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Paper title:

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Hashtags or twitter handles of influential people or organisations in the field	#childfriendly
Title of the City Know-how Not the paper necessarily. 140 characters or less	Evaluation of a Municipality's Free Play Preschool and Space
Twitter summary 100 character tweet 'hook' synopsis	An innovative methodological approach to evaluate the impact of a free play space on children's play
For attention of . . . Who needs to know outside the research community? Which city officers, urban leaders, professions, communities or organisations etc.?	Municipalities Free play advocates Child friendly spaces enthusiasts
Super summary What you did and what you found out. 150 words	Free play is essential for children's positive health and development. Ensuring opportunities for dynamic free play in children's environments is essential to a child-friendly community. This paper discusses lessons from a participatory mixed methods research partnership (multi-site case study) that evaluated the impact of a municipal indoor play-based preschool recreation program and space on free play. We used a mixed-methods approach used to understand the differences between an innovative and purposefully-designed free play-based space and two conventional preschool recreation spaces. We explored the multifaceted nature of children's play experiences and behaviours from the perspectives of parents, preschool instructors, and the children themselves. Findings from this nuanced study of the

	conditions that support free play in municipal preschool recreation programs can be used to enhance the community environment more broadly, helping them to become deliberate child-friendly places and providing policy-makers and stakeholders with evidence for future investments in children's play.
What was already known on this topic 100 words	Free play has a profound impact on children's lifelong health and development and provides individual and societal benefits. Despite compelling evidence confirming the benefits of free play, recent studies have shown a substantial reduction of time children spend in free play over the last five decades, in both formal and informal educational settings. Early learning and care environments become optimal free play environments when they offer a variety of rich, sensory play opportunities that promote children's choice and agency; increase their exposure to risks and allow them to test personal boundaries in a safe environment; and provide opportunities for social interactions and solitary play.
What this study adds 100 words	To our best knowledge, there is a little research focusing on free play promotion in preschool programs and indoor spaces offered in public recreation facilities. Our research helps to address this gap by investigating the impact of a free-play based municipal recreation preschool program and space intervention on children's play behaviours. We present the novel methodological approach used and share lessons from each of the five parts of the project, which involved different data collection methods and multiple participants. Finally, we reflect on the successes and challenges associated with the community-engaged approach and the possibilities the findings might hold for creating more child friendly communities and cities.
Implications for city policy and practice 150 words	Child-friendly communities are inclusive of children and youth and promote their well-being in society. Every decision and investment directly impacts children's right to experience a healthy, playful childhood; impacts their health; and their inclusion as full participants in their society. Free play has been given dedicated attention by international bodies interested in promoting children's health. This recognition necessitates a nuanced understanding of how to foster play in those spaces dedicated to, and inclusive of, children. Lessons learned from studies of child-centered spaces, like this one on municipal free play preschools, can be used to enhance community environments, purposefully reorienting them as inclusive, child-friendly places.
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Evaluating child-friendly spaces: Insights from a participatory mixed methods study of a municipality's preschool free-play environments

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Evaluating child-friendly spaces: Insights from a participatory mixed methods study of a municipality's preschool free-play environments

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Abstract

Free play, play controlled by the player(s), is an essential and positive determinant of children's social, physical, and emotional health. Ensuring opportunities for dynamic free play in rich physical and social environments is foundational to a child-friendly community. This paper discusses methodological lessons from a participatory mixed methods research partnership (multi-site case study) that evaluated the impact of a municipal investment in an indoor play-based preschool recreation program and space on promoting free play. We reflect on the approach used to understand the differences between an innovative space, purposefully designed to promote free play, and conventional preschool recreation spaces with respect to child-friendly design. This study explored the multifaceted nature of children's play from the perspectives of parents, preschool instructors, and children relative to children's interaction with the physical and social attributes of three preschool environments. The use of a participatory mixed methods approach permitted a nuanced study of the conditions that support free play in municipal preschool recreation programs, which also can be used to study other community spaces. Rigorous methodology allowed for the careful investigation of purported child-friendly places to reveal findings that can provide policy-makers and community stakeholders with viable documentation for future investments in children's play.

Keywords: free play; preschool; child-friendly; participatory mixed methods research; municipal recreation; Canada

Evaluating Child-Friendly Spaces: Insights from a Participatory Mixed Methods Study of a Municipality's Free-Play Preschool and Space

Abstract

Free play, play controlled by the player(s), is an essential and positive determinant of children's social, physical, and emotional health. Ensuring opportunities for dynamic free play in rich physical and social environments is foundational to a child-friendly community. This paper discusses methodological lessons from a participatory mixed methods research partnership (multi-site case study) that evaluated the impact of a municipal investment in an indoor play-based preschool recreation program and space on promoting free play. We reflect on the approach used to understand the differences between an innovative space, purposefully designed to promote free play, and conventional preschool recreation spaces with respect to child-friendly design. This study explored the multifaceted nature of children's play from the perspectives of parents, preschool instructors, and children relative to children's interaction with the physical and social attributes of three preschool environments. The use of a participatory mixed methods approach permitted a nuanced study of the conditions that support free play in municipal preschool recreation programs, which also can be used to study other community spaces. Rigorous methodology allowed for the careful investigation of purported child-friendly places to reveal findings that can provide policy-makers and community stakeholders with viable documentation for future investments in children's play.

Keywords: free play; preschool; child-friendly; participatory mixed methods research; municipal recreation; Canada

Introduction

Free play is an essential and positive determinant of child health and development, and has great potential to contribute to healthy, child-friendly communities (Gill 2008). Through free play, children exercise fine and gross motor skills; refine verbal and non-verbal communication; increase their social competence, resilience, adaptability; improve their well-being, self-confidence, and physical fitness; and enhance their creativity, thinking and problem solving skills (Gray 2009, Henricks 2009, Graham and Burghardt 2010, Fiorelli and Russ 2012). Therefore, free play has a profound impact on children's lifelong health and provides individual and societal benefits (Keating and Hertzman 1999, Alexander et al. 2014). The term *free play* refers to all forms of play that are voluntary, spontaneous, intrinsically motivated, and both initiated and controlled by children (Gray 2009, Hewes 2010). Despite compelling evidence confirming the benefits of free play, recent studies have shown a substantial reduction of time children spend in free play in formal and informal educational settings over the last five decades for a multitude of reasons (Karsten 2005, Veitch et al. 2006, Ginsburg 2007, Singer et al. 2009, Gray 2011, Alexander et al. 2014, Sandseter 2014, Brussoni et al. 2015). Play spaces and activities have become more structured, organized, and institutionalized (Singer et al. 2009) with more adult supervision (Veitch et al. 2006, Gill 2008, Alexander et al. 2014), detrimentally modifying the environments where children can play freely for their own purposes. Concurrently, the focus of Canadian public policy on identifying and addressing developmental issues and school readiness outcomes in early childhood programs further limits even very young children's opportunities for free play (Ginsburg 2007, Gray 2011). This myriad of factors contributing to the decline of children's free play can be viewed as socio-structural challenges to the actualization of child-friendly cities.

Interventions targeting early learning and care environments are one strategy to encourage engaging and dynamic play experiences, thus increasing children's exposure to positive, settings-based determinants for lifelong health (Keating and Hertzman 1999). These interventions can provide children of different ages and developmental phases a child-focused space that promotes and supports equitable free play activities and opportunities for social interaction (Dublin City Childcare Committee 2007). Research has shown that while indoor, supervised settings typically may decrease free play (Alexander et al. 2014), free flow settings (where children can navigate from one activity to another on their own) encourage more free play (Brady et al. 2008). Early learning and care environments become optimal free play spaces when they offer a variety of rich, sensory play opportunities that promote children's choice and agency; increase their exposure to risks and allow them to test personal boundaries in a safe environment; and provide opportunities for social interactions and solitary play (Children's Play Council et al. 2000, Play England 2008, Play Wales 2012).

In Canada, early childhood learning and care, including preschool, occurs in a variety of formal settings, such as private and not-for-profit centres, dayhomes, community preschool programs, public school systems, and in public preschool programs offered by the municipal recreation sector. Attendance at preschool is not mandatory, however many families seek out preschool experiences (often part-time) for their children. The lack of a single (or coordinated) delivery system for preschool programming in Canada underscores the significant need to consider the role of preschool settings in creating and sustaining a child-friendly community.

Yet this interest in promoting play-based experiences in indoor early learning and care environments is not matched by reporting of evaluative research examining the implementation or outcomes of such initiatives. Current literature reveals studies focused on single elements of

play in the early learning and care environment, often focused on the relationship between play and developmental or learning outcomes (Danniels and Pyle 2018). For example, there is research that addresses: teachers' roles in play (Kontos 1999, Harper and McCluskey 2003, Björk-Willén and Cromdal 2009, Fleer 2015), preschool classroom practices that promote play based learning (Prochner et al. 2008, Hanley et al. 2009), and may result in differences in children's behaviours or developmental outcomes (Ostrov and Keating 2004, Fiorelli and Russ 2012, Lee et al. 2015, Akbari and McCuaig 2017). Research on free play tends to be conducted in outdoor environments and is often associated with active play (c.f., Veitch et al. 2006, Active Healthy Kids Canada 2012). Studies of the physical environment and centre quality are organized around learning and development rather than play (Holloway and Reichhart-Erickson 1998, Maxwell 2007, Mashburn 2008, Berris and Miller 2011). Many of these extant studies also rely on single-method or single-outcome investigations.

There is a dearth of research investigating free play in preschools, particularly those offered in indoor public recreation facilities. There is also little methodological guidance for the rigorous, systematic investigation of the multiple factors concerning free play in early learning and care environments. This paper addresses those gaps by detailing the participatory mixed methods employed to investigate the impact of a municipal preschool free-play space on children's play. Further, the participatory nature of this research facilitated the examination of the municipal investment into children's free play, consistent with the notion that the political and ideological will of municipalities are essential foundations for fostering child-friendly city implementation, and that evidence reporting on the outcomes of those investments are critical for ongoing support.

The primary purpose of this paper is to describe and discuss the methods used to explore the impact of a 'free play' space and preschool program on children's play. The conceptual understandings behind the methodological approach are presented and lessons from each of the five parts of the project, which involved different data collection methods and multiple participants, are shared. Finally, the successes and challenges associated with the partnership between academics and the community are discussed, along with the possibilities that this approach might hold for creating more child-friendly communities. This methodological paper is offered as an exemplar for studying free play and informal educational environments in the child-friendly community.

Background

Municipal investment in a space for free play

[BLINDED] is a public recreation play space located in rural [BLINDED], a suburban municipality in the province of [BLINDED], Canada. [BLINDED] (pop. 92,403) comprises an urban community [BLINDED] and significant rural area (29.2% of total population living across 8 hamlets) ([BLINDED] 2012). [BLINDED] was a result of [BLINDED]'s investment of CAD$350,000 in recreation infrastructure and programming to create a unique community resource focusing on open-ended, play-based learning aiming to enhance young children's developmental experiences. This investment was a response to local data showing approximately 20% of rural [BLINDED] children were experiencing difficulty or great difficulty in one or more developmental areas, i.e., physical health and well-being, social competence, emotional maturity, language and thinking skills, communications, and general knowledge at entry to kindergarten ([BLINDED] 2011). Free play has been positively linked to each of these developmental areas (Hewes 2010, Fiorelli and Russ 2012) offering a compelling rationale for municipal support of

the program. The indoor [BLINDED] space offers many innovative, sensory-stimulating features that facilitate self-directed play, creative and exploratory potential, allowing children to build and re-build, make new daily discoveries, and interact with and design their own environment **(Figure 1)**. As with other intentionally designed play-based preschool environments (Hewes 2010), the purpose of [BLINDED] was to help develop lifelong learners and critical thinkers for success in school and life. The preschool offered in the [BLINDED] space is delivered by [BLINDED], which offers over 30 recreation preschool programs across five recreation facilities throughout the [BLINDED].

