A Descriptive Exploration of Quality and Opportunities in Outdoor Urban Play Spaces: The Case of Chicago Public Schools

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ABSTRACT

This study investigated the quality of children’s play spaces, both green and built, in and surrounding urban public schools in Chicago. Given children’s declining access to nature and the outdoors, especially in urban areas, the aim of the study was to both assess the current potential for high-quality outdoor experiences, as well as to uncover additional, low-cost, and low-burden opportunities that may exist for enhancing outdoor experiences. Based on a selected sample of 60 Chicago Public Schools, this mixed methods study employed quantitative ratings of play space and neighborhood quality, geographic information systems (GIS) mapping techniques to show distribution of results across the city as well as distances from the schools in the sample, and qualitative coding of visit notes and 1000+ photographs. On average, CPS play areas fell slightly below the mid-point of the quantitative quality scale, i.e., high 2’s out of 5. Play space quality ratings correlated with risk and neighborhood quality, however, varying degrees of quality were observed city-wide. Collective wear and tear, lack of dynamism, and nuanced natural elements emerged as district themes. Examples of positive outliers, such as community champions who advocated for play space improvement grants, tended gardens, and worked with children to distribute produce to the community, and found creative ways to create low-cost “outdoor classrooms,” were also found. Resources on campuses and within <0.5 mile walk from the schools, including local community gardens and Chicago Park District parks, were identified as potential enhancement opportunities. A series of recommendations was created based on the
results, such as implementing “standing permission slips” to remove barriers to visiting adjacent outdoor areas.
CHAPTER ONE
INTRODUCTION

Statement of the Problem

Abundant research verifies that nature experiences positively contribute to overall health and wellness. Essentially, nature can be healing (Haluza et al., 2014; Triguero-Mas et al., 2015; Tyrainen et al., 2014). However, modernization via urbanization, structured schooling, and digitalization have eroded the human relationship with nature, both on micro and macro levels. Human physiology, cognition, and socialization have transformed because of our growing disconnect with nature, and some of these changes have been detrimental (Kahn & Weiss, 2017; Louv, 2005; Van den Bosch & Ode Sang, 2017).

Like adults, children’s interactions with nature help support their health and well-being. Children’s time spent outdoors in nature is linked with increasing physical activity, prosociality and supporting healthy learning and development across domains (Kahn & Kellert, 2002; Kellert, 2005; Burdette & Whitaker, 2005; Munoz, 2009). When children are playing and learning outdoors or in greenspaces, they engage more of their creativity, problem solving, risk evaluation skills, cooperation, and civility (Bell & Dymet, 2008; Kellert, 2005; Sandseter, 2012; Sobel, 2014, 2016). Proximity to, views of, and exposure to natural settings also improve children’s ability to focus, academic performance, cognition, self-control, self-discipline, and significantly reduce stress and ADHD symptoms (Kuo & Taylor, 2004; Weir, 2020; Wells, 2000; Wells & Evans, 2003).
While natural settings may not be necessary for education, nature’s greatest value likely lies in its combination of affordances (Gibson, 1966, 1977). Gibson defined affordances of the environment as opportunities the environment can provide, as well as how the individual uses these contextual qualities for function. The highest quality of affordances that lend themselves to learning and well-being are not as easily found in indoor spaces. For example, the natural world tends to be more dynamic and less predictable than constructed spaces.

Diverse researchers have delineated ways of capturing the affordances of young children’s play spaces, such as the 7Cs assessment (Brussoni et al., 2017; Herrington et al., 2007). This measure was developed in an urban context and used extensively to assess various outdoor play areas to analyze the character, context, connectivity, change, chance, clarity, and challenge features of outdoor play spaces. Local efforts supporting nature-based activities here in the Chicago area for children and families (e.g., community garden programs, forest/garden/nature-based curricula, rain/shine preschool movement, Openlands/Space to Grow programs, Chicago Park District’s Nature Play Space program, NeighborSpace, nature play groups, etc.) indicate that I am not alone in seeking to boost the nature-education connection in challenging urban settings (Hirschi, 2015; Kellert, 2012; Kellert, 2016; Kellert & Wilson, 1993; Sobel, 2016; Ulrich, 1993).

Despite the current momentum of creating opportunities for outdoor activities that engage children, families and/or communities with nature and school wellness policies, accessibility to nature for Chicago area students, especially with “big nature,” is quite limited (Kahn & Weiss, 2017). Concerns of weather, safety, resources, and other factors are used to explain why children may remain indoors more often and/or have little or no contact with nature during their time at school, including recess. Additionally, nature accessibility is a privilege. Social strata trends that
we see reflected in economically diverse urban areas also relate to green space accessibility and quality. Although urban greening efforts are international, they often have the greatest impact on the communities who already have more access instead of ones that are more nature-deprived (Finney, 2014; Loughran, 2017). Simply stated, affluent people tend to have better local nature access and an increased ability to experience nature as leisure whereas marginalized groups have less access to natural spaces, parks, and play spaces of high quality (Bachin, 2004; Cranz, 1982; Ibes et al., 2021; Liu et al., 2021; McCammack, 2012; Rigolon, 2016).

Thus, researchers in urban environments have turned their focus to characteristics of outdoor play spaces, which may include limited natural elements (e.g., soil, rocks, leaves, grass, urban vegetable gardens, etc.), but can achieve some of the same benefits of nature through affordances. For example, outdoor play spaces that offer a small boulder pathway border or fibrous climbing ropes leading to a high platform provide risky play, dynamic elements, and some hints of organicness. Specifically, prosociality and engagement have been associated with both the degree of organic character and physical/social/cognitive challenges, as well as changes that outdoor play spaces can afford. Collectively, the higher overall quality/number of affordances outdoor play spaces allocate, the more prosocial the children’s behavior (Bento & Dias, 2017; Brussoni et al., 2017; Herrington et al., 2007).

Combining these interrelated concepts, the goal of this mixed methods, descriptive study was to observe and analyze what affordances CPS outdoor campus play areas provide that support healthy learning and development during unstructured play time (e.g., recess) and outdoor education. Analyzing a sample of approximately 13% of the CPS outdoor play areas at 60 different elementary schools representing diverse areas across the city, I described school playgrounds and nearby play space affordances using both quantitative and qualitative measures.
I explored nature accessibility and outdoor play spaces within CPS school communities utilizing a “just sustainability” lens, which values social justice and environmental preservation and care (Anguelovski et al., 2019). By applying this approach, I was able to assess current campus conditions, and identify and evaluate outdoor affordances for each school in the sample by comparing outdoor campuses, neighborhood and local resource affordances, and the varying degrees of quality. The ultimate intention of this research was to discover potential options for enhancing outdoor learning experiences during school hours.
CHAPTER TWO
LITERATURE REVIEW

Core Theoretical Frameworks

The commonsense idea that interacting with the natural world is beneficial for humans has a plethora of theoretical and empirical support. The positive effects of nature experiences for public health, people’s well-being, growth, and development, have been documented across domains (Haluza et al., 2014; Kahn & Kellert, 2002; Stigsdotter et al., 2010; Van den Bosch & Ode Sang, 2017). In fact, being attracted to and soothed by the natural world is in our evolutionary history, an inclination that is enhanced or diminished based upon one’s exposure to nature and enculturation of appreciation for it (Kahn & Kellert, 2002; Kellert, 2016; Ulrich, 1993). Current research regarding public green spaces and their accessibility has shown that these spaces improve overall community health by facilitating physical activity, contact with nature, and social interactions (Sugiyama et al., 2018). Studies of green spaces and contact with nature have highlighted a variety of positive health and wellness outcomes across biological, mental, and social domains, as well as helping to reduce stress and lower risk for chronic/infectious disease (Bell & Dymett, 2008; Kuo, 2015; Maller et al., 2009; Nejade et al., 2022; Pinter-Wollman et al., 2018). Interactions with nature have been shown to improve physical and mental health, attention, and social connectedness while helping to reduce stress, depression, aggression, crime, and Attention Deficit Hyperactive Disorder (ADHD) symptoms (Berto, 2014; Hartig et al., 2014; Holtan et al., 2014; Kuo & Sullivan, 2001; Kuo & Taylor, 2004; Taylor et al., 2001; Younan et al., 2016).
The theoretical background of my interest in children’s experiences in nature and the outdoors is derived from three core nature-related theories that have established why nature is central to healthy development, and why the consequences of being deprived of it can be so profound. These theories explain why/how interactions with nature can positively affect our minds, bodies, emotions, and relationships. Edward Wilson’s (1984) biophilia theory is defined as the human tendency that attends to, affiliates with, and responds positively to nature. This theory is the most general of the three (i.e., not limited to nature’s impact on attention and learning), an overarching theory that helps illuminate the deep connection humans have with the natural world and how we benefit from our relationships with it. Stress Recovery Theory (SRT; Ulrich, 1991) and Attention Restoration Theory (ART; Kaplan & Kaplan, 1989) are two “sister” theories that were developed later, with clear connections to core biophilia concepts. SRT and ART specifically examine natural influences and their restorative effects on humans. SRT is a psycho-evolutionary theory that focuses on human evolution, the preference and adaptation to natural vs. urban environments, and the restorative capacities of nature on human affect and physiology. ART is a psycho-functionalist theory that examines cognitive functions and the capacity of nature experiences to restore attention and reduce mental fatigue (Berto, 2014; Scott et al., 2021).

The German philosopher and psychologist Erich Fromm originally introduced the idea of biophilia in his book, *The Anatomy of Human Destructiveness* (1973). He described it as the tendency to passionately love life and all that is alive. Later, biologist Edward Wilson expanded Fromm’s definition, hypothesizing that humans pay attention to, affiliate with, and respond positively to life, geological, and/or climatological forces (Heerwagen & Orians, 1986; Wilson, 1984). Wilson states that there is an infinite sense of wonder, curiosity, and respect for organisms
and their systems that humans associate with life, making many of us feel akin to other organisms. Stephen Kellert and Roger Ulrich, among others, have expanded on Wilson’s ideas, further explaining why the biophilia hypothesis cannot be exclusively on one side of the nature vs. nurture debate. Kellert identifies biophilia as a “weak” biological tendency reliant on adequate learning, experience, and sociocultural support for it to become fully robust. Kellert states, “Biophilic values are highly variable, subject to human choice and free will, but the adaptive values of these choices are bound by biology” (Kellert, 2012, p. 4). In short, biophilic tendencies must continue to be valued and nurtured.

Robert Ulrich’s SRT proposes that because humans evolved over an extended period in natural environments, they are physiologically and psychologically adapted to natural environments rather than urban ones. His research has categorized nature influences as restorative and stress reducing, and the lack of them as stress-inducing. Nature experiences can positively impact both changes in physiological activity levels and emotional states (Berto, 2014; Nielson & Hansen, 2007; Ulrich, 1981; Ulrich, 1984; Ulrich et al., 1991; Van den Berg et al., 2010). Various studies using electromyography, skin conductance response, pulse transit time, and cardiac response stress measures have indicated that natural environments and exposure can speed up stress recovery (Berto, 2014; Ulrich, 1981, 1984; Ulrich et al., 1991). Brain activity is also impacted by nature exposure. Urban scenes enhance amygdala activity (associated with impulsivity, anxiety, and stress) and nature scenes promote anterior cingulate and insula activity (associated with heightened empathy and altruistic behavior) (Kim et al., 2010). Brainwave activity shows changes when experiencing natural environments (Aspinall et al., 2013; Jang et al., 2010; Schulzke, 2016; Scott et al., 2021 Williams, 2015).
Moving into green spaces yields lower frustration, engagement, and arousal, and meditative states by activating the “default mode network” and theta wave production (Aspinall et al., 2013; Jang et. al, 2010; Schulzke, 2016; Williams, 2015). As far as mental health, nature experiences have been shown to reduce depression, anxiety, aggression, and ADHD symptoms as well as induce greater happiness, well-being, and life satisfaction (Bogar & Beyer, 2016; Kuo & Taylor 2004; Song et al., 2013; Sturm & Cohen, 2014; White et al., 2013). In the Haluza et al. (2014) narrative review of articles for physiological effects and experiences in outdoor nature, several physiological parameters were identified and grouped into four body systems: brain activity, cardiovascular system, endocrine system, and immune function. Most studies associated nature experiences with positive physiological effects (Haluza et al., 2014; Nejade et al., 2022)

ART addresses how restorative activities help people recover from mental fatigue, emphasizing the potency of natural, fascinating imagery for facilitating this process. (Kaplan, 1995, 2001; Kaplan & Berman, 2010). For an activity to be fully restorative, it must satisfy the following four components: being away, extent, fascination, and compatibility. A sense of being away requires a change in setting, one that is different from the one causing mental fatigue. Extent refers to the scope and organization of an activity to occupy the mind. Fascination is effortless attention; it involves bottom-up processing and is mediated by the ventral frontal, temporal cortex, and subcortical structures (Kaplan & Berman, 2010). The last criterion, compatibility, is about coordinating with one’s purpose or goals (Kaplan, 1995; Kaplan & Kaplan, 2011). Meditation and mindful activities, such as recalling one’s favorite place, meet the fourth criterion and therefore have been shown to be restorative (Kaplan, 2001). Kaplan confirmed that experiencing natural images does fulfill the four essential criterion for attention restoration to occur.
In sum, it is clear from a substantial body of literature that nature has profound effects on adults. Nature experiences have been associated with improved psychological well-being, better cognitive functioning, fewer physical ailments, and quicker recovery from illness (Kaplan, 1973; Hartig et al., 1991; Kuo, 2015; Moore, 1986; Ulrich, 1984). Logically, these effects may be observable in children as well. However, there is a research gap. There are fewer studies focused on nature and the outdoors and their direct effects on functioning or well-being for children, even though it is widely accepted that environment profoundly affects children because of their greater plasticity or vulnerability (Wells & Evans, 2003). In the next section, I will explore historical trends that have led to disconnection from nature and the outdoors, for both adults and children.

**Declining Human Relationships with Nature and “Indoor-ification”**

**Modernization**

In the past, hunters and gatherers lived most of their lives outdoors. Nature dependency was explicit and experiences with nature were often immediate. There was more time for engagement and reflection as living, working, and learning were connected to the natural world. Agriculturalists in earlier civilizations became more “cognitive” regarding their relationship with nature, such as when planning which plants worked for food cultivation or when the best time was to grow them. People’s relationship with nature was still clearly connected to survival (Kaplan & Berman, 2010; Wilson, 1984).

The advancement of civilization via industrialization fueled by modernist ideas progressively changed the relationship with nature and the time spent outdoors. Concentrated energy shifted from being focused on reacting/assessing immediate environmental stimuli to exerting more energy directing thoughts and actions, utilizing higher-level thinking and
inhibitory efforts [ref]. As societies grew to value this type of cognition, while diminishing the need for responding to direct nature experiences, the collective human attitude regarding nature experiences lost some of its survival value. Modernization blurred the inherent connection humans have with their natural world to the point that some may delude themselves into thinking they are not responsible for their direct/indirect effects on nature (Kaplan, 1995; Kaplan & Berman, 2010). Humans changed from spending time with/in nature, to being part of the socio-industrial complex. This perception is separate from nature although ironically still so dependent on it. Obviously, children have been affected by this construct shift (Kaplan & Berman, 2010).

Over half the world’s population lives in urban environments with limited access to nature experiences. The absence/decline of experiences with natural environments has been associated with obesity, respiratory problems, sedentary lifestyles, chronic and infectious disease, stress, and mental health problems (Irvine et al., 2013). Moreover, people of color and/or low-income earners have even less access to green space. They are more often living in detrimental polluted environments when compared with white, more affluent communities (Brulle & Pellow, 2006; Wolch et al., 2014). African American and Latino communities have an increased chance of exposure to lead, contaminated water, pesticides, and mercury and report higher levels of asthma (Brulle & Pellow, 2006). The same is true for Chicago-area children residing in neighborhoods that have high amounts of poverty and higher environmental lead levels (Benfer, 2017). While U.S. cities have accessibility to parks across neighborhoods, people of color are less likely to visit parks due to safety concerns and limited transportation (Ibes et al., 2021; Liu et al., 2021; Rigolon, 2016; Wen et al., 2013). The amount of time children spend outdoors has been steadily decreasing. Access to green space, especially in urban areas, is
declining as well. In the latter half of the 20th century, there has been a significant increase of “indoor-ification” of children and adults (Louv, 2005; Sobel, 2014).

**Structured Schooling**

If you wanted to create an education environment that was directly opposed to what the brain was good at doing, you probably would design something like a classroom.

– John Medina

Overall, structured schooling is partly responsible for how and why some children have “nature-deficiency” (Louv, 2005). The industrial machine, creation of a labor force and the type of schooling that has evolved from these models has amplified the amount of time we need to spend “willfully focusing.” This “willful focus” used to be predominantly survival-related, more intrinsically motivating and possible to sustain. Now, learning is more subjective, often disconnected from the “here and now” and its benefits are not as clear. This is something that for many feels unnatural and undermines authentic learning (Freire, 1973; McLaren, 2016). Parallel to the factory model that grew out of industrialization, schools can mimic machines in form and function (Cuban 2010; Tyack, 1974; Williams & Brown, 2012).

Outdoor play has been on the decline for American school children as our society transitioned from the Industrial to the Information Age. Most children today have limited recess time outdoors, especially for those attending schools located in low-income and/or minority neighborhoods (Roth et al., 2002; Tran, 2013; Thalken et al., 2021). Specifically, the guidelines for Chicago Public Schools (CPS) outdoor recess state that if the temperature outside is 15-32°F, outdoor recess is up to principal discretion and if it is below 15°F children must stay indoors (Healthy CPS, 2023). Unfortunately, during the colder months, even when the weather is above 32°, many CPS children stay indoors during the school day. Additionally, few American schools
provide students with the opportunity to interact with their local outdoor communities e.g., visiting a local park, community garden, etc. (Smith & Sobel, 2014).

The age of accountability in schools is increasing the academic demands placed on students (Bassok et al., 2016), leading to pressures on school time including shorter recess. The controversial Nation at Risk report (commission chair Gardner, 1983) and No Child Left Behind Act (Representatives Miller & Boehner; Senators Kennedy and Gregg, 2002) inspired many of the accountability trends we see in schools today (Hirschi, 2015; Smyth, 2008; Sobel, 2016). Unfortunately, because of this movement, activities that can help relieve mental fatigue and restore attention such as recess, music, art, and gym are being reduced and/or eliminated (Bassok et al., 2016). Collectively, more time is now dedicated to math and literacy content and teacher-directed instruction and assessment, especially in schools that are considered low-performing (Bassok et al., 2016; Caplan & Igel, 2015).

In the case of early childhood education, highly didactic, structured, and technology-based practices are arguably contrary to what is recommended for healthy development and learning. For example, free/unstructured play positively impacts growing children across domains, in ways such as reducing behavioral misconduct, increasing participation in sports/extra-curricular activities, and contributions to families and/or communities (Weikart, 1998). However, free play time is on the decline in structured school settings even though restriction of free play in early childhood may have lifelong negative repercussions (Brussoni et al., 2012). These trendy methods can be categorized as mechanical rather than natural. Replenishment is not valued and is often seen as a waste of time that should be used for academic achievement and conformist behaviors. While this “culture” of U.S. schooling has
many consequences, one of these can certainly be children spending less time in states that are natural to them. We see this particularly with the reduction of time spent outdoors.

**Digital Overload**

Technology use has grown exponentially over the last few decades, particularly with information and communication technology (ICT). This trend has also reduced time spent outside and our connection to nature. ICT is technology providing information through telecommunications in the form of the Internet, wireless networks, cell phones, and other media (Christensson, 2010). Technology can influence how we communicate, interact, learn, and work and affects our health (Berg-Beckhoff et al., 2017; Card et al., 1983; Floridi, 2015). ICT proliferation has inspired a new regime of truth in a sense - globalization via hyperconnection - that is challenging our power constructs, reference frameworks, and perceptions (Foucault, 1975). The increasing availability of ICTs is reformatting our conceptualization in the following ways: defining what is reality/virtuality, blurring the distinctions between human, machine, and nature, reversing from an era of information scarcity to information abundance and shifting from the primacy of entities to the primacy of interactions (Floridi, 2015). As a result of this paradigm shift, human relationships with nature are weakening. Human’s everyday existence is becoming less “natural,” and they have moved inside.

Technology access has its advantages; however, it also can be problematic. ICTs have affected the way people work, learn and live because these experiences are “no longer bound to a certain time or place” (Berg-Beckhoff et al., 2017, p. 2). Many people are often overscheduling, multi-tasking, and focusing on what they need to do or should have done instead of engaging in what they are doing. Therefore, humans experience the sensation of time poverty (Mullainathan & Shafir, 2013). However, utilizing ICTs for work can increase work time, the need for speed
and multi-tasking, disturb work routines, and contribute to information overexposure (Mano & Mesh, 2010). As a result, the use of ICTs at work is associated with increased anxiety, frustration, chronic stress, and potential burnout. Many now rely on ICTs to guide social interactions; increasing amounts of people who are spending less time simply having actual interactions with other humans (Floridi, 2015). Screen time can negatively affect our ability to empathize with other’s emotions. In a study with 104 California preteens, after five days at an outdoor education camp without screens, the experimental group significantly improved their skills reading nonverbal emotional cues. Both lack of screen access and time outside with nature are considered as possibilities that contributed to the improvement of the experimental group that went to camp (Uhls et al., 2014).

The effects of technology on children have been debated for years. Although full details are not yet known, technology nonetheless impacts the micro-, meso-, exo-, macro- and chrono-systems, the interrelated environment where children develop and learn (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998; McHale et al., 2009). Some research has shown that technology usage can positively relate to cognitive and academic skills, but results are mixed. For example, it has been shown that technology usage does not necessarily help improve math and literacy achievement scores (Cristia et al., 2017; Li et al., 2006). Frequent computer use contributes to social isolation, as it takes time away from social activities with others and may interfere with social development (Subrahmanyam et al., 2000). Technology has affected family dynamics, as “live” parent-child interactions are declining because of media time spent and parents bringing work stress into the home (Plowman & McPake, 2010). It is common to see a parent give a child a cell phone/tablet in a restaurant or in the car to keep them entertained while engaged elsewhere.
The acute, exponential growth of ICTs is an important part of the discussion about children, healthy development and nature. As ICTs continue to be increasingly available to children, they are using them more frequently and for longer periods and users are becoming younger (Strasburger & Hogan, 2013; Vandewater et al., 2007). Over ten years ago, American children ages 8-18 were spending seven hours per day with some form of screen-based media, with Latino and African American children using media the most (Larson et al., 2019). More recently, a national study indicated that only 8.8% of children were meeting all three health guidelines for sleep, physical activity, and screen time, with physical activity and screen time guidelines being met the least (23% and 33%, respectively; Friel et al., 2020). Not surprisingly, the COVID pandemic increased screen time even more for children – from an average of 2.7 hours/day to an average of 4.1 hours/day – a 52% increase (Madigan et al., 2022). Substantial proportions of preschoolers engage in high levels of screen-based entertainment as well (Hinkley et al., 2012).

The negative effects of this digital overload on children circulating in current research are potent, but the research is underdeveloped. For children, too much screen time has been linked to reduced physical activity, being overweight, the consumption of junk food, sleep disturbances, poor school performance, lower reading scores, and violent behavior (Rideout et al., 2010). Regular use of mobile devices has been significantly linked with conduct problems, hyperactivity/inattention, and addictive behavior (De-Sola Gutierrez et al., 2016; Hosokawa & Katsura, 2018; Roberts et al., 2014). Memory disruptions, diminished learning and cognitive abilities, increased irritability, sensitivity to stress, and epileptic readiness are potentially connected to children’s ICT usage as well (Sage & Burgio, 2018).
Hyperconnection and technology availability have changed the human condition in profound ways, especially for children. Technology is required by many schools and its value is advocated by mainstream educational standards, practices, and assessments. This valuation of technology is reflected by local society in health care and business, and in global society in areas like consumerism and information exchange. Many children are experiencing a “digital overload”. Most importantly for the present discussion, this overload is partly responsible for why children can be considered nature-deprived, and less likely to play outside or at all (Louv, 2005). Unfortunately, this phenomenon can be a detriment to healthy growth and development and is certainly not “natural” (Brey et al., 2012; Strasburger & Jordan, 2010).

**Environmental (In)Justice in and Beyond Chicago**

While it is true that nature does not discriminate, the policies, systems and organizations that steward public lands can. (Martinez, 2020, p. 1)

Quality outdoor environments and positive “nature” interactions are associated with privilege and “nature capital,” whereas not having them is referred to as the “the nature gap” (Rowland-Shea et al., 2020; Wolch, 2014; Gosalvez, 2020). It is well documented that BIPOC communities traditionally and currently have less access to green space than their white counterparts and further, that this was an intentional component of marginalization (Borunda, 2020; Jelks et al., 2021; Robinson et al., 2023; Selvarajah et al., 2020). For example, the national average park size in low-income neighborhoods is 6.4 acres and more crowded, while in higher-income neighborhoods that average doubles to 14 acres.

The context of COVID-19 made these disparities even more glaring, especially in urban environments (Kahrl, 2020; Shukla, 2020; Trust for Public Land, 2020). During this crisis, green space accessibility diminished even further even though several studies have correlated increased
COVID cases and disease severity with less-green U.S. neighborhoods (Spotswood et al., 2021). According to the analysis by the Trust of Public land (2020) at the peak of the pandemic, more than 1.1 million New York City inhabitants did not have access to a park within a 10-minute walk of where they lived. Additionally, BIPOC communities were more negatively impacted by COVID-19 and had even less access to green space (Larson et al., 2021).

Efforts to improve safety, traffic, and walkability of urban green spaces positively affects community health and potentially can help reduce the socioeconomic health gap (Wen et al., 2013), however, this “urban greening” often has consequences of deepening privilege, furthering gentrification and diminishing access to communities of color even more (Corbin, 2017; Jennings et al., 2019). For instance, in Chicago and New York City, the recently constructed 606 and High Line are brilliant, elevated parks, but they are now surrounded by unaffordable housing where owners pay a premium for “views” of these unique spaces (Curran & Hamilton, 2018; Kamin, 2018; Loughran, 2017). In Chicago, the 606 is in the Logan Square neighborhood, impacting the Latinx community, which has the lowest levels of green space access compared with other ethnic and racial groups in the city (Friends of the Park, 2018). Further, these green city parks are considered what is known as “imbricated spaces,” reflecting a hybrid culture of “green and gray” (Loughran, 2017). For those with privilege, this hybridity may be interpreted as aesthetically pleasing and/or novel. However, the unintentional emergence of imbricated spaces, such as vacant lots where nature is “taking over”, is reflective of ongoing disinvestment and such spaces are found more often in urban neighborhoods of color (Sharkey, 2013). Therefore, those who endured hybridity because of neighborhood blight and decay may be more aware of the devoid cultural, political, and/or economic resources that initially created these imbricated spaces and view them differently.
Considering children specifically, children of color have less opportunities for nature engagement (Ibes et al., 2021; Islam et al., 2020). Across our country, 75% of all non-white families live in a neighborhood with less natural land than the state average (Rowland-Shea et al., 2020). Wealthier families can travel to enjoy the outdoors, tend to live in neighborhoods that are generally greener, where parks and school grounds are more aesthetically pleasing and better maintained, and organize more “nature-based” outdoor activities (Baro et al., 2021). Privilege begets privilege, and in affluent areas there may be more demands for such spaces as well as more responsiveness to those demands.

