned away from child development centered equipment and instead focused on equipment designed to appeal to the imagination of children (Figure 3). Like previous structures, this equipment was designed for physical fitness but also designed to represent aesthetically pleasing,
novelty and fantasy structures like spaceships, animals or abstract forms (Frost, 1992).

Figure 3 - Space Age rocket-themed playground set typical of the Novelty Era (Biondo, 2009).

The Modern Era (1970-present) is characterized by modular structures, starting with wood and plastic in the 1970’s and evolving to incorporate modern plastics (Figure 4). A key identifying factor in the design of modern equipment is the element of safety for children utilizing the structures.
One similar characteristic that most all play spaces, in all eras, is the lack of vegetation. There is also often an abundance of hard paved surface, like asphalt or concrete. Playspaces with abundant hard surfaces, though conducive to fast running and ball bouncing, and lack of shrub sized vegetation are often designed for the benefit of adults supervising the children (Curtis, 1913). Beginning with the advent of the outdoor gymnasium structures, there has been an increasing awareness of the dangers these structures can present to children (Frost & Sweeney, 1995; Lillis & Jaffe, 1997;
Macarthur, Hu, Wesson, & Parkin, 2000; Reichelderfer, Overbach, & Greensher, 1979). These dangers include falling from heights onto hard surfaces and entanglement in the play equipment. One reaction to these dangers has been to provide adult supervision while children are playing in the space and fewer supervisors are needed when there are no shrubs and few if any trees to obstruct the sightlines between the adult minders and the playing children.

History of Nature Play

Nature play is a concept with roots in Fröebel’s idea that the best playgrounds are outdoors in nature (Fröebel, 1885). Nature play is similar to, yet can differ from other types of play children engage in. Exact distinction between the play children engage in while on a plastic and steel superstructure compared to children playing in a dry creek bed can be difficult to define. The type of play might be exactly the same in both settings. When attempting to separate the two, some define nature play based on the setting and materials that children engage with while playing. Moore (R. C. Moore, 2014) defines a nature play and learning places as “A designated, managed location in an existing or modified outdoor environment where children of all ages and abilities play and learn by engaging with and manipulating diverse natural elements, materials, organisms, and habitats, through sensory, fine motor and gross motor experiences.” (p. 5). The emphasis in this definition towards interactive and manipulative play with nature is one important difference. Though the exact mechanisms are not well understood, many conservation and land management agencies, such as the Public Land
Trusts and The National Wildlife Federation, recognize the ability of childhood-nature interactions to increase adult environmentalism, and as such have a vested stake in increasing intimate relationships between children and the natural world (Chawla, 1998; Fjortoft, 2004; Kahn Jr, 2002; Mainella, Agate, & Clark, 2011; J. R. Miller, 2005). The National Wildlife Federation also defines nature play based on the materials engaged with while playing. From their website “The idea behind a nature play space is that instead of the standard, cookie-cutter metal and plastic structures that make up the bulk of today's playgrounds--people can incorporate the surrounding landscape and vegetation to bring nature to children's daily outdoor play and learning environments” (p. 1) (National Wildlife Federation, 2016). The Pennsylvania Land Trust (Pennsylvania Land Trust Association, 2016) defines nature play as “unstructured, frequent childhood play in informal outdoor settings” (p. 1). The Association of Zoos & Aquariums (AZA Animals, 2015) defines nature play as direct experience outside with natural materials and organisms. From these definitions and descriptions of nature play, three main themes emerge: (1) less adult-structured or more free play (2) outdoor play with (3) modular natural materials. These three elements will be discussed in detail. One might argue that children can engage in free play outdoors on any playground, which is why these elements when linked to the interaction of children with modular natural materials is of defining importance to nature play.

Children have played in nature for as long as there have been children (Donnell & Rinkoff, 2015). As cities grew larger, the wilder parts of nature were pushed beyond
the city limits and out of the reach of urban youth (Fröebel, 1885). In Moore’s book Nature Play & Learning Places (Moore, 2014) he provides a summarized history of the movement. He describes the earliest record of systematic nature play in the U.S. is the summer camp phenomenon that emerged in the 1800s (Ball & Ball, 1987; Mitchell, Robberson, & Obley, 1977; Rodney & Ford, 1971). Offered primarily through youth and religious organizations these camps are often located in more remote and rural areas where contact with wilder nature is more accessible. These camps have provided opportunities for children to engage in nature play, primarily in the summer months when school is out of session.

![Figure 5 – An early adventure playground built in Europe using rubble from buildings destroyed during World War II (Turck).](image)

Adventure playgrounds emerged in Denmark in the 1940s, designed by landscape architect Carl Sørensen (Moore, 2014). These play spaces are very free form in structure and are characterized by a central shelter element surrounded by various modules or
stations that contain loose parts that children use to build and interact with (Figure 5). When compared to gymnasium or creative style playgrounds, adventure playgrounds have been found to be more popular (Hayward, Rothenberg, & Beasley, 1974). Another play setting called children’s gardens, often found in botanical gardens and plant conservatories, these spaces can also provide a setting for robust nature play, when designed for and allow unstructured free play, (Miller, 2005). Play zoos, like children’s gardens, have adapted to be more interactive and allow more unstructured play, using supervisory play workers (Moore, 2007). The increasing availability of urban farms brings nature access to children into areas where there was limited access to direct manipulation and interaction with the earth (Moore, 2014). Another European import are preschools heavily based in nature. These forest kindergartens provide an outdoor, exploratory learning setting for children where, rain or shine, the entire school day is often spent outdoors. Supervised by teachers or playworkers, children are allowed to build, examine, explore, create, destroy, and socialize with their peers in a natural setting (Knight, 2013; Warden, 2012). Through the wide variety of settings, many different venues have developed to provide opportunities for children to interact with nature. One common element of these nature focused play areas is that they allow children to direct the play.

**Beneficial Elements of Nature Play**

**Free play.** Free play is a child-directed, child-engaged form of play. Children engage in this type of play especially when there are no perceived adult expectations
about how they should engage themselves in the moment (Ginsburg, American Academy of Pediatrics Committee on Communications, & American Academy of Pediatrics Committee on Psychosocial Aspects of Child and Family Health, 2007). It is often spontaneous and imaginative. There are strong suggestions that there are many benefits for children when they engage in free play including increased development of attention abilities, increased resilience, increased social interaction, and increased creativity (Bundy et al., 2009; Burdette & Whitaker, 2005). In addition to understanding the benefits of free play, it is necessary to understand if this kind of play is spatially dependent in the outdoors. Children spend their outdoor free time in four primary locations: in the home yard, open natural areas, parks and playgrounds and in the street (Cunningham, Barlow, Jones, & Alliance, 1996). Within these spaces children spend most of their time in the home place, followed by neighborhood open space and parks, and the least amount of time in the street (Tandy, 1999).

At the same time that more is being understood about the benefits of free play, children are engaging in it less and less (Evans, 2000; Rosenfeld & Wise, 2010; Veitch et al., 2006). There are a variety of reasons for this decline, one element these reasons have in common is that the changes are from caregiver imposition. As primary caregivers, parents are concerned about the safety of their children, they are concerned with dangers associated with traffic, strangers, gangs/teenagers (Veitch et al., 2006). They are concerned about anti-social behavior and sexual molestation (Blakely, 1994). Parents also feel pressure to expose their children to high amounts of athletics and arts
to enable them to have a competitive edge over their peers in the job market and college admissions (Hirsh-Pasek, Golinkoff, & Eyer, 2004; Jones, Ginsburg, & Jablow, 2006). This pressure toward high performance in a competitive arena may be contributing to the increasing mental health issues experienced by college students (Thacker, 2005). Despite all these reasons that limit the amount of free play children can engage in there is mounting evidence that risk aversion in the short term can lead to greater risks in the long term (Bundy et al., 2009). Meaning that if children don’t learn to assess risk as children with minor risks, then as adults they will be less equipped to larger risks. Children also have less time for free play in schools. Free play is often afforded during recess however, more and more schools are reducing and eliminating recess periods (Pellegrini & Bohn, 2005; Pellegrini, 2006). Pellegrini (2006) also states that increased pressure on schools to increase student achievements in reading and math has led to less free play for children.

Outdoor Play. Time spent outdoors has very beneficial impacts on both adults and children alike (Chawla, 2015). Gill (2014) performed a systematic literature review of articles, published before 2011, that engaged the question of what are “the benefits of children’s engagement with nature?” (p. 10). The findings were divided based on their support within the literature into three categories: (1) claims that were well supported, (2) those that have good support and (3) those with some support.
Well Supported Claims:

- Childhood time spent in nature results in pro-environmental worldview and stronger sense of place.
- You are more physically active if you live near green spaces.
- For all children, those with Attention Deficit Hyperactivity Disorder (ADHD) and children in general, time spent in nature improves mental health and emotional regulation.
- School gardening participation increases scientific learning habits and promotes healthier eating habits.
- Environmental knowledge is increased.
- Nature play results in improvements in motor fitness for preschool children.

Claims with good support:

- Social skills are improved in forest schools and school gardening projects. Forest schools are good at teaching self-control and self-awareness is improved in school garden projects.

Claims with some support:

- Green spaces are related to outdoor play which results in well-being improvement.
- Self-confidence, language and communication improvement is a strength of forest schools.
- Psychosocial health is improved with school-based conservation activities.
Since 2011 there have been numerous other studies performed that address a similar question regarding the benefits of nature play, some strengthen Gill’s findings and others add new insights, such as guided walks and free play in nature that can provide relief from poverty-induced stressors (Razani, Meade, Schudel, Johnson, & Long, 2015). Children who played in natural areas in their neighborhoods had a significantly stronger sense of place (Kroencke et al., 2015). Natural play spaces promote self-determination (choice making, problem-solving, self-regulation, and engagement-played longer) (Dennis et al., 2014, Drown & Christensen, 2014; Herrington & Brussoni, 2015; Kochanowski & Carr, 2014; Kuh, 2013; Luken, Carr, & Brown, 2011). For example, Drown and Christensen (2014) found that play on manufactured equipment did not seem to engage the children as long as the materials in the natural play space (Kochanowski & Carr, 2014). Dennis et al. (2014) found that nature play in an early childhood education setting resulted in “positive learning and developmental outcomes including enhanced imaginative play, increased physical and mental well-being, and environmental stewardship” (p. 35). They also found that when compared to indoor play spaces and traditional playgrounds, more positive behavior was observed in natural play spaces, resulting in fewer behavior-related problems. In addition, they noticed it was easier for children to connect systems learning while observing it directly in nature. Systems learning teaches children about the connections between various parts of a system. When children better understand ecological systems they better understand the impacts that changes to these systems have. This demonstrated potential for
informal science learning was also noted by Luken and colleagues (Luken, Carr, & Brown, 2011). Depending on the physical layout of the design, natural play spaces can afford more physical activity and more engagement (less boredom) (Herrington & Brussoni, 2015). Kuh (2013) and colleagues also observed that in a natural play space children’s play was more sustained, constructive and cooperative.

There are also challenges associated with play in natural play spaces. In addition to lack of resources, Drown and Christensen (2014) also observed in a natural play space in a child care center on a university campus that due to its limited size the sense of wonder can be lost when the space has been thoroughly explored. Dennis and colleagues (Dennis Jr et al., 2014) had similar findings when they observed that larger natural play spaces avoided problems of congestion and overuse. Depending on the attitude and developmental stage of the child, their response to playing in nature can vary from positive to negative (Razani et al., 2015). Lack of regular, positive experiences in nature can develop discomfort, fear and environmental dislike in some children (Gill, 2014).

**Modular Natural Materials.** The physical play manipulatives often used in outdoor play are referred to as loose parts. Loose parts are modular materials that can be used for building, manipulating the space, and imaginative play toys have long been part of play spaces (Fröebel, 1885). Children often find the adult created and ordered world around them restrictive and overwhelming and they’re often left with a feeling of helplessness (Nicholson, 1972). The Theory of Loose Parts, or being able to modify and
manipulate your surroundings, enables children to create, to modify their surroundings in ways that they associate with lasting change. This ability is extremely empowering to children. When children are allowed to collect materials from the world around them, such as rocks, bugs, and sticks, they can then use these materials to impact their surroundings by organizing, categorizing, and building with them (Lekies & Beery, 2013). Collecting these loose parts from nature also results in rich sensorial experiences. When examining self-determination, Kochanowski and Carr (2014) found that loose parts enable children to feel a sense of purpose, to make a lasting mark on their environments. Loose parts used in nature-based educational classrooms promoted “longer engagement, more cooperation, and wider variety of play behaviors compared with more traditional play materials” (p. 42) (Dennis Jr et al., 2014). In forest kindergartens, social play is enhanced through the availability of a sufficient number of loose parts to provide all children with play materials (Elliot, Ten Eycke, Chan, & Müller, 2014). This is not only true in forest kindergartens but also on manufactured play equipment (Johnson, 1935). When there are not enough resources available for all children who want to engage, even in natural play settings, there can be conflict (Drown & Christensen, 2014). Loose parts in play areas can also increase negotiation of roles, collaboration and teamwork on larger projects (Elliot et al., 2014). Dramatic play is increased with the availability of loose parts, however, Drown and Christensen were not able to conclude any preference in use of manufactured or natural loose parts. The natural play space itself afforded more dramatic play, however, this seemed to be a
function of the spatial enclosure provided in the natural play space. A similar type
enclosure was not found on the manufactured play equipment to make a true
comparison of the spaces. Maxwell and collaborators (2008) also found that spatial
closures or stages were more a predictor of dramatic play than was manufacture
versus natural loose parts. However, they also found that loose parts could be used to
construct defined spaces that did lead to an increase in dramatic play. Increases in
communication and bargaining were also observed. Drown and Christensen (2014) also
observed that loose parts can impede some play behaviors such as sand or gravel on a
tricycle path.

**Challenges Facing Nature Play**

To summarize, there is tremendous diversity in the composition of parks, from
heavily manicured to wild and wooly. However, one common design theme in parks are
the areas designated for children. The spaces for children in parks come in a variety of
forms and the differences between these forms is of interest to this study. Many of
these spaces are designed for the benefit of adult guardians, children's playgrounds are
often flat for unobstructed observation, free of excessive dirt, free of trees and other
plant life and filled with structures increasingly vetted for safety. It is common to see
these kinds of play spaces found in schoolyards and in community parks. However,
biophilia research suggests that the more engineered a park, the less beneficial to
human health (Maller, Townsend, Brown, & St Leger, 2002; Wells & Lekies, 2006). This
primal connection to less structured nature has long been understood (Hall, 1897), and
natural play spaces are reemerging (Moore, 2014) as a method for engaging children to improve health through physical activity and provide opportunities for less structured free play with natural materials in outdoor environments.

**Background**

**Connecting Children and Nature in Northwest Minnesota Project Background**

This study is an extension of a previous project that sought to engage children and communities in nature play through the collaborative creation of natural play spaces. That project, Connecting Children and Nature in Northwest Minnesota (CCNNM), was a result of collaborations begun at the Connecting Children and Nature information and networking conference held September 2010 in Crookston, Minnesota. Staff at the University of Minnesota’s Northwest Regional Sustainable Development Partnership and at the Polk County Public Health office began by identifying potential partners for the project. Engaging a broad range of partners helped to break down some of the traditional barriers that inhibit effective progress on such projects by increasing communication, increasing access to more potential volunteers, gaining local support and approval, and gave the participants an understanding of the topic of nature play. These connections were crucial to local engagement and feedback, and to ensure that health improvement goals were being met.
Along with the social and community connections, assistance was needed with the design of the natural play spaces. This was addressed by horticulture and landscape installation faculty and students at the University of Minnesota Crookston (UMC). Additionally, researchers from the Center for Sustainable Building Research’s Design for Community Resilience program at the University of Minnesota Twin Cities (UMTC) campus provided design assistance and community engagement expertise with graduate landscape architecture students from the College of Design’s Landscape Architecture program. These partners comprised the design team.

Overall the CCNNM project engaged six communities in NW Minnesota: Crookston, Warren, Fertile, Fosston, Mahnomen and Ada. Table 1 contains demographic information regarding each of these communities. Crookston and Warren were the first two communities and served as test communities. The communities of Crookston, Warren, Fertile and Mahnomen went through the entire process of planning, design, and construction. Fosston and Ada only participated in the planning and design process and as of this study have not begun to install the designs. Communities were selected based on their interest in the goals of nature play, initial approval from city decision-makers and a demonstrated commitment to coordinate volunteer groups to work on the project. To demonstrate this commitment, communities were expected to independently engage and coordinate local volunteer groups and other interested organizations for participation in the project.
A series of weekly conference calls brought the diverse partners together to define the roles, responsibilities and goals of an integrated design process that included academics, public health officials, community service groups, early childhood educators, and designers. This integrated approach consisted of holding initial community meetings convened by County Public Health partners. A variety of methods were used to inform the public about the variety of public input meetings (Table 2). Invitations were sent to targeted individuals, city administrators, Early Childhood Family Education (ECFE) coordinators, daycare providers, doctors, family members, and community service clubs. Additionally, signs were posted at various community locations to publicize the event. Table 3 highlights the roles played by stakeholders.

The first community meeting of the CCNNM project was an opportunity for everyone interested in the project to meet and to become familiar with the project, as either a community member or one of the organizing partners. Additionally, it was an opportunity for the project partners to introduce the concepts that underlie natural play spaces. For inspiration and discussion, the partners showed local, national and global examples and NPS precedents. Participants were encouraged to share their own experiences in nature, why they thought nature play was beneficial, as well as any fears or concerns they might have. Through a series of discussions and playful design exercises, the attendees shared their ideas and aspirations about what they thought natural play spaces should incorporate and look like. Participants were organized into
small groups and encouraged to come up with a schematic plan for the natural play space using base maps, sticky notes, and customized game pieces. These ideas were then shared with the larger group as a whole.