The [BLINDED] Project

In a community-university partnership between [BLINDED] and academics, the project was designed to assess the impact of the municipality's investment in this free play space and preschool on the play of children (aged 3-5) enrolled in its inaugural year. The project team comprised academics from two universities alongside [BLINDED] managers, program providers, and staff. Aligned with a participatory research approach (Minkler and Wallerstein 2008), [BLINDED] partners were instrumental in study development, data collection and analysis, and in the dissemination of findings through academic and community-oriented means. Further, [BLINDED] led the operationalization of this project in the municipality by making key decisions about data collection strategies and bringing practice-based realities to data interpretation.

The purposes of this participatory mixed method project were to: (i) identify similarities and differences between children's play in the preschool spaces (innovative vs. conventional settings); (ii) understand parents' and instructors' perceptions and experiences of children's play in preschool; (iii) reveal how children describe and represent their play experiences in their

preschool; (iv) determine the extent to which the preschool physical (i.e., space) and social (i.e., the program and philosophy) environments support sustained episodes of child-directed free play; and (v) examine whether and how children's play is influenced by the design of the preschool environment. To address these objectives, we focused on children's opportunities to actively engage in different kinds of play, the nature of social interactions in play, challenge and risk taking, how and when children exercise choice and control, creative manipulation of space and loose parts (i.e., components of the environment), and the nature and duration of play episodes.

For comparison, two conventional preschool spaces offered by [BLINDED] were chosen to better uncover their similarities and differences with the purposive free play space. The conventional sites provided comparable physical and social environments to [BLINDED]: the three sites shared the same free play-based philosophy; each was staffed with a lead and an assistant instructor; each ran once per week for three months with up to 20 children per program; and each was located in a public multi-purpose recreation facility. The primary physical space of each preschool was a playroom organized around traditional preschool activity centres (e.g., block play, sand play, water play, open-ended arts and crafts, and small manipulatives). In addition, the two conventional programs had access to an indoor mini-gym space with physical activity equipment (e.g., balls, bikes, and tunnel climber) designed to offer opportunities for gross motor play. The main difference between the three spaces was that the [BLINDED] space was intentionally designed to engage children in a range of free play opportunities with moveable pieces and loose parts. Inspired by the Children's Museum in Phoenix, USA, the [BLINDED] room includes a magnetic ball wall, a wall mounted system of airways tubing with valves that open and close, a realistic child-sized grocery store checkout with loading dock and

shelving, a set of large building blocks, a 7-foot rocket ship for children to climb and paint, and a wall mounted crank operated ball works system, among other features.

Over a 9-month period (September 2014-June 2015), a mixed methods approach organized over four parts was employed to address the project objectives and facilitate independent and integrated analyses of the four parts within and between sites. *Part 1 – Parents' and Instructors' Perceptions of Play* involved pre-post program interviews with preschool instructors and parents at all sites. *Part 2 - Inventory of Preschool Environment* consisted of a systematic audit of the three spaces. *Part 3 - Observing Play in Action* involved monthly video observations of children using the preschool spaces. *Part 4 – Listening to Children's Perspectives* was informed by the child's right to play and the right to be heard (United Nations General Assembly 1989), and was consistent with the implementation of those rights in *Building Child Friendly Cities: A Framework for Action* (UNICEF 2004). Mosaic Approach participatory strategies (Clark 2011, Clark and Moss 2011) were used to listen to children's first-hand perspectives of play in their preschool through photography and photovoice, drawings and book making, and informal conversation in one-on-one interviews and group discussion. In addition to the four parts focused on [BLINDED], the team also conducted a separate process evaluation of the collaboration (*Part 5*).

Study design

This study took the form of a participatory mixed methods approach (Olsen and Jason 2015), which involves the equitable participation of community partner organizations and academics each contributing their expertise and sharing control of the research enterprise (Israel et al. 1998, Minkler and Wallerstein 2008). Specific activities are summarized below to provide context for the reflections on lessons learned through this collaborative project.

The study received ethics clearance from the research ethics boards of the [BLINDED] and [BLINDED].

Part 1 – Parents' and instructors' perceptions of play

Adults largely influence the extent and context of children's play, as young children lack autonomy and independence in much of their daily lives (Veitch et al. 2006, Gray 2011, Lee et al. 2015). Parents' perceptions of what play behaviours and environments are appropriate can determine where, with whom, and how children play (Gill 2008). Qualitative studies with parents have revealed crime- and traffic-related safety concerns, social networks (e.g., lack of friends or playmates), and quality of facilities at public outdoor spaces (e.g., age-inappropriate equipment) as factors that may restrict children's active free play engagement outdoors (Veitch et al. 2006, Lee et al. 2015). Further, parents' beliefs about the health benefits of play, academic preparedness, and optimal characteristics of preschool environments influence their decisions about preschool programs and activities for their children (Ginsburg 2007, Fisher et al. 2008, Berris and Miller 2011, Hatcher et al. 2012).

Similarly, preschool instructors promote and discourage certain play behaviours in institutional settings. Instructors' decisions regarding day-to-day implementation of programming and the set up of the physical space may reflect their educational backgrounds, personal beliefs, and their interpretation of the preschool's philosophies. For example, research has shown that educators' reflections on their roles in promoting free play – such as balancing parental pressure toward children's academic success (Ranz-Smith 2007) and provision of risk-free environments for safe play (Berris and Miller 2011) – determine classroom practices. Therefore, capturing parents' and instructors' beliefs and attitudes toward play helps better understand patterns in children's play.

In this study, parents and instructors were invited to participate in pre-post, one-on-one semi-structured interviews regarding their children's play. [BLINDED] team members led participant recruitment with support from research assistants. Pre-program interviews were conducted in the first month of each preschool program. Post-program interviews occurred between the last month and two weeks after the programs ended. Parent and instructor interviews lasted approximately 60 and 90 minutes, respectively. At the pre-program interviews, participants completed a socio-demographic form to help contextualize analysis.

Three trained research assistants and a co-investigator used semi-structured interview guides to conduct the interviews. The interview guides were developed by the academics and then refined by [BLINDED]. Parents were asked about their: children's personalities and play at home and in other settings; perceptions of the health and developmental benefits of play; and, expectations of preschools in promoting children's health and wellbeing. Instructors were asked about their perceptions on: free play; if/how play is linked with children's health and development; how children play in the preschool; if/how the preschool space shapes children's play; and, incorporation of play in preschool routines. Purposive sampling targets were 36-45 parent pre- and post-interviews across sites (12-15 interviews per site at each time point). In total, 43 pre-interviews (participation rate of 74.1%) and 13 post-interviews (participation rate of 22.4%) occurred. For each interview completed, parents received a $20 gift certificate that could be used at any [BLINDED] facility. All instructors (2 per site) participated in pre- and post-interviews, resulting in 12 interviews. [BLINDED] compensated instructors for their time through salary. All participants provided informed written or oral consent prior to participation.

Using an inductive approach, a trained researcher coded all parent interview transcripts and two trained researchers independently coded all instructor interview transcripts. The research

team met periodically to resolve coding discrepancies and help with the organization of themes in both datasets, guided by the project's research questions. After initial coding, academic and [BLINDED] team members met to review the coding and interpret the data. Details about data analysis and results for Part 1 are reported elsewhere ([BLINDED]. 2015).

Part 2 - Inventory of preschool environment

Play spaces influence children's play and have indirect implications on children's health and development (Dublin City Childcare Committee 2007, Maxwell 2007, Mashburn 2008). Previous literature describes the benefits of preschool environments for child development and health. For example, well-defined play centers encourage specific child development domains (Evans 2006, Moore 2010), such as sensory-stimulating features for creative and exploratory activities (Berris and Miller 2011). Easy access to child-friendly toilets can enhance preschoolers' independence and autonomy, while allowing for instructor supervision (Dublin City Childcare Committee 2007). A scale-reduced environment oriented to a child's size and perspective promotes faster, prolonged engagement in cognitively complex play behaviours with increased attention span (De Long et al. 1994). The quality of preschool physical environments also moderates the negative impact of income and ethnicity on children's development (Mashburn 2008).

Quality of the play space involves design, layout and availability of equipment and learning materials. For example, in preschool settings, optimal play environments include: availability and accessibility of toys and play materials (Maxwell 2007, Prochner et al. 2008); a variety of well-defined, adjacent play centers (Evans 2006, Dublin City Childcare Committee 2007, Prochner et al. 2008, Moore 2010, Berris and Miller 2011); clear circulation paths for independent, unencumbered movement (Dublin City Childcare Committee 2007, Moore 2010);

private areas for solitary play and quiet time and noisy areas for music and gross-motor activities (Moore 2010); flexibility for changing the layout and moving furnishings and equipment (Moore 2010, Berris and Miller 2011); use of natural lighting (Dublin City Childcare Committee 2007, Read 2007, Moore 2010, Berris and Miller 2011); and small-scale structures (Read 2007).

Evaluating preschool environments through space assessments helps inform administrators, directors, and educators about how to improve areas deemed poorly designed (Dublin City Childcare Committee 2007, Moore 2010). The Children's Physical Environment Rating Scale (CPERS) (Moore 2010) was used to assess the quality of the preschool spaces in this study. CPERS is described as a first-of-its kind tool because it aims to specifically measure the quality of the physical, designed environment of early childhood settings. CPERS has four parts: Part-A Planning; Part-B Building as a Whole; Part-C Indoor Activity Spaces; and Part-D Outdoors Spaces. This study employed only Part-C given the focus on preschools' indoor spaces. Part-C comprises 54 items distributed across five subscales. Items in the Modified Open-Plan Space and Home Bases subscales are assessed on a 5-point linear-numeric scale ranging from 'not met' to 'fully met'. Observers assess whether or not the space fulfills the criteria and how well each criterion is met. For the remaining three subscales (Quiet Activity Areas, Physical Activity Areas, and Messy Activity Areas), observers identify if a particular space exists (no, yes, or shared). Three trained observers (research assistants) independently scored each preschool space on the same visit during regular scheduled programming. A total score was obtained to provide an overall quality score for each site, assessed outside of programming hours to avoid disruption. Individual subscales scores were used by [BLINDED] to identify specific areas for improvement and to inform decisions about space design ([BLINDED] 2015).

Part 3 - Observing play in action

Play space design influences children's play and social interactions (Prochner et al. 2008, Moore 2010) and moderates associations between children's socioeconomic vulnerabilities and academic development (Mashburn 2008). Observing children systematically – especially during free-play time in institutional settings – allows for comparisons of play between different physical environments. Nuanced observation can contribute to a deeper understanding of what types of play are more or less encouraged in play spaces and the role of space design in fostering or enhancing play. More importantly, the analysis of such data can help formulate specific, detailed recommendations for educators and administrators about how to use the existing physical infrastructure to create opportunities for a wide range of play activities.