Park spaces in predominantly white/affluent urban areas are usually of better quality and Chicago is no exception (Baro et al., 2021; Lougrahan, 2017). There have been instances, both historically and currently when CPD has been questioned on equity, regarding their support of black and brown communities. For example, in 1982, the federal government filed a civil suit against the park district for not abiding by the 1974 legislation to fight discrimination in housing and community development because CPD was providing fewer programs and quality facilities to neighborhoods of color (Graf, 2019; Greene, 2018). Thirty years later, they were again accused of similar practices by the Friends of the Park organization’s extensive report (2018). The CPD did respond, criticizing some of the claims by creating a retort report discussing their equality driven perspectives, referencing information such as their significant expansion since 2011, improving residential access to over 90%, and specific projects focused on diverse communities e.g., the construction of La Villita in Little Village, and improvements for Big Marsh in South Deering (Chicago Park District, 2018). However, South side parks compared with north side parks of similar size have smaller budgets and less robust programming (Toomey, 2022). Additionally, capital improvement requests from high income communities are
almost twice as likely to be approved than those made from lower income communities (Piketty, 2017). CPD explains that park advisory councils “promote ways for the community to better utilize programs and facilities” and “provide communication to the CPD on matters relating to their parks” including, “assist(ing) in locating alternate funding sources to enhance park facilities” (CPD, Advisory Council FAQs, p. 2). The reality is that finding additional financial support is easier for communities that already have capital (Piketty, 2017). In sum, a final key reason for declining relationships with nature and spending too much time indoors is the environmental racism and classism that, particularly in urban areas, restricts even well-intentioned greening efforts to a smaller and smaller number of privileged few.

**Summary: Reduced Connection to Nature, Outdoor Experiences, and the Growing Disconnection from Our Natural Selves**

In short, modernization via urbanization, structured schooling, digitalization, and environmental injustice have eroded the human relationship with nature, both on micro and macro levels, keeping children indoors more than outdoors. As these direct experiences with the natural world are declining, people are moving further away from their natural selves in ways that reduce the tendency to explore, wander, be physically active, slow down, and reflect. This phenomenon has created a different type of stress, responsible for the increasing amount of distinct mental fatigue most people currently experience (Kaplan, 1995). Obviously, mental fatigue has consequences. People who are mentally drained may exhibit performance errors, have difficulty planning, become socially uncivil, and/or be irritable (Kaplan, 1995; Herzog et al., 2011). The impacts of structured schooling and the required focus, along with a lack of appreciation for replenishment, all contribute to children’s stress and mental fatigue (Kaplan & Berman, 2010; Moreno, 2017; Moreno et al., 2018). Nature-based learning and experiences can
provide relief for this type of mental fatigue and stress, while facilitating healthy learning and development. Natural settings may not be necessary for education, but nature’s greatest value lies in its combination of affordances that lend themselves to learning and well-being. In the following sections I explore the various ways in which humans have capitalized on the outdoors for benefits to physical health, mental health, and learning.

**Nature-Based Experiences in Action: The Great Outdoors**

**Green Spaces and Public Health**

Throughout history, public green spaces have been valued. For example, over 2,500 years ago, Cyrus the Great insisted on building relaxation gardens in Babylon, Persia. John Muir, author and naturalist, along with Frederick Law Olmsted, the architect responsible for New York’s Central Park, pushed for the formation of the National Park Services that eventually led to the parks’ inclusion in legislation (Williams, 2015). Current research regarding public green spaces has shown that they help improve community health by facilitating physical activity, contact with nature and social interactions (Sugiyama et al., 2018). Studies of green spaces have highlighted positive health outcomes across biological, mental, and social domains. Consistently, green spaces have been credited with helping reduce stress and lower risk for chronic disease. Public green spaces are being explored in preventive medicine and urban planning for their potential to help reduce the socio-economic inequalities in public health, but as discussed above, parks in low-income communities tend to lack “social access.”

Associations with the distance to a green space, health, and health-related quality of life have also been identified (Korpela et al., 2014; Pearson et al., 2020; Pearson et al., 2021; Stigsdotter et al., 2010). In one study, Danes who lived less than 300 meters from green spaces reported significantly better self-rated mental health compared to those who lived further from
the green spaces. Positive mental health has been coupled with accessibility to green spaces, supporting a dose-response relationship (Wood et al., 2017). Wood et al. observed that access and exposure to green spaces affected how participants rated their mental well-being. People who had more access and/or exposure to green spaces reported significantly higher mental well-being ratings. Van den Bosch and Ode Sang (2017) confirmed connections between public health and natural environments and regulating ecosystems, socio/behavioral/cultural ecosystem services and regulating ecosystem services or defined health outcomes with their systematic review of literature. They determined strong evidence that urban natural environments help people improve their effect and reduce city heat index. They considered these findings as potential reducers of effects seen in cardiovascular disease mortality by exposure to natural environments.

Children and Green Spaces

In the context of education, despite early historical validation of “nature as education” from renowned theorists, including Frederich Frobel, Dr. Maria Montessori, and John Dewey, only limited research has been conducted analyzing the impact green spaces have on children. In an Australian study with 550 8-11-year-old elementary school participants, vegetation volume was a significant naturalness measure that predicted perceived restorativeness (Bagot et al., 2015). Vegetation proximity to one’s residence has been investigated as a potential buffer from life’s stress and adversities. In a study with 337 rural middle elementary school students, researchers determined that the impact of life stress was lower among children with high levels of nature nearby than those with little nature nearby, suggesting nature access might be a protective factor that can support resiliency (Wells & Evans, 2003). Studies using the Normalized Difference Vegetation Index (NDVI), a measure derived from satellite imaging,
have shown that elementary students have improved standardized test performance, working memory, and attention proportional to their school building’s surrounding “greenness” (Dadvand et al., 2015; Wu et al., 2014). Researchers have found that students in classrooms with natural views have higher grades, less behavior issues, and more overall positive feeling about their classroom environment. These students also exhibit better performance on attention tests and the views help increase student recovery from stressful experiences (Benfield et al., 2015; Li & Sullivan, 2016). Several studies have also indicated that for children with ADHD specifically, the “greener” a child’s play area is, the less attention deficit symptoms are observed in their usual activities following (Kuo & Taylor, 2004; Taylor & Kuo, 2009; Taylor et al., 2001).

**History of Nature-Based Learning and Education**

Incorporating nature-based experiences within academia and schooling is not a new idea. The Yuelu Confucian Academy built during the 10\textsuperscript{th} century was constructed in secluded mountains and included reflective garden spaces for students to simultaneously deepen their connection with the natural world and increase understanding of Confucian philosophy (Wu, 2005). Nineteenth century architects designed gardens for Oxford and Cambridge University campuses to provide an atmosphere conducive to study and contemplation (Dober, 2000). Frederick Frobel, the father of kindergarten, started his “children’s gardens” in mid-19\textsuperscript{th} century Bavaria. Gardens that children could explore were part of the kindergarten experience, providing a metaphor for nurturing children’s growth and development the same way you would care for plants (Hirshi, 2015). Frobel felt children learned best via play and exploration centered on self-activity with teachers as guides in a social, sensory-rich environment (LeBlanc, 2020). Over a century later, Dr. Maria Montessori also thought that children learn best from exploration and observation of the natural world and that experiences with nature facilitate healthy child
development (Montessori, 1967). John Dewey, a leader of the Progressive education movement, valued learning via experiential practice (i.e., place-based curriculum) connecting school learning with life skills. He thought school gardens would help students learn agricultural techniques that they could apply in real life, as well as assist with studying mathematics and life sciences (Kohlstedt, 2008). Frobel, Montessori, and Dewey were aware of how schools dedicated to exploratory and experiential learning, including gardens and/or outdoor education, were particularly valuable for children who were deprived of nature (Hirschi, 2015).

**Recent Varieties of Outdoor Education and Schooling**

In the United States, a school gardening movement flourished from 1890-1920 (Kohlstedt, 2008). During World War One, children were growing food for the nation. This effort was supported by the federal government’s program, the United States Garden Army (Hayden-Smith, 2006). This was organized by the Bureau of Education who funded school garden programs while they attempted to nationalize curriculum (Trelstad, 1997). The curriculum emphasized agricultural literacy and integration across various subjects. Gardens continued to be a regular component of many schools until the latter half of the 20th century. Science and technology emerged as the dominant construct and the gardens started to fade out. Growing food was no longer a necessity, nor was learning to garden, due to the mass production of cheap food. Also, there was a perceptual shift regarding “affluence” being defined now by manicured grass-dominated lawns rather than acres of fertile land (Damrow, 2005).

The nature study movement, spearheaded by Louis Agassiz, advocated that teachers study nature by the “natural method” (experiencing nature-based learning not just reading about it), gained momentum at the end of the 19th century, laying the foundation for environmental education (Armitage, 2009). Educators Dewey and Wilbur-Jackson promoted nature study ideas
as they readily fit with their progressive and constructivist philosophies (Smith, 2016).  

Concurrently, John Muir and Enos Mills were working to protect the American wilderness, leading to the establishment of National Park sites and services. Mills founded his Trail School in 1920, which had a flexible program that was led by student interests, rooted in nature study ideas (Bailie, 2016). 

This environment education movement faded during the First and Second World Wars and resurged in the 1960s. At the same time, Head Start emerged and the early childhood education field was gaining momentum. In 1967, the first official nature preschool at the New Canaan Nature Center in Connecticut began operations. A nature preschool is considered a product of cross fertilization with early childhood and environmental education and nature center movements (Bailie, 2016; Sobel, 2014). The Environmental Education Act was passed in 1970 and the first Earth Day celebration took place. Nature preschools slowly started to become more popular over the next few decades all around the United States (Bailie, 2016; Sobel, 2014). A significant spike in establishing nature-based preschools followed and as of 2015, there are now over 150 nature-based preschools in the United States alone (Merrick, 2016). Nature-based preschools have been associated with supporting creativity and problem solving, enhancing cognitive development and academic performance, social relations and self-discipline (Bell & Dyment, 2008; Burdette & Whitaker, 2005; Kellert, 2005; Taylor et al., 2001; Wells, 2000). 

The Forest Kindergarten movement began in Scandinavia in the 1950s and 60s. These programs are known for blending fantasy and nature, intentionally honoring the magical thinking of the early childhood developmental period (Robertson, 2012). In these schools, children are outdoors 80-100% of the time and most of them do not have access to a heated indoor facility. In 1985, Siw Linde founded the first I Ur och Skur, “rain or shine” school, and by 2008 there were
180 rain or shine schools in Sweden (Robertson, 2012). There are thousands of these schools now in Sweden, Denmark, Germany, Norway, the United Kingdom, Australia, New Zealand, Asia, and the United States (Sobel, 2016). In 2019, Washington state legalized public outdoor preschool and advocates in several states, including Illinois, are negotiating with lawmakers, hoping to bring outdoor schooling to the public sector (Forest Schools for Illinois, 2023; Washington State Department of Children, Youth and Families, 2019; Washington Nature Preschool Association, 2023).

Today, teachers with garden access commonly utilize this resource for science and math content or for inspiration for writing (Williams & Dixon, 2013). Garden-based programs are a functional example of cross-curricula learning. These programs have been associated with helping students develop observational and social skills, along with morality (Blair, 2009; Williams & Dixon, 2013). Garden-based programs facilitate parental involvement and promote school bonding by deepening student, staff and families’ connections with nature while promoting stewardship and improving school grounds. When children and families are directly involved with school garden programs, they have been found to change their food habits, becoming more experimental, appreciating the food they grow and eat, and eating healthier overall (Blair, 2009; Koch et al., 2006; Morgan et al., 2010).

Danish public-school teachers reported that children who attended forest kindergartens compared with peers who attended traditional kindergartens are socially advanced and identifiable as “ready to learn” (Sobel, 2016). Forest kindergarteners are successfully developing executive functioning and problem-solving skills, both strong indicators of short and long-term success, academic and otherwise. Self-directed outdoor play is ideal for nurturing these life skills (Banning & Sullivan, 2011; Burdette & Whitaker, 2005). Forest school attendees have been
shown to readily attain environmental awareness and literacy as well as be more involved with their communities. They also tend to have better attendance, motor skill development, eyesight, and concentration, include more imaginative play, and have less stress compared with their peers attending traditional preschools and kindergartens (Grahn et al., 1997; Robertson, 2012; Shimizu et al., 2002). While the schools being evaluated for the present study are not nature or forest schools, the measure that was employed to evaluate their playground quality is predicated partially on the assumption that the incorporation of some natural elements, as well as non-natural elements that can emulate some of the affordances of nature (e.g., that it changes), can begin to produce some of the same benefits that nature does (Herrington et al., 2007).

**Recess and Outdoor, Unstructured Play**

The history of recess is closely intertwined with play in American Schools (Pellegrini, 2005). Although Plato felt children need to grow in a playful atmosphere to become productive citizens and Froebel and Montessori both revered play and nature, there is limited evidence to show that recess was a common school practice (D'Anggour, 2013; Spielgaben, 2013). There are pictures of children playing outside schoolhouses, but no evident documentation for the first school/neighborhood that implemented a recess or playground policy in American schools. However, recess has been occurring as a break from learning or work since schools were first institutionalized for at least 100 years (Pellegrini, 2005). Recess/unstructured play time has been a controversial topic since the turn of the 20th century. Some felt recess provided children with needed breaks to replenish after concentrated learning times, opportunities for moderate/rigorous physical activity, socialization, and creative play. Others considered recess a waste of time and to be unhealthy, unsafe, morally contaminating, and/or a disruption of students’ concentration (Clements & Jarret, 2000; Pellegrini, 2005). Marxist, Puritan, and Calvinist ethos dictated that
work is of the utmost importance while devaluing activities for pleasure and leisure (Pellegrini, 2005). Activities like recess, where children have autonomy and limited supervision, are subject to “kids gone wild” scrutinization. Therefore, recess has been devalued cross-culturally by many educators, in modern and post-modern times (Clements & Jarret, 2000).

Fortunately, the Child Study Movement gained momentum in the early 20th century. Darwinian thought, combined with the growing child and developmental psychology movement spearheaded by G. Stanley Hall (1904) distinguished developmental stages as well as emphasized the importance of play (Cravens, 2006). Play areas were established in urban environments, which often included adult supervisors, as a means for children to develop social skills and understand “proper” ways of playing and communicating to coincide with American norms and values. Kindergartens were proliferating and the physical education movement was gaining popularity. All these factors combined helped clarify that recess and play are valid opportunities for replenishment from work and socialization.

Learning and development research continued to expand, as did understanding of the importance of play and children’s self-directed learning. Play is not frivolous; it is integral. Via play, children discover, develop, and refine essential and diverse physical, cognitive, and socioemotional concepts and skills relative to their cultural context (Bodrova & Leong, 2007; Gaskins & Miller, 2009; Lightfoot et al., 2013; Pellegrini, 2005). Children are innately driven to self-educate. Cross-culturally, children exhibit the following behavioral traits that allow for culture and information to be transmitted; curiosity, drive for competence, desire to grow up, modeling and fantasy. All of these are attributes of children’s play; clearly it serves the need of long-term educating (Gray & Chanoff, 1984). During play/free choice time, with little or no adult interference, children are more apt to use explicit, narrative-like language. Engaging in
sociodramatic play is most associated with social-cognitive and literacy development (Bodrova & Leong, 2007; Harper & Huie, 1985). Play breaks during school are especially important for students to reduce cognitive interference while maximizing school performance (Bjorklund & Harnischfeger, 1987).

According to the American Academy of Pediatrics and the Centers for Disease Control, children ages 3-5 need at least 60 minutes of unstructured play (CDC, 2022), and recess is one of the places where play is possible during the school day. However, per the CPS Office of School Health and Wellness, their current requirement is only 30 minutes of supervised recess (Lobel et al., 2020; CPS, 2023). Recess contributes significantly to the physical, social-emotional, cognitive, language, and cultural development of the young child (Clements & Jarret, 2000; Pellegrini, 2005). It is a unique segment of the school day since it is often unstructured with limited adult interaction (Pellegrini & Holmes, 2006). This time helps them to successfully adapt to school and societal norms and itself positively impacts academic achievement (Pellegrini & Holmes, 2006). On the playground, children can be observed actively practicing skills acquired in the classroom, while working on social-emotional skills, such as building peer relationships and their executive function capacities (Lightfoot et al., 2013; Rogoff, 2003; Shonkoff & Phillips, 2000). In the current study, I observed the quality of play spaces in which children primarily spend their recess time, when they are granted it. The physical resources available and their quality and upkeep are a partial indicator of the value that stakeholders place on students’ outdoor play time, and a strong indicator of the quality of play experiences students are likely to have in those spaces, even if play is not directly observed.
Environmental Affordances

I applied Gibson’s concept of environmental affordances throughout this dissertation. This way of thinking connects with core theories of learning and development and is also an appropriate lens to help analyze outdoor environments. Gibson (1979) stated,

The affordances of an environment are what it offers an animal, what it provides or furnishes either for good or ill. Man has altered the environment substantially, by altering what is organic or natural and adding artificial components like concrete, steel, etc. with the interest of making available what benefits him and reduces what injures him at the expense of other animals, life forms and the planet itself. (p. 56)

His theory is transactional, stressing a bi-directional influence like we find in the most relevant developmental concepts (Altman & Rogoff, 1987). In fact, many renowned developmental theorists referred to affordances of one variety or another. For example, both Piaget and Vgotsky proposed constructivist ideas, but Piaget emphasized the physical/cognitive affordances whereas Vgotsky stressed the social dynamism affordance of learning environments. Bronfenbrenner clarified the interactive nature of environment across the socioecological spectrum, the most proximal to the most distal, illuminating how access to environmental affordances grows as one’s environment changes in complexity.

Children perceive functionally significant properties and modify their actions based on their own resources (e.g., strength, competence, fear, etc.) (Heft, 1988). There is a close relationship between children’s degree of independent mobility license and actualization of environmental affordances (Kytta, 2004). There are potential affordances, possibilities inherent to the environment or object, and realized affordances, when children use the affordances available to the best of their capabilities. In summary, the theory of environmental affordances, particularly its emphasis on reciprocity, readily connects with several core theories/concepts that are foundational to children’s learning and development.
Consider that in 1920 western children’s average unsupervised daily roam rates were a 10 kilometers radius; nowadays that rate is a 300-meter radius (Derbyshire, 2007). In both the U.S. and Canada, the amount of “exploratory” outdoor space allocated for each child enrolled in full time care has stayed the same since the 1980s, measuring approximately seven square meters (i.e., roughly half the size of a parking space) (Herrington et al., 2007). Using Gibson’s lens of affordances, one can infer that the post-modern environment affords much less space for children to explore than in the past, especially when unsupervised and/or in urbanized areas. Most unstructured play and exploration with limited supervision for city dwellers occurs in defined outdoor spaces, such as local parks and school playgrounds. These play places offer a wide range of affordances, including the degree of “organicness” or natural character they can provide.

Figure 1. Left: Outdoor play area with limited affordances. Right: Outdoor play areas with a variety of affordances.

Figure 1 shows an example of the low end of affordances on the left - a school that has a black top designated for outdoor play also used for parking, with no or limited equipment nor access to any nature or any loose parts, and an example of the high end of affordances on the right. Although the equipment is standard, there are lookout points, a draw bridge, two types of
slides and a climbing wall. There are also different surfaces (wood chips, grass, cement) and a sidewalk path connecting different areas of the play space. A large open grass field adjacent to the play area and natural views can be enjoyed. Some items, like wood chips or plant debris, could even be used as loose parts. Analyzing such differences in affordances of the physical play spaces available to CPS students constitutes the primary activity of this dissertation.

According to Vygotskian theory, play space designers aim to create environments that promote specific play activities or behaviors while adhering to mandated safety considerations that intend to support children’s play, learning and development. However, standardization and subsequent policies for outdoor play spaces and equipment have maximized the market for expensive, “safe” equipment. These risk management industries are minimizing the importance of play with the creation of children’s “safe” outdoor play spaces, thereby reducing their affordances (Herrington & Nichols, 2007). Playground surfaces provide a telling example. When standardization and policy denote that playground surfaces need to be protective, they imply that the surface is something that children need to be protected from (e.g., to break a fall) rather than a challenge or something inspiring. A non-universal ground surface motivates children to be more planful and attend to how they would fall, depending on the ground cover (Kahn & Weiss, 2017). Additionally, sand, pea gravel, or wood chips are all considered “protective” surfacing and can also serve as loose parts to manipulate. In contrast, Pour in Place (PIP) rubber matting dominates “choice” play space surfaces (Herrington & Nichols, 2007). This ground surface is tested, designed, and marketed and is one of the most expensive materials to use in children’s play spaces, and its decay is accelerated with “loose part” contact (e.g., sand, gravel etc.).

Adults also limit the scope regarding outdoor play spaces by defining them by their characteristics and potential appropriate and non-appropriate behaviors. This perception solely
considers play areas as “forms, both natural and built” instead of thinking about the affordances these spaces can provide and how they are utilized (Heft, 1988, p. 29). For example, imagine the commonplace playground slide. Looking at the slide with a lens for its form, one applies an “adult” or “outsider” perspective. The slide is defined by certain features; it is a high point on the playground where children can climb up, slide down and gain perspective. Steps with railings are created to help students get safely up to the top. Surfaces that are sufficiently wide and deemed appropriate (e.g., flat, made of a substance that gives like wood chips or rubber, etc.) must be present at the bottom. Sides on the slides need to be high enough along the tube to ensure children do not slip out. However, we know children do not just walk up the stairs using the railing and slide smoothly down the slide every time. Children climb up the slide, jump off the slide, use the high platform as a look out spot for orienteering, turn their bodies and lodge their feet to stop themselves from going down, hang from the sides or railings, and skip steps as they climb up to the top, among other creative uses. Although these activities may not be considered appropriate by the playground creators or by the adults who enforce the rules/regulations of outdoor playtime, the slide environment nonetheless affords these types of activities, and the children take advantage of these learning and development opportunities when they can. Therefore, looking at the spaces in terms of their affordances rather than only their form is more child-like, emic, and rich.

Play space diverse affordances stimulate children’s play and exploration and clearly support healthy learning and development to varying degrees. Dynamically, environments can change children’s behaviors/play and children’s behaviors/play can also change environments. Logically, there are features of outdoor play spaces that afford more than others, eliciting intentional and unintentional behaviors on the part of those who use the play space (Fjortoft,
Reciprocally, the more organic, undefined, and dynamic spaces and objects are, the more they afford. The natural world affords diverse learning and play habitats. Landscape features and outdoor environments are viewed as an arena for facilitating physical activity, both motor skill development and risky play (Fjortoft, 2000; Little & Sweller, 2015; Sandseter, 2009). Exploration of space is a forum for children’s discovery and constructive development, crucial to gross motor skills development, concrete operational thought, a sense of initiative, industry, and self-regulation (Pellegrini 2005; Smilansky, 1968; Yoshimi et al., 2021). Natural and/or affordance rich play spaces foster encounters with socialization and cooperation, motivate children to explore nature, interact and build with diverse materials, and actively move from one setting to another (Kuh et al., 2013). A large, open field surrounded by a perimeter of trees that change with the seasons affords more exploration than a set of monkey bars. An open-ended circuitous pathway promotes more discovery and active movement than a linear sidewalk. “Loose parts” (items that can be manipulated in open-ended ways) have more attracting power and holding time for children compared to defined, non-changing objects (e.g., children will want to play with sand or cardboard boxes more often and for longer than with a Barbie doll) (Kuh et al., 2013). Navigating diverse terrain is more challenging and engaging than standard flat surfaces.

Consider the specific example of trees and slides as “high points” in an outdoor play space; they both invite climbing and discovering lookouts, but differing attributes expand or constrain their affordances. The diverse surfaces and heights of trees require children to use more of their cognitive bandwidth during climbing, increasing the challenge compared to the standard slide. Trees can also provide loose parts or enclosed spaces, change with the seasons, and enhance the organic character and connectivity of the outdoor space. Therefore, the tree option is
more diverse in terms of its potential affordances. Outdoor play space researchers, particularly those interested in helping to facilitate quality outdoor play experiences and children’s connection with nature, have determined certain affordances to be the most beneficial and supportive for healthy learning and development, particularly for early childhood. In the methods section, I address these specific affordances, using the SevenCs (7Cs) measure, designed to assess outdoor play spaces affordances and highlight related learning and developmental outcomes related to these optimal outdoor play space features.

**Literature Review Conclusion and the Present Study**

It is clear from the multi-faceted evidence presented here that green space access and quality outdoor play and educational opportunities have positive impacts on children’s learning and development across domains. However, urban youth, specifically Chicago children, may have limited to no experience with “big nature” and/or dynamic outdoor play and learning, since local green space/outdoor play space accessibility and quality vary greatly. Factors such as socioeconomic status, race/ethnicity, neighborhood public health, and vegetative index values, amongst others, can impact children’s green space access and usage (i.e., how/where/when/what children play and learn outside). As Gibson, Herrington and other researchers suggest, the next best thing to experiencing the dynamism that “big nature” and quality “nature play” offer to learning and development is to experience the same type of affordances in outdoor play and learning spaces that children can access more readily. With my research, I aimed to get a better understanding of the current CPS outdoor play and educational environments’ conditions available to students, determine what these spaces can/do potentially afford to Chicago’s children during school hours and their degree of quality. This goal led me to develop the following overarching research questions.
Research Questions

RQ1 - What is the quality of Chicago Public Schools’ outdoor play spaces and what is the relationship between play space quality and other nearby outdoor affordances?

RQ2 - Are there any qualities or opportunities suggested by the school campus, nearby neighborhood affordances, or a combination, that could allow fast and/or low-cost improvements to enhance children’s experiences during their time outside at school?

One of the main goals of this study was to accurately gauge the range of outdoor affordances’ variance across the diverse CPS district network and Chicago neighborhoods potentially available to early childhood students (PreK-2nd grade) while they are at school. I searched for an applicable measurement tool for evaluating outdoor play spaces at schools and came upon Herrington’s Seven Cs (7Cs) assessment, used successfully for determining affordance quality in outdoor preschool play areas in Vancouver, B.C., amongst other studies. I hypothesized that by using this tool, I would be able to determine a representative range of affordance quality for a comprehensive sample of 60 Chicago Public Schools. I also wanted to explore how these quality affordances would map to major geographical regions (e.g., southeast side, northwest side, etc.) and CPS school networks. Additionally, I wanted to consider school and neighborhood factors and how these could potentially covary with the determined 7Cs’ ratings, including factors like school safety/level ratings, socioeconomic status, student mobility and neighborhood physical appearances (CPS, 2023; McDonell, 2007). I anticipated also finding local options available to sampled schools that could possibly enhance the access to quality outdoor affordances, supporting overall learning and development for young people.