After reviewing the initial planning in Crookston and Warren, before beginning the process again with more communities, a few tools were developed to facilitate the

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**Table 1 - Population, size, income, park, and racial demographics of cities participating in this study**

<table>
<thead>
<tr>
<th>City</th>
<th>Population (2016)$^1$</th>
<th>Square Miles$^2$</th>
<th>Median Household Income (2016)$^1$</th>
<th>Parks</th>
<th>Demographics$^1$</th>
</tr>
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<tbody>
<tr>
<td>Ada</td>
<td>1,729</td>
<td>1.39</td>
<td>$39,464</td>
<td>4$^3$</td>
<td>White: 89.6%</td>
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<td>Hispanic: 2.78%</td>
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<td>Two+: 7.83%</td>
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<td>Crookston</td>
<td>7,814</td>
<td>5.15</td>
<td>$49,153</td>
<td>22$^4$</td>
<td>White: 80.9%</td>
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<td>Hispanic: 14.4%</td>
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<td>Two+: 1.8%</td>
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<td>Asian: 1.42%</td>
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<td>Black: 0.81%</td>
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<td>Fertile</td>
<td>997</td>
<td>2.13</td>
<td>$36,705</td>
<td>5$^5$</td>
<td>White: 95.2%</td>
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<td>Two+: 0.8%</td>
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<td>Fosston</td>
<td>1,544</td>
<td>1.71</td>
<td>$34,453</td>
<td>5$^6$</td>
<td>White: 92.7%</td>
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<td>Hispanic: 2.27%</td>
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<td>Mahnomen</td>
<td>1,261</td>
<td>1.06</td>
<td>$34,688</td>
<td>3$^7$</td>
<td>White: 45.9%</td>
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<td>Native: 39.5%</td>
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<td>Two+: 9.8%</td>
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<td>Warren</td>
<td>1,549</td>
<td>1.44</td>
<td>$55,875</td>
<td>5$^8$</td>
<td>White: 94.6%</td>
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<td>Hispanic: 3.42%</td>
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<td>Two+: 0.84%</td>
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</table>

$^*$includes city maintained landscape areas

$^{**}$included two city parks and one park in the county fairgrounds

$^{***}$four city parks and one city campground

1- U.S. Census Bureau, 2016; 2- U.S. Census Bureau, 2012; 3- City of Ada, 2015; 4- City of Crookston, 2018

5- City of Fertile, 2017; 6- City of Fosston, 2018; 7- City of Mahnomen, 2012; 8- City of Warren, 2018
initial community design exercise. One of these was a booklet that described various natural play space elements, or modular features, such as mazes, climbing logs, sand mounds, or water flow features. Each entry in the booklet contained sample images, a brief description of the feature, the types of play or activity that it encouraged, the materials needed for its construction, and an estimate of the cost of installation. Another tool developed was a set of game pieces to utilize a collage method for planning (M. Francis & Lorenzo, 2002). Each game piece symbolized one of the features listed in the booklet and could be placed on the base map like a board game. These tools provided easily accessible technical information and increased the sense of play in the design of the play spaces.
<table>
<thead>
<tr>
<th></th>
<th>year</th>
<th>2011</th>
<th>2012</th>
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<td>month</td>
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<td>7</td>
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<td>community event booth</td>
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<td>newspaper release</td>
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<td>community presentation</td>
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<td>social media</td>
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<td>newspaper release</td>
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<td>Flyer</td>
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<td>community presentation</td>
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<td>social media</td>
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<td><strong>Mason Park, Fertile, MN</strong></td>
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<td>community event booth</td>
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<td>newspaper release</td>
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<td>Planning Phase</td>
<td>Design Phase</td>
<td>Implementation Phase</td>
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<tr>
<td>Polk County Public Health</td>
<td>Arranged local meetings with community partners - including all local media events surrounding. Arranged special community planning events. Contacted community partners for financial, strategic and implementation support. Convened local advisory councils related to project.</td>
<td>Convened local advisory councils related to project. Hosted events for community members and partners (from multiple backgrounds and multigenerational) to learn about natural play spaces, to dream big and get ideas on paper. Weekly meetings with design team.</td>
<td>Provided support to U of M with supplies. Hub for information distribution. Fiscal agent. Scheduled, arrangement and publicity of work days: schedule, media, food, water, some supplies, support systems (porta potty/water). Planned, arranged and publicized Grand Opening Celebration.</td>
</tr>
<tr>
<td>U of M Center for Sustainable Building Research</td>
<td>Provided explanation and examples of natural play spaces to community groups. Engaged community members in planning and design and compiled suggestions and feedback. Worked with UMC to create designs.</td>
<td>Worked with U of M Crookston to integrate community feedback into final design. Prepared material for client feedback meetings. Created game pieces used to gain community input.</td>
<td>Supported School of Public Health graduate student and faculty on developing an evaluation plan and pre-survey.</td>
</tr>
<tr>
<td>U of M Northwest Regional Sustainable Development Partnership</td>
<td>Presented the NW RSDP’s interests and rationale to putting a priority on connecting children and nature as essential to the goal of sustainability in the region.</td>
<td>Provided funds for student designers.</td>
<td>Cheerleader and helped to spread the word. Participated in the Grand Opening.</td>
</tr>
<tr>
<td>U of M Crookston</td>
<td>Assisted and collaborated with community partners during planning meetings. Compiled, organized, and summarized community input into a design program</td>
<td>Coordinated design efforts of two design teams. Conducted meetings to facilitate stakeholder feedback on preliminary designs. Finalized stakeholder approved designs.</td>
<td>Created construction documentation, materials lists and process methodology to coordinate en masse volunteer work days. Procured construction materials and equipment. Directed volunteer efforts to implement designs.</td>
</tr>
<tr>
<td>Citizen advisory boards</td>
<td>Ensured representative of stakeholders. Advise city gov/Park Board (governing body). Developed goals of the group and NPS efforts. Contacted potential supporters- financial, design, implementation.</td>
<td>Spread the word and participate in design workshops. Provide feedback on prelim designs. Seek input from others.</td>
<td>Volunteer at work days. Spread the word about work days. Assist with planning and grand opening activities. Participate in marketing efforts. Help find volunteers with specialty skills for work days. Guide work groups at work days.</td>
</tr>
<tr>
<td>Community partners (Rotary Club, Lions Club, early childhood groups, Jaycees, daycare providers, teachers, 4H)</td>
<td>Assisted with financial planning needs as well as held fundraisers and letter campaigns.</td>
<td>Public Health presentations to community partners. Provided design feedback to Public Health staff.</td>
<td>Recruited volunteers for workdays. Served as crew leaders and volunteers on workdays.</td>
</tr>
</tbody>
</table>
The ideas, drawings, and layouts emerging from the initial CCNNM community meetings were documented and organized, and then the design team (comprising landscape architecture and horticulture students guided by faculty researchers) integrated the ideas into a few possible design layouts. The design layouts were drawn to professional quality, rendered in color, and completed with annotations and scale. A second community meeting was held to present the layouts for critique, input, and suggestion. Using the results of this last meeting, the design team created the final designs that were to be installed (Figure 6).

![Figure 6 - Final plans for the natural play spaces (2011-2015). Designs by Eric Castle, Bethany Jenkins, Kristen Murray, and Kristine Neu, Michell Sledge, Ethan Kojetin, Stephanie Reko and Mary Riestenberg.](image)

As volunteer efforts were used, the installation of the natural play spaces was organized into two phases: preparation and installation. The designs were subdivided into self-contained modular features that could be constructed individually. This allowed some features to be completed and ready for play before full completion of the full
Materials for each feature were acquired through donation, city sources, or were purchased. As many of the materials were tree based, connections with local arborists proved a valuable source of free materials. Lists of tools needed to construct each feature were compiled and collected. Individuals from community partner groups volunteered to serve as crew leaders during the volunteer workdays and received detailed written instruction on how to construct each feature. Volunteer workdays were planned and advertised using a variety of media (Table 3). As volunteers arrived to begin working, crew leaders would direct their efforts in the construction of features. This process was repeated until the modules were finished.

Allowing children to contribute to the process of creating the three new play spaces provided an opportunity for them to play. Due to the modular and sequential nature in which the features were completed, activity by users was often evident through the manipulation of the pieces and parts. Reporting on regular visits, community stakeholders often remarked that the play features were already being used by children. One example was a temporary life-size maze constructed of straw bales, meticulously designed and placed according to the plan with consistently sized pathways and enough turns and dead ends to create interest. The day after the maze was finished the designer returned to the site to find that all the straw bales were relocated by users to form a terraced and walled enclosure. This interaction suggests the importance for adults to attempt to view the space from the perspective of a child and to allow this perspective to have more weight in the decision-making process.
Overall the CCNNM project had three goals: increase physical activity of all community members, especially children, increase social capital through engagement in the creation of community spaces and finally to increase interaction between community members and nature.

Efforts of the CCNNM Project to increase Social Capital

Initial goals of the CCNNM project were to foster community engagement that would result in increased social capital. Additional goals included the production of a design and construction of a natural play space. To avoid a reoccurring situation where communities have a professionally designed space and little money or expertise to install or maintain the space once completed (Lawson, 2007), the CCNNM project engaged community volunteers to install the natural play spaces and advisory boards were formed to guide the long-term maintenance. These steps have led to an increased sense of ownership among those involved in the CCNNM project. Increased sense of ownership can contribute to the long-term success of these spaces. Community engagement efforts were spearheaded by the Polk County Public Health office. This engagement was leveraged by their intimate knowledge of community culture and their connections within the communities. Table 2 illustrates the methods and timing of community engagement efforts. Success of these engagement efforts in the communities of Crookston, MN and Fertile, MN is highlighted by the total hours (750 and 250, respectively) spent by community volunteers on the planning, design, and implementation of the natural play spaces. As Sommer (1994) found, this willingness to
spend time and physical effort is clear evidence of increased sense of ownership and is favorable to the long-term success and utilization of the play space.

The CCNNM project also provided initiative to erode institutional barriers commonly found in communities. Disconnect between academia, the public and various scales of governmental can lead to ineffective efforts, mistrust and unhealthy competition. When united in a common effort these groups can effectively synergize with positive results. Reaching out to a variety of stakeholders at the onset led to successful goal setting and realization of the CCNNM project aims. Table 3 highlights how the efforts were divided among community partners according to their interest and ability. This table also outlines the efforts engaged by the wide variety of community partners during the various stages that culminated in the successful installation of three natural play spaces.

Engagement efforts through social media and web-based venues spread interest well beyond the physical geography of the involved communities. As a result of this interest in reconnecting children to nature, a workshop was held to advise interested groups from other Minnesota communities on how to develop a similar process. This day-long workshop helped officials from state parks, state natural resource agencies, school groups, academics, and concerned citizens to build upon the methods used in the Children and Nature in NW Minnesota and strengthened community connections at a wider, regional scale. Each of the original community partners also contributed to the dissemination of the CCNNM goals (Table 3).
Additional evidence that suggests (and warranted further study) that the CCNNM project strengthened community relationships was provided by observation that other civic groups are mimicking the developed methods. At the end of 2012, a group interested in redevelopment of neglected city spaces consulted with partners of CCNNM to find ways to emulate the success found by collaborating with a wide range of community groups. Consultation with this group is ongoing.

The primary goals for the CCNNM design team were to provide planning, design and implementation consultation services to the various communities involved. Once completed, the hope was that sufficient community ownership would allow the design team to step back and let each community guide further development and management of the play spaces. As the play spaces were completed in summer 2012, communities have had enough time to develop independent control. Initial results were positive, with Citizen Advisory Boards meeting as early as winter 2013 to discuss future plans for the natural play spaces. These efforts have resulted in a significant number of well-attended community events that utilized the natural play spaces as a focal point of the event. As Dendy (1998) found the formation and activity of the advisory committee significantly adds to the increase in community social capital.

Any park or greenspace can provide the setting for physical activity that reduces BMI, but for very little investment, natural play spaces can provide increased parental buy-in or a community sense of ownership because of parental involvement in the process, which can potentially mitigate parental concerns about safety (Valentine & McKendrick, 1997).
This study examined the perceived impacts that the NPS’s had on two aspects of health, which are: community and physical. To accomplish this, this study conducted focus groups that generated theory on the collaborative process between academic, local government, and community stakeholders in the planning, design, implementation and use of the natural play spaces in rural Northwest Minnesota that were part of the CCNNM project.

**Summary Value of Research Project**

This research is intended to be of value to a variety of fields, primarily social science, planning and landscape architecture. Social scientists and those desiring to increase social capital through community involvement in community relevant projects can benefit from the theories generated from this research. Social capital is strengthened through community volunteerism and volunteerism is desirable for societies (Clary & Snyder, 1999; DiEnno, 2007). There are many factors that impact community volunteering. Martinez and McMullin (2004) identified five factors that impacted volunteerism: (1) social networks, (2) competing commitments, (3) lifestyle changes, (4) personal growth, and (5) efficacy of knowing one’s actions can make a difference. As the CCNNM project involved a wide audience in six different communities with varying degrees of success in engaging community, volunteers in each community, examination of what elements of the CCNNM project and which community dynamics impacted volunteerism in these communities is clearly warranted.
Landscape architects plan and design play spaces that families and children utilize (R. C. Moore, 2014). Natural play spaces are increasingly being built in many communities (Burdette & Whitaker, 2005; Children & Nature Network, 2016; R. C. Moore, 2014; Natural Learning Initiative, 2014; Staempfli, 2008). The CCNNM project examined in this research has a number of unique elements that can be of value. One such element is affordability, both financially and the limited technical expertise necessary to install the designs. Through the author’s personal conversations with a number of professionals who design and maintain natural play spaces it is rare to find a project that is installed for less than $100,000 U.S., with many ranging in the $200,000-$300,000 U.S. range. The CCNNM projects examined in this research were installed with budgets ranging from $5000-$15,000 U.S. The main factor contributing to this difference was that the designs specified play materials and structures that could be installed using mainly recycled or found materials that could be easily constructed by community volunteers with minimal construction experience. Additionally, often when designs for parks are complete and given to communities, they often go uninstalled because of lack of funds or lack of expertise in how to install them (Lawson, 2007). Given these unique aspects, examination of the value of the play spaces and their designs and the ability of the CCNNM project to engage community volunteers warrants further study.

**Objective**

1) Generate theory regarding the perceived impact on social capital from the community-driven planning and construction process of the CCNNM. Assess
reasons for and/or variables for future study on causes of these perceived impacts.

2) Generate theory regarding the perceived impact of the natural play spaces themselves to provide a setting to improve community health.

Premises

1) It is suspected that the community-engaged process helped foster social capital by establishing or reestablishing a sense of trust between community members who participated in the project.

2) It is also suspected that participants in the project feel an increased sense of community and ownership directly toward the natural play spaces due to their participation in the project.

There were six communities that participated in independent CCNNM processes. Each community experienced varying degrees of success in installing and programming events for their particular NPS. One major purpose of this project is to understand the unique successes and failures that each project experienced. It is also suspected that the failures were due to the lack of participation or leadership. Failures were identified as some communities did not build the natural play space after the planning and design phases were completed.
CHAPTER II

METHOD

Grounded Theory

To explore these questions this project collected data through focus groups and utilized a Grounded Theory approach in the qualitative analysis of the data. Grounded Theory as first proposed by Glasser and Strauss (1967) is defined as an “important enterprise of how discovery of theory from data-systematically obtained and analyzed in social research can be furthered” (p. 1). This analysis method is appropriately used when seeking to understand underlying questions and ideas and generating new accurate theory for further testing of less understood topics (Ritchie, 2001). The main advantage of using a Grounded Theory approach is the ability to allow meaning regarding research questions to emerge organically, rather than imposing preconceived theoretical ideas of what researchers think the answers should be. To implement a Grounded Theory approach, researchers design the study in a way that removes as much preconceived theoretical bias as possible. This removal of theoretical bias will hopefully allow for a more accurate theory regarding the subject to emerge. After discovering more accurately grounded theory, additional research can then be completed to further test this newly generated theory. A Grounded Theory approach is intended to be the initial phase of research that can then be followed up with more research built upon the newly generated theory.
The developmental history of Grounded Theory provides insights into the relationship between this qualitative approach with quantitative approaches to research. Clearly, both methods seek to make sense of observation recorded data. The need for a more stringent method that systematically generated theory based on observations in data first emerged in the field of sociology in the 1960’s (Glasser & Strauss, 1967). Glasser & Strauss described a situation where the field of sociology had developed to a point where most inquiry in the field was based on testing the theories generated by the “great men” (p. 10), within the field. The assumption of the profession at the time was that these foundational researchers “had generated a sufficient number of outstanding theories on enough areas of social life to last for a long while” (p. 10). This mentality created two dilemmas: 1) many departments of sociology were converted to the sole function of testing these theories, rather than generating new theory and 2) some of these precedential theories were based more on the preconceptions of the researcher and not in the data and therefore useless in “research, theoretical advance and practical application” (p.11). The ultimate need for theory grounded in data is to ensure that any research project (qualitative or quantitative) that builds off that theory is based in the data, rather than unfounded assumptions or preconceptions.

The goal of qualitative research is not to approximate quantitative methods, but to view data in ways that quantitative approaches are less suited. Strauss (1987) illustrates this point:
“Qualitative researchers tend to lay considerable emphasis on situational and often structural context, in contrast to many quantitative researchers, whose work is multivariate but often weak on cross comparisons because they often study on single situations, organizations, and institutions” (p.2).

Strauss readily admits there are researchers employing methods that merging quantitative and qualitative analysis, however, each can be inappropriately applied. Glasser & Strauss (1967) emphasized qualitative studies are not particularly suited to produce “scientifically reproducible fact” (p.15), however, they can be effective at describing facts about social structures and systems, and are therefore well suited to “preliminary, exploratory, and groundbreaking work” (p.15). When utilizing a qualitative approach, especially when generating theory, problems can arise when inappropriate emphasis is placed on causality or verification rather than on theory generation. Glasser & Strauss also urge the temptation to prioritize verification over theory generation: “when generating is not clearly recognized as the main goal of a given research, it can be quickly killed by the twin critiques of accurate evidence and verified hypothesis” (p.28).

Grounded Theory is extremely common in health research as this approach methodically attempts to remove researcher bias. (Bryant & Charmaz, 2007; Morse et al., 2009; Yamazaki et al., 2009). Veitch and colleagues (2006) used this method to explore social aspects of children and nature. Dennis et al. (2014) used this method qualitatively to assess the benefits of nature-based play spaces in early childhood classrooms. Therefore, application of this method, to study relationships between health, natural play spaces, & social capital clearly has precedents.
Focus Groups

Grounded Theory is a qualitative analytic tool commonly used with focus groups, or group interviews, to provide rich understanding into an area previously not well understood. As a qualitative method, focus groups began to be used in the 1940’s (Liamputtong, 2013; Merton & Kendall, 1946). A focus group is “typically 7-10 people who are unfamiliar with each other. These participants are selected because they have certain characteristics in common that relate to the topic of the focus group. The group discussion is conducted several times with similar types of participants to identify trends and patterns in perceptions. Careful and systematic analysis of the discussions provide clues and insights as to how a product, service, or opportunity is perceived by the group” (p. 1) (Marczak & Sewell, 2016). Focus groups are capable of gaining more information than individual interviews, as they are social events where data is gleaned through group dynamics (Smithson, 2000). The group dynamics experienced during a focus group are participants interacting through verbal and non-verbal communication. As used by Kidd & Parshall (2000), focus groups were used in this study to gain information at multiple levels: the individual level, the group level, and the interaction level. Due to the social nature of focus groups, insights were gained from the interaction between individuals, insights that would likely not surface in individual interviews (Stewart & Shamdasani, 2014). Focus groups are particularly suited to understand community dynamics and as such are an appropriate method given the goals of this project (Lloyd-Evans, 2006). The application of Grounded Theory using focus groups has already been used to evaluate types of play and playground
preferences (Qutub, Anjum, Iftakhar, Mehmood, & Bibi, 2015). A Grounded Theory approach combined with focus groups allows researchers to understand the meaning that the group makes, rather than the researchers imposing their suspected meaning.