This study involved monthly video observations of the children at each site during designated free-play time. Wall-fixed, remote video cameras were used to capture children's play over in-person, real time observations for data collection. Remote video cameras allow for unobtrusive observations with less influence on children's behaviours and no alteration of the play environment due to the presence of the (unfamiliar) researcher (Heath et al. 2010), which was also important to [BLINDED] instructors. Video recordings also permit more accurate and in-depth coding as data can be re-watched to ensure details are not missed (Berkhout et al. 2012) and the consideration of multiple standpoints or the exploration of new research questions (Heath et al. 2010, Fitzgerald et al. 2013). Observations consisted of two recordings collected on the same day: during the morning free play session in the preschool room, and in the afternoon, the free play session in the [BLINDED] room and conventional sites' mini-gyms. Three video cameras were mounted to the walls at strategic locations in each room to capture the entire play space while avoiding filming children's faces to preserve their rights to privacy and anonymity.

Over the 9-month program period, 150 30-minute video files were collected, comprising 75 hours of footage across sites.

Although the instructors were not the subjects of investigation, they were visible during video observations and their interactions with children may have influenced the children's play. Instructors were therefore provided written consent for the video recordings. Parents of all 61 preschoolers enrolled across the three programs throughout the research period also provided informed consent prior to the video observations. In addition to collecting parental written consent [as preschoolers may lack capacity to give free and informed consent (Homan 1991)], children's assent was sought. To do that, [BLINDED] instructors and researchers closely watched for any verbal and nonverbal signals that suggested a child was not willing to participate in the video recordings. If a child were unwilling, he or she would have been provided with a similar play activity in an alternative space out of video view, but no such occasion arose.

Files from each camera were combined into a three-way split-screen video for coding. The Observational System for Recording Physical Activity in Children (OSRAC-P) (Brown et al. 2012) was used to systematically assess physical activity and play behaviours. Originally developed to measure preschoolers' physical activity level (e.g., sedentary, limbs, fast, etc.), type (e.g., walk, run, dance, etc.), and contexts (e.g. manipulative, socio-dramatic, arts, etc.), this study adapted OSRAC-P to include social play behaviours (e.g., aggressive, cooperative, associative, etc.) and exclude non-applicable categories (e.g., swimming). Two trained observers (research assistants) coded a randomly selected focus child using the OSRAC 5-second observation/25-second coding protocol. The random selection of 60% of children enrolled in each program resulted in 13,961 observations across sites. Kappa scores showed that inter-rater reliability ranged from 0.877 to 0.994. Results were analyzed for patterns and differences

between sites, including variations in group composition and demographics. ([BLINDED] 2017). For example, at some sites there was an imbalance between boys and girls that may have shaped the types of play observed.

Part 4 – Listening to children's perspectives

In a child-friendly community, children have opportunities to influence decisions, to express their opinion, and to meet with friends and play (UNICEF 2004). In comparison to the vast literature on children's play and health, there is a small, but growing number of studies done with and for children to address the so-called 'missing child paradox' (Darbyshire et al. 2005). This study is part of that movement, *engaging children as co-researchers about their environment*. Capturing children's first-person perspectives on their preschool spaces was critical. Children are capable informants, with the capacity to share their experiences in understandable, useful, and meaningful ways (Clark 2005, Pascal and Bertram 2009). Inclusion of the children as co-researchers is also consistent with the child's right to be heard and the child's right to play (United Nations General Assembly 1989), early learning pedagogies (Edwards et al. 2011), and theoretical discourses on social agency in childhood (Christenson and Prout 2005, Sorin 2005).

To address ethical issues unique to participatory research with young children (Clark 2005, Einarsdottir 2007) and to allow for children's authentic participation, this study adopted a dynamic and responsive method based on multimodal processes. Photovoice activities (Wang and Burris 1997) were combined with the Mosaic Approach (Clark 2011, Clark and Moss 2011) to stimulate discussion about and elicit children's perspectives on their play spaces (Einarsdottir 2007). Instructors offered children time to play with the digital cameras, and then invited them to take photos of the places they liked to play at preschool. With the assistance of their instructors,

each child created a book, *Places I Love to Play*, selecting which photos to include, and adding drawings and descriptions of their play experiences. Each child was invited to share his or her book during circle or small group time. Researchers were invited to attend these presentations, allowing them to engage children in conversation, take notes, and audio record the sessions (with consent). The incorporation of the Mosaic Approach involved providing materials and opportunities for children to express their ideas using multiple representational media. Instructors led the research activities with the children, consulting the research team about the timing and specific nature of the activities at each site, and adapting them to better respond to children's needs and interests. Instructors received a *book in a box* inspiration kit, with children's story books about play and photography, open ended art materials, bookmaking supplies and templates, and suggested starting points for conversations with children about their play experiences at preschool. The research activities with the children unfolded over a six-week period to give children time to expand and develop their ideas individually and in small groups. Instructors were encouraged to document the activity sessions through photo- and note-taking. Parental written consent was obtained prior to their child's participation. Children's assent was treated as an ongoing process (Einarsdottir 2007) to facilitate informed and voluntary participation. At the end of these activities, children took their photobooks home. Scanned copies of the photobooks were retained for analysis. **Figure 2** shows some of the pictures of the Love to Play space that children took during these activities.

Common themes in children's visual representations were identified and analyzed using content analysis techniques. Instructors' and researchers' field notes contributed to data analysis. Children's visual narratives and interpretations were then pieced together like in a mosaic to reveal the play value of the space as perceived by its primary users. A summary of children's

perspectives on their spaces was prepared and examined for commonalities and differences across sites.

Part 5 – Understanding the collaboration: process evaluation

This collaborative project involved a large team of study investigators, community partners (i.e., preschool programmers and managers), and research staff over three term-based offerings (totaling a 9-month program year) of the preschools. The complexity of implementing this project inspired the partnership to evaluate the process of working together in order to better contextualize the project findings and enhance future collaborative work (by exploring what did and did not work). The process evaluation assessed the compliance of data collection activities to the study protocols, helped to maintain meaningful engagement between partners, and better captured the story of the inaugural offering of the preschool in the [BLINDED]space.

The process evaluation involved ongoing assessment of data collection activities, individual interviews at the end of the data collection, and unstructured interviews with community partners about the history of and future plans for [BLINDED] preschool programs. Detailed minutes of team meetings, journal entries of formal and informal conversations between researchers, instructors, and community partners during data collection and analyses, and dissemination activities were other means of recording pertinent study information. While not used as formal study data, this information contributed to a deeper understanding of the context of the project *per se* and the value of the [BLINDED] space. This influenced how data were interpreted for the results and how the team crafted the messages for each target audience of the program (i.e., parents, instructors, local community, and academics).

Day-to-day logistics were monitored to ensure data collection activities were consistent with the research protocols, and to adapt as needed. Factors noted daily were the degree of

difficulty or problems with equipment setup/take-down, timing/scheduling of activities, completeness of the data collection, participant-research staff interactions, general impressions, and concerns and suggestions. Immediate review of this information helped the team to better support field staff by quickly finding solutions to emergent problems, while ensuring reliability and accuracy of the gathered data.

The process evaluation also explored the broader successes and challenges experienced by the partnership. The fourteen collaborative team members were invited to participate in a one-on-one semi-structured interview about their experiences with the project. Three research team members with experience in project evaluation designed the semi-structured interview guide, which contained open-ended questions about the collaboration, expectations, and experiences. An external evaluator was hired who had autonomy to adapt the interview guide according to her experiences with the interviews. The evaluator interviewed (in person or by telephone) four (of five) academic researchers, all three (of three) [BLINDED] staff members, and four (of six) research assistants between December 2015 and January 2016. All respondents provided written or oral consent. With respondents' permission, all interviews were audio-recorded; the average interview length was 37 minutes (14-62 minutes). Several measures were taken to protect respondent confidentiality and privacy rights. The evaluator destroyed all audio files once a professional transcriptionist transcribed them verbatim. A research assistant not involved in the [BLINDED] project removed all identifiers from the transcripts, leaving only the respondents' roles in the project. Only the anonymized transcripts were available to the researchers for archival purposes. The external evaluator independently analyzed all transcripts using content analysis and sent a summary report with the main findings to all academic and community partners. Later, a second external consultant used thematic analysis for an in-depth exploration of

the community-university partnership. These analyses have contributed insights to strengthen the relationships between community partners and researchers in ongoing collaborative activities.

In addition to regular, informal interactions throughout the data collection and analysis activities, community partners also provided detailed information about the preschools to better inform interpretation of findings. Two preschool programmers and two managerial staff were engaged in one-on-one, audio-recorded one-hour unstructured conversations with a trained research assistant. The context of development and implementation of the [BLINDED] space and free-play preschool philosophy, as well as future plans for programming and revitalization of preschool spaces, were discussed. Although the partners were fully embedded in the project from its design to the dissemination – and as such have had many opportunities to share the story behind the program and space – this formal, structured documentation activity helped the academics gain an explicit, in-depth understanding of the driving forces behind [BLINDED], successes and challenges with the implementation, and next steps for preschool programming across [BLINDED] spaces. These perspectives shed light onto questions emerging from the analysis, providing a platform for a better interpretation of the findings and tailoring of recommendations. Although the process evaluation was led by the academics, community partners also valued the evaluation as it demonstrated transparency in process and because the findings could be used to help reinforce the case to senior managers for future partnered work.

Discussion and findings

This paper is primarily methodological in nature, however, it also presents considerations from the overarching findings to illustrate how a participatory mixed methods study can be employed to share lessons learned in the context of implications for child-friendly settings.

Learning from [BLINDED] about child-friendly settings

To investigate how recreation preschool spaces foster children's free play, this participatory project used a mixed methods approach, which facilitates in-depth exploration of the phenomenon's complexity in the real-life context (Crowe et al. 2011, Fletcher et al. 2015). The triangulation of quantitative and qualitative data aimed to increase internal validity (Crowe et al. 2011) and trustworthiness (Flicker 2008). Critically, it provided different yet complementary information on how different spaces impact children's play, an important determinant of their lifelong health and a key piece of social infrastructure in a child-friendly community. The four study parts were intended to provide an in-depth understanding of the perceptions of parents, instructors, and children on the preschool program and space, the physical characteristics of preschool spaces, and the children's play. Thus, data analysis was done for each part separately, followed by comparisons across parts. The nature and depth of the data collected in each part varied, but still is comparable across the three sites (Crowe et al. 2011). Comparisons began to reveal the rich, developmentally optimal play that investing in a play-based program can provide. These findings can be extended from the child-centered preschool to child-friendly spaces integrated throughout a community.

This study explored the multifaceted nature of children's play, which is better understood when multiples angles and different actors' perspectives are considered. The analyses provided empirical evidence that free play is not synonymous with active play indoors, revealing a variety of play types and behaviours during free-play time ([BLINDED] 2017). For example, while the play behaviours exhibited were consistent with extant definitions of free play, children were not always, or necessarily, physically active when playing ([BLINDED] 2017). Creativity and exploration observed in child-led activities often occurred during sedentary behaviour. Yet the

social, cognitive, and emotional development associated with sedentary free play may be as beneficial as the physical development promoted by the moderate to vigorous physical activities associated with active play. Promoting active play is still necessary for children's physical health and development, but active play often occurs during structured, instructor-led sessions. Children may engage spontaneously and voluntarily in more sedentary behaviours during free play time and these activities also promote healthy cognitive, emotional, and social development. Too much focus on active play may de-emphasize the powerhouse of skills and abilities that come from children's engagement in a variety of play. Extrapolating from the play-based preschool environment, child-friendly spaces are those that incorporate variation that facilitate all forms of play, and extend that variation to form and function that purposively consider the meaningful engagement of children of all ages (Malone 2013) and abilities (Jenvey 2013), e.g., play spaces characterized as sedentary are potentially important for children, disabled or injured, who cannot participate in other kinds of play.