Upon completing a detailed analysis of quality outdoor affordances that support learning and development available to diverse CPS school communities, I aimed to identify just and
sustainable ways to share with school communities on how to improve children’s outdoor experiences by increasing affordance access and quality, while at school. The results of this work can potentially help Chicago educators identify local outdoor affordances that support learning and development, assess their quality and accessibility, open the conversation about how to get close to these affordances (and best replicate them), ideally shifting the perception of outdoor play on the playground or blacktop only during recess to looking at the school campus and surrounding neighborhood outdoor resources as rich learning and development opportunities. In the following methods chapter, I will describe in detail the sub-questions under each major research question, and the procedures and analytic procedures used to answer them.
CHAPTER THREE

METHODS

Participants/Settings

Sixty CPS school playgrounds from fifteen CPS networks (networks 1-13, plus 44-ISP-Independent School Principals network, and 46- AUSL-Academy for Urban School Leadership network), comprised the research setting and sample. This sample represents approximately 13% of CPS district-run elementary schools (excluding charters). The sampling was stratified/purposive (Patton, 2002). The actual play spaces themselves were evaluated as the “participants.” Therefore, the Erikson Institute Institutional Review Board (IRB) for the Protection of Human Subjects determined that this study was exempt from IRB approval since this research involved only observation of common space areas. Children nor adults had any direct contact with researchers, in adherence with conditions specified in United States Department of Health and Human Behavior guideline for protections of human subjects at 45 CFR 46.101(b)(1).

Initial field data collection occurred from March 2021 through the end of May 2021. At this time of the COVID pandemic, most schools had begun staggered/hybrid scheduling, in which some students would appear on school grounds each day while the others were at home doing remote learning. Some students remained exclusively in remote learning. Researchers observed from afar and a typical field data collection session did not include interactions with human subjects, besides the few exceptions when children/families/school staff asked the
researchers questions. If there were students, families, educators, or schools present during the assessments, that was documented.

The selected schools varied in quality, demographics, and neighborhood context. Four geographically dispersed schools were selected from each network, ensuring representation from all major regions of the city. Devising a systematic school selection process was part of the study itself; please see “Procedure” below for details.

Procedure

School Selection

Sixty CPS schools (four from each of the 15 networks) were selected for the study sample. By using the 15 school networks’ information and preexisting CPS demographic and performance data, the purposive sample selected represented maximal variety of school risk factor and geographical spread. I created a “risk index” to aid in school selection, using the following variables as a first step (n = 477): demographics (Bilingual, Special Education (SPED), low income/free and reduced lunch), race/ethnicity (e.g., White, African American, Asian/Pacific Islander, Native American/Alaskan, Hispanic, Multiracial, Asian, Hawaiian, not available), accountability and school performance (CPS school quality rating policy (SQRP) individual indicator scores, Northwest Evaluation Association (NWEA) growth indicators for all students, NWEA priority groups and national attainment, Assessing Comprehension and Communication in English State-to-State (ACCESS) scores - percentage of students making sufficient annual progress, average daily attendance rates, “My Voice, My School” (i.e. Illinois 5Essentials district survey results) and mobility (percentage of student transfers) (CPS, 2023).

As a next step, internal consistency of the initial group of risk factor variables was examined to determine if the scale was cohesive so that the variables could be combined into a
single index. A reliability analysis using Cronbach’s alpha was conducted. The initial result was below 0.80 (typical rule of thumb for adequate internal consistency), therefore, individual “alpha if deleted” tables were scanned to compare the impact the different variables had on the overall scale’s cohesiveness [ref]. Individual variables were dropped one at a time from the index when the Cronbach’s “alpha if deleted” indicated that the internal consistency of the index increased substantially. Race/ethnicity and percentage of students making annual yearly progress (AYP) on ACCESS, NWEA growth indicators for all students were dropped. The following independent variables remained and a final Cronbach’s alpha of 0.87 was achieved: SQRP, NWEA national attainment growth, daily attendance rates, 5Essential surveys, bilingual, SPED, free/reduced lunch, and mobility. To create a single index, the remaining variables were converted into Z scores (since the scales were not initially uniform) and then averaged.

The 477 CPS elementary schools’ means along the risk index were calculated. Next, the means on the risk index were divided into even quartiles within each of the 15 CPS Networks. For example, if there were 16 schools in a network, four of those schools would be placed into each quartile from lowest risk (4) to highest risk (1). Thus, across the entire district, schools with a risk level of “1” did not necessarily have the same risk level as each other. Within network quartile divisions, as opposed to across networks quartile divisions, were necessary due to the high level of segregation and geographic-based inequality in the city of Chicago. Had we allowed school selection with equalization of risk across the entire district (city), relatively higher performing schools within networks that reside in neighborhoods that have more risk factors would have still been “pushed” into high-risk quartiles, likely causing complete conflation of geography with risk, washing out variability within neighborhood, and preventing fair representation.
The number of elementary schools per network ranged from 18-36; one school was randomly chosen from within each risk quartile. This resulted in four schools being selected from each network, one from each level of (within network) risk. In the final step, physical spread of the randomly selected schools within each network was visually examined. We hoped to achieve maximal physical spread so that the “micro-neighborhoods” for each of the four schools within each network were not the same (since I was also examining surrounding blocks, nearby playgrounds, etc.). If schools were too closely clustered, random selection continued until a more reasonable distance among the four schools was achieved. Figure 2 below shows the manual mapping by locations of the final school selection. A unique number code was created for each school to protect anonymity and applied as needed (e.g., map points, photos etc.)
Figure 2. CPS full sample 60 school spread manual spread on Chicagoland paper map (GM Johnson & Assoc., Ltd., 2013).
The next map (see Figure 3) shows distribution of risk index across the city, and Figure 4 summarizes the steps involved in the school selection procedure.

Figure 3. Map of within CPS within network risk index spread: first number network; second number risk quartile-1 high, -2 medium high, -3 medium low, -4, low.
Data Collection

The 60 selected CPS play spaces were assessed using Herrington’s 7Cs measurement and McDonell's Neighborhood Quality Index: Physical Appearances (see below for full measure descriptions) (see Appendix A). In addition, we also recorded date, time, other materials present (e.g., hula hoops, balls, loose parts, etc.), other unique campus features (e.g., school community gardens, water fountains, running tracks, etc.) and if students/staff/other people were present. Walkable neighborhood resources (i.e., spaces located within a 0.5-mile radius or 20 minute-walk from the school at the pace of an average preschooler) that could potentially expand students’ opportunities to access outdoor affordances were documented as well (i.e., parks, gardens, urban farms, nature play areas, outdoor art installations, etc.). Schools that had gardens on campus were revisited in fall 2021 to determine if they had been tended. Plants present at these schools’ gardens and their condition were observed and documented. These data were considered as evidence showing of garden maintenance/tending had occurred (e.g., weeding, pruning, harvested vegetables) and/or if annuals were present like tomatoes, basil, squash, mums, etc. Coders collected these data using a form created for this study (see Appendix A).
In addition to the data collected on the forms, I took approximately 3,000 photos and extensive field notes to document the sample school sites and spaces around them. Field notes and photo examples were analyzed, organized, and archived into digital files for each site. These notes and visual documents were open coded and analyzed for patterns (Merriam & Tisdell, 2016; Pink, 2012; 2013). Once patterns emerged, categories were identified, and the field notes and photos were then axial coded (Corbin & Strauss, 2014). These categories were used to group select phenomena and create additional dichotomous, “field observation” (FO) variables that are discussed further below in the measures section.

Twenty-five percent of the school sites were double coded by a research assistant to assess inter-rater reliability. The second coder was an educator, playworker, nature play/outdoor education advocate, and the former director of The Forest Preschool. This school was located in Walking Stick Woods, which is now a Chicago Park District nature play area, on the northwest side of Chicago. She is the cofounder of the Fraternal Forest outdoor play group and the head organizer for the Forest Schools for All movement, whose goal is working towards making outdoor preschool options more available to interested families, publicly and privately. She has a master’s in zoology and is currently working on her second master’s in education, while also being employed as a teacher in CPS. She was qualified to support this project because she is attuned to education, nature play, outdoor play spaces, and the potential affordances they can provide for developing children. Prior to data collection, the research assistant was briefed on the project, but she remained blind to the details of the sample selection (e.g., risk index, risk quartiles) and any other specific hypotheses and analyses. The research assistant normed her ratings against the Principal Investigator Varey at different pilot sites that were not part of the
study, until 80% agreement was achieved on three schools in a row. Five pilot sites were collaboratively evaluated to achieve this level of reliability.

The research assistant assessed the 7C’s scores and neighborhood quality ratings while taking field notes/photos (i.e., completing the data collection form) while I was simultaneously but independently evaluating these same spaces. These collaborative assessments were completed at 15 different schools from the sample, one school from each network, representing 25% of the total sample. Both measurement tools used a five-point scale. There were specific instances when point differences between the evaluators scores were greater than one. Post data collection consensus discussions were held. We analyzed scores, field notes, and photos so we could address the discrepancies and achieve consensus. Further helping to ensure accuracy, for the results of the 7Cs and Neighborhood quality rating scale, when both researchers’ ratings were within one point of each other, those scores were averaged. These consensus scores were documented and recorded as the results of the 7Cs/neighborhood quality data used for all data analyses.

Independently rated original scores from both researchers were recorded on the data forms. These raw scores (from prior to the consensus discussions) were used to evaluate our inter-coder reliability using intra-class correlation (ICC) coefficients. For the physical appearances assessment, the ICC was 0.91 (average measures) which indicated good/excellent reliability. For the 7Cs assessment, the intraclass correlation was 0.83 (average measures), indicating good reliability.

Originally, when planning for this investigation, I had intended to have semi-structured interviews with CPS teachers, administrators, staff and other parties interested in outdoor education and nature play. Due to the restrictions imposed by COVID, this was not possible.
However, I did have informal opportunities to communicate with different CPS teachers, administrators, staff, and families, along with people who work with Chicago Park District, Openlands and NeighborSpace organizations. Sometimes these were colleagues, whom I knew already or got to know because of my research interests. Other times, these were chance encounters, such as when I communicated with parents on the school playground after hours or with a building engineer who happened to be working outdoors during my field observation. Data collected and analyzed from these diverse conversations were identified as “personal communications.”

**Measures**

**Play Space Quality and Affordances**

The 7Cs measure was developed and applied during the 5-year Outside Criteria Study in Vancouver, British Columbia (Herrington et al., 2007). Taking both an action research and mixed methods approach, researchers examined the developmental contributions and shortcomings of outdoor play environments. They determined that children had quality outdoor play experiences and enriched developmental opportunities in environments with the following play space characteristics: had elements for children to manipulate and make their own, contained living things, were sensitive to climate, were designed to the scale of the child, allowed the child’s imagination to shape the play experience, and provided areas for children to play alone or in groups. From this data, the researchers created and later tested the 7Cs measure, assessing outdoor play spaces’ samples and how they support/inhibit quality affordances. This tool includes descriptive categories, each of the 7Cs - *character, context, connectivity, clarity, chance, change*, and *challenge*. The following table (see Table 1) explains each of the seven “Cs”. Every category has its own specific score and the highest total 7Cs score possible is 135.
In the initial Outdoor Criteria Study and follow up Playground Study, researchers considered reliability, using various methods (field observations, photographs, scaled-plan drawings, videos of children playing, and interviews) that were analyzed/coded to determine 7C’s evaluations for the school samples. It is inferred that evaluators collaborated on their ratings to ensure accuracy (Herrington et al., 2007). A full example of the 7Cs measure can be found in the appendix.

Table 1. 7Cs Definitions (Herrington et al., 2007)

<table>
<thead>
<tr>
<th>7C</th>
<th>Descriptor</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Character (25)</td>
<td>indicates the overall feel of outdoor play spaces, four architectural types defined (modern, organic, modular and re-use)</td>
<td>play space building quality and condition, vegetation, varied surfaces, light quality</td>
</tr>
<tr>
<td>Context (25)</td>
<td>involves how the play space interact with its surroundings</td>
<td>play space security, microclimates, views looking out from and in towards the play area, attractiveness, defined boundaries</td>
</tr>
<tr>
<td>Connectivity (15)</td>
<td>indicates the physical and visual connectedness of the play space through a hierarchy of paths and the link between indoors and outdoors</td>
<td>play spaces entrances and exits, pathways, movement around the space</td>
</tr>
<tr>
<td>Clarity (20)</td>
<td>integrates physical and perceptual legibility, play spaces should promote spontaneous exploration not confusion</td>
<td>play space design, differentiated play zones and seating, logistics for set up/break down and storage</td>
</tr>
<tr>
<td>Chance (15)</td>
<td>provides an opportunity for children to create, manipulate, and leave an impression on their outdoor play space</td>
<td>play space mystery (place making options and exploration options), loose parts and messy zones available</td>
</tr>
<tr>
<td>Change (25)</td>
<td>refers to the range of differently sized spaces and how these spaces change over time (e.g., living things can signal change in the seasons and growth and elements for play)</td>
<td>play space offers different sized spaces and ranges of spaces, activities for students from various ages/stages of development, diverse topography, materials change with the seasons</td>
</tr>
<tr>
<td>Challenge (10)</td>
<td>refers to the available challenges (e.g., physical, cognitive) that a play space provides</td>
<td>play space encourages risk taking and graduated challenge</td>
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</table>

There are several important findings that emerged from the authors’ original study (Herrington et al., 2007) with the use of the 7Cs. On average, participating children spent 15% of their outdoor play time engaged with plants or other living things and teachers with
plants in their play areas reported more positive feedback than teachers with limited to no plant life in their play areas. During such time, children were more likely to interact verbally with each other and their teachers and socialize with two or more people. Children only used the prefabricated play structures 13% of the time they were outdoors and there was no clear relationship between manufactures/designers’ themes and children’s imaginative play. Aggressive behavior among the children increased when no manipulable material was available. The physical materials of the play spaces influenced the sound landscape, which influenced stress levels; louder play spaces (e.g., hard surfaces, street sounds etc.) were more stressful for both students and teachers (Herrington et al., 2007).

Since this tool was created, it has been used internationally in several research studies and has helped people design children’s play spaces and child-friendly neighborhoods (Herrington, 2012; Herrington & Studtmann, 1998; Larcombe, 2010; Mountain, 2014; Sajadi & Khoshnevis, 2016). In a follow-up study (Herrington, 2008) data was re-analyzed from the original study (Herrington et al., 2007), examining how the design of the preschool play spaces affects children’s social behaviors and play styles. Researchers determined that children exhibited more positively engaged behavior in play spaces with the highest overall 7Cs’ scores. Specifically, play spaces high in challenge and chance had more positive peer interactions and children engaged in more cooperative play. Play spaces rated higher in change and challenge were associated with lower unoccupied behaviors. Based on these results, the character, challenge, change and chance affordances of play spaces can influence the social behaviors of preschool children who use the space (Gummerum et al., 2007). Additionally, Bjorgen (2016) concluded that local natural areas rather than standard school playgrounds facilitated more moderate to rigorous physical activity. Brussoni and colleagues (2017) determined that
improving the play space quality by increasing the 7Cs, had significant positive effects on the students’ social behavior and mental health.

One of Herrington’s ongoing studies utilizing the 7Cs measure involves her landscape architect students from UBC-SALA program who are actively investigating, assessing, and improving affordances at YMCA preschool play areas around the city of Vancouver. Participating students conduct an initial 7Cs measure of a sample preschool site. Using their input and creativity, they are designing nature play interventions to improve outdoor affordances and implementing them at these select school sites. When they finish changing the spaces and increasing the affordances for the children who use them, they also do a post assessment of the select sites with the 7Cs measure. This is an active study, however, Dr. Herrington kindly shared with me some of her students’ 7Cs’ assessments from these spaces, both scores and field notes. These data were used in my analyses as one additional comparison point for CPS play space quality (a sub-question of RQ1; see below).

**Neighborhood Characteristics: McDonnell Neighborhood Quality Rating Scale**

It is important to consider that neighborhood conditions can have acute and chronic effects on health (King & Ogle, 2014). Context itself may predict or condition stress, emotions, and coping mechanisms (King & DeLongis, 2014; King & Ogle, 2014; Mair et al., 2008). Neighborhood context impacts children’s and families’ overall well-being and has been shown to be an indicator of residents’ health, both physical and social components (Cohen et al., 2003; Coulton et al., 1995; South et al., 2003). Therefore, for this study, I decided that it was necessary for me to observe neighborhood conditions around the sample schools in order to gain a more detailed understanding of the school community context. Additionally, I wanted to observe if there were any affordances or hinderances present that could potentially impact the
outdoor learning and development of young CPS students during school hours. For example, I would locate any community resources that could potentially support outdoor learning and development (e.g., community gardens, NeighborSpace gardens/play areas, CPD parks) and the conditions of these spaces. I also would get a feel for neighborhood activity levels by taking note of the businesses around as well as people moving out and about.

In 2007, James McDonell conducted a mixed methods observational study to see how neighborhood context potentially impacted children’s safety and parenting. He created a comprehensive investigation in urban/rural South Carolina neighborhoods, using surveys, semi-structured and detailed observations using a non-invasive measure for gauging neighborhood characteristics. The resulting neighborhood rating scale was designed to measure physical appearance, social appearance, safety, and public amenities. The neighborhood quality assessment value and field notes were determined and documented by the observers (i.e., the researchers, not the residents, recorded their perceptions of the neighborhoods). That information was combined with study survey and interview data for comprehensive analysis. Results inferred that neighborhood characteristics significantly impacted parents’ perceptions of children’s safety, particularly from the physical appearances component (McDonell, 2007).

I used the physical appearances subscale (PA) for this study. Each school’s neighborhood (i.e., 0.5-mile radius around the school campus) was assessed numerically on a 1-5 scale for the 10-item scale consisting of the following items: (1) condition of the dwellings, (2) condition of the yards, (3) condition of the streets, (4) condition of sidewalks, (5) trash in the residential areas, (6) indications of neighborhood name, (7) presence of for sale/rent signs, (8) presence of abandoned vehicles, (9) presence of residential decorations, (10) presence of boarded up or
abandoned dwellings. Taking photographic examples of some of these conditions around sample school neighborhoods was also part of the data collection process.

**Additional Measures**

Additional data, both quantitative and qualitative, were also collected. Using GIS mapping and Google Earth, campus square footage was calculated. Chicago Park District (CPD) locations and their associated green spaces were represented as icons on the GIS sample map. Precise longitude and latitude coordinates were determined for each school site. Skew lines were created from sample east/west and north/south averaged coordinates. The skew lines were also incorporated into the interactive GIS map.

“Field observation” (FO) variables were created from axial coding categories. These were emergent themes that emphasized aspects of the main measures or stood on their own as patterns from the school site and neighborhood descriptive data. Each of these FO variables were associated with specific conditions, either on the campus or in the surrounding 0.5 radius of the school location. These phenomena were perceived as positive or negative. Positive variable conditions were potentially adding to the outdoor experience and increasing access to environmental affordances. Negative variable conditions were possibly hindering the outdoor areas and/or potentially reducing access to environmental affordances. Sample sites were rated with a score of 0 = no, yes = 1 for each of these variables. Negative variables (e.g., conditions such cracked/rundown blacktop surfaces, broken equipment) were reverse scored so that for all field observation variable scores closer to one indicated the presence of more beneficial environmental affordances. The following table lists all documented conditions that were tabulated as field observation variables.
Table 2. Field Observation Variables

<table>
<thead>
<tr>
<th>Observation Variable</th>
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<tbody>
<tr>
<td>Children were present in the play area</td>
</tr>
<tr>
<td>The school did not have a play area for the students (no open space, no equipment)</td>
</tr>
<tr>
<td>The school only had open space for play area, no equipment (e.g., black top space/grass)</td>
</tr>
<tr>
<td>The school play area had parts that are rundown, visible wear and tear</td>
</tr>
<tr>
<td>The school play area had parts that are broken, missing pieces</td>
</tr>
<tr>
<td>The school play area had blacktop surfaces that were cracked, visible holes/debris</td>
</tr>
<tr>
<td>The school play area had pour in place (PIP) rubber surface that was cracked, visible holes/debris</td>
</tr>
<tr>
<td>Evidence children using manipulating materials (e.g., loose parts)</td>
</tr>
<tr>
<td>The school had a garden</td>
</tr>
<tr>
<td>The school had white modular garden (evidence of the Kitchen Community 2012 grant)</td>
</tr>
<tr>
<td>The school garden was tended spring 2021</td>
</tr>
<tr>
<td>The school garden was tended fall 2021</td>
</tr>
<tr>
<td>The school was a Space to Grow program participant</td>
</tr>
<tr>
<td>The school was within 0.5 miles of a CPD park</td>
</tr>
<tr>
<td>The school was located in or directly adjacent to a CPD park</td>
</tr>
<tr>
<td>The school was within 0.5 miles of a nature play area (NeighborSpace/CPD)</td>
</tr>
<tr>
<td>The school was located within 0.5 miles of a community garden</td>
</tr>
</tbody>
</table>
Analyses

Descriptives

To describe the sample of schools across the district (rather than within network as was necessary for the school selection process), risk factor quartiles were re-calculated. Ranges, means, and standard deviations were determined for across district risk index values and used to create the updated ratings (1-4) as across-district values. The continuous risk index was divided into four quartiles, so that descriptive statistics could be presented overall, as well as by these four risk level groups. Across district ratings were as follows: quartile value of 1 indicated the highest risk, 2-medium high risk, 3-medium low risk, 4-low risk. As a result of this process, half of the sample's (i.e., 30 schools) within-network values changed, 26 increasing their risk level when analyzed across the district and four schools decreasing their risk factor value. The other half of the sample’s risk index value was the same within network and across the district. Descriptive statistical analyses were conducted for all measures. Ranges, means, and standard deviations were determined for the 7Cs (overall, subscales, and indicators) and physical appearances (overall and subscales) values. For the PA assessment, there was some concern about the measure’s accuracy because of one subscale, the presence of for rent/for sale signs. Per the measure, more for rent/for sale signs indicated lower quality not higher quality. However, during my data collection period when I was visiting all the different neighborhoods, I noticed that more affluent or actively transient communities (e.g., college areas) tended to have more for rent/sale signs on display. Conversely, in areas that were more challenged and struggling economically, the presence of for rent/sale signs was much scarcer. I conducted a t-test to verify if the for rent/sale sign subscale was significantly skewing the overall PA results, comparing total PA scores with and without the subscale. Indeed, it was. Therefore, it was determined that
to improve the accuracy of PA measure, this indicator was omitted from the entire sample and no longer used for any further analyses. The 7Cs’ and PA descriptive results were sorted into the across risk index quartiles. Geographic spread of 7Cs and PA across the city were also analyzed (see below in GIS mapping). Ranges, means, and standard deviations were also tabulated for the following additional measures: campus square footage, CPD campus square footage, longitude and latitude coordinates, and field observation variables. These results were also grouped accordingly into across district risk quartiles.

**GIS Mapping**

To provide an intuitive visualization of how key variables manifested geographically, I used GIS mapping software to generate an interactive map of the entire school sample with the help of a Northwestern undergraduate research assistant. Drop-down data tables were inserted into each site point on the map with the following data: varied photo documentation from all study campuses, within network and across network risk quartiles, 7Cs’ scores, PA scores, across district risk factor quartile rating (1-4), longitude/latitude coordinates, longitude and latitude skew lines (i.e., city “equator and prime meridian”), campus square footage, CPD park locations, largest CPD park square footage w/in 0.5 radius of the school, and number of CPD parks w/in 0.5 miles radius. Some field observation variables were also recorded in the site data tables, including the following: yes/no school garden, yes/no garden tended spring 2021 yes/no garden tended fall 2021, yes/no Space to Grow school, and yes/no if school playground is in/directly next to CPD park.

Map features and icons were used to highlight phenomena from sample sites and the district. This included showcasing ranges of measures (7Cs, PA, CPD green space, and school campus square footage) to distinguish values. Icons, sometimes with color coding, were also
used to point out features, such as if there were school gardens present and what their tending status for spring/fall 2021, if the school was part of the Space to Grow program, or if the school was located within or directly next to a CPD park.

**RQ1: What is the quality of Chicago Public Schools’ outdoor play spaces and what is the relationship between play space quality and other nearby outdoor affordances?**

**RQ1a: Visual Analyses of Play Spaces and Surrounding Neighborhoods.** Visual analyses of archived photos occurred several times. Initially, all photos from each site were uploaded into the original data collection forms. These photo collections were also organized into Google Doc files that were later used in the GIS mapping process (see below). During these processes of reviewing and archiving photos, trends emerged. It became apparent that different approaches were necessary for getting a clearer picture of the complete visual analyses. Analysis techniques, ranging from narrow (construct-level), to wider (school-level), to widest (across-district qualitative themes) were identified and implemented, resulting in the sub-questions below. In the next sections, I explain the distinct visual analysis approaches that were applied.

**RQ1aa: Individual 7Cs Constructs.** Individual 7Cs’ constructs that composed the seven measure categories (character, context, connectivity, clarity, change, chance, challenge) were explored deeply, both numerically and visually, to understand how they manifested in CPS. Descriptive statistical analyses for all 7Cs’ category items were conducted. For each individual “C” construct (e.g., character, chance), photo examples and field notes for the individual items and their conditions were examined in detail. Representatives of high and mediocre quality were compiled, and this item-level data and graphics (tables and maps) were created to showcase the results.
**RQ1ab: Overall School-Level Visuals.** For this section of the analyses, the full range of overall 7Cs’ scores were considered and then grouped according to three levels: low-, medium-, and high-rated schools. The purpose of this level of the visual analysis was to take the focus off the 7Cs measure constructs one at a time and move it to the level of schools-as-participants. Photos and field notes were revisited, and three schools were selected as representatives for these rating level groups. Specific photos from the three individual schools that were selected for low-, medium-, and high-rated examples for the district 7Cs’ measures were compiled to provide a cohesive picture of what schools commonly looked at these various levels of play space quality.

**RQ1ac: District-Level Qualitative Themes.** For this part of the visual analysis, all data sources, including but not limited to the 7Cs, were used to determine CPS play space qualitative themes. All data was reviewed. Photos and field notes were open and axial coded. Specifics from the field observation variable descriptive statistics and qualitative coding were considered. Emergent themes were identified and then used as a guide to get a better understanding of conditions or trends that were true for most sample schools in order to be able to draw some conclusions about the district as a whole. This also included outliers or “special cases” which were grouped together and analyzed individually.

**RQ1b: Comparison of Chicago and Vancouver 7Cs.** To verify that my 7Cs’ ratings and associated field notes were reasonable assessments, I attempted to locate empirical and observational 7Cs data from assessments previously conducted on outdoor play areas. As mentioned above, I was able to acquire raw data 7Cs assessments of preschool play spaces in Vancouver. I compared my 7Cs’ scores with the UBC-SALA students’ data to get an idea of how others were rating outdoor play areas for preschool students. This was an effort to clarify if my 7Cs’ ratings were at least within range for similar urban and young children focused spaces.
also looked carefully at their field notes, attempting to find any parallels or patterns with my work.

**RQ1c: Associations between Play Space Quality (7Cs) and Surrounding Features.** To answer this part of RQ1, correlations were conducted between 7Cs and risk index, PA, and campus square footage. I predicted that 7C’s would be positively correlated with (reverse) risk (recall that higher numbers indicate lower risk), positively correlated with PA, and positively correlated with campus square footage. If true, these associations would be another indicator that 7Cs is a valid measure to employ in Chicago, and supportive of the substantive idea that play space quality covaries in expected ways with surrounding features beyond the playground area itself.