It was the intent of this study to conduct focus group sessions with all six of the communities involved in the CCNNM project. However, due to lack of the ability to recruit individuals from Fosston, a focus group was not conducted in this community. Focus groups were conducted in Ada, MN; Crookston, MN; Fertile, MN; Mahnomen, MN; and Warren, MN during the summer of 2016. Table 4 contains more information regarding the focus group sessions.

<table>
<thead>
<tr>
<th>Table 4 - Focus group session details</th>
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<tbody>
<tr>
<td>Date</td>
</tr>
<tr>
<td>Ada</td>
</tr>
<tr>
<td>Crookston</td>
</tr>
<tr>
<td>Fertile</td>
</tr>
<tr>
<td>Mahnomen</td>
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<tr>
<td>Warren</td>
</tr>
</tbody>
</table>

The focus group sessions were recorded using audio and video recordings. For each focus group session, there was one moderator and one assistant moderator. The principal investigator was the moderator for each session. Each session was led by the same moderator and assistant moderator. The assistant moderator was a master’s trained researcher with experience in qualitative research. The assistant moderator was trained by the moderator and followed guidelines outlined by the moderator. The
moderator followed the question script and asked follow up questions as appropriate.

During the focus group sessions, the assistant moderator took notes. There were six focus group sessions, one for each community that engaged in the CCNNM planning process. Focus groups ranged from 3-7 participants and a total of 24 participants. One community only had one focus group participant and was subsequently excluded from the analysis. Participants were 18 years or older. This number of focus group sessions and the total number of focus group participants was consistent with peer-reviewed scholarly works that have used focus groups with a Grounded Theory analysis (Table 5).

Table 5 - Examples of studies that utilize focus groups and a Grounded Theory methodology

<table>
<thead>
<tr>
<th>Citation</th>
<th>Focus Groups</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhandari et al., 2003</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Bringer, Johnston, &amp; Brackenridge, 2006</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>D. X. Cheng &amp; Alcántara, 2007</td>
<td>2</td>
<td>29</td>
</tr>
<tr>
<td>Connors, Bednar, &amp; Klammer, 2001</td>
<td>10</td>
<td>41</td>
</tr>
<tr>
<td>Gibson, Dollarhide, &amp; Moss, 2010</td>
<td>7</td>
<td>43</td>
</tr>
<tr>
<td>Irving et al., 2014</td>
<td>6</td>
<td>26</td>
</tr>
<tr>
<td>Kean, 2010</td>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>Kumar, Guite, &amp; Thornicroft, 2001</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Larsson et al., 2007</td>
<td>6</td>
<td>26</td>
</tr>
<tr>
<td>Thom &amp; Campbell, 1997</td>
<td>4</td>
<td>29</td>
</tr>
</tbody>
</table>

The method that this project utilized, including the use of a single moderator and the total number of focus groups and participants, is also consistent with other Ph.D. projects, see Table 6.
Focus group participants were self-selected from each community’s population of individuals who participated in the CCNNM project in each community or from individuals who utilized the NPS. For detailed recruitment protocol utilized see Appendix A. Immediately after each focus group session the moderator and assistant moderator debriefed by comparing and reviewing notes taken during the session. The debriefing sessions involved reviewing the questions asked and evaluating if additional questions needed to be asked at the next focus group session.

Using a Grounded Theory analysis approach mirrors the benefits that children can get from playing in natural play spaces. In a natural play space, the behaviors children engage in are not confined and structured based on how the playground designer thinks children should play, but rather the natural play space allows children the freedom to explore and find their own meaning through play. Similarly using a Grounded Theory approach in this project allowed the meaning regarding the research questions to emerge organically from the group discussion. To facilitate this, the focus group moderator asked opening questions that allowed the participants to indicate at which stages of the Children and Nature in NW Minnesota process they engaged in

<table>
<thead>
<tr>
<th>Citation</th>
<th>Focus Groups</th>
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<tbody>
<tr>
<td>Beegle, 2000</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>Brown, 2011</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Hoyt, 2006</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>Millard, 2015</td>
<td>*</td>
<td>19</td>
</tr>
<tr>
<td>J. D. Moore, 2006</td>
<td>*</td>
<td>24</td>
</tr>
<tr>
<td>Witten, 2009</td>
<td>*</td>
<td>15</td>
</tr>
</tbody>
</table>

*conducted mixed method focus groups and individual interviews
(Krueger & Casey, 2014). After these opening questions, the moderator asked questions that allowed participants to explore if and how they feel the natural play spaces impacted their community. During the focus groups when ideas or topics were brought up that were outside of the outlined questions, follow up questions were asked by the moderator to further explore these ideas. These questions probed deeper into the original research topics of this study. This technique is often used by focus group moderators (Cyr, 2016; Krueger, 1997; Krueger & Casey, 2014). Specifically when health and design topics of interest to the research were brought up in the initial discussions, the moderator used these conversations to ask further questions to extract more meaning from these topics of interest (Krueger, 1997; Krueger & Casey, 2014).

**Focus Group Questions**

**Opening Questions:**

1) How have you been involved with the natural play space? (planning, design, implementation, programming, or utilization)

2) Why did you get involved in the project? Have your expectations been met? Why or why not?

**Introductory Questions**

1) Has the natural play space changed your community?

   a) Was there anything the process that you feel was successful? What helped make it successful?

   b) Were there challenges encountered?

      i) Were they able to be overcome? If so why or why not?

   c) Ask follow up questions that will explore more fully the topics raised by group participants.
2) If discussion topics regarding social capital or physical health arises, ask follow up questions that explore these topics. By the end of the focus group the following questions should be addressed, whether by asking follow up questions when the topic is brought up by a participant, or through specific follow up questions from the moderator:

a) Community Health

i) What new community groups or people did you get to know because of the natural play space? Were there existing connections with people or organizations that were enhanced by this process?

ii) Were there individuals or organizations that you would invite to be involved in other community projects? Who are they? Why?

iii) As a result of this project were there places in the community that you became acquainted with for the first time, or perhaps reacquainted with, or visit more frequently?

iv) Do you feel more or less connected to the community as a result of this project?

v) How would you feel if there was a proposal to remove or dramatically alter the character the natural play space? Why?

b) Physical Health

i) What kinds of activity have you engaged in at the natural play space?

ii) What kinds of activity have you observed others engaged in at the natural play space?

iii) How often do you or people you know go to the natural play space?

iv) Is there anything different about the way children play in the space than they play in other playgrounds or play areas?

3) Ending Questions:

a) “Of all the things we discussed today which one is the most important to you?”

b) After summarizing the main topics of the discussion, ask “Is this an adequate summary?”
c) “Have we missed anything”

Questions were developed using guidelines outlined by Morgan (1996) and Krueger (1997) to be open-ended within the area of interest to this study. To increase validity these questions were reviewed by the dissertation committee. Additionally after asking the questions during the first focus group session, modifications slight were made to the questions. For example question 2.a.v. “How would you feel if there was a proposal to remove or dramatically alter the character of the natural play space? Why?”. When asked in the first focus group, participants became unnecessarily concerned that this question was foreshadowing coming changes to the NPS. This was not the case, nor the intent of the question, therefore, in subsequent focus groups this question was modified to further reflect the hypothetical nature of the question.

Before each focus group participants were asked to provide consent to participate in research using the IRB approved consent form (IRB-201605-390 approved 05/19/16). After providing consent, participants filled out a demographic questionnaire (see Appendix A).

Recording and Transcription

The audio and video recordings were transcribed using a video transcription software. After the software transcribed the text, accuracy verification, punctuation and labeling of speakers was completed manually. This was accomplished by listening to and watching the video and simultaneously reading the transcript, correcting errors when necessary.
Analysis

Grounded Theory analysis is a qualitative approach to systematically derive meaning and define patterns in the data. The goal of this analysis was to identify similarities, differences or events, known as themes, that reoccurred in the data and then derive meaning from those themes. To summarize the how this process happens, once transcribed, the data passed through tri-level hierarchal coding phases: open, axial and focused (Creswell, 2012). During the open coding phase, the researcher read each line of data and summarized the main idea. Sometimes these main ideas were contained within a single word, a single line, or an entire statement. Once each line was summarized the researcher reread the transcript along with the newly created open code summaries and compared them for similarities, differences, patterns or other notable events (Charmaz, 2000). These connections were as assessed as valid by the researcher. When similarities were identified, this line-by-line coding focused the researcher’s attention on the data and minimized theoretical biases onto the data. As Charmaz explains (2000) this line-by-line coding is useful because it forces the researcher to give attention to specific lines and specific words that can easily be missed in a general thematic analysis. When comparing the data, it will exist as statements, full sentences, or even just thought fragments and line-by-line coding provides a way to connect the larger meaning from the data, not the researcher’s preconceived ideas (Ballestas, 2008). Axial coding was then used to compare the open codes to each other. This coding attempted to make connections between the open codes (Charmaz, 2000). Focused coding then took re-occurring axial codes and use them to classify larger
segments of the data (Charmaz, 2000). The Nvivo 11 software from QSR International, which is often used for qualitative data analysis, was used to code the data and organize the analysis (Auld et al., 2007; Azeem, Salfi, & Dogar, 2012). From this hierarchical, comparative analysis the data was used to create themes and recognized patterns and then used to derive meaning from them.

To begin the open coding phase the principal investigator read hard copies of one focus group transcript. During this reading, the researcher read each line of data and then summarized the meaning of that line of data by manually writing summative words in the margin of the paper. Once each line or phrase was summarized this way, the researcher reread the transcript and summaries and evaluated the content for similar themes. When similarities were identified during this rereading a single code was created for each collection of similar lines of data. These codes were then tagged to each of their respective lines of data in the InVivo software. After completing the open

![Figure 7 - Process used to apply the Grounded Theory coding process to the data into the master codebook, see Figure 8. Adapted from Charmaz (2012).]
coding phase of analysis, the researcher then examined the themes that emerged during the evaluation and sometimes combining and deleting repetitive themes. Once these themes were identified, the key words or phrases of each theme were used as a set of codes to begin to create a codebook (Morgan, 1996). Applying this initial codebook, each subsequent transcript was then analyzed as the researcher read line-by-line and tagged each line with a code if it had similar meaning to that code. If it was not similar, a new code was created to reflect the meaning it contained. Then that new code was tagged to that line and the new code was also added to the master codebook (Figure 8). Each transcript was then coded in this manner. After the first analysis of each transcript was completed, each transcript was coded again allowing for verification of accuracy of coding and to ensure that each transcript was coded correctly and that no subsequent codes emerged from the data, or in other words, the data reached saturation (Charmaz, 2000). Next, in axial coding phase, the researcher reviewed the open codes and grouped open codes that were related and created an axial code to that reflected the relationship among the grouped open codes. This process was repeated until all the open codes were in a related axial code. In some situations, the open codes were not similar to other open codes. These unique open codes were subsequently not grouped into axial codes and remained solely as open codes. For focused coding the researcher then analyzed the axial coding (and solitary open codes) and grouped similar axial codes together into focused codes, completing the hierarchy of codes. Upon completion of the coding phase, each code was analyzed and frequency distributions were calculated, tallied and compared for percentages of participant responses.
Reliability

In qualitative research bias can be introduced in the following steps in the process: subject selection, data collection, and analysis (Mehra, 2002; Petticrew et al., 2008; Silverman, 2013). Within the analysis, trustworthiness can be obtained through credibility, transferability, dependability, and confirmability (Lincoln and Guba, 1985). To avoid bias and increase trustworthiness, the following methods were utilized.

Reliability Subject Selection

Recruiting of subjects targeted the pool of people involved throughout the CCNNM project. The phases for which participants may have been involved included the planning, design, construction, or maintenance phases. Subject selection was also open to people who utilized the space for play or gathering. From this pool, subjects self-selected to participate in the project. Individuals that had free time in the evenings, which is the time the focus groups were held, were more likely to have time available to participate. This evening schedule for focus groups potentially eliminated those that have time constraints in the evenings, such as participants with children. To avoid some of this bias, children were allowed to accompany guardian adults participating in the project, however, children did not participate in the research. Even with this accommodation, it may have been difficult for some subjects with children to participate. Focus group times were also selected with consideration for this potential bias, i.e. efforts were made to select focus group times that didn’t conflict with community youth events. As all subjects were part of the CCNNM process and chose to
volunteer on the project, at some point they thought the project valuable enough to
volunteer their time, so participation in the focus groups was reasonable.

Reliability in Data Collection

Data was collected during the focus group sessions. These sessions were
carried out by a moderator who was helped by an assistant moderator. The same
moderator and assistant moderator conducted each focus group session, a technique
that allowed for consistency in the collection process. During the focus group sessions,
the moderator followed a script which also encouraged consistency (Brown, 2011). The
focus group sessions were video recorded and then transcribed and checked for content
and contextual accuracy. For example, one participant made the following statement,
shown here in an un-corrected, un-contextualized format:

“well the president and the secretary are on board with us i've personally phone
called them and then there's that one person before i even got it all out
absolutely not there is no way”

After reading that quote, it becomes clear that punctuation and some context need to
be added to increase the clarity of meaning as intended by the participant. The quote
below is a more representative version that added punctuation and contextual meaning.

“Well, the president and the secretary are on board with us. I've personally
phone called them. Then there's that one person, before I even got it all out
(they said) 'absolutely not, there is no way’”.

The most significant correction to this quote is the addition of “(they said)”’. This change
was made after reviewing the video recording, following the pacing of the verbal
statement of the participant, and recognizing the significance within context of the
larger conversation, it was clear that the participant was referring to a statement made by others, not themselves, when they reported “absolutely not, there is no way”.

**Reliability in Analysis**

A grounded theory approach was used to analyze the data in the transcripts. It is in this process that a grounded theory approach was especially effective at minimizing researcher bias. The line-by-line coding process outlined previously, strongly encouraged the researcher to center on the data which reduced any inclination to impose their personal beliefs or predetermined supposition on the data (Charmaz, 2000). For an example of the process used in the line-by-line coding, see Table 7.

**Table 7 - Line-by-line coding example with the participant statement followed by the line-by-line coding with key phrases determined by the researcher**

<table>
<thead>
<tr>
<th>Focus group participant statement</th>
<th>Line-by-line coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think it's cool for me and my family to kind of feel like we have a park now.</td>
<td>Sense of ownership</td>
</tr>
<tr>
<td>I've never seen kids picking (on each other) or being mean at natural play spaces.</td>
<td>Behavior change observations</td>
</tr>
<tr>
<td>I'm just really frustrated that they're going to make the decision to develop (over the park)</td>
<td>Feeling disenfranchised</td>
</tr>
</tbody>
</table>

Additionally, as a single researcher in charge of this project, my own personal bias could influence the research study. I did my best to avoid personal biases, however, as recommended by Shank (2006) I reported known biases in the initial proposal and added additional biases that were revealed during the study. My background with the research topic is a potential bias, I have been engaged in nature-
based pursuits and community volunteering for most of my life, and I find value in these endeavors. I was also a key member of the research team on the CCNNM project where I conducted and facilitated the planning meetings, directly supervised students as they designed the natural play spaces, and helped the communities of Crookston, Warren, and Fertile in the construction phase. Given these biases, it is appropriate to apply a grounded theory approach, as this approach was developed to have embedded reliability and validity standards (Brown, 2011). Reliability in the analysis was achieved through the open, axial (line-by-line) and focused coding (Charmaz, 2000; Creswell, 2012).

**Trustworthiness**

Lincoln and Guba proposed four measures to establish trustworthiness in the findings of qualitative data: credibility, transferability, dependability and confirmability (1985). In this study trustworthiness was achieved through detailed descriptions of the methods used to analyze the data, thick descriptions of the data and how those descriptions were then used to guide the coding process, consulting with other qualitative researchers during the analysis process, consulting with mentors familiar with qualitative research, through the creation of an audit trail. This audit trail allowed reliability assessment of the methods used to extract meaning from the data.
CHAPTER III

RESULTS

This study constructed a grounded theory regarding ideas that emerged from focus group discussions with community volunteers regarding the health value of natural play spaces. This theory expands on current understanding of health benefits of natural play spaces and will inform city managers, park managers, community health advocates, landscape architects and planners when making decisions regarding community play spaces. Findings in this section will address the following central research questions: (1) how did the planning, design, construction and programming of natural play spaces impact community health and (2) how did the use of natural play spaces impact the health of children?

Findings centered around the initial questions will alert the grounded theorist when similar themes emerge in the data. At the same time, when developing a grounded theory, the data should not be forced to fit the preconceived ideas that the questions were derived from. Grounded theory results should not be strictly presented in a way that confirms the findings to the initial hypothesis, but rather to what themes emerged naturally during the focus groups and then examining what relationship those themes have with the preconceived ideas of the researcher and existing theories (Charmaz, 2014).
Presentation of the results will be organized around four main themes, or focused codes, that emerged during the focus group discussions: Intrapersonal Dynamics, Health, Design Paradigm, and Interpersonal Dynamics. Within Intrapersonal Dynamics themes related to personal or group interactions with others; many of the themes related to social capital were captured in this theme. Interpersonal Dynamics captured ideas related to the self. Health discussed issues related to play and nature. Finally, the Design Paradigm theme capture topics that related to the design, construction and maintenance of the CCNNM. Within each main theme there are additional sub-themes, or axial codes, that emerged. For a detailed outline see Figure 7.

After the initial open coding phase, the codes were cross-compared with each other for common links of ideas and relationships. When connections were identified, the open codes were then grouped together into axial codes. Further comparison and coding was applied to the axial codes and processed for relatedness and were then grouped into the selective codes. Table 8 outlines the tiered approach to data analysis and coding used in this study.
Figure 8 – This is a diagram of the master codebook that contains all the codes and is an audit trail component: coding organization, hierarchy, and relationships across codes (shown with arrows). These arrows indicate that the open codes relate to more than one axial code. The focus codes are directly off the central “Codes” oval, followed by the next level, axial codes, and finally the open codes, which are furthest away from the central “Codes” oval. When there are only two levels of codes, for example with the “Lacking participation” is the open code and “Interpersonal dynamics” is the focus code, there is no axial code.
### Table 8 - Selected coding example process, and code hierarchy from audit trail for Health construct

<table>
<thead>
<tr>
<th>Focus Group Responses</th>
<th>Open Codes</th>
<th>Axial Codes</th>
<th>Focus Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was feeling passionate about how much I was seeing kids (...) not being active, not be outside.</td>
<td>Desiring nature play</td>
<td>Nature connection</td>
<td>Health</td>
</tr>
<tr>
<td>I feel like I have to show them how to play in the mud</td>
<td>Learning to play in nature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It allows you to be creative.</td>
<td>Nature creativity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I've never seen kids picking (on each other) or being mean at natural play spaces.</td>
<td>Behavior change observation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think your play evolves, because it doesn't have a preconceived structure.</td>
<td>Free play</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I came back the next day and they were all moved around.</td>
<td>Loose parts</td>
<td>Play</td>
<td></td>
</tr>
<tr>
<td>You watch them and they'll get together as a team effort.</td>
<td>Playing together</td>
<td></td>
<td></td>
</tr>
<tr>
<td>He claims ownership of it</td>
<td>Ownership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>They wanted to help get their parents and grandparents involved.</td>
<td>Intergenerational</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Not including “motivations” and “phases involved in” which each participant responded to, a total of 16 sub-themes emerged from the analysis of the participant responses. A list of these sub-themes, as well as the frequency which they were mentioned during the five focus groups, can be found in Table 9.
Table 9 - Frequency of references to identified themes across five focus groups, with highlighting comments that Ada made with more frequency. Unlike the other communities, at the time of this study, Ada had not completed a NPS.