Study findings suggested that free play in the preschool setting is a result of interactions between physical space, children, and instructors, illustrating that the multi-component study design permitted the multi-faceted nature of free play to present itself. Programming, space setup, instructors' attitudes and decisions, and children's perspectives all influence children's play. Thus, providing a rich physical and social environment is fundamental for stimulating engaging and dynamic play experiences. It is the combination of physical infrastructure with the practice of a free play philosophy that makes a successful, vibrant environment where children can learn by playing with whatever and whoever and however they choose, i.e., free play. These study findings contribute to literatures on play and child-friendly spaces by substantiating the value of using a multi-method approach to better reveal the complexities behind children's play.

Despite the volume of research on play, most studies report on only one dimension of play, and use only one method to explore that research question. This study moved beyond those limitations to simultaneously capture children's, parents' and instructors' perspectives on play in the preschool relative to the physical and social characteristics of that environment. Although designed with a municipal recreation preschool in mind, this community-engaged approach might further the agenda of a child-friendly city by addressing research challenges presented by the social and setting-based variations that occur throughout cities (Woolcock et al. 2010).

Rigorous research on play and on child-friendly places must move past single-dimension, single-method foci and requires nuanced methods as well as the participation of different actors. Although parents and instructors in this study agreed about the value of play for young children, their perspectives came from different angles. Children's interests and developmental needs guide the instructors' decisions about the use of different spaces, resources, and activities during the program. Parents described the play-based preschool as a place where their children could grow socially and emotionally, but also participate in academic-type learning in preparation for kindergarten. This study, which engaged both parents and instructors, offered a clearer picture of the potential tensions around the value of play in preschool settings. Previous work has identified the different priorities of parents and instructors related to the perceived benefits gained from time spent in preschool (Fisher et al. 2008, Hatcher et al. 2012). This study extends that work by integrating the children's perspectives and empirical data about their play alongside the adults' perceptions of the child's environment.

By actively engaging children in participatory research activities, this study revealed their unique ideas about play in their preschools. It is the way children see and interact with – and in – the spaces with their peers and adults that transform their surroundings into something that is

meaningful for them. Children's photographs revealed how they see the preschool world: through their eyes and from their height and position relative to the walls, fixtures, equipment, and ceilings. The stories that accompanied the photographs provide insights to children's experiences with the space and play materials. The post-interviews with parents and instructors revealed their delight and surprise with the children's photobooks, and new insights into their children's experiences of their world. The unexpected perspectives (for adults) that children have about their play in their preschools emphasizes the value of inviting children to share their ideas about the design of play spaces. In keeping with the principles of a child-friendly community, findings from this study underscore the importance of meaningfully engaging children in research in order to hear their voices about their own activities.

Learning from the participatory mixed methods approach

The [BLINDED] project was built on the idea that collaborative partnerships throughout the research process and flexibility are key components for the success of community-university partnered studies. Community partners' perspectives contributed significantly to the study design, development of the data collection activities, and interpretation of results, all hallmarks of participatory approaches (Cargo and Mercer, 2008). The preschool instructors played an important role in refining data collection strategies when research staff faced challenges with recruitment and logistics in fieldwork. Children were important co-researchers (Clark 2005, Vaughn et al. 2013), especially in the context of understanding their perspectives of the spaces in which they spent their time (Cope 2009, Malone 2013).

Prior to participant recruitment, [BLINDED] partners reviewed the data collection protocols and helped to define better strategies to facilitate parents' and children's participation in the project, embedding the research activities within the preschools' schedules.

Unsurprisingly, further modifications in the protocol were required to accommodate unexpected programming events and to accommodate children's/instructors' absences and enrolment of new children in the programs. Reconciling different, and sometimes competing, priorities of instructors, managers, parents, and children in the project was crucial. [BLINDED] staff responded to these challenges and shared their strategies with the academics to ensure that modifications to the study protocols did not adversely impact data quality or consistency.

This flexibility in the study protocols was critical in Part 4, where the researchers provided instructors with a basic process template with activities for them to select from (as per instructors' request). Instructors had autonomy to choose the sequence and timing for performing the activities with children, and adapting them according to the preschool schedule, perceived children's interests, instructors' preferences, and teaching styles. All choices were previously discussed with and agreed to by the researchers (for compliance to ethics protocols, etc.). Although it worked well and caused less interference with the preschool schedule, this strategy came with challenges. Researchers only met children at the photobook sharing session (and not during earlier stages of the activity), given the changes in the activities made by instructors. As Darbyshire and colleagues (2005) found, having only a single opportunity for the researchers to talk with or watch children's presentations was not ideal. Having an embedded researcher, e.g., as a participant observer or preschool facilitator, throughout the course of Part 4 at each site would have helped to foster relationships between researchers and children, ensure sufficient time and opportunities for children to engage in the research activities, document the development of activities and children's reactions to them in detail, and better explore children's voices and experiences about their play environment. Future research concerned with child-friendly spaces can benefit from careful development of participatory approaches that not only

involve children, but that also understand and evaluate the power dynamics and shared control in the child-adult research enterprise (Cope 2009, Wong et al. 2010). This will help to address the structural complexity of bringing children's voices to the discussion of play and space in an authentic way.

Despite the strong support of [BLINDED] staff in recruiting parents for the Part 1 interviews, the relatively low participation rate in post-interviews suggested a drawback in the data collection strategy. Scheduling interviews with parents at this busy time of year proved challenging. Future studies using pre-post interviews that align with a typical school year should anticipate a very flexible interview schedule, including nights and weekends, along with the provision of child-minding to facilitate parent participation.

With respect to Part 2, this study revealed that the objective assessment of preschool spaces in multi-purpose facilities should be completed during programming hours when the space is setup for children. Although social interactions were not part of the space audit, the dynamics occurring in the space during observation facilitate assessment of what is available and readily accessible for children to play with. The after-hours program assessment conducted here proved to be sub-optimal for assessing these spaces because they were multi-purpose rooms in a public recreation facility and not all dedicated to preschool programs all the time. In the evenings, one preschool room was being regularly used for other recreation activities, while the other two were open to accommodate sporadic non-preschool activities by people of all ages. Equipment and other room characteristics were altered to accommodate these activities. Although critical to a dynamic recreation facility setting, this recommendation also may be applicable to the assessment of spaces housing other informal play/recreation education settings and more broadly to child-friendly spaces in the cityscape. Studying how children use the spaces

that adults create for them, as well as those created without children in mind, contributes to a better understanding of children's perspectives of their environments and is fundamental to creating vibrant child-friendly space (Cope 2009, Malone 2013). This is particularly important for those spaces that do not involve children in planning and development, as their perspectives and experiences may not be appropriately embodied in the resultant spaces.

Video observations, as in Part 3 of this study, can pose a number of ethical challenges (Heath et al. 2010). For instance, the exclusion of a child without parental consent to participate may raise issues of unfairness even when an alternative space with similar activities is provided to that child. If parents withdraw consent after the video recording, their child's images cannot be readily removed from the video file. However, the biggest challenges faced concerned data collection logistics. The room sizes varied across sites, ranging between 540 and 3870 square feet. While three video cameras were sufficient for small rooms, adding a fourth camera would have better captured children's play in larger rooms where blind spots were more common. To mitigate the anxiety some instructors were feeling with the video cameras, the team chose to not use sensitive microphones and rely solely on those in the video cameras, resulting in poor audio recordings. Thus, video data coding was based almost entirely on visual cues of play behaviours, which may be insufficient for future studies that require analyzing language. It was difficult, for example, to identify the dimensions of imaginative, socio-dramatic play in the children's space without sound. Effective audio capture will enhance future use of video observation for the assessment of children's interaction with – and within – child-friendly places.

This project's greatest success was how academic and community partners came together to collectively develop strategies to overcome the afore-mentioned challenges. Aligned with a participatory research approach, this team subscribed to the principles of joint governance,

shared decision-making, and maintaining a respectful environment where power differentials among partners and participants were constantly interrogated throughout every stage of the project (Israel et al. 1998). As expected, changes in the preschool environments occurred during the project. The study protocol adapted to those changes while maintaining methodological rigour and respecting team members' areas of practice or research expertise. Ongoing communication ensured everyone was aware of important decisions on mechanisms for data collection and analysis, allowing the team to maintain openness to unexpected findings. The shared, common interests in this collaboration served interrelated and complementary purposes with mutual benefits for all partners. The community partners wanted to produce meaningful findings to support decision-making around allocation of financial resources and time into the development of future recreation preschool programs based on free play. The academics wanted to gain a nuanced understanding of the impact of the space and program on children's play, adding to the discourse on child-friendly spaces and early childhood environments, including consideration of how to collaborate with young children to create spaces that structurally and systematically include them (Cope 2009, Langhout and Thomas 2010). While this study focused on early childhood, the perspectives of older children and youth – as dreamers and critical agents of change – must be considered in the design, implementation, and evaluation of child-friendly spaces (Woolcock et al. 2010, Malone 2013), and in impact assessments of those spaces on children's social and developmental wellbeing.

The variety of expertise on the team allowed for the use of multiple, innovative data collection methods and examination of results from different perspectives for better conceptualization and interpretation. In turn, the institutional and structural knowledge brought by preschool programmers was essential for contextualizing the findings in relevant practice and

policy recommendations. The preschool programmers gained a deeper understanding of the research process (particularly regarding scientific rigour and the purpose of research ethics protocols) and the academics learned new skills related to fielding data collection in the face of municipal operational and programming realities: an important methodological concern for applied child-friendly city research. Ultimately, this partnership resulted in a stronger study design with appropriate methodologies taking into account contextual specificities revealed by insider perspective of the community partners. This collaboration has enriched the ongoing interpretation of findings and contributed to sharing findings in a more accessible and meaningful way with other stakeholders and decision-makers. More importantly, it has generated knowledge that has practical and social relevance to the community. Thus, the participatory mixed methods approach generated findings that can better inform decision-making regarding the effectiveness of the free play-based preschool spaces and programming and the feasibility of extending child-friendly principles to other municipal spaces. With respect to scholarship, this collaborative, multi-component study design has produced in-depth knowledge of the impact of a free play-based recreation preschool program and space on children's play, revealing complexity that would not have been captured otherwise.

Conclusions

Child-friendly communities are inclusive of children, promote their well-being in society and are "*committed to the fullest implementation of the Convention on the Rights of the Child*" (UNICEF 2004, p.1). Children are the canaries in the ecological coalmine of our communities. Every decision and investment directly impacts their right to experience a healthy, playful childhood; the ecological social and physical determinants of their health; and their propensity, as equal citizens, to be included in and fully participate in their society. Free play is touted as a

hallmark of childhood and has recently been afforded dedicated attention by national and international bodies interested in promoting positive health and developmental outcomes among children. This recognition necessitates a deliberate and nuanced understanding of how to foster play in those spaces dedicated to, and inclusive of, children. This paper offered a detailed example of a participatory mixed methods study and discussion of the value that this design can bring to understanding complex community-based early learning and care practices. Lessons learned from studies of child-centered spaces, like this one on play-based preschool programs offered by a municipal recreation department, can be used to enhance the physical and social environments of a community more broadly, purposefully reorienting them as inclusive, child-friendly places.

References

[BLINDED], 2011.

[BLINDED], 2012.

[BLINDED], 2015.

[BLINDED], 2017.

Active Healthy Kids Canada, 2012. *Is Active Play Extinct? The Active Healthy Kids Canada 2012 Report Card on Physical Activity for Children and Youth* [online]. https://www.participaction.com/sites/default/files/downloads/Participaction-2012FullReportCard-ActivePlayExtinct_0.pdf [Accessed 7 February 2018].