**RQ2: Are there any qualities or opportunities suggested by the school campus, nearby neighborhood affordances, or a combination, that could allow fast and/or low-cost improvements to enhance children’s experiences during their time outside at school?**

RQ2 does not have any sub-questions, but rather is an overall investigation of issues beyond the typical limited conceptualization of “playground” (i.e., the built jungle gym space). This question attempts to “widen the lens” to suggest how some of these broader features or opportunities could be capitalized upon, with limited resources, to enhance the outdoor affordances and opportunities available to CPS children during the school day. I used information from field observation variables, campus square footage descriptive statistics, photos, and field notes, while I considered full campus spaces and local outdoor resources within a 0.5 mi radius. This data was analyzed qualitatively/thematically, and also quantified when possible (e.g., how many schools were close to community gardens). These analyses were focused on how schools were observed using outdoor spaces, on and off the full campus, and
if/how the outdoor affordance access could possibly be improved quickly and economically by considering extending space usage outward. Themes emerged and were analyzed in detail to explore opportunities, strengths, and possible increases in affordances. In addition, I collated data for the ten study schools who had the lowest overall 7Cs’ scores to assess them for strengths and any possible additional affordances, both on and off campus within walking distance (<.5mi) that could enhance the outdoor experience for children while at school.
CHAPTER FOUR

RESULTS

Refining Sample Due to COVID-19

Since this was a study that took place in the context of COVID, there were days when students were remote learning (Wednesdays in spring 2021) or simply not present on the playground when the evaluations took place. There were also instances when the observation was after school hours or on the remote day when there were children present. Additionally, one of the conditions of the 7Cs’ subcategories (clarity-zones) was only scored if children were present because the specifics in the descriptor referred to designated locations that children use.

We collected data on whether children were present on the playground and conducted analyses to determine if children’s presence impacted the results. The first data collected was a visual inspection of the 7Cs means in the overall sample \(n = 58\), 60 were evaluated but two schools did not have any play spaces), when children were present \(n = 37\), and when they were not \(n = 21\). The means were: children present \(M = 62.14\) (SD =18.05) and children not present \(M = 49.93\) (SD = 11.65), which suggested that children’s presence probably did make a meaningful difference, with the inconsistency possibly posing a threat to the 7Cs validity, and further analyses were required. I therefore conducted independent samples t-tests on the aforementioned means with children present/not present as the grouping variable and 7Cs as the dependent variable. The t-test was significant \(t = 3.124, p < .003\) suggesting that raters assessed the play spaces as being of higher quality when children were present. This called the validity of the overall 7Cs measure into question for the “no children present” condition.
To determine whether the difference was isolated to subscales that might require more live interaction for their quality to “come to life” (e.g., *chance*), I conducted another set of independent samples’ t-tests with all the subcategories of the 7Cs assessment (*character, context, connectivity, clarity, chance, change, challenge*) as the dependent variables. All were significant (*p* values ranging from <.001 for *challenge*-.039 for *clarity*) in the same direction, suggesting a higher 7Cs rating when children were present. This indicated that the impact of children’s presence was not isolated to particularly interactive subscales, and that we rated the play spaces lower across the board when there were no children interacting with the space.

We had hoped that we could “work around” the unusual circumstances of the data collection period due to COVID, but the results showed this not to be the case. Given the fact that the 7Cs measure was developed with children’s presence intentionally included, we had to conclude that the data with the children present was the more valid data. Therefore, I concluded that we had to remove the 21 schools without children present during data collection (i.e., inaccurate data) from the study sample in any analyses that included the 7Cs measure. However, to determine whether this drastic attrition would bias the data in other ways, further analyses were in order. For example, would we be inadvertently removing higher-risk schools or schools from neighborhoods with lower quality environs? Would the smaller sample have significant geographical spread over CPS networks and Chicago neighborhoods? Or fair representation across district risk factor quartiles?

I visually inspected the risk index means from the sample when children were present (*n* = 37) and when children were not present (*n* = 21). The risk index means were *M* = 0.035 (SD = 0.81), and *M* = 0.21 (SD = 0.70) respectively, which suggested only small differences in the risk index values of the different conditions. I performed a t-test, using the children present/children
not present condition for the grouping variable and risk index as the dependent variable. For example, a significant difference (if present) might suggest that lower risk schools were able to have children be present in person sooner, or conversely, that lower risk schools were taking more precautions and keeping remote learning in place for longer. Fortunately, the school risk factor was not significantly different ($t = 1.22 \ p = .23$) if children were present or not when the evaluations took place. This reassures us that the sample was still representative of the risk factor range we find in CPS collectively.

Next, I performed the same analyses but with PA as the dependent variable, to determine if children’s presence or non-presence was associated with neighborhood quality, suggesting bias created by the sample attrition. I visually inspected the PA means from when children were present ($n = 37$) and when children were not present ($n = 21$). The PA means were $M = 26.19$ (SD = 7.73), and $M = 23.72$ (SD = 6.24) respectively, which suggested a lack of association between the variables given the relatively similar means. To verify this thinking, I performed another t-test, still using the children present/children not present condition for the grouping variable and neighborhood physical appearances as the dependent variable. Neighborhood physical appearances were not significantly different ($t = 1.36 \ p = .18$) based on whether children were on the school campuses at the time of the assessment.

While the direction of the risk index and neighborhood physical characteristics’ means were consistent with the 7Cs’ results (i.e., neighborhoods that had children on the playground had slightly higher scores and schools with lower risk were slightly more likely to have children present on evaluation days), both $p$-values for risk index and neighborhood physical characteristics were non-significant. This suggested that children’s presence on data collection day was not dictated by the needs-level of the school or neighborhood physical appearances.
We conducted one final exploratory analysis of whether children’s presence or absence created any bias in the sample. We used the GIS mapping tool to visualize geographic sample spread over all of Chicago’s neighborhoods/CPS networks. As mentioned earlier, 60 schools made up the total original sample. However, 37 of these 60 schools had children present, 62% of the evaluated play areas. When looking specifically at the geographic spread of these 37 schools with children present, all CPS networks (except for networks 12 and AUSL, which has disbanded since initial data collection) have sample representation. Even distribution across the city is apparent when visually analyzing the spread of the 37 schools on the map (see Figures 5 and 6).

All analyses above considered, I concluded that while 21 is a high level of attrition out of a sample of 60, removing these schools from the sample with respect to 7Cs’ analyses improved validity of the study, and did not introduce bias in key variables. Moving forward at this point in the study, only the refined sample with 37 schools will be used for any additional 7C’s analyses.
Figure 5. Children not present RED/Children present GREEN. Original sample $n = 60$. 
In this section, I share the overall descriptive statistics for all the quantitative variables in the study. Included here are the results for the main measures: Risk index, 7Cs, physical appearances, and additional field observation (FO) variables, including campus square footage and additional emergent codes that were identified from the axial coding process.
School Risk Level

Recall as mentioned in methods, all variables were grouped by across district risk factor to observe any possible patterns. The risk index overall mean was $M = -0.06$ ($SD = .77$) and the following table shows the risk index mean values by risk quartile: high risk (1), medium risk (2), medium low risk (3), and low risk (4).

Table 3. Risk Index Descriptives

<table>
<thead>
<tr>
<th>Risk Quartiles</th>
<th>Mean (Standard Deviation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=15</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>-1.07 (0.44)</td>
</tr>
<tr>
<td>2</td>
<td>-0.26 (0.11)</td>
</tr>
<tr>
<td>3</td>
<td>0.21 (0.15)</td>
</tr>
<tr>
<td>4</td>
<td>0.89 (0.30)</td>
</tr>
<tr>
<td>Sample totals</td>
<td>-0.06 (0.77)</td>
</tr>
<tr>
<td>n=60</td>
<td></td>
</tr>
</tbody>
</table>

7Cs Descriptives

In this portion of my results, 7Cs’ descriptives are discussed. Ranges, means, and standard deviations for the 7Cs’ categories and overall 7Cs’ scores were presented. Additionally, trends evident from the 7Cs measure for the whole district sample were identified. The following table includes the descriptive statistics for the 7Cs measure overall as well as by risk index quartiles.
Table 4. 7Cs Descriptives by Risk Index Quartile Groups

<table>
<thead>
<tr>
<th>7Cs categories</th>
<th>RQ1 (n = 7)</th>
<th>RQ2 (n = 11)</th>
<th>RQ3 (n = 8)</th>
<th>RQ4 (n = 11)</th>
<th>Sample totals (n = 37)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean  SD</td>
<td>Mean  SD</td>
<td>Mean  SD</td>
<td>Mean  SD</td>
<td>Mean  SD</td>
</tr>
<tr>
<td>Context</td>
<td>12  3.25</td>
<td>11.32  4.06</td>
<td>12.88  2.18</td>
<td>15.64  4.27</td>
<td>13.07  3.94</td>
</tr>
<tr>
<td>Connectivity</td>
<td>7.21  2.87</td>
<td>6.55  2.16</td>
<td>8.13  1.96</td>
<td>9.23  2.73</td>
<td>7.81  2.59</td>
</tr>
<tr>
<td>Clarity</td>
<td>7.29  3.15</td>
<td>7.32  3.18</td>
<td>7.63  1.41</td>
<td>10.18  2.72</td>
<td>8.23  2.93</td>
</tr>
<tr>
<td>Chance</td>
<td>1.71  0.81</td>
<td>1.68  0.78</td>
<td>1.94  0.68</td>
<td>2.36  1.03</td>
<td>1.95  0.86</td>
</tr>
<tr>
<td>Change</td>
<td>11.71  4.12</td>
<td>10.09  2.91</td>
<td>12.31  2.43</td>
<td>13.46  3.89</td>
<td>11.88  3.51</td>
</tr>
<tr>
<td>Challenge</td>
<td>4.43  1.17</td>
<td>4.18  1.08</td>
<td>4.81  0.92</td>
<td>5.5   1.29</td>
<td>4.76  1.21</td>
</tr>
<tr>
<td>7Cs total</td>
<td>57.36 18.46</td>
<td>53.91 17.15</td>
<td>62.25 9.91</td>
<td>73.32 19.42</td>
<td>62.14 18.05</td>
</tr>
</tbody>
</table>

Note. Risk Quartile = RQ.1 = high 2=medium-high 3=medium-low 4 = low.

As shown in Table 5, there was a wide variance in 7Cs’ scores found across the study sample. The lowest overall 7Cs score was 29 and the highest was 104. Interestingly, Quartile 2 consistently has the lowest means, rather than Quartile 1 as one might expect. This is likely the case because the Space to Grow (S2G) playground improvement initiative is concentrated in the highest risk neighborhoods. Indeed, there are a greater number of S2G schools in quartile 1. The following map shows the study schools’ overall 7Cs’ scores at their locations. Larger circles indicate higher 7Cs’ scores. Clearly, different levels of 7Cs’ scores (low, medium low, medium high, and high) are found in all sections of the city (NE, NW, SE, SW) and CPS networks, suggesting that there does not seem to be systematically lower or higher play space quality in particular portions of the city.
Figure 7. Overall 7Cs’ scores for the entire sample across district, the larger the circle the higher the score.

Overall, 7Cs descriptives indicate that most CPS schools had “run of the mill” play spaces, with average degrees of quality according to their 7Cs scores. Specifically, for the categories of the 7Cs measure (character, context, connectivity, clarity, chance, change and challenge), their prospective subcategories mean ratings ranged between 0-3 (out of 5) (see Table 5). These results showed that across the district, the 7Cs’ ratings for all descriptors from each subcategory were of low-medium quality. Most of the subcategory ratings were evaluated
between 2-3 (medium-low, medium). However, there were a few subcategories that had average ratings under 2 (low), which I investigated further below in RQ1aa and RQ1ab.

**Neighborhood Physical Appearances (PA) Descriptives**

Physical appearances’ ratings across the study sample also demonstrated a widely distributed range. The following table shows the PA descriptive results for all categories, total ratings as well as by risk index quartile groups.

Table 5. Physical Appearances: Minimums, Maximums, Means & Standard Deviations Grouped by Risk Index Quartile Groups and Full Sample (FS)

<table>
<thead>
<tr>
<th>Physical appearances</th>
<th>RQ1 (n = 7)</th>
<th>RQ2 (n = 11)</th>
<th>RQ3 (n = 8)</th>
<th>RQ4 (n = 11)</th>
<th>FS (n = 37)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Dwelling</td>
<td>2.3</td>
<td>0.8</td>
<td>0.9</td>
<td>0.8</td>
<td>0.7</td>
</tr>
<tr>
<td>Yard</td>
<td>2.7</td>
<td>1.0</td>
<td>0.6</td>
<td>0.6</td>
<td>0.8</td>
</tr>
<tr>
<td>Street</td>
<td>1.7</td>
<td>0.4</td>
<td>1.0</td>
<td>0.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Sidewalk</td>
<td>2.2</td>
<td>0.3</td>
<td>0.5</td>
<td>0.8</td>
<td>0.3</td>
</tr>
<tr>
<td>Visible trash</td>
<td>2.5</td>
<td>0.5</td>
<td>2.32</td>
<td>0.32</td>
<td>3.06</td>
</tr>
<tr>
<td>Neighborhood Name</td>
<td>1.2</td>
<td>0.3</td>
<td>1.0</td>
<td>0.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Abandoned</td>
<td>3.3</td>
<td>1.4</td>
<td>1.7</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Vehicles</td>
<td>1.4</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
<td>0.9</td>
</tr>
<tr>
<td>Decorations</td>
<td>1.4</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
<td>0.9</td>
</tr>
<tr>
<td>Abandoned</td>
<td>2.5</td>
<td>1</td>
<td>2.96</td>
<td>5</td>
<td>3.81</td>
</tr>
<tr>
<td>PhysicalAppearances</td>
<td>21.5</td>
<td>6.4</td>
<td>22.5</td>
<td>6.9</td>
<td>26.3</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

Note. Risk Quartile = RQ. 1 = high 2=medium-high 3=medium-low 4 = low.
The lowest physical appearance score was 11 and the highest was 38. PA total scores mean was $M = 26.19$ ($SD = 7.73$). Not surprisingly, in the far NW and SW communities, higher scores were more common, where white middle class and/or city workers tend to populate. Areas with lower PA scores were slightly more concentrated just southeast of the latitude skew line and west of the longitude skew line. The following map shows the geographic PA spread across Chicago. PA scores were spread out to some degree; there were low, medium low, medium high and high physical appearances’ scores in all city areas (NW, NE, SE, SW).

![PA map larger circle, larger PA w/longitude and latitude skew lines.](image)

Street conditions were notably poor across the city. Affluence did affect this slightly but not to the degree one might have expected. Boarded-up buildings, visible trash, and abandoned vehicles often indicated lower quality. However, if there was a local auto mechanic or even
someone who worked on cars for a hobby and they had a visible collection, according to the measure this would be evaluated as lower quality. There were also a few instances in population dense northside neighborhoods that were of medium-high/high quality where there was more visible trash. In some ways, I felt that when I was applying this tool, it told a familiar story comparable to real estate websites that rate Chicago neighborhoods’ quality. On its own, it was not detailed enough to really capture and evaluate Chicago’s diverse neighborhoods’ physical appearances. However, what did occur when I was conducting the PA measure was that I was able to discover “hidden gems” like community resources (e.g., block clubs, NeighborSpace gardens), unique features (e.g., art installations), and/or natural phenomena (e.g., abundant park space, old trees, people growing food at home/in the street parkways etc.). I also was able to observe some specifics regarding neighborhood challenges (e.g., CPD parks were not well maintained, limited active businesses, transportation access challenges etc.). I found my observational information to be more pertinent to this investigation rather than the actual PA measure ratings. Nonetheless, the PA rating scale provided a course baseline assessment of the physical conditions of school neighborhoods.

**Campus Square Footage**

There was a large variance across the district with school campus square footage. The minimum value was 22,533.72 square feet and the maximum value was 118,925.49 square feet. The mean for the sample schools \( (n = 60) \) was \( M=118,925.46 \ (SD=85,959.27) \). This space quantity variance was found all over the city as well. The map below is of the sample and corresponding campus square footage data. As you can see, there are schools that have larger and smaller square footage quantities in all city quadrants. Expectedly, towards the outer edges of the Chicago city boundaries, the square footage tended to get larger (e.g., far NW, far SE, far W).
Figure 9. School sample (n = 60) campus square footage across the district. The first number in circles is CPS network; second number is risk quartile.

Based on my rough dimensional estimates that were taken using a rolling measuring tape during initial field collection, the campus equipment area spaces normally ranged between approximately 1,600-10,000 sq. feet. These were also the most common places that children were observed playing outdoors. Play areas were often a smaller fraction of the campus total areas, compared to other parts of the space (e.g., sports fields, black top/sidewalk open areas, grass spots, landscaping etc.).
Field Observation Variables

Most of the field observation variables emerged dynamically from axial coding of field notes and photos. Recall all variables were treated dichotomously and some of these variables were related to on/off campus features and/or conditions that were positive or negative.

Table 6. Field Observation Variables Percentages (n = 60)

<table>
<thead>
<tr>
<th>Field observation variables</th>
<th>Schools w/ FO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Had campus garden</td>
<td>65%</td>
</tr>
<tr>
<td>Had white modular beds</td>
<td>47%</td>
</tr>
<tr>
<td>Had other materials for garden set-up</td>
<td>27%</td>
</tr>
<tr>
<td>Tended in spring 21</td>
<td>22%</td>
</tr>
<tr>
<td>Space to Grow program participant</td>
<td>12%</td>
</tr>
<tr>
<td>In/directly next to CPD park</td>
<td>27%</td>
</tr>
<tr>
<td>Rundown/wear and tear visible</td>
<td>85%</td>
</tr>
<tr>
<td>Rundown/cracked blacktop</td>
<td>72%</td>
</tr>
<tr>
<td>Rundown cracked surface turf/PIP</td>
<td>48%</td>
</tr>
<tr>
<td>Had broken/missing pieces</td>
<td>55%</td>
</tr>
<tr>
<td>Loose part work evident</td>
<td>32%</td>
</tr>
</tbody>
</table>

Unlike the other measures, the field observation variables’ descriptive information was used to clarify qualitative themes. Sometimes, these variables emphasized certain details of the 7Cs measure that were quite evident in CPS/Chicago outdoor areas. Sometimes these showcased
unique resources. These FOs’ results are expanded upon further in section RQ1ac and RQ2 below.

**RQ1 - What is the quality of Chicago Public Schools’ outdoor play spaces and what is the relationship between play space quality and other nearby outdoor affordances?**

**RQ1a: Visual Analyses of Play Spaces and Surrounding Neighborhoods**

In this section of the results, the goal was to provide the reader with a deep and detailed visual analysis of the quality of CPS playgrounds. Each of the three subsections provide a somewhat different lens on the issue of play space quality. As introduced in “Methods”, in RQ1aa, individual constructs of the 7Cs measure are examined numerically and visually (photos and maps). In RQ1ab, overall 7Cs’ results are analyzed for three individual schools that serve as sample representatives with low, medium, and high overall scores to illustrate what schools look like at these varying degrees of play space quality. In RQ1ac, I explored emergent qualitative themes, using all data sources, to describe trends that were true of most of CPS as whole. Each of these sub-questions’ results will now be presented in turn.

**RQ 1aa: Individual 7Cs Constructs.** In this section, some individual 7Cs constructs were explored deeply to illustrate how they manifested in CPS. In the following table, I presented the finest grain subcategories that compose the 7Cs’ categories. From this item-level data, I chose which constructs for which to provide visual demonstrations.
Table 7. 7Cs Items (n=37)

<table>
<thead>
<tr>
<th>7Cs categories</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Character</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Build quality</td>
<td>2</td>
<td>5</td>
<td>3.15</td>
<td>0.92</td>
</tr>
<tr>
<td>Atmosphere</td>
<td>1</td>
<td>5</td>
<td>3.10</td>
<td>0.95</td>
</tr>
<tr>
<td>Vegetation</td>
<td>1</td>
<td>5</td>
<td>2.97</td>
<td>0.99</td>
</tr>
<tr>
<td>Surface material</td>
<td>1</td>
<td>5</td>
<td>2.78</td>
<td>1.01</td>
</tr>
<tr>
<td>Light quality</td>
<td>1</td>
<td>4.5</td>
<td>2.45</td>
<td>0.93</td>
</tr>
<tr>
<td><strong>Context</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health safety</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>0.92</td>
</tr>
<tr>
<td>Micro-climate</td>
<td>1</td>
<td>3.5</td>
<td>1.61</td>
<td>0.73</td>
</tr>
<tr>
<td>Views looking out</td>
<td>1</td>
<td>4.5</td>
<td>2.87</td>
<td>0.89</td>
</tr>
<tr>
<td>Views looking in</td>
<td>1</td>
<td>5</td>
<td>2.95</td>
<td>1.02</td>
</tr>
<tr>
<td>Boundaries</td>
<td>1</td>
<td>5</td>
<td>2.65</td>
<td>1.08</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entrance exits</td>
<td>1</td>
<td>4.5</td>
<td>2.77</td>
<td>0.83</td>
</tr>
<tr>
<td>Pathway hierarchy</td>
<td>1</td>
<td>5</td>
<td>2.42</td>
<td>1.12</td>
</tr>
<tr>
<td>Moving around space</td>
<td>1</td>
<td>5</td>
<td>2.62</td>
<td>1.02</td>
</tr>
<tr>
<td><strong>Clarity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td>1</td>
<td>5</td>
<td>2.99</td>
<td>1.11</td>
</tr>
<tr>
<td>Zones</td>
<td>1</td>
<td>4</td>
<td>2.84</td>
<td>0.99</td>
</tr>
<tr>
<td>Seating</td>
<td>1</td>
<td>5</td>
<td>2.41</td>
<td>1.20</td>
</tr>
<tr>
<td>Logistics</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Chance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mystery</td>
<td>1</td>
<td>4</td>
<td>1.95</td>
<td>0.86</td>
</tr>
<tr>
<td>Loose parts</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Messy zones</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Change</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Different sized spaces</td>
<td>1.5</td>
<td>5</td>
<td>2.87</td>
<td>0.83</td>
</tr>
<tr>
<td>Space range</td>
<td>1</td>
<td>4</td>
<td>2.9</td>
<td>0.77</td>
</tr>
<tr>
<td>Activity variety</td>
<td>1</td>
<td>5</td>
<td>2.90</td>
<td>0.97</td>
</tr>
<tr>
<td>Ground plane</td>
<td>1</td>
<td>4</td>
<td>1.5</td>
<td>0.90</td>
</tr>
<tr>
<td>Materials</td>
<td>1</td>
<td>3.5</td>
<td>1.69</td>
<td>0.67</td>
</tr>
<tr>
<td><strong>Challenge</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risky play</td>
<td>1</td>
<td>3</td>
<td>2.22</td>
<td>0.57</td>
</tr>
<tr>
<td>Graduated challenge</td>
<td>1</td>
<td>4</td>
<td>2.54</td>
<td>0.72</td>
</tr>
</tbody>
</table>

As Table 7 shows, all item-level ratings averaged from 0-3 (low to medium). The majority were evaluated between the 2-3 rating range. However, there are some that were clearly low (1-2): content-microclimate $M = 1.61$, chance-mystery $M = 1.95$, change-ground plane $M = 1.69$. 
1.5 and \( change\text{-}materials \, M = 1.69 \). There were also three items that were not measurable because of floor-level existence: \( clarity\text{-}logistics \), \( chance\text{-}loose \text{ parts} \), and \( chance\text{-}messy \text{ zones} \). These specific items were explored further.

In the \( logistics \) item in the \( clarity \) category there were no examples of spaces where materials were “easy to set up or pack away.” This is important because storage and easy movement of materials makes play spaces more dynamic and easier for teachers to change and keep fresh for the children. The only examples of any storage were freight train containers and what was inside was unknown. Therefore, this was rated as a 0 score for all schools in the sample.

Figure 10. Logistics subcategory, only visible storage on campuses, not related to play areas.

In the \( chance \) category, \( loose \text{ material plays} \) and \( messy \text{ zones} \) items were not possible to tabulate numerically because of floor levels of evidence. There were no clear options on CPS campuses for children to manipulate any natural objects or any designated messy zones where students could work with water, sand, or dirt. It was certainly possible that teachers occasionally organized some version of this type of play and took it down, leaving no signs of it for us to
observe. For the observations, however, we had no choice but to rate these items as 0 for all study schools.

However, even though no “school-sanctioned” opportunities for loose parts or messy play were provided, there was evidence that children found a way to create adjacent types of play for themselves anyway. This was determined both from observing children play this way as well as from their arrangements of these types of materials they left behind. On 32% of the outdoor spaces, there was some evidence of children using loose parts for their play. For example, I observed some older elementary students waiting on a younger student to come out from the school, sitting at a picnic table arranging tree debris (seeds, sticks, etc.) into different designs. On several campuses, it was apparent that children were collecting rocks, sticks, and random objects and placing them underneath the slides. Children even used broken pieces of equipment/PIP surface pieces as well for loose part play. The following photos showcase these examples.

![Figure 11. 0203 (West Rogers/Little India) observed children pushing small sticks under the slide; 0903 (Canaryville) located rocks stored underneath a small hole in the slide base.](image-url)
Figure 12. 0103 (Norwood Park) child playing with piece of broken PIP surface as loose parts.

As you can see, even though loose parts and messy zones were not clearly a part of the designated outdoor experience for CPS students, children were nevertheless engaging in this type of play.

In addition to logistics, loose parts, and messy zones, there were four additional items that were rated at near-floor levels collectively across the district: microclimate, mystery, ground plane, and materials. The microclimate item in the context section mean was $M = 1.61$ (out of 5). Many of the district play areas were exposed to weather conditions. Collectively, minimal shelter and shade were noted. The following set of pictures shows an example of what an exposed outdoor play area looked like. The only opportunity for any shelter or protection from conditions in this space was underneath the play equipment platforms. There were a few schools that did have some type of shelter, but this was rare.
Figure 13. 4403 (Lakeview) different components of the play areas and campus features, minimal shade from some of the perimeter plants, no shelters.

Figure 14. 0203 (Albany Park); left-tarp shelter with active school garden 0801 (Brighton Park) Right - Space to Grow participant school seating with shelter.

In Figure 14 (left), the school garden was very active both in spring and fall 2021 and the tarp pictured here was the only shelter present on the campus. In Figure 14 (right), this school
was a participant in the Space to Grow program, a study outlier group that is further analyzed later in the results, section RQ1ac.

In the chance section, the mystery item mean was $M = 1.95$ (out of 5). Recall that in the 7C’s vernacular, the mystery indicator means features/materials promote exploration (e.g., places to look behind, stand on for prospect, crawl into, look up to, etc.). The materials and areas that promoted exploration were somewhat limited. Many schools had standard platform high points on the play equipment that students could stand on for prospect. However, options that invited students to crawl into or look behind/into were sporadic and dependent on the equipment, most commonly some form of climbing tubes, such as in the following photos.

![Figure 15. M = Mystery - 0802 (Back of the Yards) upper left, climbing archways and potential vistas from equipment platforms; 0501 (upper right Wicker Park) 4601 (lower left South Shore), 0202 (lower right Uptown) climbing tube examples.](image)

Children were observed crawling on top of and underneath the climbing archway and observing the adjacent field in the upper left photo of this collection. The remaining three photos are clear examples of the climbing tube options that were commonly found at different play
areas. As the only options, these slide tubes did not provide adequate opportunities for children to experience mystery.