<table>
<thead>
<tr>
<th>Design Paradigm</th>
<th>Total</th>
<th>Ada</th>
<th>Crookston</th>
<th>Fertile</th>
<th>Mahnomen</th>
<th>Warren</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>38</td>
<td>11(39)</td>
<td>2(7)</td>
<td>8(29)</td>
<td>6(21)</td>
<td>1(4)</td>
</tr>
<tr>
<td>Design</td>
<td>19</td>
<td>6(32)</td>
<td>3(16)</td>
<td>5(26)</td>
<td>3(16)</td>
<td>2(11)</td>
</tr>
<tr>
<td>Funding</td>
<td>20</td>
<td>14(70)</td>
<td>1(5)</td>
<td>2(10)</td>
<td>2(10)</td>
<td>1(5)</td>
</tr>
<tr>
<td>Location</td>
<td>134</td>
<td>44(33)</td>
<td>30(22)</td>
<td>32(24)</td>
<td>8(6)</td>
<td>20(15)</td>
</tr>
<tr>
<td>Maintenance</td>
<td>20</td>
<td>0(0)</td>
<td>2(10)</td>
<td>5(25)</td>
<td>9(45)</td>
<td>4(20)</td>
</tr>
<tr>
<td>Health</td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intergenerational</td>
<td>14</td>
<td>4(29)</td>
<td>9(64)</td>
<td>1(7)</td>
<td>0(0)</td>
<td>0(0)</td>
</tr>
<tr>
<td>Play</td>
<td>51</td>
<td>12(24)</td>
<td>15(29)</td>
<td>17(33)</td>
<td>3(6)</td>
<td>4(8)</td>
</tr>
<tr>
<td>Nature Connection</td>
<td>39</td>
<td>9(23)</td>
<td>17(44)</td>
<td>10(26)</td>
<td>2(5)</td>
<td>1(3)</td>
</tr>
<tr>
<td>Intrapersonal Dynamics</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changing Paradigm</td>
<td>3</td>
<td>0(0)</td>
<td>3(100)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
</tr>
<tr>
<td>Persistence</td>
<td>11</td>
<td>4(36)</td>
<td>1(9)</td>
<td>2(18)</td>
<td>3(27)</td>
<td>1(9)</td>
</tr>
<tr>
<td>Interpersonal Dynamics</td>
<td></td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changing Group</td>
<td>4</td>
<td>4(100)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
</tr>
<tr>
<td>Engaging &amp; Recruiting</td>
<td>68</td>
<td>39(57)</td>
<td>3(4)</td>
<td>19(28)</td>
<td>2(3)</td>
<td>5(7)</td>
</tr>
<tr>
<td>Government Relations</td>
<td>103</td>
<td>73(71)</td>
<td>13(13)</td>
<td>5(5)</td>
<td>3(3)</td>
<td>9(9)</td>
</tr>
<tr>
<td>Lacking Participation</td>
<td>12</td>
<td>0(0)</td>
<td>0(0)</td>
<td>0(0)</td>
<td>11(92)</td>
<td>1(8)</td>
</tr>
<tr>
<td>Lobbying</td>
<td>32</td>
<td>27(84)</td>
<td>4(13)</td>
<td>1(3)</td>
<td>0(0)</td>
<td>0(0)</td>
</tr>
<tr>
<td>Social Capital</td>
<td>100</td>
<td>16(16)</td>
<td>36(36)</td>
<td>22(22)</td>
<td>13(13)</td>
<td>13(13)</td>
</tr>
<tr>
<td>Total Comments</td>
<td>983</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

An initial comparison and discussion of the installation status of each community and their NPS is warranted. Crookston, Fertile, Mahnomen, and Warren all installed portions of the NPS in their community. At the time of this focus group, Ada and Fosston did not complete any portion of the NPS design. A comparison of the responses from these focus groups revealed that Ada focus group participants made a higher percentage of overall comments within the themes of Government Relations, Engaging & Recruiting, Lobbying, and Funding (see highlights on Table 9). Further research could be completed to examine why these differences exist. In addition to Ada, the community of Fosston, MN also went through the design process but did not carry it
through to the installation phase. At the focus group conducted in Fosston only one individual participated, therefore the results were not coded and could not be included in Table 9. However, after reviewing the Fosston transcript there were few unique contributions to this study that were incorporated into the analysis. To summarize these additions, the focus group participant reported that Fosston didn’t complete the NPS due to the extended nature of the construction timeline which conflicted with the hard deadlines set by a funding donor. In addition, there were two separate funding sources, and though both initially agreed on how the funding should be spent, they later disagreed, resulting in no funding being spent on the project and effectively terminating efforts to complete the NPS.

At the focus groups, each participant was surveyed as to which portions of the CCNNM project they were involved in: planning, design, installation or programming. Among the 24 focus group participants, 21 of them were involved with two or more phases of the project; only 3 of the 24 participated in only one phase of the CCNNM project. It was the hope of the researcher that unique insights could be gained by analyzing the contributions of these individuals. However, upon examination of their responses, there didn’t appear to be anything unique, or different, about their responses, other than the fact that they didn’t discuss aspects of the process that they weren’t involved in.
Intrapersonal Dynamics

Motivations

Focus group participants indicated which phases of the project they were involved in as well as the variety of reasons for their involvement in the project.

Participants also indicated a variety of ways that the project impacted them personally (Tables 10 & 11)

Table 10 - Phases of the project participants reported being involved in (N=24)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>71%</td>
</tr>
<tr>
<td>Design</td>
<td>58%</td>
</tr>
<tr>
<td>Construction</td>
<td>63%</td>
</tr>
<tr>
<td>Post-Construction Programming</td>
<td>50%</td>
</tr>
<tr>
<td>Other</td>
<td>17%</td>
</tr>
<tr>
<td>All Phases</td>
<td>29%</td>
</tr>
</tbody>
</table>

Participants indicated that their initial interest in the project centered around three motivators, professional benefit, personal benefit or for more altruistic reasons.

Some mentioned only one of these motivators, while others mentioned two or all three.

Often they were involved with another person, be that a friend or relative (Table 11).

Many participants were involved because of the overlap between the project and their professional careers. Participants were most often in a health-related field, either working for a hospital or in a public health-related field. The next most mentioned profession was education, at the early childhood and elementary levels. The most common reason for participation at a personal level was the benefit to their family, specifically their own children. Yet others were involved, not for professional benefit,
nor had children that could play at the space, but for other more community-oriented reasons. The most common of these reasons was that they wanted to have a part in increasing outdoor activity for children. Some participated because of the commonality between the project and other volunteer efforts they were involved in. Others wanted to improve the community. One participant, whose current job involves working on the natural play space in their community, outlined common motivations and the overlapping goals:

“When the idea of the NPS (...) came up, I was right in the midst of doing, kind of, my own initiative of the fit kid program, where it was (...) educating kids about the importance of balance and their choices and the impact that the overuse of technology was having on their overall health. So it was a direct fit with things that I was trying to do in the community through club kid, through other programs. It ended up going to Community Ed and so it was very exciting to see that happening because they tied together perfectly”.

Table 11 - Participants reported being in the project with the following individuals (N=24)

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friend</td>
<td>75%</td>
</tr>
<tr>
<td>Own child</td>
<td>54%</td>
</tr>
<tr>
<td>Child for which they were caregiver</td>
<td>17%</td>
</tr>
<tr>
<td>Grandchild</td>
<td>13%</td>
</tr>
</tbody>
</table>

**Changing Paradigm**

Participants also outlined how involvement with the projects changed individuals and communities involved. One individual remarked how they expanded their beliefs and behaviors:

“Every time I go down there I know more about how it’s changed me though too, because I am kind of like ‘things where they’re supposed to be’ and even though I understand the concept, I embrace the concept, the fact that (...) I spent a lot of
time and energy and thoughts and dreams and wishes (...) to be down there and so at the grand opening it looked awesome that sand was where it was supposed to be, the hay bales. The hay bales, I love the hay bales moving, that I can handle, but now when I go down there, like, the weeds. The weeds really bother me (...) and I need to let (go...) so I have to learn to let go of different things too and so it helped me as an adult.”

Participants observed how the project seemed to be changing how parents approach play supervision of their children.

“Well last night, so this young gentleman (...) very active gentleman in a family, climbed up onto that lookout tower (...) and grabbed onto a branch next to it and was monkeying himself out and (his) mom’s like ‘oh no get down, get down!’ I was like ‘no that’s cool, he... look at him he’s able to do that’ and mom was worried that he would break the branch.”

When commenting on what they perceived to be changes in the community, one participant remarked:

“I think there are people who will say they look at education differently, people who will say they look at economic development differently, people who will say they look at economic development differently. I think the city leaders in town here will say they look at things a little differently because it’s been a (...) very much community-driven process that has ended up in something concrete, where not everything you do in a community ends up being concrete.”

**Volunteer Persistence**

Another reoccurring idea mentioned by participants was the motivating drive to complete the project in the face of adversity. Comments on this theme revolved around four concepts: sunk costs, “a really good thing”, culture, and to counter against opposition (spite).
**Sunk Costs.** Sunk costs, an idea used in business and economic decision making, refers to unrecoverable costs. Often when making future decisions, people will value these sunk costs when evaluating whether to continue investing in the same direction. When responding to opposition against the NPS project, participants remarked that they desired to continue the project because they had put so much time into it already.

“**A really good thing**”. One of the factors that motivated participant involvement in the project was the feeling that it was a worthwhile project to encourage kids to be outside. When asked why they wanted to continue working on the project, one participant remarked:

“It never did get to the Phase 3, it’s like Phase 1 probably and then the grand ending for one thing and I was hoping the city would (...) take over, but also some people thought what we had there was a really good thing and maybe we want to leave some of the area just grass (...) and so there’s several areas over there.”

**Culture.** Others mentioned the importance of finishing what they started as a matter of community culture or honor to finishing what they committed to:

“We’re just stubborn Norwegian, so we started this and we’re going to finish it. We aren’t going down without a fight.”

**Against Opposition.** Participants valued continuation of the project or the desire to finish the project recognizing that if they did not, the project would be cast aside or parties opposing the project would be vindicated:

“If we die on it, the city will walk right over us and there will be something else in there, why not keep going? I mean it’s doing good.”
Health Aspects

Maller et al. (2002) suggested that natural play spaces could potentially benefit communities by impacting five aspects of community health. This study was particularly suited to provide a stronger theoretical foundation for this claim, especially the physical health and community health elements. During the focus groups participant’s comments reflected three of the five aspects of community health: physical health (play), ecological health (nature connection), and community health (intergenerational & social capital).

Nature Connection

Participants commented on four primary aspects related to nature: desiring nature play, learning to play in nature, nature creativity and behavior changes observed by those in the natural play spaces.

Desiring Nature Play. When asked about personal motivations for being involved in the natural play space project, almost all participants echoed this one participant’s response:

“Yeah, so I didn’t do childcare in the summer so I was able to do this program. Ok it was one time we first did it with Club Kids, then did it with community education and we did skits and we did hands-on things, so each week we would talk about ‘okay this week we’re talking about movement, why is movement important’ and we would have a skit that talked about how when you’re using technology you weren’t moving your body and the next week would be nature so it would be nature-based. We’re missing out on nature. Another would be social interaction. We’re missing out on social interaction when we’re engaged with technology too much. It wasn’t saying technology was bad and evil, it was
just saying we’re missing that balance and our choices, and the hope was to empower the kids with the knowledge so that they would then take (...) make healthy choices after that, so it was Friends Interacting Together (FIT). So it would have the social piece, that was FIT, as well, as I kind of mentioned in that, you know, the interaction socialization part as well as the fit, when you think of it you think of healthy and strong.”

Most participants commented that they hoped the project would create a nearby location that would help kids play together in nature away from technology-based games and personal devices and that this time in nature would lead to better health.

Learning to Play in Nature. Participants interpreted that children needed to learn how to interact with the natural play spaces. It was a new play setting that they hadn’t experienced before. Regarding this interpretation, one participant contrasted what they felt about traditional playground spaces with large colorful play structures and natural play spaces:

“Kids see that first, the big thing that they’re familiar with and the bright colors and ‘oh I know what to do here’ and they kind of miss what’s in the background (the natural play space nearby), that’s those hidden amongst the trees and I think again, to truly enjoy and for a child to get it when they’re not used to that it takes time and they see that first, it’s like (the natural play space) ‘that’s boring, it is just sticks and there is sand’ but once they go and they realize the fun they have and how creative they can be and all the different options in the building they can do in the moving around of all ... all rules are off, then they get it, then they want to go there.”

Nature Creativity. One design intent in the natural play space focused on the manipulation and interaction with loose parts. Loose parts consisted of natural materials that were intended to be manipulated and moved, such as sticks, small logs,
tree trunk sections (stumps and thin slices), sand, rocks, mulch and water. One participant summarized their learning how to facilitate play with loose parts:

“I’m not as creative as you are. I’ve learned from it, when I first went down there I was picking up crap boards all over, heck, carrying them, putting them back up in a pile there...I learned, don’t touch them. They (kids) can move unbelievable amounts of material, they’re like ants, I’m not kidding you, watch ‘em.”

Participants also remarked on how these loose parts and unscripted spaces fostered “natural creativity” when recalling a conversation with their child, one participant said:

“I said, ‘what was your favorite thing tonight?’ After we had all these awesome things to do but she’s like ‘making our ganache’ and they made this like they’d done their own competition where they pretended that they were like bakers and they were mashing up flowers and you know adding water and putting sand and seeing what, how...anyway so to see that natural creativity that just doesn’t happen when technology, just, kind of, showed you this, this and this, and doesn’t even allow you to have that time to use your own thoughts to be creative.”

This creativity allows for the inclusion of loose parts and can help adults to “let go” of certain amounts of order and control.

**Behavior Change Observations.** Participants commented on behavior changes, both communal and individual, they attributed to the natural play spaces. Participants associated the natural play spaces with wider community conversations on community health, in particular:

Participant 3: “There was a coalition at the school with a vested interested in it and put up signs about no smoking.”
Participant 2: “After we were done, I forgot about that, they took a proposal to the city council to make it (the natural play space) tobacco-free. That was the first park of I don’t know how many counties to be tobacco-free so now since then they’ve added other parks, holiday park is tobacco-free and the ball field and stuff but Island Park (the natural play space) was tobacco-free couple years before any other parks and now that's something. Work in public health is tobacco-free parks, so there's several that are now (smoking free).”

One participant also noted that they didn’t observe any conflict between children while playing in the natural play space:

“You know what else I’ve noticed is you never see kids picking on each other there or being mean to each other, you know, in a traditional playground you’re always having discipline problems at recess or you’re always having discipline problems that afterschool daycare someone’s doing…but you know what, I’ve never seen kids picking or being mean at natural play spaces.”

**Play**

**Free play.** Each focus group that had a built natural play space in the community, had participants comment that they felt the natural play space facilitated free play. Free play allows more flexibility than play typically engaged in on most manufactured play equipment, what one participant called structured play on the playground. Structured play on play equipment is defined as a more prescriptive type of play for a given set of play equipment. For example, even when being creative children can only engage a slide in a limited amount of ways; they can go down it, climb back up, stop somewhere along the way or jump off. There are rules as to appropriate uses of the slide, if children start to break those rules, other kids or adult minders often remind them of those rules. Spaces that encourage free play have fewer rules regarding what is
and what isn’t permitted with the play structures. Sand and water have long been known to facilitate free play. One participant commented on this type of free play:

“When they played at a traditional playground they do what they feel is expected of them at a traditional playground. They turn the wheel, because the wheel is supposed to turn, they climb the steps, because the steps go up, they kind of follow the preconceived instructions that a plastic playground kind of traditionally tells them. Where at the nature-based playground, a lot of the time, to start with they don’t do anything, they kind of stand there for a little while and kind of take it all in and then they just start to, kind of, fiddle around and that kind of evolves. I think your play evolves because it doesn’t have a preconceived structure.”

When children play, without adult direction, in open fields, woods and streams, they define the parameters of play, the space is less constraining on the activity. One community, that had just a few of the design modules of the natural play space built, remarked that although the space was limited it still facilitated free play:

“When you go to the fairgrounds and there’s something there for the kids to do and when we go out there I mean the kids really do use it, even if there’s not a lot to do out there, or you know, they are creative in themselves, you know, let’s go to the woods, you know, it’s just a little path through there but they have fun with it so I mean I think it is a good thing and I do think that there’s lots of potential for it.”

**Loose Parts.** Many participants mentioned how they observed loose parts being an important part of the play.

“But the cool thing is when you, you know, one thing I really cherished was when I had time and need to be down there almost every day, I would see a change just from 4 clock one afternoon until the next morning. (...) The (straw) bales, you know we spent a lot of time and effort to make them into a maze, which was on the plan, but the plan called for the maze to be made out of a plant-based material and we couldn’t get there. So for the grand opening, we purchased straw bales to do that with and I very meticulously, on graph paper, measured
the bales and had them scientifically, mathematically set on the surface like they were supposed to be. I came back the next day and they were all moved around and then we put them back and then the next day or two came back and they were actually in the house form and the one time that we came during that maybe two-week process, we came down and it was a house that had rafters and the rafters were made out of the half logs that were stored up by the shed, intended to be made into benches and those logs had been lifted up and made into rafters with bales over the top of them. So knowing the weight of the bales and the weight of the log structures that they were using, those had to be at least 10-12-year-old young adolescents who were doing that. Then we had community members called who were worried about the safety of it so we did alter the structure a little bit just to make sure that they would be safe, but then we left them and the bales were moved everywhere, every day, every place and they became really great.”

Playing Together. One participant observed how loose parts also facilitated children playing together as a team:

“Well you look at those sticks, you can go there one day and there’s a pile here, a pile over there and a pile there. The next day you go, the piles are over here, and they’re around and you watch them and they’ll get together as a team effort. There aren’t big kids, these are little kids, they’ll go over and they’ll get this one stick or a log and they haul it around and move it or, somebody is the leader telling them where to put it.”