Akbari, E., & McCuaig, K. (2017). Early Childhood Education Report. Retrieved from http://ecereport.ca/media/uploads/2017-report-pdfs/ece-report2017-en-feb6.pdf

Alexander, S.A., Frohlich, K.L., and Fusco, C., 2014. Playing for health? Revisiting health promotion to examine the emerging public health position on children's play. *Health promotion international,* 29 (1), 155-164.

Berkhout, L., Hoekman, J., and Goorhius-Brouwer, S., 2012. Observation instrument of play behavior in a classroom setting. *Early Childhood Development and Care,* 182 (10), 1325-1333.

Berris, R. and Miller, E., 2011. How design of the physical environment impacts early learning: educators and parents perspectives. *Australasian Journal of Early Childhood,* 36 (4), 1-17.

Björk-Willén, P. and Cromdal, J., 2009. When education seeps into 'free play': how preschool children accomplish multilingual education. *Journal of Pragmatics,* 41(8), 1493-1518.

Brady, L.M., Gibb, J., Henshall, A., and Lewis, J., 2008. *Play and exercise in early years: physically active play in early childhood provision.* London, UK: Department for Culture, Media and Sport.

Brown, W.H., Pfeiffer, K.A., McIver, K.L., Dowda, M., Almeida, M.J., and Pate, R.R., 2012. *Observational System for Recording Physical Activity in Children-Preschool (OSRAC-P): OSRAC-P training manual for observers.* Columbia: University of South Carolina.

Brussoni, M., Brunelle, S., Pike, I., Beate Hansen, E., Herrington, S., Turner, H., Belair, S., Logan, L., Fuselli, P., and Ball, D.J., 2015. Can child injury prevention include healthy risk promotion? *Injury Prevention*, 5, published online.

Cargo, M. and Mercer, S.L., 2008. The value and challenges of participatory research: strengthening its practice. *Annual Review of Public Health*, 29, 325-350.

Children's Play Council, Playlink, and National Playing Fields Association, 2000. *Best play: What play provision should do for children*. London, UK: Children's Play Council.

Christenson, P. and Prout, A., 2005. Anthropological and sociological perspectives on the study of children. *In:* S. Greene & D. Hogan, eds. *Researching Children's Experience*. London, UK: Sage, 42-60.

Clark, A., 2005. Listening to and involving young children: a review of research and practice. *Early Child Development and Care,* 175 (6), 489-505.

Clark, A., 2011. Multimodal map making with young children: exploring ethnographic and participatory methods. *Qualitative Research,* 11 (3), 311-330.

Clark, A. and Moss, P., 2011. *Listening to young children: The Mosaic Approach.* 2nd ed. London, UK: National Children's Bureau.

Cope, M., 2009. Challenging adult perspectives on children's geographies through participatory research methods: insights from a service-learning course. *Journal of Geography in Higher Education,* 33 (1), 33-50.

Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A., and Sheikh, A., 2011. The case study approach. *Bmc Medical Research Methodology,* 11, 100-108.

Danniels, E. and Pyle, A., 2013. Defining play-based learning. *In* R.E. Tremblay, M. Boivin, RDeV. Peters, eds. P.K. Smith, topic ed. *Encyclopedia on Early Childhood Development* [online]. http://www.child-encyclopedia.com/play-based-learning/according-experts/defining-play-based-learning. [Accessed 7 February 2018].

Darbyshire, P., MacDougall, C., and Schiller, W., 2005. Multiple methods in qualitative research with children: more insight or just more? *Qualitative Research,* 5 (4), 417-436.

De Long, A.J., Tegano, D.W., Moran, J.D., Brickey, J., Morrow, D., and Houser, T.L., 1994. Effects of spatial scale on cognitive play in preschool children. *Early Education and Development,* 5 (3), 237-246.

Dublin City Childcare Committee, 2007. *We like this place...:guidelines for best practice in the design of childcare facilities*. Dublin, IE: Government of Ireland.

Edwards, C., Candini, L., and Forman, G., 2011. *The hundred languages of children: The Reggio Emilia experience in transformation.* 3rd ed. Santa Barbara, CA: Praeger.

Einarsdottir, J., 2007. Research with children: methodological and ethical challenges. *European Early Childhood Education Research Journal,* 15 (2), 197-211.

Evans, G.W., 2006. Child development and the physical environment. *Annual Review of Psychology,* 57, 423-451.

Fiorelli, J.A. and Russ, S.W., 2012. Pretend play, coping, and subjective well-being in children: a follow-up study. *American Journal of Play,* 5 (1), 81-103.

Fisher, K.R., Hirsh-Pasek, K., Golinkoff, R.M., and Gryfe, S.G., 2008. Conceptual split? Parents' and experts' perceptions of play in the 21st century. *Journal of Applied Developmental Psychology,* 29, 305-316.

Fitzgerald, A., Hackling, M., and Dawson, V., 2013. Through the viewfinder: reflecting on the collection and analysis of classroom video data. *International Journal of Qualitative Methods,*12, 52-64.

Fleer, M., 2015. Pedagogical positioning in play–teachers being inside and outside of children's imaginary play. *Early Child Development and Care*, *185*(11-12), 1801-1814.

Fletcher, A.J., MacPhee, M., and Dickson, G., 2015. Doing participatory action research in a multicase study: a methodological example. *International Journal of Qualitative Methods,* 14 (5), 1-9.

Flicker, S., 2008. Who benefits from community-based participatory research? A case study of the Positive Youth Project. *Health Education & Behavior,* 35 (1), 70-86.

Gill, T., 2008. Space-oriented children's policy: creating child-friendly communities to improve children's well-being. *Children & Society,* 22(2), 136-142.

Ginsburg, K.R., 2007. The importance of play in promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics,* 119(1), 182-191.

Graham, K.L. and Burghardt, G.M., 2010. Current perspectives on the biological study of play: signs of progress. *Quarterly Review of Biology,* 85(4), 393-418.

Gray, P., 2009. Play as a foundation for hunter-gatherer social existence. *American Journal of Play,*1(4), 476-522.

Gray, P., 2011. The decline of play and the rise of psychopathology in children and adolescents. *Journal of Play*, 3(4), 443-463.

Hanley, G.P., Tiger, J.H., Ingvarsson, E.T., and Cammilleri, A.P., 2009. Influencing preschoolers' free-play activity preferences: an evaluation of satiation and embedded reinforcement. *Journal of Applied Behavior Analysis*, 42(1), 33-41.

Harper, L.V. and McCluskey, K.S., 2003. Teacher–child and child–child interactions in inclusive preschool settings: do adults inhibit peer interactions? *Early Childhood Research Quarterly*, 18(2), 163-184.

Hatcher, B., Nuner, J., and Paulsel, J., 2012. Kindergarten readiness and preschools: teachers' and parents' beliefs within and across programs. *Early Childhood Research & Practice,* 14(2), 1-17.

Heath, C., Hindmarsh, J., and Luff, P., 2010. *Video in qualitative research: analysing social interaction in everyday life.* Thousand Oaks: Sage.

Henricks, T.S., 2009. Orderly and disorderly play: a comparison. *The American Journal of Play,* 2(1) 12-40.

Hewes J., 2010. Voices from the field – Learning through play: A view from the field. *In:* R.E. Tremblay, R.G. Barr, R. Peters, and M. Boivin M, eds. *Encyclopedia on Early Childhood Development* [online]. Montreal, Quebec: Centre of Excellence for Early Childhood Development, 1-6.

Holloway, S.D. and Reichhart-Erickson, M., 1988. The relationship of day care quality to children's free-play behavior and social problem-solving skills. *Early Childhood Research Quarterly*, 3(1), 39-53.

Homan, R., 1991. *The ethics of social research.* London: Longman.

Israel, B., Schulz, A.J., Parker, E.A., and Becker, A.B., 1998. Review of community-based research: assessing partnership approaches to improve public health. *Annual Review of Public Health,* 19(1), pp. 173.

Jenvey, V.B., 2013. Play and disability. *In* R.E. Tremblay, M. Boivin, RDeV. Peters, eds. P.K. Smith, topic ed. *Encyclopedia on Early Childhood Development* [online]. http://www.child-encyclopedia.com/play/according-experts/play-and-disability. [Accessed 7 February 2018].

Karsten, L., 2005. It all used to be better? Different generations on continuity and change in urban children's daily use of space. *Children's Geographies,* 3(3), 275-290.

Keating, P. and Hertzman, C., 1999. *Developmental health and the wealth of nations.* New York, NY: Guilford Press.

Kontos, S., 1999. Preschool teachers' talk, roles, and activity settings during free play. *Early Childhood Research Quarterly*, 14(3), 363-382.

Langhout, R. and Thomas, E., 2010. Imagining participatory action research in collaboration with children: an introduction. *American Journal of Community Psychology,* 46(1), 60-66.

Lee, H., Tamminen, K.A., Clark, A.M., Slater, L., Spence, J.C., and Holt, N.L., 2015. A meta-study of qualitative research examining determinants of children's independent active free play. *The international journal of behavioral nutrition and physical activity*, 12(5).

Malone, K., 2013. The future lies in our hands: children as researchers and environmental change agents in designing a child-friendly neighbourhood. *Local Environment,* 18(3), 372-395.

Mashburn, A.J., 2008. Quality of social and physical environments in preschools and children's development of academic, language, and literacy skills. *Applied Developmental Science,* 12(3), 113-127.

Maxwell, L.E., 2007. Competency in child care settings - the role of the physical environment. *Environment and Behavior,* 39(2), 229-245.

Minkler, M. and Wallerstein, N., eds., 2008. *Community-based participatory research for health: From process to outcomes (2nd ed.)*. San Francisco, CA: Jossey-Bass.

Moore, G.T., 2010. *The Children's Physical Environment Rating Scale (CPERS)*. Sydney: Environment, Behaviour & Society Research Group, University of Sydney.

Olsen, B. D. and Jason, L.A., 2015. Participatory mixed methods research. *In* S. Hesse-Biber and B. Johnson, eds., *The Oxford handbook of multimethod and mixed methods research inquiry*. Oxford, UK: Oxford University Press, 393-405.

Ostrov, J.M. and Keating, C.F., 2004. Gender differences in preschool aggression during free play and structured interactions: An observational study. *Social development*, 13(2), 255-277.

Pascal, C. and Bertram, T., 2009. Listening to young citizens: the struggle to make real a participatory paradigm in research with young children. *European Early Childhood Education Research Journal,* 17(2), 249-262.

Play England, 2008. *Design for play: a guide to creating successful play spaces.* London: The Department for Children, Schools and Families (DCSF) and the Department for Culture, Media and Sport (DCMS).

Play Wales, 2012. *Play spaces: planning and design*. Cardiff: Play Wales.

Prochner, L., Cleghorn, A., and Green, N., 2008. Space considerations: materials in the learning environment in three majority world preschool settings. *International Journal of Early Years Education,* 16(3), 189-201.

Ranz-Smith, D., 2007. Teacher perception of play: in leaving no child behind are teachers leaving childhood behind? *Early Education and Development,* 18(2), 271-303.

Read, M.A., 2007. Sense of place in child care environments. *Early Childhood Education Journal,* 34(6), 387–392.

Sandseter, E.B.H., 2014. Early childhood education and care practitioners' perceptions of children's risky play; examining the influence of personality and gender. *Early Child Development and Care,* 184(3), 434-449.

Singer, D.G., Singer, J.L., D'Agostino, H., and DeLong, R., 2009. Children's pastimes and play in sixteen nations: is free-play declining?. *American Journal of Play,* 1(3), 283-312.