The *ground plane* item in the *change* section mean was 1.5 (out of 5). Recall that *ground plane* evaluates interesting variations in topography, of which there were few. Most campuses were flat. Only two in the entire sample had hills and a few of the school playgrounds incorporated mounds, such as in the following examples.

![Figure 16. Ground plane - 0204 (Ravenswood) left, mounds on play area; 1201 (Chatham/Avalon Park) hill.](image)

The *materials* item in the *change* section mean was 1.67 (out of 5). Remember, the *materials* item description refers to these changing seasonally. The only materials observed at different data collection periods that changed with the seasons were some of the campus landscaping and garden plants. For example, during the fall 2021 visits, some of the deciduous trees’ leaves had already begun to change colors. Some of these seasonal materials were used as loose parts by the children. However, recall that loose parts were not readily incorporated into the outdoor experience for them but rather a byproduct of the natural way that children play and
manipulate their environments. Foliage quantity and quality was the primary driver of seasonal material variance. Therefore, schools with limited plants had very little if any seasonal change. Campus foliage was analyzed further as part of *nature interactions*, an emergent theme explored in detail later in this results section. With two of the subcategories of change at such low levels, this obviously impacted the overall score. This is an example of the lack of dynamism that was evident in many play areas around the city. This phenomenon is also further explored as an emergent theme in section RQ1c.

**RQ1ab: Overall School-Level Visuals.** In this section, examples of entire schools with play areas with low, medium, and high overall 7Cs’ scores were explored. The following photo collection (see Figure 17) shows the school example that had the lowest overall 7Cs rating, total = 29.

![Image of school example with low 7Cs rating](image1)

Figure 17. 0503 (Garfield Park) sample of one of schools with the lowest 7Cs. Broken equipment, equipment off set in SE corner on deteriorating blacktop, dumpster/overgrown caged garden view, broken electrical box that children could open.
This school had extensive wear and tear, broken/vandalized equipment, and a modular design that was set on deteriorating PIP rubber surface and blacktop. It was completely exposed with no vegetation in the play area and hardly any on campus at all (e.g., limited grass/landscaping). There were no clear pathways or seating areas. The play space view included school dumpsters, a fenced in overgrown modular garden, and an alley. There was a broken electrical box that children could open within reach and sight of the play equipment. On my second visit in fall 2021, I noted that new equipment and some surfaces had been installed, which can be seen in the photo collection in Figure 18.

Figure 18. 0503 (Garfield Park) old equipment replaced with new equipment, untended garden, broken electrical box remained fall 2021.

If reevaluated, these changes would have improved this school’s 7Cs’ scores. However, the overall design and feel remained the same, including the broken fencing, untended garden, and accessible rundown electrical box.

Below is an example of a school that was in the mid-range for the overall 7Cs, with a score of 62. This spot had two different play equipment set ups, one for 3-5 yrs. and the other for
5-12 yrs. next to each other. The one for younger children was older, having more notable wear and tear. The one for the older children included swings. The space was large and had a grass field and blacktop areas where children also were permitted to play. Students were observed playing soccer, kickball in the field, hanging out with friends, and climbing around on the equipment (*note these students were older elementary students, most likely 5-6th graders). There was limited bench seating that students were using to socialize on the day of my visit. They also occupied some of the platform areas on the equipment where they talked in small groups. Many surfaces were rundown and cracking. An uprooted street sign was left in the SE campus corner and was present during both spring and fall 2021 data collection visits. The campus had artwork, a modular garden, a tree lined/fenced perimeter, and a long grassy area by the main entrance that included landscaping. The garden was fenced off completely. However, it was tended and was overgrown with tomatoes in the fall of 2021.

Figure 19. 1003 (West Lawn) sample of a midrange 7Cs, two different play spaces and swings (one older, one newer), large open field, blacktop around campus cracked and rundown, some wear and tear on equipment, tree lined/fenced perimeter.
One of the strengths of this campus was the ample space that was available to the students to use during their outdoor time. Trees of various sized lined the school perimeter, growing in the neighborhood street parkway. This helped to soften the space and created some light differentials as well.

In the next photo collection (see Figure 19), I found an example of a campus with an overall 7Cs score of 78. (Note that I did not choose the very highest 7Cs score found because that campus was unique and grouped with other district outliers that are discussed as an emergent theme in section RQ1ac.) This higher quality example campus had a large area for children to utilize with different sections that opened options for various activities. There was a somewhat rundown grass field with a baseball field next to a large black top area. There was a modular garden that was tended in both spring and fall 2021 located at the southeast end of the blacktop. The play equipment was newer. There was an area towards the back end of the school that had more developed garden space, labeled as an outdoor classroom.

Figure 20. Beverly SSW: 1004 newer play equipment, large space and students using field for kickball, blacktop and long street sidewalk, outdoor classroom, tended garden both modular in class area, landscaping, foliage and light differential variety.
One of the biggest strengths of this space, in addition to the fact that it was a large campus, was that children were permitted to use the space in a variety of ways. Observed activities included playing kickball in the grass field, doing sidewalk artwork, playing with the equipment, hanging out with friends, and using the blacktop for basketball. Also, this was one of the few schools in the study that identified part of the outdoor area as a classroom.

**RQ1ac: District-Level Qualitative Themes.** In this section, I used all data sources (including but not limited to the 7Cs), to deduce overall qualitative themes related to the visual quality of CPS play spaces. In other words, this section describes schools not at the individual construct level, nor at the individual school level, but overall trends across the CPS district. The following themes were concluded after an extensive open and axial coding process of study of visual documentation and fieldnotes: (1) collective wear and tear, (2) lack of dynamism, and (3) nuanced natural elements. For each of these categories, overall theme evidence is presented first, and exceptions follow. Even if there was district-level evidence for a weakness in the play space quality, I included contrasting strengths or exceptions to help clarify my critique, as it can be difficult to visualize a lack of something. I also included a fourth qualitative category to discuss sample outliers I felt were worthy of highlighting, such as unique features or campuses that were part of limited and targeted efforts to improve play space quality (i.e., schools with Space to Grow grants). All emergent themes, strengths and challenges, highlighted features, and outliers were explored in detail and analyzed using collected photos as visual evidence for these conclusions.

**Collective wear and tear.** Across the study sample, it was more common to see campuses that appeared worn down, with evidence of wear and tear, than those that were in good condition. From the analysis of field notes and photographs of the spaces observed, 85% were
described as rundown or having significant wear and tear and 55% had evidence of broken or missing pieces in the equipment. The next collection of photos (see Figure 21) from a single school depicts wear and tear.

Figure 21. 1301 (Kensington SS) poor play space quality.

As you can see, the built equipment was quite rundown and there were several parts of the equipment and surfaces that were broken. The campus did have some diverse foliage, a large grass field as part of the play area and was adjacent to a CPD park. However, neither the park nor play area was well maintained. There was graffiti, missing pieces, and significant wear and tear. Additionally, I discovered (per a conversation I had with an engineer on campus) that a cement post barricade was installed between the two spaces as an attempt to prevent people from driving over the grass. Despite this effort, there were still tire tracks visible in the fields. Missing
parts and deterioration were observed at several other schools as well, such as in Figure 22 below.

![Figure 22. 1304 (Eastside SSE) left - missing monkey rings and zip slide, right - plants growing through the surface, deteriorating metal platforms, chipping paint.](image)

Here, the equipment was missing rings for children to use for climbing. Also, the zipline did not have the apparatus that children use to zoom across it. The metal platforms were dipping, rusting, and deteriorating. Paint was chipping in many spots. There were missing patches of grass in the field. The PIP rubber surface was coming apart in some spots and some plants were even growing through some of the cracks. In the next set of photos, there was also chipping paint, deteriorating platforms, and a missing zipline apparatus. Something that stood out in this photo set (see Figure 23) were the bricks, coming loose from the short border wall between the equipment and courtyard areas. They had been laid right next to the wall and were easily accessible to the students who used the space. Also, several floor planters were empty in the courtyard.
Situations like benches and/or planters with parts missing or broken fences with residual wiring were common. There were several instances where broken objects and/or debris were left around play areas and campuses. I observed a rusted pipe framed out on the SE corner of the campus perimeter in the exact same position spring and fall 2021. I saw an overturned street sign and post on the SE corner of the campus perimeter in the exact same position spring and fall 2021. These examples of broken materials were not only negligent but sometimes dangerous as well.
Figure 24. 1202 (upper left Eastside) broken benches in sport field; 0602 0201 (lower left Canaryville and Rogers Park); 0401 (right Hermosa) missing wood slate from bench, frayed ends.

Figure 25. 0703 (East Pilsen, upper left) rusting pipe frame, present spring and fall 2021; 1003 (Westlawn, lower left) fallen street sign and pipe metal, present spring and fall 2021; 0903 broken fencing with loosened wiring (Canaryville); 1304 broken perimeter fencing, rolled up, rusting debris (Eastside).
It was especially common for the blacktop and PIP rubber surfaces to be rundown, cracked or broken. For blacktop, 72% of the sample had evidence of poor surface quality and 48% had poor surface quality for the PIP rubber surfaces, as in the following four sets of photos (see Figures 26-29). The wear and tear were apparent on these playground surfaces at these seven different sites, and there were many more across the sample that were in a similar condition. In these situations of wear and tear, broken equipment and surfaces, children could not use the facilities to their fullest potential and sometimes the play equipment environment itself could even be unsafe.

Figure 26. 0101 (Albany Park) large blacktop area, holes/rundown/loose pieces.
Figure 27. 1003 (West Lawn) large blacktop areas, holes/rundown/loose pieces.

Figure 28. 0504 (West Garfield Park/Lawndale) rundown blacktop on walkways and basketball courts, holes/rundown/loose pieces with debris.
There were schools that did have newer equipment and/or were more upkept (e.g., newer equipment and surfaces; surfaces holes replaced with new pieces, etc.) such as the ones in the pictures below (see Figure 30).

Figure 29. 0502 (East Garfield Park), 0702 (Little village), 0103 (Norwood Park), 0304 (West Belmont/Cragin).

Figure 30. 4404 (Mt. Greenwood) playground equipment is new for both younger and older students; all surface and equipment are in quality condition.
In both examples, the equipment and spaces were in good condition and well maintained. Nothing was broken and the equipment was relatively clean. In the second set, 0301, you can see that even the PIP rubber surfaced had been patched. There were also two instances where schools had obtained new play equipment, observed in spring 2021. However, despite these exceptions, the district sample I observed for this study was more rundown than updated or well maintained.

**Lack of dynamism.** Collectively, there is minimal dynamism present in outdoor play areas accessed by children attending CPS schools. Students do not have many options for novel or changing experiences while they are outside during school hours. Specifically, when analyzing the play equipment, space differentiation, and opportunities for challenge/risk across the district this lack of dynamism is apparent. The following subthemes underline the conclusions around lack of dynamism.

1. **Lack of Space Diversification.** Differentiated spaces were not readily available where the children played, besides the different age level options that some spaces had. Play equipment
design variety across the district was minimal. All CPS play areas observed had some version of modular play equipment placed on top of PIP rubber playground turf. There were schools that had equipment for young children (ages 3-5), elementary students (5-12), or both. The following pictures showcase typical examples for the play spaces for these different age groups. Height differences are the most obvious difference between the age-based play area designs. However, features such as slides or climbing apparati are similar.

Figure 32. 0604 (Chinatown/Bridgeport) left - 5-12 yrs. old left, right - 3-5 yrs. old right; equipment next to each other on the PIP rubber surface.
Defined sections or zones observed on campuses were only the following types: play equipment, sports fields, open areas (grass/blacktop/sidewalk) and walkways, aesthetic foliage/school gardens and occasional bench seating. The photo below is an example of what minimal space differentiation looked like commonly on campuses.

Figure 33. 0603 (East Pilsen) left - 3-5 yrs old, right - 5-12 yrs. old; equipment next to each other, separated by sidewalk pathway.

Figure 34. (Little Village) typical zones, designated spaces seen commonly on CPS campuses including play equipment area, sport field, walkways and some landscaping.
This typical set up with play equipment for different ages, turf field, and sidewalk pathway does not provide clear or inviting options for small groups or individual children to spend their time. Also, school staff ultimately mandate where, when, and how students can use space on the campus. For example, students may have a turf field space; however, during their recess time they are not permitted to use that part of the campus and are confined to the play equipment area only.

There were occasional examples of equipment sections that did invite differentiated space usage because of their design such as what is featured in the photo set below (see Figure 35).

Figure 35. 0404 (Old Town left) and 4403 (Lakeview right) children using equipment to create more intimate spaces.

As you can see, children were gathering underneath platforms, slides, or drawbridges in small groups or even by themselves. However, such clearly designated intimate spaces, where children could meet with small groups or be alone, were rare. Children could not manipulate or modify any of the spaces either; all campus structures and established areas were permanent.
2. Lack of Challenge/Risk. Typical examples of play equipment areas around CPS afforded mostly physical challenges. The following two sets of photos illustrate what the common “risk” options were: heights/views from platforms, climbing apparatus, monkey bars/rings and slides.

Figure 36. 0904 (Hyde Park).
As mentioned earlier in RQ1aa, the ground plane on school campuses was almost always flat. Undulated surfaces were rare and the areas under the play equipment were usually made of PIP rubber surfaces. On occasion, there were some features that possibly challenged students like equipment heights or expansive views, such as in the next set of photos (see Figure 38).
Some schools had engaging climbing activities, such as layered netted ropes or “rock walls.” A few schools had tunnels to crawl through and many had ziplines/monkey bars/hanging options for upper body work. The next set of photos (see Figure 39) shows examples of climbing and crawling challenges.
When it comes to the play equipment and its challenge that it may afford, it was almost always limited to physical development. However, there were a few instances where cognitive and/or social development was considered. For example, two schools had music features like drums and xylophones. Sometimes there were games like tic tac toe present. There were a few schools that had dramatic play objects placed on play areas. Additional games/objects were plastic features that matched with the school equipment style like we see in the next photo set (see Figure 41). Children were observed using the drums, although I did not observe any child using the built-in games or dramatic play objects. Additionally, children did take risks sometimes simply because of working around/with broken, rundown, or inappropriate materials. However, children’s opportunities for physical, cognitive, and/or social challenges in the play areas that could support their learning and development were for the majority directed by the equipment itself, physical in nature, and moderate at best.
Figure 41. 0701 (Little Village - upper left) drums and tic tac toe game; 0401 (Hermosa - lower left) drums and boxes, children observed beating on both; 1304 (Eastside - right) dramatic play prop underneath platform.

**Nuanced natural elements.** Most of what children could experience regarding nature interactions/play on CPS campuses was either indirect or vicarious (Kellert, 2012). Most of the schools had some form of landscaping; however, it was often limited to grassy areas, borders with bushes, annual plant decorations and/or perimeter trees. The diversity, abundance, and upkeep of these areas varied substantially but was primarily in the low to average ratings range for associated 7Cs’ items. There were a few 7Cs’ items in the character category that in combination were specifically assessing aspects of the natural elements: atmosphere, vegetation and light quality. Recall atmosphere ratings looked at playground design types (e.g., modular, organic, reuse, or modern) and the overall sense of softness of the play area. The average atmosphere item rating for the district was 3.01 (out of 5). The vegetation item assessed visual stimulation and opportunities for interactions with nature. The average vegetation item rating for the district was 2.97. When rating light quality, balance and color differentials were considered. This item rating mean for the district was 2.45. Averaging these three 7Cs’ subcategory
character items connected to nature, atmosphere, vegetation and light quality, their combined mean score was 2.81, which is within the low-medium to medium range for the district.

It was clear certain schools dedicated more time and resources into tending their grounds than others. This was a school with one of the biggest campuses in the study that had been investing in their outdoor areas (see Figure 42).

![Figure 42. 4402 (South Deering) Large campus with diverse plants and well upkept landscaping.](image)

There was plant variety in the landscaping and perimeter trees around the whole campus. There was a pebble track around a large grass field on the eastern front of the school next to a plant lined courtyard walkway and entrance areas. There was also a large grass field on the north side lot. Around the children’s play area were also some flowering trees, bushes, and shrubs. This aesthetic was inviting and helped to create campus ambiance.

Some campuses had areas where there were interesting natural features. However, where the children were allowed to move about, minimal foliage was present (see Figure 43).
Figure 43. 0604 (Chinatown - top photos) play area has limited plants, rundown fenced in grass area but has a curved walkway with tended, diverse plants adjacent to the front entrance; 4604 (Humboldt park- bottom photos) play area only has some perimeter plants off campus, turf field but has a walkway leading from the front of the school to the back with tended, diverse plants; both schools have neighborhoods growing food, some in parkways (i.e., per Chicago’s zoning ordinance, the public space between the street and nearest parallel property line, including sidewalk area).

Both schools in Figure 43 had walkways lined with diverse plants. However, the students did not play near these areas. The areas where they had recess were rather devoid of greenery. Many play areas were quite exposed and did not have much or any in the form of nearby foliage. In these types of spaces, students were more affected by the weather conditions and the light differentials were also limited. Some schools that were lacking in campus foliage were fortunate to have natural views from the play areas.
Figure 44. 1302 (Hegewisch left) and 4603 (Englewood) exposed campuses, limited light differentials and minimal to no foliage on campus.

Figure 45. 0901 (Washington Park) School campus has very little foliage present, expansive park views on the eastern end of the play area.

Overall, natural elements and how they were incorporated into play areas and school campuses across the district was rather nuanced. There were schools that had better atmosphere, light differentials, views, and foliage variety than others. Collectively, most of the designs invited a hands-off/aesthetic appreciation only regarding natural elements. No campuses had
clear designations for children to manipulate any organic materials, although as mentioned earlier, sometimes they did this on their own. Sometimes when there were green, aesthetic spaces, they appeared to not be utilized or were even inaccessible to students. Natural elements and organic parts of the campuses tended to provide ambiance rather than additional spaces to learn, explore and/or play except for some of the outliers discussed in the next section.

**Outliers and Unique Features.** During my qualitative coding process, it became apparent that there were some CPS areas that had unique features and/or higher quality outdoor areas, compared with the district majority. There were a few stand out challenges; however, most of this section of results discusses outlier strengths I felt were important to highlight and analyze, such as interesting features, additional affordances or campuses that were part of limited examples and targeted efforts to improve outdoor experience quality (i.e., schools with Space to Grow grants) within the study sample.

There were two schools that were part of the study that did not have any play spaces or equipment evident. Interestingly, both schools without play areas were also STEM schools. There were two schools that did have an open space for children to have recess, but no equipment was present (see Figures 46 and 47). Both spaces were long and thin, not providing much room for students to move around either. Although this was only 7% of the sample and more of an outlier, having no play area at all or one that was barren with minimal space limits children’s access to outdoor affordances during their time at school.
Figure 46. 0603 (Tri-Taylor); 0803 (McKinley Park) No equipment/open place for children to have recess; widest space visual on campus was sidewalk perimeter around the building (left) and cement walkway in between main building and trailer (right).

Figure 47. 0302 (Austin - left) and 1204 (Calumet Heights - right) school play areas have no equipment but some open space with some grass.

In contrast, positive outliers in the study included four schools that had outdoor classroom set ups visible during the data collection, such as in the photo set below. Seating was also considered as well as flexibility. These designs can be modified to accommodate different activities, adding dynamism to the space (see Figure 48).
There were seven schools in the study that were active participants in the Space to Grow (S2G) program and one school that just unveiled their new Space to Grow play area in fall 2022. These Space to Grow schools had higher 7Cs’ scores. The total 7Cs mean score for these schools was $M = 74.7$ compared with the mean for the entire sample, $M = 62.14$. Additionally, 4/7 of the S2G schools were part of the across district highest risk quartile, group 1. This statistically impacted the results. Recall from the 7Cs’ descriptive statistics presented, the mean for total 7Cs’ scores in the high-risk quartile, group 1 was $M = 57.36$. This was higher than the medium to high-risk quartile, group 2, whose mean was $M = 53.90$. Space to Grow play areas and campuses were of higher quality, better maintained and offered more affordances to the children than other CPS play area spaces. Equipment was newer and invited more challenges, including changes in topography in some instances, observable in the photo set here. Their equipment was updated, offered more challenges and mounds had been included.
Space to Grow schools had spaces that were clearer about differentiation, which helps increase activity variety for outdoor time. For example, one campus had modernized play equipment for both younger (PreK/K) and elementary level students, a basketball court, a multipurpose turf field, areas for small groups to sit/play games and a performance space or large group meeting areas (i.e., outdoor classroom space) available for student use, pictured below (see Figure 50). Having increased options and clearer space designations invites students to work and play in more diverse ways when they are outside.
More attention was given to *connectivity*, and discernable pathways were present on these campuses. This helped to bridge the different campus areas and to identify the different options/spaces that students could use while they were outside. Landscaping, garden areas, and overall natural aesthetics were also notably better on these campuses. Examples included community gardens for growing food, rain gardens with native plants and rocky sloughs, and native plants and trees growing throughout the schoolyard, like these included in the photo set below (see Figure 51). Here you can see how designers weaved together the foliage, both native to Illinois and cultivated, with the overall layout, giving these campuses an increased aesthetic and better flow.
One distinct study school had a campus that was much more organic and varied in its design compared with the rest of the sample. This space also was rated as the highest overall 7Cs score, 104. It had components of nature play available to the students, a community garden, art installations, a turf field, changes in elevation and extensive foliage and landscaping. Although the space also had an area on campus with modular equipment and a PIP rubber surface, it was unique as well. It had the highest equipment vista point observed in the study and there were mounds as an added surface feature. The photo collage below showcases this campus (see Figure 52). This space was very different than anything else in the district. The school also had a champion, an ecologist who worked directly with students and families, as part of their school staff since the mid-1990s who was unfortunately let go in fall of 2022.
RQ1b: Comparison of Chicago and Vancouver 7Cs

To help me gauge the CPS school site 7Cs assessments with other assessors’ ratings who are doing similar work, I compared my scores, field notes and photos with Dr. Herrington’s University of British Columbia-School of Architecture and Landscape Architecture (UBC-SALA) students’ recent data collection from their rewilding play spaces project. Overall, the Vancouver pre-intervention raw data was scored higher than my CPS data. However, three subcategory conditions were not evaluated during CPS play spaces’ data collection (clarity-logistics, chance-loose parts, and chance-messy zones - see above in methods/7Cs’ visual analyses/results section 1A). Therefore, the UBC-SALA study scores by default were automatically 1-15 points higher than mine for each sample site 7Cs total value. To make the data comparable across samples, I removed these three scores from the Vancouver raw data and
re-calculated their averages without the logistics, loose parts and messy zones values as part of total 7Cs’ scores.

The Vancouver sample size \( (n = 8) \) was much smaller than the CPS sample \( (n = 37) \). The range of my data was 29 min and 104 max vs. Vancouver’s 44.4 min and 95.7 max (*note 104 was an outlier). The mean for CPS was \( M = 62.13 \) \( (SD = 18.05) \) and for Vancouver raw data was \( M = 79.21 \) \( (SD = 16.38) \). The standard deviations are relatively close numerically \( (SD = 16.38 \) and 18.05). These are large SD values, showing us that there was much variance in the observed data around our 7Cs’ means, both samples’ 7Cs’ values were quite spread out.

For the UBC recent study, they had three to four student evaluators and Dr. Herrington’s added qualitative comments to the 7Cs’ subscales for their sample schools, whereas I only had myself and my research assistant (for 25%) evaluating the sites’ 7Cs’ scores and documenting field notes/photos. The spaces assessed in the UBC study were YMCA childcare centers in Vancouver, B.C. whereas my spaces were CPS elementary schools with PreK classrooms. The lower rated spaces in the UBC study had documented field notes and 7Cs’ ratings that were more parallel with common types of CPS play areas and their affordances. Vancouver’s three lowest 7Cs’ scores \( (M = 44.84, 71.73, 74.3) \) mean value, \( M = 63.63 \), was close to my mean of \( M = 62.14 \). In their lowest rated space, it was identified as “urban” compared with the others, even though all of them took place in the city of Vancouver. Descriptions included things like parking lot views, chain link fences, exposed areas, small spaces with play equipment dominating, which were common conditions I documented around the CPS. From comparing all the UBC data with mine, it is fair to say that the pre-intervention spaces that they evaluated in their study had somewhat better quality and more affordances.
To determine whether Vancouver’s play space quality was significantly higher than Chicago’s, I conducted a summary t-test on the means and standard deviations of the overall 7Cs total from each city. The result was statistically significant ($t = 2.46, p < .05$). Thus, while we cannot be sure whether Vancouver’s superior quality might have been due to their play spaces being designed for preschoolers as opposed to the wider range of ages and grades in Chicago, we have some sense of a noticeable difference and a likely lower quality play experience on Chicago Public Schools’ playgrounds.

**RQ1c: Associations between Play Space Quality (7Cs) and Surrounding Features**

In this section of the results, correlations between play space quality as measured by the 7Cs’ and other key study measures were explored. This effort was meant to both confirm the concurrent validity of using the 7Cs in Chicago, as well as test my prediction that 7Cs would be correlated in expected ways with features beyond the built playgrounds. Given the way each variable was scaled, positive correlations were expected in each case. Pearson correlation coefficients were computed to assess any possible linear relationships between the 7Cs’ total scores and each measure.

Table 8. Correlations: 7Cs with Main Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>$r$ (n=37)</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk index</td>
<td>.48**</td>
<td>0.003</td>
</tr>
<tr>
<td>Physical appearances total</td>
<td>.46**</td>
<td>0.004</td>
</tr>
<tr>
<td>Campus sq. footage</td>
<td>0.29</td>
<td>0.09</td>
</tr>
</tbody>
</table>

*Note. **Correlation is significant at the 0.01 level (2-tailed).*

As shown in Table 8, 7Cs was significantly correlated in the expected direction with school risk (lower quality play spaces covaried with higher risk schools) and PA (lower quality
play spaces covaried with lower quality physical appearances of the surrounding neighborhood). The relationship between school campus square footage and 7Cs was also positive and approached significance, suggesting a weak association in the expected direction. This infers that the size of campus was a small factor associated with the 7Cs scores, but not a primary driver.

RQ2 - Are there any qualities or opportunities suggested by the school campus, nearby neighborhood affordances, or a combination, that could make fast and/or low-cost improvements to enhance children’s experiences during their time outside at school?

To answer RQ2, it was necessary to “widen the lens” or take a more “bird’s-eye view” approach when analyzing the study sample. This entailed both considering the full campus space and some local resources (< 0.5 mi radius) that could potentially enhance CPS children’s access to outdoor affordances during school hours. Recall my analyses for RQ2 were centered around how outdoor spaces were being used to the best of my knowledge, and how the outdoor experiences could possibly be enhanced quickly and affordably by extending that usage outward.