Ownership. When children can manipulate their surroundings and “leave their mark” they feel a sense of ownership and empowerment. One participant observed:

“I think the best one was that little sign, you go up by it where the manufactured playground is, and I’m driving out one day and I seen a little white sign on the stick in the dirt that’s they (city maintenance crews) sprayed (lawn chemicals), that’s what I thought, I drove by. Next day I was out there and I stopped to look at it, I don’t know if I still have the picture of it or not. It said ‘Castle Park Rocks!’ and he put his name on there.”
Another participant recounted a story from a family who travels 30 miles, from a different city, to play in the natural play space:

“Through the facebook page, there is a family from a community, from Grand Forks (ND), a grandmother and her grandson, who come over frequently and the only reason I know is because, I don’t know the situation, but I don’t know, I gather that he had, not sure anyway, it meets some needs that he cannot get met other places and it is his playground and some of the logs and structures are his and the Grandma shared with me one, you know, at first when he came back the next time he was kind of upset that things that he had done were changed or got moved and so, but she said that’s been a learning process for him too but it’s still his and he claims ownership of it so I think that’s kind of interesting, fun to know that it’s affecting, you know, that the effects I think are beyond what we will ever know.”

Intergenerational

Participants frequently remarked at the ability of the entire process of the natural play spaces, from planning to construction to programming, to engage and facilitate interaction amongst all ages. When commenting on the potential for success, one participant, who lived in a community without an installed natural play space, foreshadowed:

“I think it would be more utilized by more generations of people instead of just the, you know, 8 to 16- year- olds.”

One participant noted that during the planning process:

“That’s helped to getting the kids excited about something because then they wanted to help get their parents and grandparents involved.”
Participants also noted that they felt that the installation of the spaces also connected all ages of people together. In particular, one participant noted:

“We see this intergenerational stuff all the time, one that I think about is during the implementation process and we had strangers, older retired people down there to work and they ended up working on a project together, Eric maybe assigned them to do a certain section together and they started talking about fishing on the river and stories being told ‘when I was young, here’s how we would get to the river’ and ‘have you ever done this’ and ‘do you think about that’ and so you know the implementation process and mixing generations was cool, you know, so a student from West Virginia talking to an older gentleman and grew up in Crookston and the values they got out of that…and yeah tons of stories.”

After their natural play space was installed, one participant’s feelings summarized how the space had fostered intergenerational play:

“When you have your monthly thing, it’s not like going to scouts for the parents dump them off and you gotta babysit, the parents come, their parents are part of, they like decorating that wood, they like decorating pumpkins.”

Participants felt that the process that engaged all generations, throughout the entire process was successful at creating more interaction.

**Design Paradigm**

This section organizes participant remarks related to the planning, the natural play space design as a planning document, location of the NPS, NPS construction and maintenance, and reflections on the as-built physical implementation of the design documents.
Feedback from community-engaged planning meetings informed the designs, allowing community members input on the look, feel and composition of the final design solutions. Elements in the natural play space designs were selected for their ability to engage and entertain users. In addition, the designs were intentionally created to be modular with features that were simple enough for volunteers to install in phases with low cost or recycled materials. While reflecting on these aspects focus group participant responses centered around two ideas: modularity and balance

**Modularity.** Modularity is the combination of modular play space elements and loose parts. The designs created for each community were composed of modular play ‘stations’ that could be installed in phases, each module had the ability to be built and used independent of other elements. Reflecting on this modularity one participant responded:

“The thing that I love about it is that it’s not meant to be one set thing in time. So when we were building it everyone was like ‘is this done’, ‘is this it?’, I’m like, ‘no it should always be evolving’ and so it’s definitely met my expectations in that it can be what the community wants it to be. So you know as different people have different ideas for programming it’s changing that way structurally as, you know, Boy Scouts or a volunteer group wants to put a bench there or someone wants to plant a tree or you want to make a new path or you want to whatever, it is meant to, that you can touch and feel and interact with nature and it provides an environment to interact intergenerationally which I think totally serves, meets, my needs in a way that I could not ever have imagined it being”.

Loose parts were play elements that were intended to be freely manipulated by users. These elements consisted of rocks, sticks, sand, log slices, stumps, dirt, or mulch often located near like type elements. Participants responded that initially community
members not involved in the project viewed the visual appearance of loose parts with skepticism:

“When it first started we’ll hear a lot of comments about ‘what are those piles of sticks out there and the dirt?’ and then it was like ‘oh’. It was really neat and then my friends, most people I know, are taking their grandchildren out there and they love to be able to do that…I think a neat part of it is the part where if you can move things and you don’t have to put it back and once adults get that they aren’t running after them saying ‘you can’t do that’. Once they realize that, it’s kind of cool”.

**Balance.** The design process often stretches the boundary of possibility. Participants often commented about a need for balance between what was possible and what was likely feasible. These discussions revolved around design intent, necessary maintenance, construction material selection, and the limitations of a low-budget, volunteer installed natural play space. Illustrating this balance one participant stated:

“We did the design, (...) the kids were here, and they had some great ideas, (...) when the design came out it didn’t incorporate too many of the ideas the kids came up with, I didn’t think. We were also strapped, probably, for cash and resources so I can understand that a little bit, but I know they (the kids) were disappointed that some of the things that they thought might be in there, were not”.

During the initial planning meetings participants were shown images of other natural play spaces around the world. When reflecting on these images a group of participants had the following conversation:

Participant One: “A few of those pictures were kind of grandiose”  
Participant Two: “Oh yeah, for sure, like the top tier of a natural play space”  
Participant Three: “You have to keep it down to the reality of the community”
One element that grounded decisions regarding design element selection was necessary maintenance. Specifically selecting low maintenance design elements. One participant mentioned:

“If I’m going to be somebody who helps take care of this park and picks weeds, or whatever, while my kids are playing and help them instill that, you know, sense of work ethic and we take care of the place we play in, I don’t want to have to just pull weeds while I’m there and I want it to be do-able and I want the city council to believe in me, when I say ‘we’ll take care of it’ you know”.

**Construction**

**Community-engaged Construction.** Each community relied on volunteer efforts throughout the process of creating the NPS, starting at the planning all the way through the construction. These volunteer efforts revealed a few interesting aspects of a volunteer-led construction process. Recruiting and then engaging volunteers that believed in and felt a sense of ownership in the project was a goal of participants. One participant mentioned:

“What we’re trying to explain to them is that a natural play space is something that you build on and you grow with and the community helps to be part of”

One reoccurring characteristic of volunteers was the ability to realize the intended vision of the design and get excited and maintain that enthusiasm through the extended execution of the design:

“I think there was a lot of ideas generated but then there became a lot of naysayers when it got down to what we needed to figure out how to make happen, so you lose your numbers sometimes that way from the naysayers,
saying ‘oh this would be cool, but it’s not really possible’, then you have to find
the ones that have the attitude ‘we can do this, I think we can find a way to do
this.’”

The modular nature of the design was intended to facilitate a construction timeline that
was flexible enough to allow the sourcing of materials and the fluctuating whims of
volunteers. One participant remarked:

“I’ve learned that, as an adult, from (another participant) when we first started
doing all this and things will move and change and she’s so happy and so excited
because that was the goal. It’s like, oh yeah that’s really the goal”

A few participants pointed out that the volunteer-led, flexible execution, and relying on
donated materials sometimes led to a more protracted construction timeline.

Regarding the sourcing and installation of wood chip mulch that comprised much of the
groundcover of the NPS, one participant mentioned:

“We’re putting, gonna put, wood chips around everything out there, because it’s
kind of a design, some of it, and the person we’ve been working with wood
chips, that wants to donate them, every time it comes to the time to do it,
they’ve been rotten, so then we have to wait…”

**Flexible Execution.** The modular nature of the design also facilitated a flexible
approach to its execution. This flexibility allowed a number of additions to the projects,
including a youth-led art installation and the inclusion of a business-sponsored edible
garden, among others. Sometimes this flexibility was reported to be beneficial and
sometimes not. Deviation from the original design sometimes resulted in a lack of
direction that delayed construction and resulted in unintended problems. On one
project, volunteers substituted easier to source materials, a substitution that resulted in much more time intensive maintenance. One participant summarized this situation as such:

“So that’s where we went differently from the design. We had a hard time coming up with the wood chips and the funding and that sort of thing. Again when it came down to that part, it felt like there was probably just a few of us. Not that a few of us maybe couldn’t have accomplished it, but those few of us seemed to be involved in a lot of other things, so we ended up with that design, the figure-eight, is actually wood chips, so the rest is grass.”

One participant noted that the flexible nature of the execution of the NPS construction resulted in the inability to build the NPS. This was primarily due to the fact that the funding for the purchase of materials used in the construction was not spent within the timeline outlined by the donors.

Donated Materials. Donated materials, while on the one hand are free or low cost, sourcing of these materials further delayed some projects. One participant outlined his experience leading an effort to prepare and install a log that would serve the function of a slide in the NPS:

“I know you had that vision of that log sliding down the hill, believe it or not, I still have the log. I just haven’t pressured the guy in the cutting it yet, he talked to me this spring, helped me lift my motor up on the saw, I says ‘call me up any time’. We haven’t done it yet, but the log is laying in his yard, waiting to be sawn in half, laying down the hill”.

Location

Comparing Locations. When deciding on a location for the natural play space, participants compared and contrasted uses that were adjacent to the proposed natural
play space site and reflected on pressures they faced while selecting a location for the
natural play spaces.

Land used directly adjacent to the natural play space was a common concern
mentioned by participants. Their comments often reflected the complimentary or
detracting nature of the adjacent land use. Elements that participants felt were
complimentary were trees for shade and fruit, picnic shelters, bathrooms, unmaintained
woods, lighting, trusted neighbors, a garden-like feel, water for play, and parking. Less
desired uses included manufactured play equipment, perceived hiding spots for child
predators, areas subject to flooding, cross highway access and temporary industrial
housing. Interestingly, unmaintained woods was seen as both positive and a potential
spot for child predators to hide.

Participants reflected on various pressures imposed on them while selecting a
location for their respective natural play spaces. These pressures were either political or
from the land being used or developed for other purposes, such as housing. Political
pressures felt by participants were either from governmental leaders or other influential
community members. One participant mentioned:

“The issue we run into there is there’s already like a volunteer committee in the
city that takes care of this park and there’s one of those three primary people
that are running that park who says ‘absolutely no, no way you’re not coming
here. Kids don’t belong here.’ This is an older woman who does not have
children, never had, doesn’t really care for kids so she doesn’t want them ruining
her bushes and ruining the gardens and stuff that she’s done.”
When faced with such pressures participants also felt the need to compromise on their preferred location. Reflecting this, one participant remarked:

“First, ask them to share the space. Should we, second, as for Eastside Park and have the chance of having a big huge bear fight on our hands, or do we just move forward and go with the baseball diamonds behind the Deko (park) because James said pretty much you can pick anywhere in the Deko. It doesn’t have to be right where they want and he can get us (indistinguishable).”

**Inspired by Other Locations.** When planning their natural play space, participants often visited or saw images or videos of other natural play spaces. This exposure to the spaces and ideas of these natural play spaces served as a goal to aspire to, educate on the possibilities, and serve as a model to imitate or borrow from. One participant commented on the inspirational nature of this exposure:

“We were pretty lucky that we had the help of the landscape students, but like they mentioned that one of the catalysts for it was when the kids helped with the planning. So I think it is a good suggestion with what you said about having the initial meeting and then having some kids brainstorm ideas because they will have the best ideas of a natural play space. You do think of a lot of different crazy ideas which are fun so that maybe for a new group starting, they may think ‘oh we have to spend money to get an architect’ but you really don’t because if you go visit the ones that have been successful you can kind of borrow ideas from other places and you can have it as simple or fancy as you want, so they don’t limit themselves in their planning and I think involving the kids early would be good.”

**Leveraging Location Synergies.** Connecting the natural play spaces to existing or proposed community amenities, particularly transportation networks such as trails was a reoccurring theme among participants. When asked on how the natural play space has changed their community one participant answered:
“Well there are several examples, but a very concrete example is many people (...) do not know about the trail system that surrounds the natural play space and so a lot more individuals have got to utilize and see the beauty of the trail system that’s there, that maybe they would not have utilized that space in the past.”

**Location as Destination.** During each focus group where there were at least a few elements, and in some cases all, of the natural plays spaces installed (Crookston, Fertile, Mahnomen, and Warren), participants commented on how the natural play space had become, in most cases, a destination in the community. Participants felt this was due to a few aspects, mainly the unique role the natural play space played in their community and because of the diverse audiences to which it afforded play. One focus group centered discussion around how the natural play space had not become the destination they’d hoped it would be.

Participants mentioned a wide variety of community members who used the natural play spaces, many of which, they felt, did not use the space before. The list of people they mentioned included: multi-generational families playing, daycare groups, schools, people exercising, university students, residents from other communities visiting primarily for the natural play space, community groups, professionals who worked nearby during lunch breaks, family parties, professional photographers, social workers and mental health professionals using the space for therapy, and large community events. One participant captured part of this wide-ranging appeal:

“I think it is a family friendly place where (...) everyone has something. I feel like adults enjoy it because they know that their kids are in a safe area, they love to see how creative they can be but they can also relax and just, it’s beautiful there, people go there for family pictures a lot now.”
Participants also commented that they felt the success of their natural play spaces was also due to the unique roles that the space filled. One surprisingly simple way that one natural play space was unique from other playgrounds was the presence of shade. One participant commented on the value of shade near a play space:

“To kinda go with the shade issue (...) during the Fertile Fair when we have families come in and do entries and sometimes they are here for a long period of time and they get some breaks. I’ve had families ask me ‘you know, we have the school with all the equipment, you know, playground, but where is a shaded area, park areas that we can use to hang out?’ That’s the place (the natural play space) a lot of them go to.”

Another way participants felt the spaces were unique was the manner in which they afforded creative play. One participant summarized:

“They (kids) have instant gratification now with everything they have, it’s instant, they don’t have to wait for anything to ... for things to develop and get good. It is instant, so I think this is a really good alternative for the kids to be able to be creative and use it.”

Participants also felt that having a unique destination, like the natural play space was something that only larger communities would have the ability to provide.

“I think what people and communities like to see are, excited to see, when groups bring in new things to the community you keep... you know, so people don’t have to go somewhere all the time to do something fun. They’re working on this splash pad, you know, and I think ‘oh gosh, that would be so neat when that happens’, that these kids don’t always have to go to Grand Forks or Crookston, and you can have it in your own backyard, even if you’re a small community.”
One participant also mentioned that larger communities, like Grand Forks, don’t have a natural play space, so people travel from these larger communities to visit them in smaller surrounding cities.

Participants also commented on how the spaces fostered a sense of ownership within the community. As an example of this, one participant mentioned an “unauthorized expansion” of their natural play space:

“So it evolves over time. We have a lookout tower (that) showed up this weekend (...) it’s not part of the plan. We (do our best) to make sure it was safe and that it follows playground guidelines as best we can, but it’s community-driven, somebody put their heart and soul and time and I mean there’s a lot of effort.”

During their focus group, one community remarked as to why they felt that their natural play space was not as successful as they felt it should have been. One participant outlined they felt the isolated location and lack of regular programming was the primary reason for this lack of success:

“People use it, but the fairgrounds aren’t used a lot. We did have in the fall, I guess, we had about 70 people out there for the Fall Festivities so they were out there using it and maybe if we got something out there once a month maybe, you know it would be used more, but then again it’s the planning and getting volunteers to make sure you have good numbers for adults and kids.”

**Site Identification.** When it came down to selecting a location, participants reflected on the negative process they engaged with the city and mentioned the frustration they sometimes felt when this negotiation didn’t go the way they hoped. One participant remarked:
“We thought we had a place and there were changes at the city and there were changes in our group and that was really frustrating because we thought we already had the Westside Park and we still don’t know, that’s to be determined next week.”

**Maintenance**

Four of the six NPSs have elements that have been installed. Of those four, two of the play spaces have at least basic maintenance (mowing, garbage removal, etc) performed by city maintenance crews. In all situations, the city or county maintenance crews were responsible for maintaining, including mowing, before the NPS was installed, and two of those organizations, one city and one county, stopped performing even basic maintenance, like mowing, even though the design included grass that needed to be mowed. As the maintenance regime has altered, much of the maintenance has shifted to volunteers. Commenting on defining these roles, one participant mentioned:

“It was a lot of hard work and it turned out very good I think. I think it turned out, it looks really...although I heard from (name removed), before I heard from you about this (focus group) that said that some of the stumps are rotting or something and the city had contacted the JC’s about replacing them and the JC’s said that this is a city park and you guys need to replace them. So I guess that is a problem right now, I don’t know.”

Even as the maintenance regime was being redefined another level of maintenance complexity was added due to the unique aspects of the natural play spaces. When learning the new maintenance techniques required by the loose parts found in the natural play spaces, one participant remarked:
“I’ve learned from it, when I first went down there I was picking up crap boards all over, heck, carrying them, putting them back in a pile there... I learned, don’t touch them.”

As the natural play spaces were often located in very close proximity to unmaintained woods, poison ivy present in those woods would often migrate into the natural play space. In addition to the ivy in direct contact with the natural play space, children would often venture into the nearby woods, and contact the poison ivy. Mentioning these challenges, one participant commented:

“Yeah, well we have to go to them (the city) and ask for sand and or, I see Washington (park) got some new wood chips and we sure could use some. But it’s maintained in the poison ivy and not put up chemical so you bother them, you know, I put up the snow fence (as a barrier), I don’t know if you seen (...) it when you’re out there, cause it was getting so bad, then I was spraying it but I was putting that barrier up there now I still got a few shoots coming up in to those bird nests, so I got to get up and get them out of there before somebody gets poison ivy, yeah, but I’ve got her controlled around there.”

Installation of the natural play spaces required one-time volunteer efforts, maintenance, however, required continued volunteer efforts. Many participants remarked that recruiting volunteers to perform maintenance was often difficult and overwhelming. In addition one natural play space, the installation deviated in material from the design, substituting grass instead of mulch in the play area with loose parts. Commenting on the increased maintenance this substitution required, one participant remarked:

“I think just keeping it mowed and well-kept in general. I mean, yeah, because we do have one, we put some tires out there and then we do have a fort building area. So where the fort building area is, of course, there’s grass so you know you
can mow around twigs but then eventually, you need to move them, you know, because it does get very long and it doesn’t look appealing...it should only take an hour to upkeep it but after a while it just gets, you know, and I mean it’s not like I’m sitting here complaining that I have to upkeep it, I don’t want anybody to like walk away with the perception that’s what I’m doing.”

Maintenance of the natural play spaces differed from traditional play spaces, as such a new type of maintenance needed to be learned and new roles by city maintenance crews and volunteers needed to be defined. If more maintenance work was expected from volunteers this maintenance could sometimes be overwhelming, especially if construction materials deviated from those specified in the designs. The continued maintenance by volunteers also speaks to the level of commitment these volunteers feel toward the natural play space and their level of personal commitment to continue working on the efforts they started.

**Interpersonal Dynamics**

The ability each community had to work together seemed to have a significant impact on the projects. There were a variety of factors that enabled and detracted from communities working together toward the design, installation and use of their natural play space.

**Social Capital**

Organizers of the NPS designed the planning process with the intent to enhance social capital in each community. They invited community member input and
participation throughout the entire process. Focus group participants remarked that social capital was enhanced in a variety of ways.