Sorin, R., 2005. Changing images of childhood – reconceptualizing early childhood practices. *International Journal of Transitions in Childhood,* 1, 12-21.

UNICEF, 2004. *Building child friendly cities: a framework for action.* Florence: Innocenti Publications.

United Nations General Assembly, 1989. *Convention on the Rights of the Child.* New York: UN General Assembly.

Vaughn, L.M., Wagner, E., and Jacquez, F., 2013. *A Review of Community-Based Participatory Research in Child Health. MCN: The American Journal of Maternal/Child Nursing,* 38(1), 48-53.

Veitch, J., Bagley, S., Ball, K., and Salmon, J., 2006. Where do children usually play? A qualitative study of parents' perceptions of influences on children's active free-play. *Health & place,* 12(4), 383-393.

Wallerstein, N. and Duran, B., 2010. Community-based participatory research contributions to intervention research: the intersection of science and practice to improve health equity. *American Journal of Public Health,* 100, S46.

Wang, C. and Burris, M.A., 1997. Photovoice: concept, methodology, and use for participatory needs assessment. *Health Education & Behavior,* 24(3) 369-387.

Wong, N., Zimmerman, M., and Parker, E., 2010. A typology of youth participation and empowerment for child and adolescent health promotion. *American Journal of Community Psychology,* 46(1), 100-114.

Woolcock, G., Gleeson, B., and Randolph, B., 2010. Urban research and child-friendly cities: a new Australian outline. *Children's Geographies,* 8(2), 177-192.

Evaluating Child-Friendly Spaces: Insights from a Participatory Mixed Methods Study of a Municipality's Free-Play Preschool and Space

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Abstract

Free play, play controlled by the player(s), is an essential and positive determinant of children's social, physical, and emotional health. Ensuring opportunities for dynamic free play in rich physical and social environments is foundational to a child-friendly community. This paper discusses methodological lessons from a participatory mixed methods research partnership (multi-site case study) that evaluated the impact of a municipal investment in an indoor play-based preschool recreation program and space on promoting free play. We reflect on the approach used to understand the differences between an innovative space, purposefully designed to promote free play, and conventional preschool recreation spaces with respect to child-friendly design. This study explored the multifaceted nature of children's play from the perspectives of parents, preschool instructors, and children relative to children's interaction with the physical and social attributes of three preschool environments. The use of a participatory mixed methods approach permitted a nuanced study of the conditions that support free play in municipal preschool recreation programs, which also can be used to study other community spaces. Rigorous methodology allowed for the careful investigation of purported child-friendly places to reveal findings that can provide policy-makers and community stakeholders with viable documentation for future investments in children's play.

Keywords: free play; preschool; child-friendly; participatory mixed methods research; municipal recreation; Canada

Introduction

Free play is an essential and positive determinant of child health and development, and has great potential to contribute to healthy, child-friendly communities (Gill 2008). Through free play, children exercise fine and gross motor skills; refine verbal and non-verbal communication; increase their social competence, resilience, adaptability; improve their well-being, self-confidence, and physical fitness; and enhance their creativity, thinking and problem solving skills (Gray 2009, Henricks 2009, Graham and Burghardt 2010, Fiorelli and Russ 2012). Therefore, free play has a profound impact on children's lifelong health and provides individual and societal benefits (Keating and Hertzman 1999, Alexander et al. 2014). The term *free play* refers to all forms of play that are voluntary, spontaneous, intrinsically motivated, and both initiated and controlled by children (Gray 2009, Hewes 2010). Despite compelling evidence confirming the benefits of free play, recent studies have shown a substantial reduction of time children spend in free play in formal and informal educational settings over the last five decades for a multitude of reasons (Karsten 2005, Veitch et al. 2006, Ginsburg 2007, Singer et al. 2009, Gray 2011, Alexander et al. 2014, Sandseter 2014, Brussoni et al. 2015). Play spaces and activities have become more structured, organized, and institutionalized (Singer et al. 2009) with more adult supervision (Veitch et al. 2006, Gill 2008, Alexander et al. 2014), detrimentally modifying the environments where children can play freely for their own purposes. Concurrently, the focus of Canadian public policy on identifying and addressing developmental issues and school readiness outcomes in early childhood programs further limits even very young children's opportunities for free play (Ginsburg 2007, Gray 2011). This myriad of factors contributing to the decline of children's free play can be viewed as socio-structural challenges to the actualization of child-friendly cities.

Interventions targeting early learning and care environments are one strategy to encourage engaging and dynamic play experiences, thus increasing children's exposure to positive, settings-based determinants for lifelong health (Keating and Hertzman 1999). These interventions can provide children of different ages and developmental phases a child-focused space that promotes and supports equitable free play activities and opportunities for social interaction (Dublin City Childcare Committee 2007). Research has shown that while indoor, supervised settings typically may decrease free play (Alexander et al. 2014), free flow settings (where children can navigate from one activity to another on their own) encourage more free play (Brady et al. 2008). Early learning and care environments become optimal free play spaces when they offer a variety of rich, sensory play opportunities that promote children's choice and agency; increase their exposure to risks and allow them to test personal boundaries in a safe environment; and provide opportunities for social interactions and solitary play (Children's Play Council et al. 2000, Play England 2008, Play Wales 2012).

In Canada, early childhood learning and care, including preschool, occurs in a variety of formal settings, such as private and not-for-profit centres, dayhomes, community preschool programs, public school systems, and in public preschool programs offered by the municipal recreation sector. Attendance at preschool is not mandatory, however many families seek out preschool experiences (often part-time) for their children. The lack of a single (or coordinated) delivery system for preschool programming in Canada underscores the significant need to consider the role of preschool settings in creating and sustaining a child-friendly community.

Yet this interest in promoting play-based experiences in indoor early learning and care environments is not matched by reporting of evaluative research examining the implementation or outcomes of such initiatives. Current literature reveals studies focused on single elements of

play in the early learning and care environment, often focused on the relationship between play and developmental or learning outcomes (Danniels and Pyle 2018). For example, there is research that addresses: teachers' roles in play (Kontos 1999, Harper and McCluskey 2003, Björk-Willén and Cromdal 2009, Fleer 2015), preschool classroom practices that promote play based learning (Prochner et al. 2008, Hanley et al. 2009), and may result in differences in children's behaviours or developmental outcomes (Ostrov and Keating 2004, Fiorelli and Russ 2012, Lee et al. 2015, Akbari and McCuaig 2017). Research on free play tends to be conducted in outdoor environments and is often associated with active play (c.f., Veitch et al. 2006, Active Healthy Kids Canada 2012). Studies of the physical environment and centre quality are organized around learning and development rather than play (Holloway and Reichhart-Erickson 1998, Maxwell 2007, Mashburn 2008, Berris and Miller 2011). Many of these extant studies also rely on single-method or single-outcome investigations.

There is a dearth of research investigating free play in preschools, particularly those offered in indoor public recreation facilities. There is also little methodological guidance for the rigorous, systematic investigation of the multiple factors concerning free play in early learning and care environments. This paper addresses those gaps by detailing the participatory mixed methods employed to investigate the impact of a municipal preschool free-play space on children's play. Further, the participatory nature of this research facilitated the examination of the municipal investment into children's free play, consistent with the notion that the political and ideological will of municipalities are essential foundations for fostering child-friendly city implementation, and that evidence reporting on the outcomes of those investments are critical for ongoing support.

The primary purpose of this paper is to describe and discuss the methods used to explore the impact of a 'free play' space and preschool program on children's play. The conceptual understandings behind the methodological approach are presented and lessons from each of the five parts of the project, which involved different data collection methods and multiple participants, are shared. Finally, the successes and challenges associated with the partnership between academics and the community are discussed, along with the possibilities that this approach might hold for creating more child-friendly communities. This methodological paper is offered as an exemplar for studying free play and informal educational environments in the child-friendly community.

Background

Municipal investment in a space for free play

Love to Play is a public recreation play space located in rural Strathcona County, a suburban municipality in the province of Alberta, Canada. Strathcona County (pop. 92,403) comprises an urban community (Sherwood Park) and significant rural area (29.2% of total population living across 8 hamlets) (Strathcona County 2012). Love to Play was a result of Strathcona County's investment of CAD$350,000 in recreation infrastructure and programming to create a unique community resource focusing on open-ended, play-based learning aiming to enhance young children's developmental experiences. This investment was a response to local data showing approximately 20% of rural Strathcona County children were experiencing difficulty or great difficulty in one or more developmental areas, i.e., physical health and well-being, social competence, emotional maturity, language and thinking skills, communications, and general knowledge at entry to kindergarten (ECMap 2011). Free play has been positively linked to each of these developmental areas (Hewes 2010, Fiorelli and Russ 2012) offering a

compelling rationale for municipal support of the program. The indoor Love to Play space offers many innovative, sensory-stimulating features that facilitate self-directed play, creative and exploratory potential, allowing children to build and re-build, make new daily discoveries, and interact with and design their own environment **(Figure 1)**. As with other intentionally designed play-based preschool environments (Hewes 2010), the purpose of Love to Play was to help develop lifelong learners and critical thinkers for success in school and life. The preschool offered in the Love to Play space is delivered by Strathcona County Recreation, Parks, and Culture (SCRPC), which offers over 30 recreation preschool programs across five recreation facilities throughout the County.

The Love to Play Project

In a community-university partnership between SCRPC and academics, the Love to Play project was designed to assess the impact of the municipality's investment in this free play space and preschool on the play of children (aged 3-5) enrolled in its inaugural year. The project team comprised academics from two universities alongside SCRPC managers, program providers, and staff. Aligned with a participatory research approach (Minkler and Wallerstein 2008), SCRPC partners were instrumental in study development, data collection and analysis, and in the dissemination of findings through academic and community-oriented means. Further, SCRPC led the operationalization of this project in the municipality by making key decisions about data collection strategies and bringing practice-based realities to data interpretation.

The purposes of this participatory mixed method project were to: (i) identify similarities and differences between children's play in the preschool spaces (innovative vs. conventional settings); (ii) understand parents' and instructors' perceptions and experiences of children's play in preschool; (iii) reveal how children describe and represent their play experiences in their

preschool; (iv) determine the extent to which the preschool physical (i.e., space) and social (i.e., the program and philosophy) environments support sustained episodes of child-directed free play; and (v) examine whether and how children's play is influenced by the design of the preschool environment. To address these objectives, we focused on children's opportunities to actively engage in different kinds of play, the nature of social interactions in play, challenge and risk taking, how and when children exercise choice and control, creative manipulation of space and loose parts (i.e., components of the environment), and the nature and duration of play episodes.

For comparison, two conventional preschool spaces offered by SCRPC were chosen to better uncover their similarities and differences with the purposive free play space. The conventional sites provided comparable physical and social environments to Love to Play: the three sites shared the same free play-based philosophy; each was staffed with a lead and an assistant instructor; each ran once per week for three months with up to 20 children per program; and each was located in a public multi-purpose recreation facility. The primary physical space of each preschool was a playroom organized around traditional preschool activity centres (e.g., block play, sand play, water play, open-ended arts and crafts, and small manipulatives). In addition, the two conventional programs had access to an indoor mini-gym space with physical activity equipment (e.g., balls, bikes, and tunnel climber) designed to offer opportunities for gross motor play. The main difference between the three spaces was that the Love to Play space was intentionally designed to engage children in a range of free play opportunities with moveable pieces and loose parts. Inspired by the Children's Museum in Phoenix, USA, the Love to Play room includes a magnetic ball wall, a wall mounted system of airways tubing with valves that open and close, a realistic child-sized grocery store checkout with loading dock and

shelving, a set of large building blocks, a 7-foot rocket ship for children to climb and paint, and a wall mounted crank operated ball works system, among other features.