The following main themes emerged as parts of the layered answer to this research question: maximizing available campus space, campus gardens, CPD parks, community gardens, and nature play spaces. These themes are analyzed in turn below, exploring opportunities, strengths, and possible increases in affordances. I also showcased some schools taking advantage of available resources and discussed some “quick fixes” that could possibly enhance students’ outdoor experiences. In the last section of RQ2 results below, I present data for the ten study schools with the lowest overall 7Cs’ scores, collating across potential strengths/affordances, both on and off campus within walking distance (<.5mi) from the school. This was an effort to exemplify how quickly and cost-effectively affordance diversification could possibly occur in these spaces.
Use of Campus Space: Cautious, Common Approaches to Maximizing Resources

Creatively

Recall from Table 7 that there was a large range of campus square footage across the district sample. The campus jungle gym/play equipment area sizes ranged between approximately 1,600-10,000 sq. feet, often a small fraction of the campus total areas, compared to other parts of the space (e.g., sports fields, blacktop/sidewalk open areas, grass spots, landscaping, etc.). Built play equipment areas were the most common places that children were observed playing outside. Below I describe a “space access continuum” that I interpreted to exist across the district. On one end, I describe a gated/contained group of schools, where areas other than the built play equipment spaces were gated off or otherwise inaccessible to the children, but it is possible that the spaces beyond the partitions could be easily accessed in the future. Next on the continuum is a group of schools I call open access. In this cluster, a wider and more varied area of square footage was accessible to the children; however, there was no evidence of additional proactive efforts to enhance these spaces or do anything with them – they were simply available. Finally, on the other end of this spectrum, there was a group of schools I call proactive/creative, where there was access to large and varied spaces, plus evident efforts to use those spaces creatively. Each of these three clusters on the continuum of use of space are described in turn.

Gated/Contained. For the sample school sites, 1/3 of the play area spaces were contained inside their own fencing, often gated/locked, isolating them from the rest of the campus. This occurred even in some cases when the play equipment area was next to an open area where children could move around more if they were given access. All of the schools in the pictures below had those conditions.
There is a variety of potentially reasonable explanations why children’s access to more space was limited in this group. It is possible that this decision was made because of safety, the age of the students who use the space, or staffing. This will be addressed further in the Discussion section.

Additionally, there were instances at schools that had contained play equipment areas, in which alternative spaces existed that could be used but appeared not to be since these areas were also gated like the ones below.
In these cases, these spaces were gated off, seeming inaccessible to students, except for the top right photo. At that school, there was no play equipment on campus and this picture is of their front lawn area. Also, the areas where the children actually played in these cases had smaller dimensions than these alternative areas. These could be opportunities to take advantage of available campus space. Students and teachers could utilize these areas in a variety of ways, adding to the outdoor affordances’ children experience during the school day.

**Open Access.** About 2/3 of the sample schools had more fortunate layouts where the play areas were adjacent to open space, like a field, undefined blacktop, or courtyard, and sometimes children were permitted to use those spots along with the equipment, like in the examples below. Freedom to access open space gives the children more opportunities to move around, increasing affordances beyond what is provided by the play equipment.
Proactive/Creative. There were schools that were clearly making efforts to increase access to diverse campus space. The following is an example of utilizing auxiliary space uniquely.
Per a personal conversation I had with a 0402 first-grade teacher and the principal of this school, the PreK classrooms used this area to play and explore often (first grade teacher, personal communication, September 21, 2021; principal, personal communication, October 14, 2021). As a result, they felt there had been a renewed interest in improving the school garden and “greening” other areas of the school. In fall 2021, the school organized a committee with educators, administrators, and families to plan how they could improve their campus and enhance students’ outdoor experience. Here are other examples of schools utilizing campus spaces creatively.
In the upper left photo, PreK classes have exclusive access to this playground. Teachers allowed the students to explore the available natural elements while they were outside (e.g., perimeter trees, landscaping, and wood chip areas) during their recess time (0801 PreK teachers, personal communication, May 11, 2021). In the lower left photo, I observed PreK classes using this area of the campus. It also appeared they were the only ones who accessed this space since it was surrounded by a fence and the PreK classroom door was the only visible entrance and exit. The PreK children used the old, raised beds as interactive work areas (working with mud, water, sand, etc.). In the picture on the right, the school created a small, organic pathway and outdoor seating area in one of their small side lots that the PreK and K children used (0101 school families, personal communication, May 21, 2021). In all examples in this group, I had access to information from observations of space (dynamic, multi-level physical elements were present), observations of children interacting with the space, and/or personal communications with
affiliated adults. It is possible that creative use of space was more prevalent than these limited opportunities allowed me to assess.

**Campus Gardens: Opportunities to Outreach**

Many CPS school campuses have gardens. Recall from Table 8, a sizeable 65% of the sample schools had some form established gardens spaces, intended for growing food, herbs, and sometimes ornamentals. These were distinguished and different than the perimeter or campus landscaping features that were discussed earlier in RQ1ac (nuanced natural elements). Campus gardens could be found throughout the district networks and their quality and upkeep varied substantially. There were gardens that were not tended, ones that were tended, and some that were very well-maintained, creative, and even proactive with their surrounding communities.

The map below showcases the district spread of campus gardens and if/when these were tended for the data collection period, spring/fall 2021. Gardens that were tended spring/fall 2021 were more prevalent on the northside (green dots) and gardens that were not tended spring/fall 2021 (blue dots) were more prevalent on the southside.

Only 33% of the schools had their gardens tended at the first round of data collection, spring 2021. This figure almost doubled for fall 2021, with 64% of campus gardens tended at that time. It is possible that some schools with gardens that were not tended in the spring 2021 (purple dots) started their garden work later in the season, since I did my first round of data collection throughout mid-April-May 2021.
Figure 58. School gardens map.

Here are some examples of gardens that were not tended below.
In these two cases, there were perennial herbs such as sage/thyme that were quite large and flowered out, dandelions and clover growing in the white modular beds. This indicated that the plants had been there for some time without anyone caring for them and that the beds were not tended for the spring/fall 2021 growing season. There were even a few examples of neglected areas, where it was obvious that no one had done anything to them for well more than one growing season, as in the next two photo sets. Clearly, these examples were left to rot, which is a bit dangerous because of the cracked/loose wood boards, and not tended from well before my data collection period (spring/fall 2021).
Gardens that were tended presented obvious additional affordances for children, such as aesthetics, hands-on learning and development opportunities, STEAM activities, habitat study/preservation and/or school community outreach. The following are examples of white modular gardens that were proactively tended. At these sites, annuals such as tomatoes, basil, squash, kale, and corn were evident. These two examples also had additional features (e.g., water feature and tarp for shade/shelter) that added to their aesthetics and affordances.
Figure 61. 1104 (West Englewood/West Lawn - left) and 0203 (North Park – right) white modular gardens tended fall 2021.

Some schools had more involved gardening occurring, such as the school below that incorporated a sensory garden, captured in the next two sets of photos.

Figure 62. 0103 (Norwood) spring 2021 some beds cleaned out, perennials coming up, sensory garden established.
This campus garden was a participant in the Illinois Schoolyard Habitat Grant Program Project. The school received support from the Illinois Department of Natural Resources (IDNR) for this program committed to developing and/or enhancing wildlife habitat on school grounds and other public places (IDNR, 2023). Another active school garden community from the sample had various tended beds around the school. Additionally, they had a chicken coop on campus, and I observed volunteers and students helping to care for the chickens during school hours. The next three sets of pictures showcase this unique space.
Figure 64. 0403 (Lakeview) various garden areas on campus, including raised beds and white modular varieties, tended in the spring.

Figure 65. 0403 (Lakeview) garden tended fall 2021, some annuals were harvested already (e.g., corn and squash), some basil plants/tomatoes still thriving.
Figure 66. 0403 (Lakeview) active chicken coop.

Some of the food grown here was shared with the school community. I saw the woman who was tending to the chickens in the above photo harvest a bundle of basil. Additionally, there were three schools in the study that had community gardens on campus and were distributing some of what they were growing directly to their local communities.

Figure 67. 0704 (Pilsen - upper left), 0204 (Ravenswood - lower left) and 0902 (Oakland - upper/lower right) schools with active community gardens growing food and distributing to their communities.
These school garden communities were advocating growing healthy food. For example, the school in the lower left hosted a weekly volunteer gardening night where community members came through to take care of the garden. They were also growing food open to the public in the parkways around the perimeter of the school. At the school in the upper left photo, the PreK teachers managed the garden with some support from volunteer school community families. Anything they grew on campus that was edible was shared with families (0704 PreK teachers/colleagues, personal communication, May 7, 2021). The school in the photo on the right had weekly produce share dates that they promoted to their local school communities via signs posted around campus. People came by on designated days to pick up the free fruits, vegetables, and herbs.

In sum, there was a spectrum of what campus gardens look like across CPS and if/how they were used. As the above information showed, some spaces were completely neglected, creating an “eye sore” and possibly even hazardous conditions in some cases. On the other end, there were several schools demonstrating a high level of engagement with their gardens, including outreach to provide nutritional foods to their local communities. These garden spaces could be, and in some cases already are, valuable resources that enhance outdoor affordances and enrich learning and development experiences for young children. Potential reasons for not tending existing gardens and recommendations for facing those challenges will be explored in the Discussion section.

**CPD Parks**

In addition to applying a “bird’s-eye view” to the school campus, it is possible to spread the lens further and consider some local parks as options for enhancing outdoor experiences for young children. All schools in the study were within 0.5 miles radius of a CPD park except for
one (at 0.6 miles). The map below shows the study sample spread combined with the park space that we have across the city.

![Map showing school sample and CPD park space](image)

Figure 68. School sample (red dots) with CPD park space (green).
Chicago is a fortunate city to have 98% of its residents living within walking distance from the parks, well above the national average, 55% (Trust for Public Land, 2023).

Interestingly, the average number of parks within walking distance of the schools was slightly over three parks. This shows that not only do most CPS schools have accessibility, but many also have multiple options for different parks they could visit. Additionally, 27% of schools were located directly next to or inside CPD parks. The map below shows these neighboring schools across the district (see Figure 70).

Figure 69. Light green=less than one-acre, medium light green=1-4 acres, medium green=4-10 acres, dark green=more than 10 acres (Trust for Public Land, 2023).
Figure 70. Green=schools located in/directly next to CPD park.

The longitude and latitude skew lines are also present in this map. You can see that on the southside, there were seven schools located within the parks, compared with the three on the northside. There were also only three schools that were located within parks on the westside compared with seven in the east.

To get a sense for whether CPD parks might be an underutilized resources for schools that were especially close to one (i.e., <.25 mi), I did a closer analysis of this subset of schools (27%). Unfortunately, a clear narrative did not emerge. For example, the school depicted below did not use the CPD play equipment (right) for recess, even though the school had no clearly designated play area or equipment on campus. In fact, the PreK classroom never even went out into that area, but instead used an interior courtyard (not depicted) to have their recess time (0804 PreK teacher colleague, personal communication, April 20, 2021). The available data
sources for this study did not provide a clear answer as to why the school seemed to choose not to use this inviting space that was easily accessible.

Figure 71. 0804 (Gage Park) left - CPS campus on right, campus/park boundary is the sidewalk; right - CPD play equipment.

In other cases, students were allowed to use the park facilities as part of their recess time. In the example below, the CPD park equipment and play areas were in much better condition and afforded much more than the campus play equipment area. The students used the CPD park space daily for their recess time.

Figure 72. 0404 (North Central) left - CPD park actively used by students. Equipment is newer and offers some unique affordances like the climbing rope dome, has one of the highest points on equipment in the city; right - on campus play equipment for younger students hardly used by students, structure in and surfaces not in great condition.
During my visits, I observed students using the CPD equipment, basketball courts and field. The students did not use the campus play space at all. A first-grade teacher and friend at that school confirmed that the students used CPD spaces daily and hardly ever used their own play equipment area (0404 first grade teacher, personal communication, May 12, 2021).

Additionally, the condition of the school campus play equipment was much more rundown and designed for younger students, compared with CPD equipment that was in quality condition and afforded more to the multi-aged children who used it for their regular recess time. At this next space (see Figure 73), I observed students playing on both equipment areas on campus and at the CPD park next door.

![Figure 73. 1303 (Roseland/Beverly) left - CPD park; right - CPS play area; school uses both facilities for outdoor play (far south).](image)

Both park and school equipment areas were in good condition and placed next to grass fields, where children were also permitted to play. In this next group of photos, the CPD park essentially served as the play area (see Figure 74). The CPD park had two different playgrounds. It also had tennis courts, baseball fields, soccer fields, and a bike path. Students of all ages were seen in many different areas of the park, playing, and learning during their school day hours.
In sum, there were schools in the SE, SW, N-North Central, and NW where I observed students who used the parks regularly, and there were schools in the SW, SE, S where it was confirmed by school staff that they did not use parks regularly, only for special events. The story of the potential additional affordances that may be available from neighboring CPD parks is not entirely clear. However, there are at least some schools in very close proximity to CPD parks with inviting spaces that are being underutilized. While this potential enhancement of outdoor experiences right next door may not be available across the district, it is an option for 1/3 of the schools in this study.

**Local Community Gardens Are Abundant in Chicago**

The majority of CPS schools are also within close proximity of community gardens. CPD has 70 community gardens as parts of the park district (CPD, 2023). The map below shows their spread across the city (see Figure 75).
NeighborSpace, a non-for-profit urban land trust in Chicago dedicated to preserving and sustaining gardens on behalf of dedicated community groups, helped create and has supported 125 garden spaces around Chicago as well (NeighborSpace, 2023). The map below identifies their sites (see Figure 76).
Figure 76. NeighborSpace sites (NeighborSpace, 2023).
As you can see from both the CPD and NeighborSpace maps, many of these spaces are close to CPS schools. Additionally, there are different organizations that support community garden work such as block clubs or church groups. Several of the community garden spaces are registered members of the Chicago Community Gardeners Association. The map below showcases spaces registered with this particular organization.

![Map of Chicago Community Garden Association members’ sites](image)

Figure 7. Map clip, Chicago Community Garden Association members’ sites (Chicago Community Garden Association, 2021).

We see clearly there is an abundance of community garden spaces around Chicago. Similar to the CPD spaces, the vast majority of CPS schools are within walking distance from them. I did not have access to data (including the informal personal communications that have been a part of other sections) that would allow me to evaluate how frequently, if ever, CPS students visit community gardens as a part of recess or as short field trips. However, these community spaces are another potential low-cost opportunity that could enhance students
outdoor experiences while at school. Students could visit the gardens to enjoy the aesthetics and atmosphere, write and draw, observe the plant and animal life growing, or even conduct some inquiry or investigation. Some liaisons from these spaces are interested in working with children and families, helping them to understand more about urban growing, sustainable environments and stewardship (Assistant Director, NeighborSpace, personal communication, January 27, 2023).

**Nature Play: Growing Interest, More to Investigate**

As explained in the literature review, *nature play* spaces are different from natural elements on campuses, parks, or gardens. These types of play spaces are specifically designed for children and families to have interactive play experiences that incorporate natural elements as well as loose parts. The following two sets of photos exemplify *nature play* spaces and materials.

![Figure 78. Nature play.](image-url)
Chicago has opportunities across the city for children to engage in spaces specifically designated for *nature play* spaces and these are growing in numbers. Several of Chicago’s *nature play* spaces were created by the NeighborSpace organization and the park district. The following map shows city locations for these types of spaces, including some that are proposed for the near future.
The map shows that there is more established nature play areas on the northside compared with the southside; there are also more proposed and in progress spots on the northside. OpenLands is another organization involved in promoting nature play and outdoor education throughout the city of Chicago and surrounding areas shown in the following “Get Outside” map below.
This showcases some of the sites that Openlands is promoting for children and families to get outdoors to learn and play in nature. Recall that Openlands is one of the major contributors to the Space to Grow program and helps CPS schools implement gardens.

The practice of accessing nature play for CPS students during school hours appeared to be limited. There was a small handful of study schools that allowed students to visit nearby nature play areas at times. Two southside schools utilized nearby NeighborSpace nature play/community garden areas with their preschool classrooms. I was only able to confirm that one northside school was taking advantage of nature play spaces. This school was fortunate to
have some *nature play* designs established on their campus (0204 CPS vendor/nature play area designer, personal communication, May 14, 2021). These spaces are showcased below.

Figure 82. 0702 (Little Village/Lawndale - left) and 4401 (Little Village - right) NeighborSpace nature play/community areas used by school community during school hours.

Figure 83. 0204 (Ravenswood) nature play objects and space utilized by students on campus.

As you can see in these photos, natural elements and even loose parts are woven into these types of play spaces. Another three schools are currently engaging with CPD efforts to establish some nature play areas in their adjacent parks (CPD nature engagement specialist,
personal communication March 10, 2023). Additionally, at these developing nature play sites, some neighboring students’ input has even been incorporated into the design schemes. These spaces are already utilizing CPD property space for outdoor time as well.

Nature play spaces that currently exist, similar to what I inferred above about community garden spaces, appeared to be underutilized by CPS students. It is unclear if other schools were not interested in this opportunity for students or simply did not permit students to leave campus during school hours. However, if/when they were used is beyond the scope of this research. I had originally planned to take a deeper dive into nature play, to explore if/how this was incorporated into early childhood outdoor play/learning at select CPS schools. I wanted to figure out why some schools can use nature play areas off campus with their students and some schools cannot/do not. I was curious about how CPS teachers felt about this type of play and if/how they facilitated it with their students. However, due to COVID and the resulting restrictions, I was unable to complete any part of my investigation with human subjects besides personal communications and these inquiries were left unanswered. This is something I would like to investigate further in the future.

**Opportunities That Could Be Enjoyed Affordances at Lower Rated 7Cs Schools**

As explained in the methods section, I grouped the lowest scoring 7Cs’ schools together for further analyses related to RQ2, specifically considering the possibility of increasing outdoor affordances by broadening the lens of what could be included during outdoor time at school. Considering the opportunities explored above, all schools in this lower rated 7Cs group had either on campus, off campus or a combination of the following potential options for increasing outdoor affordances: large amount of open campus space, updated equipment, campus garden
area, CPD park <.25mi, community garden space <.5mi, and nature play space <.5mi. Table 9 below compiles this information.

The average number of resources available to this group for potentially improving the outdoor experience was three per school. All schools had at least one option available to them on campus to potentially increase outdoor affordances. Large campus space, campus gardens, CPD parks nearby, and local community gardens were the most common options. A majority of this group’s schools had them (60-70%). Having open space, even if it is a blacktop area, is an advantage that can be used for a variety of activities. Campus gardens were also present at 7/10 of these schools (4 not tended, 3 tended). With some efforts, this available campus resource could diversify affordances and be used for a variety of learning and development experiences. More than half of this group were closely located to CPD parks. Although students would have to leave campus, the walk would be short (<.25mi) and in some cases, the park is even visible from the campus itself. Most schools in this group also were near a community garden space as well.
Table 9. 7C’s Potential Affordances (PoA)

<table>
<thead>
<tr>
<th>7Cs PoA</th>
<th>Location</th>
<th>7Cs Space</th>
<th>New Equipment</th>
<th>Campus Garden *Tended</th>
<th>CPD Park &lt;.25mi</th>
<th>Community Garden &lt;.5mi</th>
<th>Nature Play</th>
<th>On Campus Additional Affordances</th>
<th>Off Campus Additional Affordances</th>
<th>Potential Site Affordances Total</th>
</tr>
</thead>
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<tr>
<td>901</td>
<td>38</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>2</td>
<td>2</td>
<td>4</td>
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<tr>
<td>1102</td>
<td>37.5</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1104</td>
<td>39</td>
<td>x</td>
<td>x</td>
<td>✓ *</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>203</td>
<td>39</td>
<td>✓</td>
<td>x</td>
<td>✓ *</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>2</td>
<td>2</td>
<td>4</td>
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<td>1302</td>
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<td>x</td>
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<td>x</td>
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<td>✓ *</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Affordance category totals: 7 2 7 6 7 1 16 14 30

Note: ✓=has affordance x=does not have.
CHAPTER FIVE

DISCUSSION

It is well documented that green space access and quality outdoor play and educational opportunities positively impact children’s learning and development across domains. Yet, children have been experiencing a steady decline in access to quality outdoor play opportunities during school hours. When they do get outside, the options available to them tend to be limited in scope in terms of the affordances available to them that can best support their growth and development.

This study demonstrated that CPS is no exception to this trend. Although the district has a clear policy requiring a daily outdoor recess of 30-minutes when weather permits, and which cannot be taken away for behavior reasons, the specific implementation of recess and outdoor play rests on the judgments of the school administrators, teachers, and staff. Additionally, because of conditions like safety, staffing, academic performance pressures and others, students’ recess experience and outdoor play time can be limited or even eliminated. Spaces where the children are granted permission to play during school hours are normally designated, built play equipment areas, whose affordances tend to be more static and focused on physical development. However, there are many pockets of strength as well, such as local champions, educators, urban gardeners, nature play enthusiasts and experts, school families, and others around Chicago who have prioritized improving outdoor play and learning for their students and want to help increase students’ access to more outdoor affordances. It was my hope that this study would shed some
light on this layered story of outdoor play and affordance access for the CPS school children while opening the conversation about possibilities on how it could improve.

To tell this descriptive story, I needed to get an overall idea of what CPS outdoor play quality was like across the entire district. With the help of the 7Cs tool, a measure centered on evaluating spaces and materials that would be beneficial for children’s development, I analyzed the spaces that were used for play on the campuses, and I used informal data sources that were accessible to me to make best-guess determinations of how the space was used by children when possible. I assessed what outdoor affordances were currently and commonly available to students. At the same time, I “widened the lens,” and considered outdoor space and resources beyond the play equipment areas as possibilities for enhancing children’s access to different affordances. Part of the research included identifying these opportunities and finding examples of schools diversifying their affordances using spaces in creative ways on and off campus. I also hypothesized about potentiality and located other spaces and resources that could be used by the sample schools. These options I identified were simple and low- or no-cost, either on campus or a short walk away (<0.5mi) and if utilized, could improve the outdoor affordance variety that CPS students have access to during their school day.

It is important to keep context in mind when discussing my study phenomena. I did my data collection spring-fall 2021, and the effects of COVID were notable. Overall attendance in CPS dipped significantly in the 2020-21 school year and slightly more the following year. For the 2021-22 school attendance records, chronic absenteeism was at 45% and BIPOC students on the south and west side were documented as missing the most school during both 20-21 and 21-22 school years (Koumpilova, 2022). Recall, online learning was implemented during fall 2020 and a hybrid model was later implemented in spring 2021, when I was first collecting my data.
Wednesdays were established as a remote learning day and families did have the option of keeping their children at home. During the first round of data collection, I encountered some schools that had signs up on their play areas, saying they were closed even though students/staff were active on campus such as the examples below (see Figure 84).

![Figure 84. 4401 (Little Village) upper left, 0202 (Uptown) lower left, 1001 (Ashburn) right.](image)

Generally speaking, fewer people were around, using and/or maintaining the campus facilities, especially during spring 2021 when I initially evaluated all play areas in the sample. By fall 2021, CPS students had returned to campuses full time. However, their attendance numbers turned out to be slightly worse for the 2021-22 school year. Part of the reason for this decline was that online “participation/attendance” rates were difficult to track. However, the increase in chronic absenteeism seen over the course of both school years had a significant effect. The CPS rate of attendance for the 2021-22 school year was documented at 85%, a 6% reduction from pre-COVID attendance rates (CPS, 2023).
Another interesting part of the context to consider is that in some senses, the quality of my data collection was *better* due to COVID. I walked around outside on these campuses for at least 20-30 minutes each visit. I measured play area perimeters, looking carefully at play areas and campus affordances, took extensive photos, and detailed observation notes without anyone asking me who I was, why I was there, who/what was being photographed, etc. Across the total of 60 schools that I visited multiple times, I only had one security guard ask me for my intentions and credentials.

**Summary of Findings**

**RQ1: What is the quality of Chicago Public Schools’ outdoor play spaces and what is the relationship between play space quality and other nearby outdoor affordances?**

The goal of RQ1 was to explore and describe a representative sample of the CPS outdoor play spaces, surrounding neighborhoods, and nearby outdoor affordances to assess quality, both quantitatively and qualitatively. I predicted that I would see a range of quality across the city. However, I also anticipated that I would see commonalities, such as play equipment designs, features, and designated spaces for outdoor recess.

In the first section of the results, I took a deep dive into visual analysis of the quality of CPS playgrounds. In addition to the main measures (7Cs and PA), I also utilized photos, maps, field notes, and qualitative coding to help describe the CPS play areas and their affordances in detail. Recall, this visual analysis, RQ1a, was divided into three subsections: RQ1aa-individual 7C’s constructs, RQ1ab-representative samples of high, medium, and low 7Cs’ schools/overall school visuals, and RQ1ac-emergent qualitative themes for the district. These distinct approaches provided different ways for examining the full spectrum of the play space quality issue.
In RQ1aa, regarding individual 7Cs’ constructs, I provided detailed information about how various constructs within the 7Cs measure manifested in CPS playgrounds, exploring specifics from the 7Cs’ subcategories. There were three items that were not measurable due to lack of evidence/clear alignment with their descriptors. The *clarity-logistics* item was not tabulated because there were no storage areas on campus clearly designated for play-related materials. Freight train containers with unknown contents were the only storage options observed on campuses. This play area feature is important so that teachers and staff can have the chance to move different materials that could enhance the space and play experience in and out easily. We want schools to include a variety in materials, activities, options, and spatial layouts because this is a best practice for creating recess and outdoor play environments that supports children’s learning and development trajectories (McNamara et al., 2015). Teachers/school staff need logistics, storage, and space to help make play spaces dynamic with convenient set-up and clean-up. Simple structures like sheds or tarps do not take up a lot of space, can be economical, and can function successfully as storage spots for a variety of materials. Thus, the total lack of evidence for storage across the district was a significant and telling finding.

In the 7Cs *chance* category, *messy zones and loose material play* could also not be assessed due to no evidence at any school, and in the *change* category, the *materials* item was measurable but very low. All of these indicators are related to each other, since they address undefined/variable materials. There were not any designated options or spaces where children could work with undefined materials like sand, sticks, or water. The only materials observed at different data collection periods that changed with the seasons were some of the campus landscaping and garden plants. No interactions were happening with these plants. There are concerns about safety, improper use of materials, getting wet/dirty, and/or maintenance/storage
and these may be part of schools’ explanations as to why *loose material play/messy zones* are not incorporated into the play areas. I know some teachers occasionally organized this type of manipulative work/play with close supervision, although there was not any clear evidence of this effort observable during my study besides sidewalk chalk work.

Just like working with any materials in and outside the classroom, children and teachers need support so they can understand what they can and cannot do with manipulable resources. We also know that there will always be situations of misuse regardless of what the material is when working with humans. However, by their very nature loose parts are undefined, versatile, and novel, since they can always be arranged in new and different ways, affording unique opportunities to each student. Open-ended, process-oriented activities invite creativity, engage children, and sustain their attention better than closed, product driven, and/or teacher-led activities (Isbell & Yoshizawa, 2016). Also, when children are delighted and involved with their play and learning, they are less likely to misbehave (Hynes-Berry & Ryan 2011).

In 32% of the play areas, I documented children’s resourcefulness in creating loose parts play for themselves by observing them working with found loose parts or I saw evidence of their work in leftover arrangements. We know from the literature the vast benefits of loose parts play, including supporting development across domains in ways such as stimulating imagination, risk taking, problem solving, prosocial behavior (including less gender stereotypical/age-exclusion behaviors), and complex verbal/nonverbal communication (Flannigan & Dietze, 2018; Maxwell et al., 2008). Loose parts are also described as a child-led activity, a condition recommended for early childhood education and that CPS students demonstrated (Bredekamp, 2016).