**Keepers of Castle.** According to Putnam (1995) social capital is the “connections among individuals - social networks and the norms of reciprocity and trustworthiness that arise from them” (p. 19). These networks of trust enable smooth functioning of community action. One goal of the project organizers was to create, or reinforce, social capital in communities. In one of those communities, focus group participants felt strongly that the creation of and actions of a group called the Keepers of Castle was evidence of bolstering social capital in their community. An understanding of the reason why this group was formed is warranted. To summarize, a developer proposed to the city council a plan to build a long-term campground in the same park as the natural play space. One focus group participant summarized why the group formed:

“I’ve been thinking about this you know, we have a big issue when they wanted to put the campground right there, that the Castle Park neighborhood took over and said ‘not in our natural play spaces’. I mean there was a committee formed, we met weekly, sometimes two or three times a week depending on what was going on. Well we got involved with it because (name withheld) was our mailman and they wanted (mail carrier) involved in it because he was all around the neighborhood. It was a lot of hours, a lot of hours when they were going to railroad this through and we ended up, because the people in the castle park neighborhood, they ended up changing enough minds on the City Council to make sure that did not happen.”

To further explore more about how focus group participants felt about social capital, an examination of the following emergent themes is necessary.
Sense of Ownership. Many participants reported they felt an increased sense of ownership in the community, specifically for the natural play space. When asked why this might be, one participant summarized:

“So there is a lot of sweat equity and the concept for implementation was to get service groups to kind of take ownership for each individual section, per se, and that didn’t quite evolve, but we did have quite a few people through the service group interaction, and visits and talks that we had at our meetings, they did come and volunteer and there were older than average people, retired people who are very invested in the community in many ways who came and put a lot of sweat equity in and comments made like ‘you know I put a lot of sweat into this, you darn well better know that my kids are going to come’ but the fact that they had really given of their time and effort and thought, they brought grandchildren there because they were interactive.”

Other participants mentioned how sourcing of local materials by volunteers, increased their sense of ownership:

“I personally think it is kind of cool we can say ‘mom and dad helped plant those trees and now they’re now making apples’ and ‘oh look we got those raspberry bushes from grandpa and grandma’s and your parents brought them here and they’re really good raspberries’. So on a personal level, I think it’s cool for me and my family. I kinda feel like we have a park now.”

Widely engaging. Participants remarked that the more widely engaging the project was, the more they felt empowered to make a difference in their community through the project. One participant mentioned how a flexible approach allowed community members to contribute in ways that they wanted:

“The thing I love about it is that it’s not meant to be one set thing in time. So when we were building it everyone was like ‘is this done?’, ‘is this it?’, I’m like ‘no, it should always be evolving’. So it’s definitely met my expectations in that it can be what the community wants it to be. So you know as different people have different ideas for programming it’s changing that way structurally. As you
know Boy Scouts or a volunteer group wants to put a bench there or someone wants to plant a tree, or you want to make a new path or you want to whatever.”

Another participant mentioned the importance of engaging media to communicate the successes:

“To me, the key in this kind of thing is to make sure you engage with the community and that means meeting with them where they’re at and also acknowledging them. I think that part of it is give and take, our media in Crookston has had a nice role in that we have been able to kind of bridge the pieces. One of those things I felt like I tried to do is to keep the media engaged and try to keep, you know it makes everybody feel good to see activity and when you see progress”

One participant highlighted what they felt was the ability of the CCNNM to connect multiple generations, creating social capital between them:

“(another participant) touched on it earlier, but the intergenerational, the grandparents that are bringing their grandkids is just phenomenal that they’re doing that and they’re having as much fun as the children are. It’s fun to see that the language and the vocabulary and what they’re saying to the kids and how positive it is.”

**Leadership.** Leadership of the projects was something that was brought up in all the focus groups. All participants felt a central force driving the project forward was essential. Each community had an initial committee that was organized by core natural play space leadership. These committees were composed of representatives from local government, civic groups, local schools, early childhood initiatives, and interested community members. After these committees were organized, each community independently formed the leadership dynamics appropriate for their community.
Communities varied in composition and style of this central leadership. Although each community’s leadership dynamics were unique, they were either led by a relatively few individuals, or collectively by a cohort of leaders.

Commenting on the value of a paid central leader, one participant mentioned:

“But I think it was really important that we had (leader), (they were) the main motivator, got everybody going, ‘let’s do this, let’s do this’. We had somebody that was the head, that’s why I think it was so successful because of that. I think it wouldn’t have been that successful if we wouldn’t have had that and then (initial leader) in the beginning getting it rolling, (second leader) you know, taking over, and you have to have strong motivated people that are willing to commit and I think it was because of, a part of it is their job and it wasn’t all just volunteer time, but the rest of us that were helping more volunteers that we were doing it after work when we could, you know, I think that made a big difference.”

When commenting on leadership provided by a central group, or cohort of leaders, one participant stated:

“(Our community) is very good about having that value of community and the passion and the willingness to help out, but in any group or organization there’s always the core group that’s always there and then others will come in and out, and that’s fine, that’s normal in any volunteer situation”

When following up regarding how this project got done without a central leader, another participant felt:

“I really do feel, and there are several of them sitting at this table, that there are people that know how to get things done in this community, and if you have two or three of those groups working on the same thing, it get’s done. I’ve seen that before.”
This history of community of volunteering combined with a rich network of community volunteerism seemed to work in successfully building the natural play space.

One participant mentioned a challenge to the cohort of leaders approach, especially where there wasn’t as much volunteer support outside of the cohort of leaders:

“It’s the same people that are involved in everything and they’re so busy, you know. It’s just one more thing on their plate to come and help with or go to meetings or whatever.”

Specific leadership qualities that helped move the project forward were also mentioned. When asked what advice they would give to other communities interested in engaging on similar projects, one participant summarized:

“Empower your community members, you know, give them a voice, give them a purpose, give them a role because of them that are gonna sustain it in the long run. That’s probably the best advice I’d say. You can’t just be one entity that takes it on and it can’t be a bunch of people’s just jobs, it has to be people that truly care about it and want to make it happen and want to keep it going.”

When asked if they feel more or less connected with the community as a result of this project, one participant agreed with another who stated that they felt “much more connected with the community”:

“I would strongly agree as well and I have this philosophy that I like things, like everything in my life to be one or two phone calls away or text messages, or you know whatever, and so I feel as if this initiative or the combination of several phases of this initiative has enriched different people that I know and so it’s like if I, you know, I know this person from the natural play space work, but I also know that they have a woodworking talent, so if I have that need or if I know someone that has that need I can say ‘oh hey, do you know so-and-so?’ and I can connect them or if I have, you know, we’ve been talking a lot about the use of, how we use the river in Crookston and it’s, like, okay so I know someone from
the NPS and I know another person that is deeply invested in the river thing and it’s like, okay, connect because they have a similar interest.”

Engaging and Recruiting

Recruiting Methods. Participants reported spreading information about the projects through a variety of methods. These consisted of local newspapers and radio, interactive booths with videos and activities at community events, social media postings, and social media polls.

Recruiting through Engaging. To gain support for their projects, participants reported that they recruited with an informative meeting that also invited participation in the design process. In addition to this initial meeting, recruiting new volunteers, though sometimes difficult, was successful through interactive booths at community events, one-on-one personal interactions, and visiting other natural play spaces. One participant summarized many of these methods used to spread the word and increase participation:

“We were pretty lucky that we had the help of the landscape students (at the initial informative meeting), but like they (other focus group participants) mentioned that one of the catalysts for it was when the kids helped with the planning. So I think it is a good suggestion with what (another participant) said about the initial meeting and then having some kids brainstorm ideas because they will have the best ideas and once their minds are open to the idea of a natural play space (they) do think of a lot of different, crazy ideas which are fun. So that maybe for a new group starting they may think ‘oh we have to spend money to get an architect’ but you really don’t, because if you go visit ones that have been successful you can kind of borrow ideas from other places and you can have it as simple or as fancy as you want.”
Engaging for Long-Term Commitment. Many focus group participants discussed the desire to encourage community members to connect with the project in a long-lasting way. Most comments revolved around connecting with children by actively involving them in contributing their ideas about the design ideas or creating physical objects for the park. One participant expressed the value of engaging children in contributing to the design of the NPS:

“They’re going to remember that they worked on it so maybe, [...] that the impact would be for them personally that they’ll want to draw or go that way (in a career or hobby), or they’ll be bugging their parents to help out at building the park and then using the park so it can help in lots of ways.”

Another participant expressed the importance they felt having the children create art that would be housed in the NPS:

“Well what I notice there are some children that maybe aren’t very verbal, but they really connected with the art and that was kind of different to see because I’m probably too verbal as a person so I’m curious about that in other people and was interesting to see the shy, maybe someone who may be shy, really blossom doing art and it’s just a big tool with nature. Ok, well we did it here in this room but then we were out at the space for inspiration. We brought it together at the fair with the display, so in those children some of them were already in 4H and then like I said, the new families have been in our club, (at) various levels of being active[...], but they’re still doing things in 4-H because of that initial interaction.”

Convincing Decision-makers. In order for each community to gain the initial support to begin the NPS process, decision-makers for the property location had to be fully supportive of the projects. Due to the local political landscape changing, some groups had to re-engage and gain support from new decision-makers. Decision-makers
were engaged through personal contact via telephone, email, one-on-one in person, and at public meetings. A more detailed review of participants views can be found in the Lobbying section in the Results chapter.

**Lack of Engaging.** In two communities, governmental decision-makers waivered on their support for the natural play space and began entertaining other options for the land where the natural play spaces were to be located. In both of these focus groups, participants remarked that they felt like these conflicting housing development proposals were not being adequately communicated to the general public. This potential conflict to the NPS’s and the relatively subdued publicity of the proposals led these participants to organize opposition against them. Further discussion of these interactions is found in the next section.

**Government Relations**

All of the natural play spaces were located on city or county property. This required heavy involvement from decision-makers within these governments. Working together with governmental decision-makers was deemed important by participants. When not initially supportive of the project, educating and gaining support from decision-makers was essential. Due to the relatively long timeframe between the planning and construction of the NPS’s, at times there was inconsistent support from governmental decision-makers either from competing land use pressures or personnel changes. At times, there was the feeling expressed that government decision-makers were making decisions that left participants feeling frustrated, disconnected and undervalued.
Partnering with Authority. When commenting on working with decision-makers, two ideas surfaced. First, working with supportive decision-makers was not only beneficial but also increased access to a variety of resources.

“From my perspective I felt like they’ve been a (...) during the whole planning phase (...), they were present at the majority of the meetings, showing support, now experience with Kid’s at Castle the events that are going on (...) during the season of summer and fall. They are very supportive and keep it very clean and (...) well-kept and (...) are there if we need extra supplies, if we need water, they’re picking up garbage, they’re making sure we have the things we need, so they’ve been very responsive, supportive of, you know, and allowing us to use it, because they could say ‘you can’t do it’, it is a city park, so…”

When supportive, working with government agencies allowed access to usable land, community history, construction materials, maintenance resources, and as one participant mentioned:

“(City decision maker) helped us find grants that would have earned us money .... (they’re) very, very knowledgeable with grants and where to find them and what they’re good for. (They’re) very good at putting you in touch with people in the community that you need to work with.”

The second was the importance of working with decision-makers that were flexible and open to new ideas. This open-mindedness was important in regard to the physical location of the NPS, and also important when learning about and approving the many new ideas associated with a NPS. When remarking about this flexibility one participant said:

“They have had a history of trying to do different things in that park previous to this request. They had looked at doing a skate park and they did move in a few little things, but before those things were there they planned a whole bigger
scale skate park, but they didn’t get funding, so they already had the idea that place as a good central place to try things.”

When speaking of the city council changing their minds on a conflicting land development proposal that focus group participants were against, one participant said:

“You know our leaders, [...] have been very open-minded related to those kinds of things, but to get the whole city council to endorse that (voting down conflicting land development proposal) and sometimes I think city councils are much more financially driven, more what they think of economic impact driven and for them to be able to see the relationship between something that parks and, and local healthy lifestyles are not just fluffy stuff, not just that, that quality of life stuff. For them to embrace that and see the connection to economic development is a step and I think they’re starting to see that and it’s all pieces to that puzzle.”

**Negotiating with Authority.** Participants reported many strategies used to attempt to gain more support from decision-makers. One participant, upon the recommendation of a mentoring city employee, engaged a one-on-one communication strategy:

“(City employee) wants us to make sure we know that we go and talk to those people individually, because they’re afraid about what everybody else in the group is going to say so (they) encourages us to talk to those people individually.”

When conveying ideas or attempting to convince, several participants mentioned the importance of making direct and detailed requests:

“They want to know ‘how much is that gonna cost, who’s taking care of, who’s going to mow the lawn, who’s gonna pay for the water bill if you have water tables, who’s gonna maintain the trees and shrubs?’ They’re more worried about it and pretty much how it’s been explained to me is that they’re afraid
we’re not going to take care of it and it’s going to be put on the city’s shoulders to take care of.”

Clearly defining roles and responsibilities was not only important for the governmental representatives, but also among the various groups that participated in the project.

When asked how they would feel if there were hypothetical plans to remove the NPS project that they worked on, one participant replied:

“No very good, it was a lot of hard work and it turned out very good, I think. I think it turned out, it looks really...although, I heard from (name) before I heard from you about this (focus group meeting) that said that some of the stumps are rotting or something and the city had contacted the Jaycee’s about replacing them and the Jaycee’s said that this is a city park and you guys need to replace them. So I guess that is a problem right now.”

Once support was gained, varying methods were used to update and maintain this support.

“Just reiterating what they (other focus group participants) said, making sure that the community leaders are, you know, that you’re always visiting with them and keeping them updated and making sure that they know that we value their opinion and their support.”

One participant, who felt restrictions of their public opinion due to their employment at the county, outlined their approach to gaining support from decision-makers:

“We from a public health entity, we maintained a very... well I personally felt it was important to maintain a reasonably neutral position, but to continue to educate on what the original intentions were of the play space and just to share, continue to share the original plan, continue to share the original intention and you know, to talk about it being a natural play space, which, I think is important, to delineate the difference between just a playground and, you know, the fact that we want deer, we want animals to be interacting with the space, you know
we want things to be moved around... to kind of keep sharing that, but without putting a personal ask or opinion on that.”

After defining roles and responsibilities, one participant mentioned the importance of following through and demonstrating commitment:

“We had gotten to that point and had so many people involved with getting to where it was at, but I felt like once we kind of won that battle, if you want to call it, we couldn’t just kind of be like complacent with where we’re at, we needed to take that and now we really need to show community support around this. We really need to do what we can to make it the best it can be.”

**Changing Political Environment.** Two participants outlined the importance of a strong supporter in the city government. After a change in city administrators, they mentioned how the new city administrator was less involved and therefore less helpful to the project:

Participant 1: “I think (previous city administrator) wanted to see it happen.”

Participant 2: “I think so too and there were some funds, with like, trails and things and that may still be in the works, but there were major things being planned. They wanted to get a trail to kind of put them all together and we had talked about a few different places for natural play space in it. (They were) a little bit more hands-on and I think (they had) maybe, had more time than what (new city administrator) has. (New city administrator) is just a part-timer.”

**Feeling Disenfranchised.** Focus group participants also reported feeling, at times, powerless and undervalued in the process. These feelings seemed to be connected to changes or modifications to previously agreed upon decisions. This happened when decision-makers did not consult with or gain consent from the natural plays space organizers. Participants reported feeling manipulated, not represented, that
their efforts were wasted and not valued, that they had to start over completely from scratch, and that they felt like giving up. One participant remarked:

“I feel absolutely disgusted. When you have a group of people, like, putting in that much work for free and want to do something good and getting that much pushback. You would think the city would be excited to have all (the help).”

**Lobbying**

These projects required gaining approval and support from government decision-makers and leaders from civic and volunteer organizations. A number of techniques discussed below were employed to gain support of these influentials.

**Gatekeepers.** Gatekeepers was a term used by focus group participants to describe members of the community (not focus group participants) who had volunteered or had significant influence on the location where the projects were proposed. Working on projects that improve community conditions often creates a sense of ownership. This sense of ownership can result in a sense of pride, and/or a more literal sense of ownership of a public space. A few of the NPS projects impacted the community spaces that these gatekeepers “owned”. Formal approval from these individuals was not required, but rather their permission or support was sought as they could be an influential ally, or if offended a potential adversary to the project. One participant identified one potential challenge to the project when they stated:

“The issue we run into there is, there’s already like a volunteer committee in the city that takes care of this park and there’s one of those three primary people that are running that park who says ‘absolutely no, no way you’re not coming here, kids don’t belong here’. This is an older woman who does not have
children, never has, doesn’t really care for kids so she doesn’t want them ruining her bushes and ruining the garden and stuff that she’s done”.

One participant also brought up a situation where conflicts between two gatekeepers resulted in a delay that ultimately prevented the NPS from being built.

Both these gatekeepers provided funding for the project, and initially they agreed how the funding should be spent. However, after delays in the project, one of the funders decided the money should be directed to other efforts.

**Champion.** One interesting technique used for gaining political support was the use of a “champion”. These individuals were often gatekeepers themselves or were closely connected with decision-makers and they had a strong desire to see the projects move forward. These individuals would advocate for the project with other decision-makers. Additionally, champions were particularly clued into to the political climate and would create and share with project members strategies designed to gain support for the natural play space projects.

**Persistent Lobbying.** Many participants reported that they needed to continue lobbying throughout their projects. Reasons for this varied from a need to continually increase support, to change decision-makers unsupportive opinions and to also gain support from newly elected or appointed decision-makers. Upon learning that the city-approved site for the natural play space was being considered for a different kind of development, one participant conveyed the need to persistently update and gain support from decision-makers:

“We thought we had a place and there were changes at the city and there were changes in our group and that was really frustrating because we thought that we
already have the West Side park and we still don’t know, that’s to be determined next week”.

**Targeted.** In response to specific pressures facing natural play spaces, project members planned and coordinated lobbying efforts targeted at overcoming perceived threats to the natural play space. One participant remarked:

“I hate confrontation, I’m not a political person so for, for myself specifically to stand up in a city council meeting, I’ve never been in a city council meeting in my life before that time, you know, and I’m saying that for me, but I know other people too, this was a reason, I mean, (we) got together as the neighborhood and were, you know, planning out what can we do, how are we going to do it, and it was, was a really unique and special process to be a part of”.

**Changing Group Dynamics**

A common remark was that during the initial planning meeting it was common to have more people participate in that meeting than in the later stages of the project. Thus, many more people contributed their efforts in the early planning stages, then did not contribute in the later phases. Many stated that it was most valuable to have people engaged throughout the entire process, one participant said:

“Finding those people are sometimes hard to come by, so, you know, that first meeting that we probably had was not a lot of these faces (present at the focus group) but then you kind of visit with people and get the word out there and then it starts to come together and now this group is awesome.”