Over a 9-month period (September 2014-June 2015), a mixed methods approach organized over four parts was employed to address the project objectives and facilitate independent and integrated analyses of the four parts within and between sites. *Part 1 – Parents' and Instructors' Perceptions of Play* involved pre-post program interviews with preschool instructors and parents at all sites. *Part 2 - Inventory of Preschool Environment* consisted of a systematic audit of the three spaces. *Part 3 - Observing Play in Action* involved monthly video observations of children using the preschool spaces. *Part 4 – Listening to Children's Perspectives* was informed by the child's right to play and the right to be heard (United Nations General Assembly 1989), and was consistent with the implementation of those rights in *Building Child Friendly Cities: A Framework for Action* (UNICEF 2004). Mosaic Approach participatory strategies (Clark 2011, Clark and Moss 2011) were used to listen to children's first-hand perspectives of play in their preschool through photography and photovoice, drawings and book making, and informal conversation in one-on-one interviews and group discussion. In addition to the four parts focused on Love to Play, the team also conducted a separate process evaluation of the collaboration (*Part 5*).

Study design

This study took the form of a participatory mixed methods approach (Olsen and Jason 2015), which involves the equitable participation of community partner organizations and academics each contributing their expertise and sharing control of the research enterprise (Israel et al. 1998, Minkler and Wallerstein 2008). Specific activities are summarized below to provide context for the reflections on lessons learned through this collaborative project.

The study received ethics clearance from the research ethics boards of the University of Alberta and MacEwan University.

Part 1 – Parents' and instructors' perceptions of play

Adults largely influence the extent and context of children's play, as young children lack autonomy and independence in much of their daily lives (Veitch et al. 2006, Gray 2011, Lee et al. 2015). Parents' perceptions of what play behaviours and environments are appropriate can determine where, with whom, and how children play (Gill 2008). Qualitative studies with parents have revealed crime- and traffic-related safety concerns, social networks (e.g., lack of friends or playmates), and quality of facilities at public outdoor spaces (e.g., age-inappropriate equipment) as factors that may restrict children's active free play engagement outdoors (Veitch et al. 2006, Lee et al. 2015). Further, parents' beliefs about the health benefits of play, academic preparedness, and optimal characteristics of preschool environments influence their decisions about preschool programs and activities for their children (Ginsburg 2007, Fisher et al. 2008, Berris and Miller 2011, Hatcher et al. 2012).

Similarly, preschool instructors promote and discourage certain play behaviours in institutional settings. Instructors' decisions regarding day-to-day implementation of programming and the set up of the physical space may reflect their educational backgrounds, personal beliefs, and their interpretation of the preschool's philosophies. For example, research has shown that educators' reflections on their roles in promoting free play – such as balancing parental pressure toward children's academic success (Ranz-Smith 2007) and provision of risk-free environments for safe play (Berris and Miller 2011) – determine classroom practices. Therefore, capturing parents' and instructors' beliefs and attitudes toward play helps better understand patterns in children's play.

In this study, parents and instructors were invited to participate in pre-post, one-on-one semi-structured interviews regarding their children's play. SCRPC team members led participant recruitment with support from research assistants. Pre-program interviews were conducted in the first month of each preschool program. Post-program interviews occurred between the last month and two weeks after the programs ended. Parent and instructor interviews lasted approximately 60 and 90 minutes, respectively. At the pre-program interviews, participants completed a socio-demographic form to help contextualize analysis.

Three trained research assistants and a co-investigator used semi-structured interview guides to conduct the interviews. The interview guides were developed by the academics and then refined by SCRPC. Parents were asked about their: children's personalities and play at home and in other settings; perceptions of the health and developmental benefits of play; and, expectations of preschools in promoting children's health and wellbeing. Instructors were asked about their perceptions on: free play; if/how play is linked with children's health and development; how children play in the preschool; if/how the preschool space shapes children's play; and, incorporation of play in preschool routines. Purposive sampling targets were 36-45 parent pre- and post-interviews across sites (12-15 interviews per site at each time point). In total, 43 pre-interviews (participation rate of 74.1%) and 13 post-interviews (participation rate of 22.4%) occurred. For each interview completed, parents received a $20 gift certificate that could be used at any SCRPC facility. All instructors (2 per site) participated in pre- and post-interviews, resulting in 12 interviews. SCRPC compensated instructors for their time through salary. All participants provided informed written or oral consent prior to participation.

Using an inductive approach, a trained researcher coded all parent interview transcripts and two trained researchers independently coded all instructor interview transcripts. The research

team met periodically to resolve coding discrepancies and help with the organization of themes in both datasets, guided by the project's research questions. After initial coding, academic and SCRPC team members met to review the coding and interpret the data. Details about data analysis and results for Part 1 are reported elsewhere (Nykiforuk et al. 2015).

Part 2 - Inventory of preschool environment

Play spaces influence children's play and have indirect implications on children's health and development (Dublin City Childcare Committee 2007, Maxwell 2007, Mashburn 2008). Previous literature describes the benefits of preschool environments for child development and health. For example, well-defined play centers encourage specific child development domains (Evans 2006, Moore 2010), such as sensory-stimulating features for creative and exploratory activities (Berris and Miller 2011). Easy access to child-friendly toilets can enhance preschoolers' independence and autonomy, while allowing for instructor supervision (Dublin City Childcare Committee 2007). A scale-reduced environment oriented to a child's size and perspective promotes faster, prolonged engagement in cognitively complex play behaviours with increased attention span (De Long et al. 1994). The quality of preschool physical environments also moderates the negative impact of income and ethnicity on children's development (Mashburn 2008).

Quality of the play space involves design, layout and availability of equipment and learning materials. For example, in preschool settings, optimal play environments include: availability and accessibility of toys and play materials (Maxwell 2007, Prochner et al. 2008); a variety of well-defined, adjacent play centers (Evans 2006, Dublin City Childcare Committee 2007, Prochner et al. 2008, Moore 2010, Berris and Miller 2011); clear circulation paths for independent, unencumbered movement (Dublin City Childcare Committee 2007, Moore 2010);

private areas for solitary play and quiet time and noisy areas for music and gross-motor activities (Moore 2010); flexibility for changing the layout and moving furnishings and equipment (Moore 2010, Berris and Miller 2011); use of natural lighting (Dublin City Childcare Committee 2007, Read 2007, Moore 2010, Berris and Miller 2011); and small-scale structures (Read 2007).

Evaluating preschool environments through space assessments helps inform administrators, directors, and educators about how to improve areas deemed poorly designed (Dublin City Childcare Committee 2007, Moore 2010). The Children's Physical Environment Rating Scale (CPERS) (Moore 2010) was used to assess the quality of the preschool spaces in this study. CPERS is described as a first-of-its kind tool because it aims to specifically measure the quality of the physical, designed environment of early childhood settings. CPERS has four parts: Part-A Planning; Part-B Building as a Whole; Part-C Indoor Activity Spaces; and Part-D Outdoors Spaces. This study employed only Part-C given the focus on preschools' indoor spaces. Part-C comprises 54 items distributed across five subscales. Items in the Modified Open-Plan Space and Home Bases subscales are assessed on a 5-point linear-numeric scale ranging from 'not met' to 'fully met'. Observers assess whether or not the space fulfills the criteria and how well each criterion is met. For the remaining three subscales (Quiet Activity Areas, Physical Activity Areas, and Messy Activity Areas), observers identify if a particular space exists (no, yes, or shared). Three trained observers (research assistants) independently scored each preschool space on the same visit during regular scheduled programming. A total score was obtained to provide an overall quality score for each site, assessed outside of programming hours to avoid disruption. Individual subscales scores were used by SCRPC to identify specific areas for improvement and to inform decisions about space design (Nykiforuk et al. 2015).

Part 3 - Observing play in action

Play space design influences children's play and social interactions (Prochner et al. 2008, Moore 2010) and moderates associations between children's socioeconomic vulnerabilities and academic development (Mashburn 2008). Observing children systematically – especially during free-play time in institutional settings – allows for comparisons of play between different physical environments. Nuanced observation can contribute to a deeper understanding of what types of play are more or less encouraged in play spaces and the role of space design in fostering or enhancing play. More importantly, the analysis of such data can help formulate specific, detailed recommendations for educators and administrators about how to use the existing physical infrastructure to create opportunities for a wide range of play activities.

This study involved monthly video observations of the children at each site during designated free-play time. Wall-fixed, remote video cameras were used to capture children's play over in-person, real time observations for data collection. Remote video cameras allow for unobtrusive observations with less influence on children's behaviours and no alteration of the play environment due to the presence of the (unfamiliar) researcher (Heath et al. 2010), which was also important to SCRPC instructors. Video recordings also permit more accurate and in-depth coding as data can be re-watched to ensure details are not missed (Berkhout et al. 2012) and the consideration of multiple standpoints or the exploration of new research questions (Heath et al. 2010, Fitzgerald et al. 2013). Observations consisted of two recordings collected on the same day: during the morning free play session in the preschool room, and in the afternoon, the free play session in the Love to Play room and conventional sites' mini-gyms. Three video cameras were mounted to the walls at strategic locations in each room to capture the entire play space while avoiding filming children's faces to preserve their rights to privacy and anonymity.

Over the 9-month program period, 150 30-minute video files were collected, comprising 75 hours of footage across sites.

Although the instructors were not the subject of investigation, they were visible during video observations and their interactions with children may have influenced the children's play. Instructors were therefore provided written consent for the video recordings. Parents of all 61 preschoolers enrolled across the three programs throughout the research period also provided informed consent prior to the video observations. In addition to collecting parental written consent [as preschoolers may lack capacity to give free and informed consent (Homan 1991)], children's assent was sought. To do that, SCRPC instructors and researchers closely watched for any verbal and nonverbal signals that suggested a child was not willing to participate in the video recordings. If a child were unwilling, he or she would have been provided with a similar play activity in an alternative space out of video view, but no such occasion arose.

Files from each camera were combined into a three-way split-screen video for coding. The Observational System for Recording Physical Activity in Children (OSRAC-P) (Brown et al. 2012) was used to systematically assess physical activity and play behaviours. Originally developed to measure preschoolers' physical activity level (e.g., sedentary, limbs, fast, etc.), type (e.g., walk, run, dance, etc.), and contexts (e.g. manipulative, socio-dramatic, arts, etc.), this study adapted OSRAC-P to include social play behaviours (e.g., aggressive, cooperative, associative, etc.) and exclude non-applicable categories (e.g., swimming). Two trained observers (research assistants) coded a randomly selected focus child using the OSRAC 5-second observation/25-second coding protocol. The random selection of 60% of children enrolled in each program resulted in 13,961 observations across sites. Kappa scores showed that inter-rater reliability ranged from 0.877 to 0.994. Results were analyzed for patterns and differences

between sites, including variations in group composition and demographics. (Hughes 2017). For example, at some sites there was an imbalance between boys and girls that may have shaped the types of play observed.

Part 4 – Listening to children's perspectives

In a child-friendly community, children have opportunities to influence decisions, to express their opinion, and to meet with friends and play (UNICEF 2004). In comparison to the vast literature on children's play and health, there is a small, but growing number of studies done with and for children to address the so-called 'missing child paradox' (Darbyshire et al. 2005). This study is part of that movement, *engaging children as co-researchers about their environment*. Capturing children's first-person perspectives on their preschool spaces was critical. Children are capable informants, with the capacity to share their experiences in understandable, useful, and meaningful ways (Clark 2005, Pascal and Bertram 2009). Inclusion of the children as co-researchers is also consistent with the child's right to be heard and the child's right to play (United Nations General Assembly 1989), early learning pedagogies (Edwards et al. 2011), and theoretical discourses on social agency in childhood (Christenson and Prout 2005, Sorin 2005).