Something that stands out about this collective finding is that children were initiating this loose parts play, without any specified resources, designated areas, and/or permission, which
speaks both to open-ended materials’ potency as well as children’s own agency in constructing dynamic experiences for themselves. The children who want to do this type of activity are doing so “under the radar.” This phenomenon is a “teachable moment” for the adults, who should take advantage of this student enthusiasm. It is logical and best practice for children and educators to be encouraged to work and play with open-ended materials during recess time and be supported in their efforts in doing so. Additionally, many loose part materials are low-cost. Some business establishments, such as Home Depot, will even donate items (e.g., cardboard, saw dust, etc.) to schools. Incorporating recyclable and repurposed materials is responsible and practical. It models environmental stewardship and resourcefulness while inspiring invention and engineering. Many school materials are not economical. It is common knowledge that most teachers spend “out-of-pocket” money on supplies for their students. Thrifty, open-ended materials, therefore, are a “win-win.”

As previously mentioned, all data sources, including but not limited to the 7Cs, were utilized to deduce overall qualitative themes related to the visual quality of CPS play spaces. As a result of these layered analyses, overall trends across the entire CPS district were identified. The following categories were created after extensive coding processes: (1) collective wear and tear, (2) lack of dynamism (including subthemes limited space diversification and lack of challenge/risk), (3) nuanced natural elements, and (4) outliers.

During the data collection, it was more common to see campuses that appeared worn down with evidence of wear and tear, rather than those that were in good condition. The results from analyzing field notes, photographs, and field observation variables of the observed play spaces included 85% described as rundown or having significant wear and tear and 55% with evidence of broken or missing pieces in the equipment. Poor surface quality was also a regular
sight as 72% of blacktop areas needed repair/replacement and 48% had PIP rubber surfaces that were deteriorating. Some of this collective lack of care could have been coupled with some of the COVID phenomena. For example, I observed old metal debris in the same place during my spring and fall 2021 school site visits on three separate campuses. Graffiti and garbage were not uncommon on play areas. As addressed in the beginning of this chapter, it is possible that the maintenance of school grounds did not get as much priority as other areas inside of the building since much time and effort went into managing students in indoor spaces rather than outside due to handling COVID conditions. However, much of the observed wear and tear appeared as though it was from before COVID. Having a broken, rundown environment does not convey a positive message to students/families who use these spaces, and it also can be hazardous. I witnessed various unsafe circumstances, such as broken wire fencing, accessible but old electrical boxes, missing rungs from the slide platform perimeter, and cracked wood bench seating. Children also used some of the rundown, broken features as loose parts or challenges.

Some of these repairs may be costly, such as pouring a whole new layer of blacktop or replacing an entire PIP surface. This could be why repairs are being avoided. Other types of repairs are more acute and cost-effective, requiring minimal effort such as getting rid of any campus debris, filling surface holes, or covering compromised fencing. Playgrounds are supposed to be safe. Considering our current risk aversion in public school culture, I was surprised at the neglect and rundown character that I consistently observed across the district. Also, the argument can be made for exploring some better options. For example, schools could consider welded wire fencing as an option. This material is safer, harder to climb, more secure, more durable, easier to install, and requires less maintenance than chain linked fencing. It is slightly more expensive than chain link, but within reason (Page, 2018). Schools can also
rethink metal fencing and consider natural boundaries like trees, bushes, and other foliage. These can create barriers and protection while also adding to other affordances, such as increasing vegetation and light differentials while improving the overall aesthetic.

The next theme and sub-theme of lack of dynamism-limited space diversification, was evident across the district. Differentiated spaces were most often limited to the different age level equipment options, i.e., young children (ages 3-5) and elementary students (5-12), with height differences being the most obvious distinction between the two types. Features like slides or climbing tubes were similar in both models. There was very little variety in play equipment and area designs besides a few outliers. All CPS campuses with play equipment had modular, “formulaic” structures placed on top of rubber playground turf.

Campus sections/zones were the following types: play equipment, sports fields, open areas (grass/blacktop/sidewalk) and walkways, aesthetic foliage/landscaping/school gardens and occasional bench seating. These typical set-ups did not afford clear options for small groups or individual children to gather in creative ways. As with loose parts, children did sometimes find a way to gather creatively in spaces such as underneath the slides or on top of draw bridges, but designated intimate spaces were rare. All structures and established spaces were permanent; children and school staff could not modify or manipulate anything. Recall the context-microclimate 7Cs item was low. Most play areas did not have any or only minimal shelter/shade and were subject to the seasonal weather conditions. When there was some form of protection and/or light differentials, it mostly came from foliage and structure shadowing.

As Gopnik reminds us, “...young human learners are highly exploratory, both in terms of their search for external information and their search through hypothesis spaces” (Gopnik, 2020, p. 1). Children are born ready and motivated to explore their worlds, driven by sensory input,
natural curiosity, and inquiry to comprehend the environment around them while constructing their own learning (Hammond, 2014; Wadsworth, 2003). Children’s outdoor preferences and behaviors are driven by children’s individual developmental needs across domains of which they are progressing uniquely on their trajectories (Aziz & Said, 2012). Additionally, space and place are connected to young children’s willingness to participate, sense of belonging, developing identities, school readiness, and understanding of citizenship (Kernan, 2010). Children value diverse affordances offered by the environment, that permit engagement with their choice activities, and will have distinct space and place preferences at different times, including while at school. Logically, spaces that have variety attract children and invite active play (Castonguay & Jutras, 2010).

*Challenge/risk,* another quality needed for dynamic play experiences, was limited to mostly physical challenges. Common “risk-taking” options were heights/views from platforms, climbing apparatus, monkey bars/rings and slides. In the *change* section, the *mystery* item mean was low. CPS resources and areas that invited exploration were mediocre. High points on the play equipment that students could stand on for prospects were common, usually slide platforms. Options where children could crawl into or look behind/into were dependent on the equipment and not always available. The *ground plane* item in the *change* section was also low. Most campuses were flat and undulated surfaces were rare; S2G schools installed mounds and only two schools had hills. One hill was technically part of an adjacent CPD park that was rarely used by the PreK classrooms (personal communication, September 2021). There were a few schools that had cognitive or social challenges afforded by including music features like drums and xylophones or games (e.g., tic tac toe). Two sites had dramatic play objects incorporated into the play area, part of the same structure design. Collectively though, children’s opportunities for
physical, cognitive, and/or social challenges in the play areas that could support their learning and development were principally directed by the equipment itself, and the risks they afforded were predominately physical and moderate.

Abundant, diverse literature and sound empirical studies have shown consistently that “risky,” active play is essential for healthy development and the outdoor context provides the optimal space for it to occur safely and regularly (Tremblay et al., 2015). However, adult preoccupations about safety and “keeping children under control” have negatively impacted children’s access to risky play, independent mobility, and overall outdoor play, essentially denying children the chance to challenge themselves and learn important lessons (Wyver et al., 2010; Cevher-Kalburan & Ivrendi, 2016). Part of this prescribed inhibition is cultural. Lancy (2015) explains that our western society is a neontocracy. This type of society highly values young children, proclaiming that protecting and sheltering children to the highest level is necessary. He also argues that this neontocracy has gotten out of control. The “helicopter,” over-protective adults combined with institutional risk aversion culture have invaded schools for some time and are reflective of this perception. This is not a surprise, as American public schools tend to adopt WEIRD (western, educated, industrialized, rich, and democratic) values, attitudes, and practices, which have embraced this neontocracy. However, enduring hyper-protection can be detrimental developmentally (Lancy, 2015; Brussoni et al., 2017).

Children learn from experience. This includes their challenges, failures, or even when they get hurt. Risky play allows children to practice their risk assessment skills, negotiate risks and better understand their own personal limitations (Tremblay et al., 2015). When children take on risky activity while playing, they are also more likely to challenge themselves developmentally, essentially “pushing the window” of their Vygotskian zone of proximal
development (ZPD) because they are intentionally stepping out of their comfort zones (Bodrova & Leong, 2007).

Considering the well-researched benefits of risky play, adults should give children the chance to engage in some reasonable risk. This does not translate into being complacent about safety, but rather it means having a clear understanding of the difference between hazards and risk (Jago et al., 2009; Veitch et al., 2006). Related to what was discussed above regarding the overall wear and tear emergent theme, it was ironic that I observed instances when hazardous items (e.g., broken equipment, holes in fences, rusty metal debris, etc.) were accessible to some children playing outside, while at the same time, most students did not have any opportunities at school to experience moderate risky play such as undulated surfaces, loose parts, or being allowed to climb up the slide. Utilizing outdoor space and time in more creative ways and opening the available and diverse affordances to the students, can be part of the solution for incorporating some healthy risk-taking into the school day. This is explored and discussed further in RQ2 below.

I chose the name *nuanced natural elements* for the next overall theme because this was not a consistent strength or weakness of play space quality across the district. There were subtle nuances in the variety of types and purposes of natural elements within CPS playgrounds, but the prevailing type of layout invited a hands-off, aesthetic-only appreciation. Recall, the district had below average-average 7Cs’ ratings ($M = 2.8$) for the three items that addressed natural elements in the character category: *atmosphere, vegetation,* and *light quality*. Most schools had some type of landscaping, such as perimeter trees, foliage borders (e.g., bushes), grass, and/or annual plants for aesthetics. The variety, quantity, quality, and maintenance of the campus' natural elements had a vast range. As far as incorporating nature into the outdoor experience for children and the
upkeep, 17% exhibited the bare minimum, i.e., nothing organic near play areas. Most sample schools were somewhere in the middle, such as having a great natural view or walkway bordered by a variety of plants, but these were separate from where the children used the outdoor spaces. On the more “lush” end of the spectrum, there were few campuses that made notable efforts to include natural aesthetics and took great care of their spaces. These were outliers and/or had some of the additional affordances I examined (e.g., available, and creative use of campus space, campus gardens, CPD parks, community gardens, and nature play spaces) and were explored in RQ2. It is important to note that the function served by most green space, natural elements, and the more organic parts of the campuses was ambiance. Experiences that children had with “nature” were mostly indirect or vicarious rather than these more natural spaces and attributes being embraced as direct, rich opportunities to learn, explore, interact, and/or play which afford more to the children (Chawla et al., 2014; Chawla, 2015; Holt et al., 2019). One of the main goals I have had since the inception of this project, was to help encourage people who work with children to make a perceptual shift. Instead of the common hands-off, appreciation-only perception of campus, local neighborhood natural elements, and outdoor affordances, I invite educators to view and approach these resources as hands-on and exploratory, like a live laboratory providing open canvas for healthy and constructive play, learning, and development.

Highly unusual campuses were categorized as outliers, some of which were negative but most of which were positive. On the negative side, there were two schools that did not have any play spaces at all despite the fact that outdoor recess is written into the CPS health and wellness policy and children are supposed to be getting outside daily (CPS, 2023). It was beyond the scope of this research for me to determine what these children did for recess or any gross motor activities at these schools, but their only visible outdoor options were concrete walkways and
parking lots. Interestingly, these both were STEAM schools and outdoor areas can be conducive for a host of STEAM activities. Also, incorporating STEAM early on is recommended (DeJarnette, 2018). STEAM methods align with revered ECE approaches like inquiry-based, Reggio Emilia, or other project-based options for effective teaching and learning [ref]. Therefore, I think the lack of access to outdoor space is something that should be remedied for those two schools immediately. While both these schools are very near (<0.25 mi) to a CPD park, and we can hope that they are using this resource in the meantime (discussed in more detail in RQ2), all elementary schools should also have play spaces they can call their own to make outdoor play and education highly accessible and frequent.

On the more positive side of outliers, there were four schools that had outdoor classrooms visible on their campuses. Their design was simple and easy to modify or enhance. For example, one school had a collection of stumps where the children could sit and learn with a chalkboard on wheels next to the space. Another outdoor classroom had raised garden beds around the perimeter of the floor log seating area. The plants were being maintained and they had an interesting variety of native perennials and annual ornamentals. I found evidence of students using the area for creative activities and possible investigations (e.g., child-made bird feeders were located and being used by some local birds). Taking students outside for learning makes sense because when outdoors, children are likely to be more relaxed, focused, and prosocial (Kaplan, 1995; Weir, 2020). Outdoor learning environments can be enriching, enabling students to learn beyond the classroom borders. They have great potential for strengthening pedagogy and students’ learning and development (Blair, 2009; Goodall, 201; Rickinson et al., 2004; Wistoft, 2013). However, outdoor classroom set-ups are not frequently integrated into the public-school environment, including CPS. Teachers are sometimes not comfortable making this
outside transition because they may think that “outdoor learning” is not formalized or accepted by their educational/institutional practices, have lack of confidence, don’t know how to get started, or experience barriers related to physical constraints (van Dijk-Wesselius et al., 2020). Creating semi-permanent work areas and open-air classrooms like the ones observed can help teachers bridge into working outdoors with their students since they are slightly more defined. This is an area worthy of future studies as well.

Another important outlier that positively impacted the results of this study was the Space to Grow (S2G) Program. There were seven sample schools that were S2G participants and one that just finished their campus upgrade project in fall 2022. S2G schools had higher 7Cs’ scores. Recall, the mean for these schools was $M = 74.7$, much higher than the overall sample mean ($M = 62.14$). Also, four of seven of the S2G participants were part of the high-risk index group, in quartile 1. As a result of their higher 7Cs’ scores, the overall mean for the high-risk index group (quartile 1 $M = 57.36$) was higher than the medium-high-risk index group (quartile 2 $M = 53.90$), contrary to what one might expect. These campuses and play spaces were superior and open to the public. Their spaces had better quality and upkeep, invited more challenge, as well as giving more attention to connectivity, diversifying spaces and overall natural elements.

Stewardship is a big part of the S2G program as well. One of the program’s main goals is to improve storm water management in the city. Creators and engineers also think about prairie restoration as part of the solution to the management challenge and add native plants to the campuses. Additionally, the program actively recruits schools in underserved communities, those in need of improvement for their outdoor campuses, and those that are located in flood zones. S2G is expanding and intends to improve more CPS campuses with their environmentally conscious efforts (personal communication, Director of Education: Openlands, March 1,
Overall, this is an excellent program, significantly improving schoolyards while helping manage some of the city’s water challenges. Hopefully, S2G schools will continue to proliferate.

Correlations were explored for 7Cs’ total scores with main measures (risk index, physical appearances, campus square footage) to determine if there were any significant linear relationships and associations. For risk index, lower quality play spaces significantly covaried with higher risk schools. This was an expected result, however, not always the case. Recall that the outlier S2G program participants were an exception here. Also, there were schools that were low- or medium-low risk that had lower quality play spaces, including two STEAM schools with no outdoor spaces and one school with outdoor space, but no play equipment. Lower quality play spaces also significantly covaried with lower quality physical appearances of the surrounding neighborhood, as expected. There were exceptions here, too, when higher quality neighborhoods had schools with lower quality play areas. Campus square footage and 7Cs’ scores had a positive relationship, that approached significance, suggesting a weak association. Campus size was a small factor that was associated with 7Cs’ scores. However, there were instances when schools had large campuses but low-medium 7Cs’ scores because of the play area conditions or the opposite: smaller campuses with higher quality play areas. Although these measures have associations, one important outcome from this study is that play area quality does not always match the typical pattern/common bias when we are looking at geographical locations across the city. We see a range play space quality in the four quadrants of the city.
RQ2: Are there any qualities or opportunities suggested by the school campus, nearby neighborhood affordances, or a combination, that facilitate fast and/or low-cost improvements to enhance children’s experiences during their time outside at school?

The first goal of RQ2 was to discover if/how schools were using their campus affordances to their fullest capacities and/or any local resources that offered additional ones. The second goal of RQ2 was to explore options that could potentially improve accessibility to outdoor affordances during school hours for CPS students. As explained, to fully answer this question required applying a “wider lens” for analyzing the sample, looking beyond the campus play spaces. My analyses were focused on what available outdoor affordances both on campus and from local resources within a short walking distance from the school (< 0.5mi radius) were present, how these outdoor spaces/affordances were being used by the schools, what schools permitted as far as access to any additional affordances, and how the outdoor experiences for the children could be enhanced, quickly and economically, by expanding outdoor affordance usage outward. Recall the following emergent themes from RQ2: maximizing available campus space, campus gardens, CPD parks, community gardens, and nature play spaces. To further unpack how quick and affordable affordance diversification could possibly occur for schools, I also looked critically at the ten schools with the lowest overall 7Cs scores and their potential strengths/affordances, both on and off campus within walking distance (<.5mi), to exemplify this suggestive process for enhancing the outdoor experience for young children during school hours, even in cases where the immediate play space is lower quality in its current state.

In terms of usage of campus space, there was a large range of approaches across the district. Commonly, the built play areas for the children made up only a small fraction of the campus area totals, and yet these spaces were where play was concentrated. I identified a “space
access continuum” and organized schools into three clusters: gated/contained, open access, and proactive/creative. In the gated/contained group, areas beyond the play equipment spaces were not accessible to the children; this was the case for 1/3 of the sample. In the open access group, more square footage was available to the children, usually in the form of a field or open black top space. However, these spaces were not defined and there was no evidence that schools were using them proactively; this was the case for the majority of school play areas, slightly less than 2/3 of the sample. The proactive/creative group was an outlier and therefore small in numbers.

For the gated/contained schools, many reasons could explain why the schools decided to contain the play areas. It is possible that containing the children during recess could have been for safety reasons. The decision to have the play areas fenced in also could be related to the age of the children using the equipment, as equipment designs that were geared towards the younger children (ages 3-5) were self-contained more often than ones designed for elementary children (ages 5-12). CPS teachers are permitted to take their students outdoors to play or work outside and many do this from time to time. However, for the majority of students’ designated recess time, other school staff have the responsibility to monitor them. Schools may be in the position that they are short on recess supervisors, and it is more manageable for them to have the students contained while they are outside. For the open access group, the data collected here did not provide sufficient evidence to know how well or frequently these spaces were used. I did observe a wider use of space in these schools on occasion. There were a few instances when I observed special occasions at both the gated/contained and open access campuses such as field days and gym obstacle course events, when children were occupying more non-traditional areas of the campus. However, most of the time when children were playing outside, they remained inside the equipment space/designated areas and/or close by in an open area. Future research will
benefit from more systematic teacher interviews to assess space usage and potential barriers. Likely, barriers cited would be similar to those I suggested for the *gated/contained* group (e.g., lack of sufficient supervision), even though the open access group does not specifically gate off the wider spaces. The *proactive/creative* outliers were thinking outside the box and using their spaces in unique and productive ways, including using campus auxiliary space, affording more opportunities to the children, and getting students closer to the campus natural elements. One cost effective way to expand children’s access to outdoor affordances is to simply open more of the campus space. Students and teachers could utilize these areas in a variety of ways, such as some of the unique examples that were observed in this study, adding to the outdoor affordances’ children get to experience during the school day e.g. outdoor classrooms. It is very possible that there are more CPS schools that are doing creative work with space regularly that enhances the outdoor experiences for the children than the ones that I was able to represent in these data. A question I have and would like to further investigate is why some schools are allowed to utilize more outdoor space on campus in interesting ways and are others not.

Many schools maintain a strict stance about CPS affiliates only using the campus space during school hours. However, after hours, some do open their space to the public. Closing public space off for safety can have the reverse effect. For example, public parks that get visited less usually have higher crime rates and get damaged more often compared with those that have higher traffic (Hipp & Floyd, 2023; Marquet et al., 2020). Events that bring local communities together at public parks help with crime prevention (Hipp & Floyd, 2023). Designers and advocates for “green” schoolyards, including the local Chicago S2G program, favor and implement play area/campus designs that are open to the public and joint use agreements because
this helps to build community (Bates et al., 2018; Healthy Schools Campaign and Openlands, 2022).

Ideally, we want schools to be a community hub. Having a campus that is open, inviting and used by students and families in a variety of ways helps to build that sense of community and can also be safer. Starting from the inside out, inviting CPS affiliates to maximize campus space during school hours could help expand the perception of the campus beyond just the jungle gym for young children. The school campus can be a classroom, a laboratory, a habitat, an art studio, a nature play space, a special spot to connect with friends or be alone to reflect. A school wide perceptual shift like this could also help with outreach, modeling to the local surrounding community that the campus space is a diverse, public space that we care about it because people play, learn, socialize, and relax here healthily and comfortably.

Another important way to utilize campus space beneficially – campus gardens - was implemented by more than half of the sample, i.e., 65%. Gardens were present in all the district networks and their condition, quality, and maintenance varied substantially. Similar to the “campus space access continuum” I identified and explored above, collectively CPS garden quality can be described as on a spectrum. On one end, there were gardens that were neglected and not cared for since well before COVID, with decaying parts that in some cases were hazardous. There were gardens whose beds were in decent condition but were not tended in either spring or fall 21. Thirty-three percent of gardens were tended in spring/fall 21, 64% were tended in fall 21 only, and a few outliers with dedicated champions were doing incredible work (e.g., maintaining a sensory garden/habitat preservation, animal husbandry, advocating for urban farming/healthy foods by supporting their local communities with free, fresh produce, etc.).
School gardens have a long history as part of the educational experience. There are numerous benefits and positive outcomes that are associated with campus gardens including some of the following: positive impact on availability, access, and consumption of fresh produce, support for students’ social-emotional well-being including engagement and executive function skills, hands-on/inquiry-based/STEAM learning opportunities, and improvements to academic performance/cognitive function/creativity (Eugenio-Gozalbo et al., 2020; Pollin & Retzlaff-Furst, 2021; Williams & Dixon, 2013).

Some challenges do come with the decision to have a school garden. They require dedication, labor, background knowledge/professional development, and ongoing maintenance. In Illinois, districts/school communities are responsible for how these campus spaces will be used and if/when garden-based activities are integrated into students’ learning and development. Speaking from personal experience, this process often involves local champions, i.e., someone from the school who is passionate/knowledgeable about gardening, does the research to get the funding, and can sustain the ongoing activity needed for the space to flourish with the support of the school.

CPS is fortunate to have some gardening resources for those who wish to acquire gardens or maintain or improve their quality. They have a school garden team that is part of the Office of Health and Wellness (CPS, 2023). This team in collaboration with school garden partner organizations, such as Openlands, CPD-Community Gardens, NeighborSpace, Chicago Community Gardens Associations and others, claim to “support schools across the district in creating long-lasting garden programming and infrastructure that suits the individual needs of each school” (CPS: School Gardens, 2023, p. 1). They offer workshops and resources for gardens and related programming such as garden tool kits, seeds, planting guides, etc. There is
also an “eat what you grow” certification process that they offer along with SafeSchools that CPS staff members can complete yearly which then grants permission to the school to eat campus grown food.

Schools that have pre-existing gardens areas should use them, if possible. The ones that have been neglected should be cleaned up and/or recreated. Schools that do not have campus gardens should take advantage of the opportunities that are available from various non-for-profits and/or the private sector (e.g., WholeKids Foundation) to help schools construct them and learn about how to integrate garden-based experiences into the school day (Whole Foods Market, 2023). Gardens are a rich, diverse resource for children and school communities that support a variety of positive learning and developmental outcomes. These special spaces afford different opportunities that children can have when they are outside playing and learning at school.

Additionally, CPS is a fortunate district that offers resources, professional development, and partnerships with many local partner organizations that promote, create, and help support school campus gardens. Undoubtedly, other areas of resource deprivation (e.g., time, energy, information) create challenges for accessing the resources the district does provide. In the future I hope to support urban districts in championing the dissemination of resources, such as having a garden in every school, in the same way CPS committed to SEL programming and healthy lunches in every school.

**Looking Outward Beyond the Campus**

In addition to applying a “bird’s-eye view” to the school campus as I did above, it is also logical and cost-effective to widen the lens even further by considering local resources within 0.5mi that could potentially increase access and diversify outdoor affordances for CPS students. There are community gardens and CPD parks near almost every CPS school. There are some
schools that have these potential resources quite close (<.25mi). There is a plethora of community gardens spaces around the city. Additionally, many of the gardens are also affiliated with the partner organizations that actively support gardening at CPS schools already (CPS, 2023). I did not have access to information that allowed me to determine if/when CPS students visited any community gardens or what/if any relationships these organizations had with their neighboring schools because that was beyond the scope of this research. However, this is an area I would like to investigate further. Overall, it is safe to say that visiting these community garden spaces, developing relationships with liaisons, and deepening connections with those who already support the district gardening efforts could provide another affordable opportunity that could enhance CPS students’ outdoor experiences and enrich their overall education.

The majority of Chicagoans (98%) live within walking distance from city parks (Trust for Public Land, 2023). All sample schools were within 0.5 miles radius of a CPD park except for one (at 0.6 miles) and the average number of parks close by the sample sites was over three, giving schools not only proximity but also variety in many cases. As an attempt to get a better understanding of if/how schools were using park spaces during school hours, I chose to focus on a subgroup – the 1/3 of the study schools that were located in close proximity to the parks (<.25mi). What I found were examples of students using the CPD parks both regularly and hardly at all in the four city quadrants. Additionally, it was confirmed by various informal personal communications with school staff, that park usage was a regular component of students’ outdoor time while at school for certain schools. Conversely, other personal communications confirmed that the students did not use the park spaces except for rare special occasions such as parades or field days.
As with schools, conditions of the CPD parks also had a range of quality and upkeep, and this likely impacted their usage. In the examples that I observed and was able to clarify information with personal communication with school staff, at schools that were actively using the CPD parks for outdoor time, the park facilities were visibly in better condition. In contrast, at schools that were not using, or only sporadically using CPD parks, the adjacent parks had facilities that were more rundown, had broken/missing parts, and were less maintained. Here is a photo example of one CPD park that was hardly used by the neighboring school. As the photos reveal, this neighboring CPD park was not in good condition, lacking overall upkeep and repairs. This may be part of the reason that the school did not regularly use the space.

![Figure 85. 0804 (Gage Park) Left - CPD soccer field, large holes in turf; Right - cracked pathways around CPD park; School has students/families that use park before/after school, special events but daily recess occurs on school property in the immediate perimeter on grass/sidewalk or in an internal courtyard (via informal interview with PreK teacher).](image)

There are complex phenomena that may justify why some park spaces were better cared for than others. However, phenomena also parallel what can happen with schools (Kelly, 2020). Wealthier communities can afford to allocate funds to “greening.” For example, part of the reason why schools who were able to develop campus resources, such as the impressive garden programs (sensory garden, habitat restoration, animal husbandry etc.) or outdoor classroom set
ups, increasing student access to outdoor affordances, is that they had funds and support from the families/local school council to spend in this way. Overall, the story I discovered about the relationships between CPD parks and local schools that do or do not use them was nuanced and left more to be told, going well beyond the scope of this research. Nonetheless, CPD parks are indeed accessible to CPS schools and incorporating them into the outdoor experience for the children can and does provide additional opportunities to the children in some cases.

Another off-campus opportunity, nature play spaces, has been growing in local and national interest, especially since the COVID context (Children and Nature Network, 2023). In this study, there were some schools that were nearby established CPD or NeighborSpace nature play spaces. However, it was only confirmed that two study schools visited local nature play areas that were close by during their school days from time to time. Similar to the story with community gardens and CPD parks, there is more to uncover about why some schools go off campus to these spaces and why some schools cannot or do not. The director of education for Openlands and a former ECE CPS educator, explained that in her experience nature play site visits are dependent on administration and varied from school to school (personal communication, March 1, 2023). She shared that some schools would allow teachers to write an all-year field trip form that they kept on hand during their bi-weekly visits. Other schools would require a new permission slip every time students left the campus, presenting barriers to frequent visits, and some schools flatly forbade such visits.