**Lacking Participation**

Participants reported feeling that in their community there is a core group of people that volunteered on the NPS project. That same group of people were working
on other projects. They recognized that each project can only take so much attention from that group. That attention given is what moves the projects forward, yet at the same time, the same group of people can only do so much on each project. When that core group of people was large enough, there was generally enough people to keep the project moving forward. One participant summarized the situation when there weren’t enough people to keep the project moving forward:

“I think that there is in some other groups in our community and I do think that there is some interest, but when I think about those people that have ideas and interest, those people are really busy as well with some of the same things we’re involved in our community. So again that just runs into a volunteer... you know, so I wouldn’t say there’s no interest in our community, but when you call on those same people all the time to ‘can you help do this, can you help do that?’ Eventually everybody just, bottom line, gets kind of tired.”

**Generation of Theory**

Given the objective of this study to generate theory regarding the perceived impact of the CCNNM on social capital and how play in the NPS’s provided a setting for improved community health, a discussion connecting the data analysis and generation of theory is warranted. Methodological connections in this process were made by examining the relationships of the codes (Figure 7) to the original objectives of the study and the frequency of references to particular codes (Table 9). Figure 7 identifies the themes discussed by the focus group participants and two of the four focus codes (Health and Interpersonal Dynamics) directly address original goals (perceived impact on community health and social capital) of this study. Within those two focus codes, there was significant discussion during the focus groups. 50% of all coded sections of the
transcripts were coded under the Interpersonal Dynamics focus code (Table 9).

Examination of all the codes (open and axial) within this focus code, reveals these codes have a strong relationship with concepts allied to social capital. Though only 10% of all the coded section of the transcripts were coded under the Health focus code, the relationship of this code to objectives of the study highlight its value in the analysis and inclusion in the subsequently generated theory. Relevance of the specific issues discussed during the focus groups and their constructive relationship to theory generation will be examined further in the Discussion chapter.
CHAPTER IV

DISCUSSION

Maller et al. (2002) proposed that parks have the potential to revitalize many aspects of health in communities. Through the lens of the Children and Nature in Northwest Minnesota project, this study has generated theory around two of the health-promoting aspects of parks proposed by Maller et al.: physical health and community health. Discussion of the results centers on three potential audiences or future research areas: children’s health and well-being, development of Natural Play Spaces and development of social capital. Relevant audiences for these discussion topics include early childhood educators and care providers, city parks departments, volunteer and community organizers, and landscape architects and other designers. In addition to these application based results, this section also discusses the grounded theory of nature play therapy, and the potential variables that can be tested and observed through future research. These variables are: 1) natural play spaces have the potential to build social capital, 2) fewer behavior problems observed in children while playing in the space, and 3) natural play spaces are particularly adapted to teach, or reteach, children and adults how to play in nature.
Children’s Health and Well-being

An almost universal motivating factor reported by participants was the desire to increase the time spent outdoors by children in their respective communities. This desire emerged from a perception that children spend less time in unscripted free play outside (nature play) and the perception that this deficit leads to unhealthy physical, emotional and social results. Participants reported a desire to facilitate nature play in their own children or grandchildren and for children in the community. One insight reported by participants is the observation that children and adults needed coaching on how to engage in unscripted free play in the natural play spaces. This could be due to the novelty or their apprehension of not wanting to play the “wrong way” in a public space. While that may be the case there is research that suggests additional factors that might also be of importance. Outdoor play is diminishing in the experience of childhood, with less exposure to play in outdoor environments it is logical that the knowledge of how to play in these spaces also diminishes (Hurley, 2000). Pyle (1993) refers to this as the “extinction experience”: when we lose nature, we lose the knowledge of how to play and interact in it. Though Pyle suggests that the loss of knowing how to play in nature is due to the disappearance of nature from our cities, one might reasonably expect the same result if nature still existed within our cities, yet children were removed from it.

One element that was often a new experience for first-time users of the NPS’s were loose parts of natural materials. Participants mentioned that sticks, rocks, sand, mulch, sections of tree trunks, and straw bales were played with by individuals and
groups of children. The inclusion of loose parts into children’s play spaces began to be studied in the 1970’s (Nicholson, 1972) and some research suggests there is a strong correlation between loose parts and constructive and dramatic play (Maxwell, Mitchell, & Evans, 2008). This correlation is significant because constructive and dramatic play are considered higher order play activities (Rubin, 1982; Vygotsky 1976) and are associated with language (Pellegrini, 1980), performance on cognitive tasks (Rubin, Maioni & Hornung, 1976), and academic achievement (Smilansky & Shefatya, 1990). Researchers are also exploring the aspects of interaction with nature and natural materials like these loose parts. Kaplan and Kaplan (1989) reported that contact with nature as restorative and MacKinnon (1962) and Ackerman (2011) found the restorative aspects of nature to foster creative behavior. McCoy and Evans (2002) found that contact with natural materials positively correlated with creativity and conversely contact with manufactured materials negatively correlated with creativity. Taylor et al. (1998) also found that locations with more green pace stimulate more creative play. Participants of this study echoed these findings, reporting observations of increased creativity when playing with these natural materials. Participants also reported findings similar to Dennis et al. (2014), that interaction with the loose parts elicited cooperative behaviors between the children. Often this cooperation was out of necessity when a child desired to manipulate a loose part that weighed more than they could lift individually. Cooperation was also fostered when children desired to move large quantities of materials around the play space. Participants also reported fewer behavior problems when children were playing in the natural play space. One participant posited
that this might be due to the abundance of materials which leads to children not having to wait their turn to play. White and Stoecklin (1998) found evidence supporting the notion that play in nature increases the likelihood of children having positive feelings about peers which leads to more cooperation, findings that are supported by the study reported on in this paper. Sedola (2014) reported that teachers in outdoor classrooms reported fewer behavior problems and Faber, Taylor and Kuo (2011) found that while in green spaces children were better able to cope with stress and adult supervision, both sources of behavior challenges. Gray (2013) suggests that the less rule constrained free play in nature enables children to self-learn how to appropriately behave and express emotion.

Participants also reported positive aspects of involving children in the entire process of planning, designing and installing the NPS. Doing so helped foster a sense of ownership in the play space. Goody and Gold found that involving children in the planning process raises their awareness that they can impact the world around them (1987). Engaging children at this level of community involvement can form a positive foundation on which to build social capital. Once children realize they can affect their local community, there is the opportunity for them to realize that local environmental resources can be consumed and need to be appropriately managed (Furnham, 2015). This awareness in children can also raise their consciousness regarding the environmental health of their local surroundings.
Development of Natural Play Spaces

Location

Participants reported on the importance of the location of the natural play spaces with other community assets and infrastructure. They felt that success of the space was closely connected to other community assets. Connections to sidewalks, trails and other transportation networks was seen as important to success. Trail networks that connected the NPS to other natural areas held great synergistic value. Conversely, Waller et al. (2010) found that limiting access of children to the community isolates this often isolated population. They also found that isolation limits their ability to develop attachment to place. In addition, this attachment to place is enhanced when children repeatedly experience community spaces in social settings with peers and adults (Jack, 2008). Participants involved with a NPS that was less successfully implemented and perceived to be used less, reported that the isolated location of their NPS contributed to factors that prevented more of the plan being installed and community members using elements that were built. Simoncini et al. (2017) suggest that locating community-built playgrounds nearby volunteer residences contributes to their successful installation. Francis et al. (1984) found that when community gardens have connection to neighborhoods and pedestrian and vehicular transportation networks they are more likely to be successful. The findings from this study, as well as those of others, support locating volunteer-built community elements in easily accessible areas that synergize with other existing or potential community assets.
Flexibility in Design Interpretation and Construction

Participants discussed the value of flexibility and adapting the design to fit the changing community needs and resources. Adaptable approaches were reported to increase the likelihood of connecting with appropriate volunteer expertise or volunteers interested in particular aspects of the natural play space. Positive aspects of flexibility also extended to the ongoing nature of the natural play spaces. Often the play spaces were installed a module at a time as funding and volunteer interest allowed. However, one focus group discussed challenges they faced that resulted from deviations from the design. Other researchers have also noted the never-completed nature of community built spaces (Casey, 2007). Allowing these spaces to exist in a state of continual flux and constantly evolving to meet the current needs and interest of the community facilitates a rejuvenating vitality to the spaces (Hou, Johnson, & Lawson, 2009).

Maintenance

Herbach (1998) found that community spaces, like the NPS’s examined in this project, that are installed and run by volunteers cost governmental bodies much less to maintain and run than those that are more fully controlled and run by parks departments. Therefore, these governmental bodies would be well served to work closely with volunteer groups interested in operating these spaces. Participants in this study offered insights into how governing bodies can more successfully interact with volunteer groups engaged in local community spaces.
Maintenance of the NPS’s was a common issue among focus group participants. These maintenance issues center around the unique character of the NPS. From the very early stages of the NPS, the project was unique. Parks departments, accustom to making many of the decision regarding community open space, were not in the lead on the projects, but instead, they were partners alongside community volunteer groups and individual volunteers. Participants reported this change in routine resulted in questions about who was responsible for maintenance. Some volunteer groups begrudgingly performed the maintenance, only because the city maintenance crews didn’t view it as their responsibility. Another group coordinated with the city and defined maintenance roles, sharing the maintenance responsibility accordingly. Coordinating and defining maintenance roles with governing bodies early in the process is recommended (Simoncini, Sawi, & Manson 2017).

Another reason the maintenance of the NPS’s was an issue was due to the unique composition of the spaces themselves. Using loose parts, such as sticks, logs, rocks, tree trunk slices, bare earth piles, sand and mulch for play materials in public spaces is not common. As such, maintenance regimes for such spaces are not well understood or practiced. Volunteers, long engaged in the entire process, still had to be trained regarding the goals and purpose of the loose parts and their value in play. Even more effort was reported to be needed to train city maintenance crews how to appropriately maintain these spaces, crews who mostly spend their time mowing turf grass and who were unfamiliar with the custom maintenance required. In addition to the unique maintenance demands of the materials, the location of many of the NPS’s
presented challenges. It was common to locate the NPS’s near areas of minimal maintenance on the edges of the city, such as near woods. This proximity to unmaintained natural areas allowed aggressively spreading plants from these areas to migrate into the disturbed areas of the NPS’s themselves. The colonizing plants of most concern were toxic to humans (Poison Ivy) and the rest were deemed as weeds and identified for removal. Removal of these plants, was again, a custom maintenance routine that required training.

Designers of the NPS’s intentionally drew up plans that were intended to be installed by a volunteer labor force. Part of this intentionality was modularity and flexibility in materials and organization. Participants reported that the adaptable nature of the designs facilitated the process and in one circumstance, hindered the process, specifically the maintenance. During one focus group, participants reported that they were overwhelmed by the maintenance required for the space. Upon examination of the NPS material selection revealed that a material choice deviation from the design resulted in the offending increased maintenance requirements. Flexibility and modularity can both benefit and impede a NPS.

In summary, when developing natural play spaces, participants in this study found that finding the right setting with access to synergistic resources was important in the success of the space. In addition, maintaining flexibility in both the design interpretation and in the construction timeline was important. Finally, the unique maintenance required for the play spaces needed clear definition of responsible parties and those parties needed to learn the maintenance regime.
Social Capital

Volunteering in planning and building in neighborhood and community level projects has the potential to increase, for participants, a sense of ownership (Napawan, 2015). Participants reported a wide variety of ways their volunteering in the NPS project expanded community trust which was used to accomplish the common goal of realizing the natural play space in their respective communities. Their motivations, volunteering persistence, all-ages volunteerism, peer volunteer collaboration, relationship with decision-makers and volunteer leadership were important in understanding the insights revealed by the participants.

Volunteer Motivations

Participants were motivated by a wide variety of reasons to participate in the NPS project. Participation in the project was motivated by professional benefit, personal benefit or community benefit. Such coproduction is common among volunteers (Backman, Wicks, & Silverberg, 1997; Trauntvein, 2011). Almost all participants were motivated because they felt the project would benefit the health of their own children or children in their community. As all these participants were united in promoting the health of children; social adjusive function, which is an attitude held by individuals because it helps them adapt to social situations in ways considered important by reference groups (Katz, 1960), suggests that actions that work toward this common goal (of health promotion) creates social cohesion (Smith, Bruner, & White, 1956). Those interested in utilizing and promoting volunteer efforts find value in
understanding what common goals can entice volunteers to participate and persist. Aligning project goals and volunteer motivations will likely increase volunteer persistence and satisfaction.

Volunteers often find compatibility between volunteer projects and their employment. Volunteers are often motivated to participate in projects because that volunteering is viewed favorably by peers and employers and can often be a way to increase chances of future desired employment (Clary et al., 1998). Most participants in this study were employed in health fields, both physical and mental health, followed by educators and then child care providers. Goals of the initial project were to increase many aspects of health of community members, particularly children. Clearly there was a connection between overlapping professional and volunteer goals. Omoto & Snyder (2002) found that individuals tend to persist longer and are more satisfied with the volunteer experience if their initial motivations are more focused. It seems those interested in increasing volunteer persistence and satisfaction would be well served by connecting with individuals whose professional context overlaps with the goals of the volunteer project.

**Volunteer Persistence**

When discussing reasons for continuing to work on the project, even in the face of resistance, participants reported a number of aspects that helped them maintain involvement. These included: valuing the goals of the project, amounts of resources already invested in the project, personal or group culture, and resistance against
opposition. Omoto & Snyder (1995) found that volunteers were involved longer if they feel satisfied during the process. Participants continued involvement in the project because they valued the end results of the project. One might infer that participants felt satisfied with the volunteer process and that their continued involvement would achieve a valued end result.

Leadership

Leadership in community projects that results in a volunteer-built space is vital to its success (Simoncini, Sawi, & Manson, 2017). The specific leadership structure of this dynamic was unique for each community in the NPS project. Each community was either led by a relatively few (1-3) individuals, or collectively by a cohort of leaders (4+), or a paid central leader who worked closely with an active cohort of leaders. The way that these dynamics were organized was important in the outcome and success of the NPS. As Trauntvein (2011) found, volunteer leaders have a variety of roles which requires more commitment. Participants from communities with no central paid leader and relatively few volunteer leaders (1-3) found it more difficult to keep moving forward on the project because they were not only fulfilling the role of volunteer leaders, but were also performing a majority of the installation and maintenance on the NPS. These participants reported more burnout because there was too much work for them to accomplish. Participants from communities with either a paid central leader and/or a large core of volunteer leaders reported less burnout and more focused direction.
Intergenerational Volunteerism

In addition to adults, children volunteers were involved during the entire CCNNM process. Participants reflected on evidence that children felt a sense of ownership through volunteering in the process used to create the NPS, that they can “leave their mark” as one participant mentioned. When both children and adults participate in the process of community planning, children see that they can impact community, and both groups can work toward the shared goals (Alparone & Rissotto, 2001; Spencer, Wolly & Dunn, 2000). Participants reported that one important element of this project’s success was the ability to engage multiple generations in meaningful ways. Lawson (2005) also found that successful, volunteer-based community gardens engage a broad range of participation from all ages.

Children Volunteers

From the beginning of the CCNNM project children were intentionally engaged in the planning, design, construction and programming. This intentionality was directed to benefit children, adults and the social capital of the communities at large (Horelli, 1994). Focus group participants reported a wide range of perceived impacts that the project had on children. Participants reported that children were very excited when working on planning the project because they felt that their ideas for shaping their community were truly valued. Children have the ability to meaningfully contribute to the planning process and have unique and valuable insights into the planning process (Hart 1987; Tonucci & Rissotto, 2001; Wolley et al, 1999). Participants perceived that some children
were disappointed that their ideas weren’t used in the project, an idea examined by Wolley et al (1999) and Alparone & Rissotto (2001) who caution that this disappointment may promote mistrust by children and work against building of social capital. Participants mentioned that one goal of the project was to increase, especially among children, social interaction within the same physical space with their peers. Through this volunteering, child participant’s social networks could potentially be strengthened (Corbishley, 1995). For children, repeated social interaction in community spaces can have great influence on place attachment (Jack, 2008). Participants also found that using art to recruit and engage children volunteers was particularly effective, which is an idea that others have also found useful (Hou, Johnson, & Lawson, 2009).

Participants in this study reported that a variety of factors that impacted social capital in their communities. Initial involvement in the project was more appealing to individuals whose personal and professional goals were aligned with the goals of the project. Once involved in the project, volunteers stayed engaged for a variety of reasons, including personal or professional alignment with the goals of the project, the amount of personal resources already invested in the project, a personal or ethnic culture to see things finished, and resistance toward interests opposed to the project. The leadership styles of the projects were either a single leader (often paid) or a cohort of leaders all taking responsibility for the project. Another powerful element of the project was the ability to engage all ages of volunteers in meaningful and productive ways.
Study Limitations

Regarding diversity of the study participants, most of the participants were white, female and interested in promoting active play among children, especially outdoor play. The racial composition of the focus groups reflect regional patterns observed, however, the gender composition is not reflective of the region. This could be due to a variety of factors. As noted in the discussion, there were strong health and education connections among the goals of the natural play space projects and the professional interests of participants; many of the focus group participants were nurses and early childhood educators. These professions are heavily dominated by women (McMenamin, 2015; Saluja, 2002). In addition, volunteers engaged in environmentally related projects also tend to be women (Zelezny, 2000; Tindall, 2003). Thus the dominance of women participating in this project could be expected.

As researcher bias can impact the objectivity of any study, a recognition of this bias and attempts to minimize the influence of this bias is sought after. Rather than attempting to rid the researcher of bias, throughout this research process I have attempted to recognize these biases and note how they potentially impact my interpretation of the data. The analysis of this study, based on the systematic approach of a grounded theory, pulls meaning directly from the data and applies that meaning consistently across the data. Through this approach, a grounded theory minimizes researcher bias (Bryant & Charmaz, 2007; Morse et al., 2009; Yamazaki et al., 2009). Another way that bias was introduced was through the selection of themes that emerged and the analysis of those themes. I identified themes that appeared to me and
from my perspective, appeared to have connections. Another researcher might have come up with a different set of themes or connections between those themes. However, bias was minimized by a consistent application of those themes across the data. It is impossible to completely eliminate researcher bias, however, Shank (2006) outlines a best practice for qualitative researchers, which is to clearly state sources of their potential bias. The following are my potential personal biases. I have long been involved in the natural play space projects discussed during the focus groups of this research project. I was the member of a team that coordinated and facilitated all of the natural play space planning sessions. I directly supervised the design of all the natural play spaces and I coordinated and directed the installation of three of the natural play spaces and consulted on the installation of the others. I have a background that is professionally and personally rooted in nature play and I believe that children benefit from free play in nature.

Every study is limited in its application and this study was no exception. Through the analysis of the collected data, certain patterns emerged that could lead to potential bias. Specifically, the lack of racial and gender diversity in the focus group participants was one potential source of bias, however, the given the demographics of the region and gender bias others have observed in environmental projects, these are expected. I have also identified potential sources of my personal biases.
Considerations

In addition to the development of the theory of nature play therapy (see Conclusion), it became evident that there was additional information that focus group participants stated were important lessons they learned from the CCNNMN project. In addition to statements by focus group participants, this section contains information that the researcher’s review and analysis of the data indicate warrant further study or consideration. Other parties interested in engaging in or researching similar community-driven, volunteer-implemented, creation of community spaces might find this information insightful.

For Landscape Architects and Designers

Within the realm of natural play space creation and programming, planners and designers provide planning guidance, documenting community input and apply that input towards a design direction. They can also consult on material selection and installation techniques. Specific lessons learned from this project include:

- Get input from the community, especially children early on in the process.
- Make sure that the contributions of the community, especially children, are readily visible in the design.
- A modular approach allows volunteers the flexibility to install modules depending on volunteer interest and expertise, and when funding or materials are available. Consider the ability of each module to have value and functionality even when installed prior to other modules.
• Tailor the size of the natural play space to the size of the community and the potential volunteer and leadership pool available. A design that can be installed in relatively short amount of time allows communities to feel a sense of accomplishment and see and enjoy the space. A design that is too small might be underwhelming and might not take advantage of community willingness to contribute. A design that is too large can burn out a limited volunteer base and result in an incomplete installation.

• Include a wide variety of loose parts into the space.

• Keep the design in balance with the budget and construction expertise available in the community.

• Arrange the design and choose materials that can be reasonably maintained under the anticipated maintenance regime.

• Be prepared to teach maintenance crews and supervisors appropriate maintenance for the spaces.

• Be prepared to educate the public about the disorganized nature and appearance of loose parts.

• Remaining flexible to adjustments in locations or with material selection can increase success.

• Proximal, desirable amenities include: trail networks, large shade trees, picnic shelters, bathrooms, unmaintained woods, lighting, trusted neighbors, water for play, a garden-like feel, and parking.

• Conduct field trips to other natural play spaces to get ideas.
For Site Hosts

The location of the natural play spaces examined in this study was of critical importance and of great influence. Equally important were the individuals and councils responsible for making decisions regarding these spaces. These decision-makers grant approvals and provided resources, both financial and social. This group includes local government decision makers, childcare center decision-makers, and school administrators. Specific lessons learned from this project include:

- Remain flexible with the programming and use of the natural play space.
  Increased flexibility has the potential to engage a wider audience.

- Prepare and allow for educating users (especially adults) on how to enable child-directed free play in the natural play space.

- Remain flexible with how play objects are used in the natural play space.
  Children often find creative and unanticipated ways to use objects for play.

- Foster and cultivate a sense of ownership in the space, especially among children.

- Anticipate a flexible timeline when relying on volunteer installation and donated materials.

- Sites that have the following amenities are more desirable: trees for shade or fruit, picnic shelters, bathrooms, unmaintained woods, lighting, trusted neighbors, a garden-like feel, water for play and parking. Seek for synergistic relationship with these amenities.
• Less desired site features include: manufactured play equipment, locations isolated from neighborhoods, perceived hiding spots for child predators, areas subject to natural hazards, cross highway access and transient housing.

• Engage other stakeholder groups and individuals who have influence on the site.

• Capitalize on the ability of the natural play space to become a destination in the community.

• Leverage cost savings afforded by volunteer efforts and donated materials to incorporate natural play spaces in underserved neighborhoods.

• Continually engage and involve volunteers, especially when circumstances regarding the natural play space changes. Transparency and respect can engender goodwill and understanding.

• Recognize the time and effort of volunteer contributions and take measures to make sure they feel respected.

For Community Organizers

Community organizers performed a variety of roles in the projects discussed during the focus groups. They networked with and recruited individuals and community groups in all phases of the projects. In addition, they liaised between volunteer groups and local governments. Specific lessons learned from this project include:

• Leverage the overlap between professional and personal interests with the volunteer project.
• Embrace flexibility to ideas and events throughout the process and use of the natural play space.

• Recognize factors that impact volunteer persistence and deal with them in appropriate ways.

• Engage all age groups in the project.

• Plan on the project continuing to develop and expand as volunteers are continually engaged to participate in the project.

• Promote a can-do attitude among volunteers, especially during the planning phase.

• Consider maintenance implications when considering deviating from the design of the natural play space.

• Engage other stakeholder groups and individuals who have influence on the site, especially decision-makers.

• Promote visiting and becoming familiar with other natural play spaces to get ideas and generate excitement.

• To create a sense of ownership of the new space involve as many people as possible, including all age groups and community members that typically might not be involved.

• Seek donated materials to not only reduce costs but to also create a sense of ownership among those who donated.
• Recruit volunteers and advertise events using a wide variety of media format, including, but not limited too: social media, radio, television, newspaper, flyers, community events, school visits, and community club visits.

• Seek understanding of community leadership dynamics and build on existing networks.

• Continually update and reaffirm support from community decision-makers. Anticipate change in composition (elections, job change, etc) and plan to gain support from new community leaders.

• Seek a partner-like relationship with community decision-makers

• Seek to understand the goals of local government councils as well as the individuals on those councils and when possible align these with project goals. Partner with like-minded individuals on these councils. Lobby those whose goals differ from the project goals.

• Avoid volunteer burnout, especially among habitual volunteers.

• Ensure funding sources are aware of and can support extended timelines of volunteer executed projects.

• Continually update and gain support of funding sources, especially if there is more than one funding source.

For Health Professionals

Synergizing project goals with volunteer interests can increase success of the project and increase volunteer interest and satisfaction. There were naturally aligned
health-related interests and goals of the project that attracted health professionals to engage in this project. The individuals who participated in the focus groups came from a wide variety of backgrounds, including: county health departments, mental health counselors, physical therapists, physicians, nurses, and school counselors. The reported interest in being able to effect change in the community and clients through their involvement with the natural play space project. Specific lessons learned from this project related to these individuals include:

- Connect with those in your community who are interested in increasing outdoor activity among children and adults.
- Leverage the open-ended aspect of loose parts and natural plays spaces for clients who would benefit from these situations.
- Use the interest and attention of the natural play space to springboard public attention and volunteer assistance to other public health initiatives.
- Initial observations suggest there are fewer behavior problems among groups of kids while playing in the natural play spaces, consider utilizing the space for groups or individuals with behavior challenges.
- Use the natural play space with groups or individuals that benefit from activities that elicit patience.

**For Educators**

The second group of volunteers most involved in this project were interested, at least partly, because of their interest in childhood education and care. These volunteers
have specific ties to elementary and early childhood education, daycare providers, and other educational advocates. Specific lessons learned from this project related to these individuals include:

- Utilize loose parts to afford creative and imaginative play.
- Remain flexible with how play objects are used in the natural play space.
- Capitalize on the free play afforded by the natural play space.
- Initial observation suggests that the loose parts and free play aspects of the natural play space affords cooperation and teamwork among children while playing in the space.
- The unscripted aspects of the natural play space appear to elicit play that requires patience.

**For Maintenance providers**

During the focus group sessions themes related to the maintenance of the natural play spaces emerged. These discussions revolved around two main ideas. The first is the unique nature of the spaces and the (mostly) custom maintenance they required. The second is because these projects originated, were planned and installed outside the normal public space design and approval process, once the spaces were ready for regular maintenance, the roles of who performs that maintenance was initially unclear. Parties interested in these lessons learned include parks departments, volunteer maintenance coordinators, and local government decision-makers.
• Remain flexible with how play objects are used in the natural play space. Be open to learning and adopting new maintenance practices and regimes.

• Train maintenance crews on the unique maintenance requirements of the natural play space. These may include management and replacement of loose parts, control of weeds (including poisonous weeds), selective weeding, outdoor musical instrument care, and care of thematic structures.

• Define and coordinate early on the maintenance roles and regimens between volunteer groups and parks department crews.

  Avoid relying on volunteers for regular and routine maintenance as this can sap their energy and enthusiasm.
CHAPTER V

CONCLUSION

Through the systematic analysis of focus groups, I have presented a picture of many aspects of the community-engaged planning, design, implementation, programming and use of natural play spaces in six rural communities in northwest Minnesota. Participants identified themes regarding design implications, interpersonal dynamics, intrapersonal dynamics, and health which resulted in the development of the theory of nature play therapy. Analysis of these discussions provided variables that can be tested for researching various aspects of the theory of nature play therapy. In addition, lessons learned from the focus group derived themes can be directly applied by the spectrum of stakeholders interested in community-engaged planning and implementation efforts to enhance community spaces and specifically nature play oriented spaces.

The stated objectives of this project were:

1) Generate theory regarding the perceived impact on social capital from the community-driven planning and construction process of the NPS. Assess reasons for and/or variables for future study on causes of these perceived impacts.
2) Generate theory regarding the perceived impact of the natural play spaces themselves to provide a setting to improve community health.

These objectives were selected because the premises of this study suspected that the community-engaged process helped foster social capital by establishing or reestablishing a general sense of trust between community members. Additionally, it was suspected that participants in the natural play space projects felt an increased sense of community and ownership directly toward the natural play spaces due to their participation in the natural play space project. The analysis of the data led to the development of the theory of nature play therapy.

Theory of Nature Play Therapy

The notion that play in nature is healthy for the mind and the body has long been suspected. This study researched this idea in more detail through the lens of a community-engaged process that resulted in the planning, design, installation, programming and use of natural play spaces. The resultant theory is: community-engaged natural play space creation and play in that space prompts therapeutic responses. Focus groups comprised of project participants revealed many themes related to the process and a number of those themes revolved around the notion that engaging the natural play space elicited therapeutic responses from users. More specifically a community wide engagement with a natural play space, especially when involved early in the planning process, has potential to build community trust that results in more social capital, thereby healing, what is becoming increasingly more
common, social poverty. Nature also provides a setting that elicits more fundamental aspects of play. Natural play spaces appear to provide a space for children and adults to play, as defined by Grey (2013) as 1) self-directed and self-controlled, 2) an activity where the means are more valuable than the ends, 3) involved rules derived from the participants, 4) imaginative or removed from real life, and 5) engage and active, non-stressed mind. Particular aspects of the design of the natural play spaces that facilitated this play were the open-ended spaces and loose parts. A wide variety of sizes and shapes of sticks, rocks, tree cookies, log stumps, straw bales, and sand allowed users to interact with and manipulate their play environment at will. When large groups of children played in the spaces adult minders observed fewer behavior problems, suggesting therapeutic aspects of social play. One reason suspected for this decrease in behavior problems that deserves further research is the widespread availability of loose parts, reduces competition for access to play objects. A final note of the therapeutic value of the natural play space is the value that space provides for rekindling knowledge of how to play in nature. Both adults and children had to be taught, either through timid exploration or through example or encouragement, how to engage the natural play spaces. This action of reconnecting to nature through play has potential to heal many facets of the current human condition. These variables can provide a foundation where future research can test and examine various aspects of the theory of nature play therapy. These variables and associate research questions are:

1) Natural play spaces have the potential to build social capital.
a. Which dimensions of social capital are demonstrated? Using measures proposed by Nahapiet and Ghoshal (1988) these dimensions are: 1) Structural Dimension, examples include appropriate organization, network ties, and network configuration. 2) Relational Dimension: identification, norms and trust. 3) Cognitive Dimension: shared culture and goals.

b. Is it the community-engaged component of the process that builds social capital or something inherent in the natural materials used in the space itself?

c. Are the social capital promoting aspects of the natural play space process unique or is it more a function of volunteers jointly impacting a persisting community space and is regardless of the specific composition of that space?

2) Fewer behavior problems observed in kids while playing in the space.

a. Is it the natural play spaces that elicit this behavior or some other variable such as group dynamics of the children, weather, general mood or temperament of the children, or something else? A systematic observation of children’s behavior in comparative spaces and comparative activities would be valuable.

b. Are there certain elements or materials in the natural play space that foster this behavior? If so, are there some elements or materials that
more reliably elicit these behaviors and what about these materials is conducive to these responses?

c. Can the behaviors observed in the natural play spaces be observed at the same rates and frequencies in manufactured, or non-natural environments?

3) Natural play spaces are particularly adapted to teach, or reteach, children and adults how to play in nature.

a. Are these observations unique to this study or are they more generalizable?

b. Can social capital between generations be strengthened by older generations demonstrating to younger generations how they played in nature?

c. Is there any advantage to teaching how to play in nature in a natural play space versus a natural environment that is not a play space? Is it just the close proximity of the natural play spaces to urban environments that increases the likelihood that they will be utilized. For example, would a natural play space that is only available during business hours and only accessible by car be more or less beneficial than an unmaintained creek or woods that are located nearby? Is the familiar park-like setting of where parents can come and observe their children while they play more important?
The theory of nature play therapy suggests that participating in either the creation of and/or playing in a natural play space promotes therapeutic responses. These beneficial reactions can relate to the increase in levels of social capital, positive changes in behavior while playing in the spaces when compared to playing in manufactured play spaces, or the ability of these spaces to introduce users on how to play in nature.
Appendix A

Demographic Questionnaire

To help us understand more about you and your involvement in the natural play space process please fill out the following information. Your answers are voluntary and you may skip any question.

Focus Group ID Number __________

Gender
Male
Female

Age
18-29
30-39
40-49
50-59
60-69
70-79
80+

Please circle the phases in the natural play space process that you were involved in (select all that apply).
Planning phase
Design phase
Building phase
Playing in the natural play space
Other ____________________

During your involvement in the natural play space process, which of the following people were involved with you? (circle all that apply)
Friend
Your child/children
Children for which you were the caregiver
Grandchild

How far did you travel to be involved in the natural play space process?
The natural play space is in my community
I live just outside the community where the natural play space is located (less than 10 miles)
I travel more than 10 miles to the natural play space

Occupation
Professional
Administrator
Mechanic
Caregiver
Service Sector
Sales
Unemployed
Retired
Student
Other____________________

Education, indicate the highest level of education you achieved
Some high school
High school diploma
2 year degree
4 year degree
Graduate degree

Race
Are you of Hispanic, Latino, or Spanish origin?
No, skip to next question
Yes, Mexican, Mexican American or Chicano
Yes, Puerto Rican
Yes, Cuban
Yes, another Hispanic, Latino or Spanish origin
Yes, other________________________

If you answered no above what is your race?
White
Black or African American
American Indian or Alaska Native, indicate the name of enrolled or principal tribe below
____________________________________
Asian Indian
Chinese
Filipino
Japanese
Native Hawaiian
Korean
Vietnamese
Guamanian or Chamorro
Samoan
Other Pacific Islander __________________________
Some other race ___________________________

What is your marital status?
Single/never been married
Married
Separated
Divorced
Widowed

Research Timeline.
Planning (February-April 2016)
One focus group will be conducted in each of the communities where the CCNNM process was used, primarily: Crookston, Warren, Fertile, Fosston, Mahnomen and Ada. Conducting multiple focus groups often results in more reliable findings that just a single group (Kidd & Parshall, 2000). It is anticipated that each group will vary in participant number with an estimated maximum of 12 and a minimum of four. Group participants will be recruited based on their involvement in any of the stages of the CCNNM process: planning, design, implementation or programming/use of the space. All group participants will be adults ages 18 and older.

Questions and Moderator Protocol
I will moderate each focus group in order to ensure consistency and familiarity with the topic. The approach will be a moderately structured approach, starting off with general questions regarding the overall impact of the CCNNM on each community, then funnel down (Morgan, 1996) to specific ways in which the CCNNM process has impacted the five aspects of health that are of interest to this study: community, physical, mental, spiritual, and ecological. See appendix for specific moderator protocol and questions to be asked during the focus group.

Recruiting strategies:
Seek funding for dinner for each community where the focus groups will be held. Funding for these dinners will be sought from the Northwest Regional Sustainable Development Partnership IDEA grant. It is anticipated that payments to participants in the focus groups will likely not be needed as it is hoped that their prior engagement in the process will intrinsically motivated them to continue to contribute to a project that they have already volunteered to help
out. Another intrinsically motivating factor is that they have played in the park and want to contribute to a better understanding of the benefits of the space. Providing dinner will be a small incentive to participate, and as the focus groups will be held in the evenings it will also help simplify the evening schedule of participants.

I’m going to contact participants by phone number and email. The source of this information will come from sign in sheets from planning meetings and contacting community members who served as points of contact during the projects. I will also recruit through the various community and government partners that have been involved with the CCNNM project. I will recruit 20% more than needed to account for no shows. See appendix for specific recruitment script.

Identify focus group locations and times:
Locations: focus groups will be held in community centers or locations where the initial projects were held. In the event these locations are not available, then other venues in the communities will be identified.

Budget:
Funding will be sought to provide travel costs for researchers to the focus group locations and to provide refreshments for group participants. Video recording equipment and recording media will be checked out from the University of Minnesota Crookston (UMC) Media Services office. Funding will also be sought to purchase video transcription software and the Nvivo Software for coding the transcript.
The final phase of the planning process will be to submit the research protocol to the University of North Dakota (UND) IRB for approval.

Observations (April-May 2016)
Conduct focus groups in each of the identified communities. Video record each session. The assistant moderator will take notes during the session. After each focus group session, the moderator and an assistant will review the discussion and evaluate if additional questions would be appropriate for the remaining groups in the study. If necessary submit addition questions to IRB for approval.
Backup recordings of sessions.
Analysis (May – September 2016)
Use video transcription software to transcribe the focus group recordings. After the software transcribes the text, accuracy verification and labeling of speakers will be completed manually.
Analysis of the data will be qualitative. The analysis will focus on identifying key words or themes that reveal relevant information regarding the impact of the CCNNM social capital and physical health. The depth of the analysis will be determined upon cursory review of the data. It is anticipated that a time intensive, transcript-based analysis approach, primarily looking for key words or
phrases will be needed. However, if upon preliminary review it is clear that the results are readily apparent then a transcript-based approach will only be conducted if necessary to illuminate other topics of interest to the study (Krueger & Casey, 2014). Both the moderator and assistant moderator will code the data independently. The Nvivo 7 software from QSR International, which is often used for qualitative data analysis, will be used to code the data (Auld et al., 2007; Azeem et al., 2012). Comparison of the moderator-coded and assistant moderator-coded data will help ensure interrater-reliability.

Examine 1-2 group datasets and develop hypothesis and coding schemes that can be used with the remainder of the groups (Morgan, 1996).

When analyzing the data particular attention will be given to identify and highlight, with tags, statements that prove to be relevant to the research. Tag similar statements on each code category from each of the focus groups.

Summarize tagged code categories

After a thorough study of moderator and assistant moderator notes and transcript, summarize major themes of the discussion. This particular method captures information and insights within the data that the coding method is less-able to capture and articulate (Krueger & Casey, 2014).

Reporting (September – May 2017)

The analysis of the data will consist of a summarization of the dataset tags as well as summarization of the discussions. Summarization of the discussions consists of finding meaning and connections between all the discussion summarizations. A final analysis of all the data will consist of balance reporting between summarization of discussions and exemplary direct quotations.

Throughout all the analysis, particular attention will be given to finding the big ideas presented and communicate that information through a balanced use of summary charts and graphs of the coded information and quotations and discussion summarization (Krueger & Casey, 2014).

Terminate IRB
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