Recall from the nature play space map that there are only five CPD nature play areas on the south side of Chicago compared with the many up north. The parks that have nature play areas are in more affluent areas of the city. Some of the explanation as to why this is the case parallels CPDs parks in general, explored in the next section. NeighborSpace has supported
nature play areas around the city as well. They have eight established nature play locations and in contrast to the others, these are located predominantly in communities of color. NeighborSpace is interested in developing more nature play spaces, outdoor play, and urban gardening outreach with equity of green space access in mind.

For the last part of my RQ2 analyses, I created a group of the ten lowest scoring 7Cs schools, to further investigate the possibility that even in the lowest quality spaces by initial appearances, there might be hidden strengths or underutilized opportunities. All the schools in this subgroup had some combination of the following potential options for increasing outdoor affordances: large amount of open campus space, updated equipment, campus garden area, CPD park <.25mi, community garden space <.5mi, and nature play space <.5mi. The average number of resources available to this group for potentially improving the outdoor experience was three, and all schools had at least one option available to them to potentially increase their outdoor affordances. Large campus space, campus gardens, CPD parks nearby, and local community gardens were the most common options for increasing affordances for the subgroup (60-70%). This data shows that what I hypothesized, and still hope for, is accurate. Schools do have the chance to increase outdoor affordances in affordable ways by thinking critically and creatively about how to use campus space and local outdoor resources to their advantage – even those schools that appear to have the most limited outdoor resources. Additionally, this study has highlighted the variety of ways that some CPS schools are already highly engaged in maximizing quality outdoor time for their students.
Reasons for Hope

As mentioned earlier, Openlands is a non-for-profit and one of the partnering organizations for the Space to Grow program. Openlands makes an effort to recruit schools for the S2G program that are in underserved communities. Openlands also hosts professional development workshops for teachers around topics such as maintaining gardens and tree care, along with giving out grants for making/maintaining gardens and planting trees in neighborhoods. They also have a “birds in my neighborhood program” which supports teachers and students in learning and practicing local birding (Openlands, 2023). They host boat tours on the Little Calumet River, centered around African American history and the African American Heritage Water Trail during warmer months. They now have a director of education who is a former CPD preK teacher. She is making efforts to open up programming to all ages of children and is very passionate about connecting BIPOC families with nature opportunities, learning more about what different people associate with positive nature experiences and play. This well-established organization has been protecting natural and open spaces and promoting nature opportunities and stewardship in northeastern Illinois since 1963.

Recall, most of the CPD nature play spaces already created are on the northside. However, the CPD nature play engagement specialist is aware of this access imbalance and making a conscious effort to network with more communities of color, hoping to get more families and children involved with parks, outdoor education, and nature play. There are four more nature play areas (Robinson, Wildwood, Horner, Leon Beach) being constructed and 11 more planned for the future including ones in more diverse areas such as Rogers Park. Neighborspace has done some incredible urban gardening, outdoor education, and nature play work with many different communities around the city, some of which has already been
highlighted in this study (e.g., community garden spaces and *nature play* sites). As an organization, Neighborspace is dedicated to building out and supporting community spaces that are guided by the people who use them, the most sensitive stakeholders. They have adopted a philosophy and approach to working with diverse communities that is more naturalistic, constructivist, transactional, and subjective (Guba & Lincoln, 1989; Lincoln & Guba, 1985; Lincoln, 2001; NeighborSpace, 2023). In addition to their ongoing work, they are going to be joining forces with the City of Chicago Department of Business Affairs and Consumer Protection (BACP) in the Community Growers Program. The goal of this program is to tackle the problem of food inequality experienced by many low-to moderate income neighborhoods, exacerbated by COVID-19, by reducing barriers to urban agriculture. Partner agencies (Advocates for Urban Agriculture, Chicago Food Policy Action Committee, Community Food Navigator, DePaul Steans Center, Grow Greater Englewood, Urban Growers Collective, and Windy City Harvest), NeighborSpace, and the city of Chicago intend to support urban growers with land access, resources, and technical support. This will include continuing to invest in existing sites and building urban gardens/farms on vacant lots with the goal of increasing equitable community access to healthily food, reducing neighborhood food insecurity.

I will be working with NeighborSpace, along with other evaluators to support the West Side Nature Play organization in identifying and clarifying their goals, curating resources, and working with local early childhood educators and other interested partners to activate outdoor play/portable play opportunities in public spaces that align cohesively with the surrounding community (personal communication, Assistant Director, NeighborSpace, February 27, 2023). I am very excited about this work because for this study, I initially planned to investigate *nature play*, to explore if/how this was incorporated into early childhood outdoor play/learning at select
CPS schools. However, due to COVID conditions, the study changed significantly and did not involve any human subjects besides personal communications. Thus, key inquiries were left unanswered. I hope this work with NeighborSpace and the West Side Nature Play organization will be an opportunity to revisit some of my original study intentions. While each section in the discussion above was concluded with some recommendations, in the section below I summarize recommendations derived from this study, that I hope to share with the various levels of stakeholders.

**Recommendations**

The following is a list of recommendations that I have compiled after completing this comprehensive mixed methods study.

For CPS schools/campuses, administration, teachers, staff, students, and families:

- Starting with what is unsafe, district schools need to clean up their overall campuses e.g., remove of any loose debris, garbage, signs of vandalism, etc. They should fix/replace any broken components of the play equipment areas e.g., missing rungs on railings, detached swing chains, cracked seating areas, etc. and any broken/rundown components of surfaces including PIP rubber surfaces, cement and/or blacktop. It is possible to organize school campus cleanup days. The school community, i.e., CPS staff, students, and families can work together to organize, “spruce up”, and improve their outdoor grounds and resources.

- Ongoing care of outdoor spaces’ natural elements is also needed, including maintaining them, and increasing and diversifying them when possible. I suggest forming “schoolyard” committees, recruiting members from interested educators and/or families, their local school councils, and/or district representatives from the offices of health and wellness and STEM to organize and oversee the outdoor campus care.
• Encourage changing perceptions of the outside space from the recess spot only, to a valuable resource. Administration should open as much of the campus space as possible for the students, teachers, and families to use during the school day and after hours. This includes increasing the opportunities for the school children to observe and interact with more space in general and with natural elements on their campus, both for learning and play.

• Allow children to utilize diverse loose parts/undefined materials while outside, both found and provided materials. Not all materials need to be natural. Provide children with opportunities to engage in play/learning that is messy, e.g., water tables, mud construction, chalk creations, etc. These open-ended and process-oriented materials and experiences support inquiry, interdisciplinary learning, and development, and function in unique ways when they take place outside. Teachers can keep a set of rain boots/jackets at school that children can put over clothes to minimize getting dirty/wet. It also makes sense to create/use storage areas near the play areas such as pre-existing freight container access, sheds, tarped areas etc. to house supplies they can use to create different set ups and tools for working outside. Any materials that could change more often would add to the affordances of the play areas, increasing their dynamism, replicating one of the most important features of nature.

• Invite teachers and students to change the spaces, to diversify and/or increase affordances, especially in ways that would invite differentiated spaces, exploring and risk/challenge. Examples: Set up a cardboard pop-up play area, use fabrics/tarps/tents to enclose areas, decorate chain link fences, collect leaves from fallen trees to create temporary leaf piles or art creations, have large loose parts that can be rearranged like boards and logs. This includes making semi-permanent structures that provide shelter/protection from weather conditions.
such as tarps, tents, skeletal pavilions, and/or alternative learning environments such as outdoor classrooms and nature play setups.

- Install campus gardens, and care for those that already exist. Take advantage of district and supporting partners’ resources for gardening, outdoor education, and play.

- Educate teachers about incorporating outdoor play and learning into their pedagogy and aligning activities with curricula. Adopt quality of outdoor play space and incorporation of natural elements as district priorities that are part of existing mandates, such as STEM, health and wellness, and/or SEL. For example, in addition to recess, require a certain amount of education per year be conducted outside. Encourage the school community to get involved with local stewardship.

- Take children on walks to observe their local surroundings so they understand more about and appreciate the nature and outdoor spaces close to them. Use “standing” field trip permission slip practices to increase ease of visiting nearby CPD park facilities, local community gardens, local nature play areas, outdoor art installations, and other community resources.

For our city:

- Use the 7Cs measure to evaluate city play areas including other CPS schools, CPD and NeighborSpace, consider pre and post assessments for play affordance enhancement projects (e.g., S2G, CPD, NeighborSpace, nature play space).

- Gardeners, farmers, and outdoor explorers continue to navigate ways to connect with CPS children, families, and schools and increase mutually beneficial partnerships and activities. Make use of offers from these organizations and individuals to engage with CPS.
• Think creatively and critically about how we can improve access to outdoor education and nature play for Chicagoland’s children, especially for children and families of color. This should start with welcoming and respecting families’ “funds of knowledge” regarding quality outdoor time, while learning about what types of spaces and experiences they want to have, and feel will best support their families and communities.

**Limitations**

Several limitations impacted my descriptive study about CPS play spaces and outdoor affordances. As mentioned, data collection occurred during the height of the COVID pandemic, between total school shutdowns and the emergence of hybrid re-openings. Therefore, I was unable to include human subjects other than distal observations and informal personal communications. I had originally planned to conduct semi-structured interviews with teachers and administrators in CPS. There is no doubt that their input would have made a rich contribution to this work and answered some lingering questions, such as why some schools permit students to go off campus and play and others do not. I also would have been able to gather more information about when teachers took their students outside for play and learning, what their comfort levels were regarding working outside, and what they would do when they were outside (e.g., read a story, conduct a math lesson or science experiment, create chalk drawings, etc.).

My study was also constrained by the fact that children were not present interacting with the spaces in approximately 1/3 of the sample of schools. When I was well into my data analyses, I realized that the 7Cs measure was significantly lower at school sites where children were not present. Therefore, I had to reduce my sample size from 60 schools to 37 for any analyses conducted with the 7Cs tool. I was only able to use the measure’s data for sites where I
observed children and documented how they were using equipment, interacting with the environment, taking advantage of affordances, etc. Beyond the issue presented in terms of the 7Cs validity, even the non-7Cs’ observations would have been enhanced with more human presence, since the ultimate concern undergirding this study is a humanistic one, i.e., how children benefit from outdoor play. Given the fact that I did discover children being resourceful and constructing their own positive play despite some environmental constraints (the opposite of affordances), it stands to reason that I would have witnessed additional examples of this if I had more opportunities to observe children.

As with most dissertations, I was the principal researcher. While I was fortunate to have a research assistant help me with 25% of the data collection so I could achieve inner-rater reliability, conducting over 100 field visits was an extensive effort, and took longer than expected despite not having the challenges of scheduling visits with human subjects. Furthermore, my lenses on early childhood education, nature, and environmental justice could not be removed, and likely served to both benefit and disadvantage the data quality, in ways that are not entirely possible to know. I did my best to be objective, however, most field notes, photographs, and measure ratings were documented and interpreted from my multiple biases. I am a white, North American, middle-class, educated, female, teacher, gardener, and nature lover. When I look at all forms of nature, I tend to find inspiration. For example, I get excited when I see prairie grass growing through concrete. I have had the privilege to experience diverse forms of “big nature” in different places, both locally and beyond. I have many positive associations and memories inextricably linked to the outdoors. I am aware that my perception is going to be different than that of someone who witnessed the prairie grass come through the concrete and
overtake a neighboring business or home, showcasing disinvestment in their community rather than “awesome nature.”

Another challenge was that there is almost no other research available that has conducted quantitative measurements of children’s play space quality, and therefore almost impossible to know how the current results compare to others. To my knowledge, the 7Cs measure is the only one of its kind that exists. Therefore, I reached out to Dr. Susan Herrington, the designer of the 7Cs measure. She responded, in the middle of COVID, and was kind enough to share raw data and field observations from her current “rewilding” study that she was conducting with her landscape architect students in preschool play areas in Vancouver, B.C. The Vancouver sample size was much smaller, and they had more researchers collecting data. However, it was extremely helpful to have something to compare my ratings and documentation to, since Vancouver is a large urban city and both of us were focusing on young children, their development, outdoor play, and the affordances that different types of spaces could provide.

A final limitation to this study was the complexity involved in the inequities and injustices implied by the data, wanting to avoid “victim blaming,” and also wanting to offer urban schools some reasonable suggestions for improvement of outdoor play experiences, while knowing that these would be only “nipping at the heels” of the larger systemic problems, such as the property taxes structure of funding of public schools. This complex mix of imperatives inspired RQ2, and I hope that I achieved my goal of highlighting strengths and low-burden, low-cost opportunities, even for the lower-quality spaces. Still, I remain cognizant that seemingly easy suggestions such as using garden spaces if they exist, repairing the most hazardous wear and tear conditions, and taking more walks to nearby nature spaces, each involve time and economic burdens that simply may not be surmountable, especially during the age of emerging
from COVID. Even if schools do have the resources to surmount these obstacles, they may choose other priorities, such as pressures they are receiving to recover from COVID “learning loss” (Patrinos et al., 2022). Beyond the dissertation itself, the only way to address this limitation is to “be the change” we are looking for, and that is what I intend to do as I pursue a career that revolves around environmental and educational justice for young children.

**Future Studies**

I have many ideas about future studies that are related to my exploratory mixed methods work examining children’s outdoor play spaces, experiences, and affordances that they can provide, especially those that best support human development across our city. Due to significant attrition because of lack of children’s presence, only 37 schools out of the 476 elementary schools were analyzed with the 7Cs tool. To improve CPS play space assessment accuracy, it makes sense to evaluate all CPS schools with the measure and also utilize more and diverse researchers to collect that data. This would provide a more complete picture of the school campus outdoor play area and types of experiences that the children are having while they are working and playing outside during school hours. Conclusions drawn from district-wide data would also be more reliable, due to the increased sample size and number of researchers evaluating the spaces. That information could be shared with the district, helping to identify the schools that were in the most need of improvement overall, as well as highlight specific areas of strengths and weaknesses that are both district wide and associated with specific campuses. For example, from my study, excluding outliers, challenge/risk afforded to the students was limited. By looking at the district as whole, I imagine that finding would be confirmed and more outliers would surface, providing examples of how to include more affordances that support healthy challenge/risk that are also accepted by the district.
The use of the 7Cs measure can also be utilized for pre- and post-assessments of play areas that get modified. For example, S2G school participants would be ideal district candidates to collect and interpret before/after 7Cs data. The pre 7Cs evaluation of existing school play areas would help playground designers fine tune their accommodations and improvements the spaces. The post 7Cs evaluation and interpretation would help to justify the significance of these enhancement efforts to investors, other CPS schools, and potential skeptics. Having this pre/post data could potentially help the S2G program expand. CPD and NeighborSpace can also utilize these same methods for the same reasons, when they are selecting parks or other community spaces to construct nature play areas and after they complete their different projects.

As mentioned in the limitations section, I was unable to include human subjects and having their input about study topics and findings would add substantially to this research. More information is needed in understanding CPS administrators, educators, children, and their families’ perceptions about outdoor learning, play and their ideas, associations with positive outdoor experiences, around this layered topic. More investigation around any utilization and perceptions of CPS (e.g., work with gardening team), community garden (e.g., NeighborSpace), CPD (e.g., park usage/nature play) or other local outdoor-centered resources is also needed from these same stakeholders. This inquiry is particularly important when it comes to BIPOC communities because of the research gap evident and the needed increase for access to quality outdoor spaces, both locally and nationally. Starting with district wide data collection efforts, such as surveying CPS employees, families, and children is imperative. From there, focus groups could be created and semi-structured interviews conducted to unpack these rich stories. “Missing links” could potentially be uncovered, such as why certain schools permit teachers to take students out at different times on campus, use additional parts of the campus besides the
designated play areas, and are allowed go off campus during school hours while others are not. Ideas could be cultivated that could help schools improve overall learning and development experiences for children as well as to become more of a community hub, better supporting families and CPS personnel.

Concluding Thoughts

My work has told part of the complicated story about outdoor play affordances and experiences that are offered to CPS students and families that use the spaces. There were some challenges revealed, such as the collective wear and tear and lack of dynamism that many children endure when they are playing outside on CPS campuses during their recess. However, this work was also very inspiring. Some schools were creative and proactive in their own ways when it comes to supporting children’s learning and development outside. Collectively, this information shows that there are options, which can be low-cost, providing solutions for enhancing the outdoor experiences happening during school hours, especially important for the spaces that had the least amount to offer within their built equipment and immediate surroundings. In some cases, the study information already validates what is there, such as large open space or a campus garden. In others, it may be as simple as walking across the street.

It is important to keep in mind that when students and families get the chance to work directly with nature, such as exploring habitats, growing diverse plants, caring for animals, or simply just enjoying being outside, these are valuable and healthy learning opportunities. Not only do these types of experiences support learning and development across domains, they also can provide a “live” laboratory of sorts where children could have the chance to interact hands-on with and be comfortable in their natural worlds. I encourage all CPS schools to transition, “widen their lens” and make this perceptual shift. By taking advantage of their own and local
resources as well as support systems, schools can evolve their outdoor spaces and affordances, making them more appealing, developmentally appropriate, diverse, and inviting. This could help boost community perceptions of schools as positive community hubs, where children and families want to come and spend their time. At the same time, it remains in the hands of communities, schools, and their champions to go beyond maximizing “what is” on a school-by-school basis, to committing to collective activism towards environmental justice for children. This includes the school day, where quality time spent outdoors is a vital part of what helps children stay aligned with their humanity, thereby promoting their self-actualization.
APPENDIX A

HERRINGTON’S 7CS MEASUREMENT AND
MCDONNELL’S NEIGHBOR QUALITY INDEX:

PHYSICAL APPEARANCE
Date: 
Children present: 
School Name: 
Network: 
Quartile Rating: 
Neighborhood: 
Ward: 

Neighborhood assessment

<table>
<thead>
<tr>
<th>Physical Appearances</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwelling Conditions</td>
<td>Poor</td>
<td>Below Average</td>
<td>Average</td>
<td>Quality</td>
<td>High Quality</td>
</tr>
<tr>
<td>Yard Conditions</td>
<td>Poor</td>
<td>Below Average</td>
<td>Average</td>
<td>Quality</td>
<td>High Quality</td>
</tr>
<tr>
<td>Street Conditions</td>
<td>Poor</td>
<td>Below Average</td>
<td>Average</td>
<td>Quality</td>
<td>High Quality</td>
</tr>
<tr>
<td>Sidewalk Conditions</td>
<td>Poor</td>
<td>Below Average</td>
<td>Average</td>
<td>Quality</td>
<td>High Quality</td>
</tr>
<tr>
<td>Visible trash</td>
<td>Highly Visible</td>
<td>Visible</td>
<td>Somewhat Visible</td>
<td>Scantly Visible</td>
<td>Scarcely visible, not visible at all</td>
</tr>
<tr>
<td>Neighborhood Name</td>
<td>Scarcely visible, not visible at all</td>
<td>Scantly Visible</td>
<td>Somewhat Visible</td>
<td>Visible</td>
<td>Highly Visible</td>
</tr>
<tr>
<td>For sale/rent signs</td>
<td>Highly Visible</td>
<td>Visible</td>
<td>Somewhat Visible</td>
<td>Scantly Visible</td>
<td>Scarcely visible, not visible at all</td>
</tr>
<tr>
<td>Abandoned vehicles</td>
<td>Highly Visible</td>
<td>Visible</td>
<td>Somewhat Visible</td>
<td>Scantly Visible</td>
<td>Scarcely visible, not visible at all</td>
</tr>
<tr>
<td>Residential decorations</td>
<td>Scarcely visible, not visible at all</td>
<td>Scantly Visible</td>
<td>Somewhat Visible</td>
<td>Visible</td>
<td>Highly Visible</td>
</tr>
<tr>
<td>Boarded up Abandoned</td>
<td>Highly Visible</td>
<td>Visible</td>
<td>Somewhat Visible</td>
<td>Scantly Visible</td>
<td>Scarcely visible, not visible at all</td>
</tr>
</tbody>
</table>

Describe any local green spaces (public parks, play areas, community gardens, open lots etc.):
Estimated square footage:
7Cs

<table>
<thead>
<tr>
<th>Character Traits</th>
<th>Questions to consider</th>
<th>Notes</th>
<th>Rating 1-5 Total____/25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build quality</td>
<td>What condition is the play space in (including its features)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atmosphere</td>
<td>What is the character of the play space? Does this play space have an overall sense of softness?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetation</td>
<td>Does the vegetation offer visual stimulation? Are there opportunities for interaction with the vegetation? Is vegetation used as a play prop?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface Material</td>
<td>Is there a range of surface materials in the space? Are these materials engaging and stimulating? Do they contribute to an overall sense of softness in the space?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light quality</td>
<td>Is light quality balanced? Are there color differentials?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Context Traits</td>
<td>Questions to consider</td>
<td>Notes</td>
<td>Rating 1-5 Total /25</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Health and Safety</td>
<td>Is the play space secure from traffic and other dangers?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Does the space suffer from vandalism or animal incursion?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microclimate</td>
<td>Have microclimate conditions been addressed? (e.g., too hot, cold, wind exposed etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Views Looking Out</td>
<td>Does the play space offer views to the surrounding landscape?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>What can children see beyond the play space boundaries?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Views Looking In</td>
<td>Is the play space attractive to look at?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundaries</td>
<td>Are there clear physical boundaries that are stimulating and engaging?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Where possible, do boundaries create a link with the surrounding landscapes?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connectivity Traits</td>
<td>Questions to consider</td>
<td>Notes</td>
<td>Rating 1-5 Total___/15</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------------------</td>
<td>-------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Entrance and Exits</td>
<td>Is it easy to access outdoors?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is indoor and outdoor space connected visually?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there a clear entrance and exit to the space?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hierarchy of Pathways</td>
<td>Are there paths that promote movement and exploration of the space?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do these paths allow safe integration of foot and bi/tricycle traffic (if necessary)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moving Around the Space</td>
<td>Do the paths loop?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do the paths allow children to make decisions about where to go?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clarity Traits</td>
<td>Questions to consider</td>
<td>Notes</td>
<td>Rating 1-5 Total /20</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------</td>
<td>-------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Design</td>
<td>Is the layout of the play space clear and navigable?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is the play equipment appropriately placed (i.e., not dominating the center of the play area)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zones</td>
<td>Are there different zones of play clear (e.g., messy zones, sand play, water play, bicycle/tri space etc.)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seating</td>
<td>Are there spaces where children can sit (including informal setting, stumps, boulders etc.)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are there comfortable places for adults to sit adjacent to the play space?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logistics</td>
<td>How easy is it to set up and pack away the play space?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there ample storage?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-rocks, table/bench seating in modular garden area only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chance Traits</td>
<td>Questions to consider</td>
<td>Notes</td>
<td>Ratings 1-5 Total____/15</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------</td>
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<td>--------------------------</td>
</tr>
<tr>
<td>Mystery</td>
<td>Are there areas and materials that promote exploration (e.g. look behind, stand on for prospect, crawl into, look up into)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loose Material Play</td>
<td>Are there natural materials in the play space to create, build with, manipulate and move throughout the play space?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Messy Zones</td>
<td>Are there areas for water play? Are there places to play in the dirt? Are there sand play areas? Can children make mud?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change Traits</td>
<td>Questions to consider</td>
<td>Notes</td>
<td>Ratings 1-5 Total_/25</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
<td>-------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Differentially Sized</td>
<td>Are there small spaces for individuals, medium spaces for small groups, large spaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spaces</td>
<td>for group assembly?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range of Space Types</td>
<td>Are there open spaces for movement and activity?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are there undefined spaces that accommodate play?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are there spaces that provide shade or shelter?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activities with variety</td>
<td>Are there activities for different aged students?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are there activities children can explore at different stages of their development?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ground Plane</td>
<td>Are there changes in the topography that make space stimulating and engaging (e.g.,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>mounds, steps, ramps, undulating surfaces, ditches, decks, terraces etc.)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>Do the materials in the play space change with the seasons?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Challenge Traits</td>
<td>Questions to consider</td>
<td>Notes</td>
<td>Ratings 1-5 Total____/10</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Risky Play</td>
<td>Are children encouraged to take risks and challenge themselves in the space (e.g. height, balance, speed, using tools other materials etc.)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduated Challenge</td>
<td>Does the space contain opportunities for physical and cognitive challenges with varying levels of difficulty?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL SCORE______/135
Table 1. 7 Cs Definitions (Herrington et. al, 2007).

<table>
<thead>
<tr>
<th>7C</th>
<th>Descriptor</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Character (25)</td>
<td>indicates the overall feel of outdoor play spaces, 4 architectural types defined (modern, organic, modular and re-use)</td>
<td>play space building quality and condition, vegetation, varied surfaces, light quality</td>
</tr>
<tr>
<td>Context (25)</td>
<td>involves how the play space interacts with its surroundings</td>
<td>play space security, microclimates, views looking out from and in towards the play area attractiveness, defined boundaries</td>
</tr>
<tr>
<td>Connectivity (15)</td>
<td>indicates the physical and visual connectedness of the play space through a hierarchy of paths and the link between indoors and outdoors</td>
<td>play spaces entrances and exits, pathways, movement around the space</td>
</tr>
<tr>
<td>Clarity (20)</td>
<td>integrates physical and perceptual legibility, play spaces should promote spontaneous exploration not confusion</td>
<td>play space design, differentiated play zones and seating, logistics for set up/break down and storage</td>
</tr>
<tr>
<td>Chance (15)</td>
<td>provides an opportunity for children to create, manipulate, and leave an impression on their outdoor play space</td>
<td>play space mystery (place making options and exploration options), loose parts and messy zones available</td>
</tr>
<tr>
<td>Change (25)</td>
<td>refers to the range of differently sized spaces and how these spaces change over time (e.g., living things can signal change in the seasons and growth and elements for play)</td>
<td>play space offers different sized spaces and ranges of spaces, activities for students from various ages/stages of development, diverse topography, materials change with the seasons</td>
</tr>
<tr>
<td>Challenge (10)</td>
<td>refers to the available challenges (e.g., physical, cognitive) that a play space provides</td>
<td>play space encourages risk taking and graduated challenge</td>
</tr>
</tbody>
</table>
REFERENCE LIST


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VITA

Kate Varey had a long and varied higher educational journey before attending Loyola University of Chicago. She started at The Evergreen State College and graduated with a dual bachelor’s degree in science and art in 2001. Next, she taught high school in Chicago for three years. Then, she studied and taught abroad in Mexico and Brazil, earning her TESOL certification and working as an English as a second language teacher with adolescents and adults. Upon returning home, Kate obtained her type 29 teaching certification to be able to teach public school in Illinois and a position as a bilingual second-grade teacher at an elementary school. She was awarded a scholarship to complete her Master of Science in Education for Northern University. She earned her master’s degree in 2007. She also taught second grade and kindergarten at that same school for 17 years.

Deciding to return to academic life yet again, Kate was awarded a PhD candidacy from Loyola University of Chicago/Erikson Institute in fall of 2015. While completing her studies, she worked as an adjunct faculty, SEL program facilitator and researcher, and coach for teaching candidates in their master’s degree programs at the Erikson Institute. In 2020, she started a full-time faculty position with City Colleges of Chicago: Harry S. Truman in the Education, Child Development and Family Studies Department. Kate was granted tenure with City Colleges of Chicago in spring of 2023, when she also successfully defended her dissertation to satisfy completion of her doctoral degree.