To address ethical issues unique to participatory research with young children (Clark 2005, Einarsdottir 2007) and to allow for children's authentic participation, this study adopted a dynamic and responsive method based on multimodal processes. Photovoice activities (Wang and Burris 1997) were combined with the Mosaic Approach (Clark 2011, Clark and Moss 2011) to stimulate discussion about and elicit children's perspectives on their play spaces (Einarsdottir 2007). Instructors offered children time to play with the digital cameras, and then invited them to take photos of the places they liked to play at preschool. With the assistance of their instructors,

each child created a book, *Places I Love to Play*, selecting which photos to include, and adding drawings and descriptions of their play experiences. Each child was invited to share his or her book during circle or small group time. Researchers were invited to attend these presentations, allowing them to engage children in conversation, take notes, and audio record the sessions (with consent). The incorporation of the Mosaic Approach involved providing materials and opportunities for children to express their ideas using multiple representational media. Instructors led the research activities with the children, consulting the research team about the timing and specific nature of the activities at each site, and adapting them to better respond to children's needs and interests. Instructors received a *book in a box* inspiration kit, with children's story books about play and photography, open ended art materials, bookmaking supplies and templates, and suggested starting points for conversations with children about their play experiences at preschool. The research activities with the children unfolded over a six-week period to give children time to expand and develop their ideas individually and in small groups. Instructors were encouraged to document the activity sessions through photo- and note-taking. Parental written consent was obtained prior to their child's participation. Children's assent was treated as an ongoing process (Einarsdottir 2007) to facilitate informed and voluntary participation. At the end of these activities, children took their photobooks home. Scanned copies of the photobooks were retained for analysis. **Figure 2** shows some of the pictures of the Love to Play space that children took during these activities.

Common themes in children's visual representations were identified and analyzed using content analysis techniques. Instructors' and researchers' field notes contributed to data analysis. Children's visual narratives and interpretations were then pieced together like in a mosaic to reveal the play value of the space as perceived by its primary users. A summary of children's

perspectives on their spaces was prepared and examined for commonalities and differences across sites.

Part 5 – Understanding the collaboration: process evaluation

This collaborative project involved a large team of study investigators, community partners (i.e., preschool programmers and managers), and research staff over three term-based offerings (totaling a 9-month program year) of the preschools. The complexity of implementing this project inspired the partnership to evaluate the process of working together in order to better contextualize the project findings and enhance future collaborative work (by exploring what did and did not work). The process evaluation assessed the compliance of data collection activities to the study protocols, helped to maintain meaningful engagement between partners, and better captured the story of the inaugural offering of the preschool in the Love to Play space.

The process evaluation involved ongoing assessment of data collection activities, individual interviews at the end of the data collection, and unstructured interviews with community partners about the history of and future plans for SCRPC preschool programs. Detailed minutes of team meetings, journal entries of formal and informal conversations between researchers, instructors, and community partners during data collection and analyses, and dissemination activities were other means of recording pertinent study information. While not used as formal study data, this information contributed to a deeper understanding of the context of the project *per se* and the value of the Love to Play space. This influenced how data were interpreted for the results and how the team crafted the messages for each target audience of the program (i.e., parents, instructors, local community, and academics).

Day-to-day logistics were monitored to ensure data collection activities were consistent with the research protocols, and to adapt as needed. Factors noted daily were the degree of

difficulty or problems with equipment setup/take-down, timing/scheduling of activities, completeness of the data collection, participant-research staff interactions, general impressions, and concerns and suggestions. Immediate review of this information helped the team to better support field staff by quickly finding solutions to emergent problems, while ensuring reliability and accuracy of the gathered data.

The process evaluation also explored the broader successes and challenges experienced by the partnership. The fourteen collaborative team members were invited to participate in a one-on-one semi-structured interview about their experiences with the project. Three research team members with experience in project evaluation designed the semi-structured interview guide, which contained open-ended questions about the collaboration, expectations, and experiences. An external evaluator was hired who had autonomy to adapt the interview guide according to her experiences with the interviews. The evaluator interviewed (in person or by telephone) four (of five) academic researchers, all three (of three) SCRPC staff members, and four (of six) research assistants between December 2015 and January 2016. All respondents provided written or oral consent. With respondents' permission, all interviews were audio-recorded; the average interview length was 37 minutes (14-62 minutes). Several measures were taken to protect respondent confidentiality and privacy rights. The evaluator destroyed all audio files once a professional transcriptionist transcribed them verbatim. A research assistant not involved in the Love to Play project removed all identifiers from the transcripts, leaving only the respondents' roles in the project. Only the anonymized transcripts were available to the researchers for archival purposes. The external evaluator independently analyzed all transcripts using content analysis and sent a summary report with the main findings to all academic and community partners. Later, a second external consultant used thematic analysis for an in-depth exploration of

the community-university partnership. These analyses have contributed insights to strengthen the relationships between community partners and researchers in ongoing collaborative activities.

In addition to regular, informal interactions throughout the data collection and analysis activities, community partners also provided detailed information about the preschools to better inform interpretation of findings. Two preschool programmers and two managerial staff were engaged in one-on-one, audio-recorded one-hour unstructured conversations with a trained research assistant. The context of development and implementation of the Love to Play space and free-play preschool philosophy, as well as future plans for programming and revitalization of preschool spaces, were discussed. Although the partners were fully embedded in the project from its design to the dissemination – and as such have had many opportunities to share the story behind the program and space – this formal, structured documentation activity helped the academics gain an explicit, in-depth understanding of the driving forces behind Love to Play, successes and challenges with the implementation, and next steps for preschool programming across SCRPC spaces. These perspectives shed light onto questions emerging from the analysis, providing a platform for a better interpretation of the findings and tailoring of recommendations. Although the process evaluation was led by the academics, community partners also valued the evaluation as it demonstrated transparency in process and because the findings could be used to help reinforce the case to senior managers for future partnered work.

Discussion and findings

This paper is primarily methodological in nature, however, it also presents considerations from the overarching findings to illustrate how a participatory mixed methods study can be employed to share lessons learned in the context of implications for child-friendly settings.

Learning from Love to Play about child-friendly settings

To investigate how recreation preschool spaces foster children's free play, this participatory project used a mixed methods approach, which facilitates in-depth exploration of the phenomenon's complexity in the real-life context (Crowe et al. 2011, Fletcher et al. 2015). The triangulation of quantitative and qualitative data aimed to increase internal validity (Crowe et al. 2011) and trustworthiness (Flicker 2008). Critically, it provided different yet complementary information on how different spaces impact children's play, an important determinant of their lifelong health and a key piece of social infrastructure in a child-friendly community. The four study parts were intended to provide an in-depth understanding of the perceptions of parents, instructors, and children on the preschool program and space, the physical characteristics of preschool spaces, and the children's play. Thus, data analysis was done for each part separately, followed by comparisons across parts. The nature and depth of the data collected in each part varied, but still is comparable across the three sites (Crowe et al. 2011). Comparisons began to reveal the rich, developmentally optimal play that investing in a play-based program can provide. These findings can be extended from the child-centered preschool to child-friendly spaces integrated throughout a community.

This study explored the multifaceted nature of children's play, which is better understood when multiples angles and different actors' perspectives are considered. The analyses provided empirical evidence that free play is not synonymous with active play indoors, revealing a variety of play types and behaviours during free-play time (Hughes 2017). For example, while the play behaviours exhibited were consistent with extant definitions of free play, children were not always, or necessarily, physically active when playing (Hughes 2017). Creativity and exploration observed in child-led activities often occurred during sedentary behaviour. Yet the social,

cognitive, and emotional development associated with sedentary free play may be as beneficial as the physical development promoted by the moderate to vigorous physical activities associated with active play. Promoting active play is still necessary for children's physical health and development, but active play often occurs during structured, instructor-led sessions. Children may engage spontaneously and voluntarily in more sedentary behaviours during free play time and these activities also promote healthy cognitive, emotional, and social development. Too much focus on active play may de-emphasize the powerhouse of skills and abilities that come from children's engagement in a variety of play. Extrapolating from the play-based preschool environment, child-friendly spaces are those that incorporate variation that facilitate all forms of play, and extend that variation to form and function that purposively consider the meaningful engagement of children of all ages (Malone 2013) and abilities (Jenvey 2013), e.g., play spaces characterized as sedentary are potentially important for children, disabled or injured, who cannot participate in other kinds of play.

Study findings suggested that free play in the preschool setting is a result of interactions between physical space, children, and instructors, illustrating that the multi-component study design permitted the multi-faceted nature of free play to present itself. Programming, space setup, instructors' attitudes and decisions, and children's perspectives all influence children's play. Thus, providing a rich physical and social environment is fundamental for stimulating engaging and dynamic play experiences. It is the combination of physical infrastructure with the practice of a free play philosophy that makes a successful, vibrant environment where children can learn by playing with whatever and whoever and however they choose, i.e., free play. These study findings contribute to literatures on play and child-friendly spaces by substantiating the value of using a multi-method approach to better reveal the complexities behind children's play.

Despite the volume of research on play, most studies report on only one dimension of play, and use only one method to explore that research question. This study moved beyond those limitations to simultaneously capture children's, parents' and instructors' perspectives on play in the preschool relative to the physical and social characteristics of that environment. Although designed with a municipal recreation preschool in mind, this community-engaged approach might further the agenda of a child-friendly city by addressing research challenges presented by the social and setting-based variations that occur throughout cities (Woolcock et al. 2010).

Rigorous research on play and on child-friendly places must move past single-dimension, single-method foci and requires nuanced methods as well as the participation of different actors. Although parents and instructors in this study agreed about the value of play for young children, their perspectives came from different angles. Children's interests and developmental needs guide the instructors' decisions about the use of different spaces, resources, and activities during the program. Parents described the play-based preschool as a place where their children could grow socially and emotionally, but also participate in academic-type learning in preparation for kindergarten. This study, which engaged both parents and instructors, offered a clearer picture of the potential tensions around the value of play in preschool settings. Previous work has identified the different priorities of parents and instructors related to the perceived benefits gained from time spent in preschool (Fisher et al. 2008, Hatcher et al. 2012). This study extends that work by integrating the children's perspectives and empirical data about their play alongside the adults' perceptions of the child's environment.

By actively engaging children in participatory research activities, this study revealed their unique ideas about play in their preschools. It is the way children see and interact with – and in – the spaces with their peers and adults that transform their surroundings into something that is

meaningful for them. Children's photographs revealed how they see the preschool world: through their eyes and from their height and position relative to the walls, fixtures, equipment, and ceilings. The stories that accompanied the photographs provide insights to children's experiences with the space and play materials. The post-interviews with parents and instructors revealed their delight and surprise with the children's photobooks, and new insights into their children's experiences of their world. The unexpected perspectives (for adults) that children have about their play in their preschools emphasizes the value of inviting children to share their ideas about the design of play spaces. In keeping with the principles of a child-friendly community, findings from this study underscore the importance of meaningfully engaging children in research in order to hear their voices about their own activities.

Learning from the participatory mixed methods approach

The Love to Play project was built on the idea that collaborative partnerships throughout the research process and flexibility are key components for the success of community-university partnered studies. Community partners' perspectives contributed significantly to the study design, development of the data collection activities, and interpretation of results, all hallmarks of participatory approaches (Cargo and Mercer, 2008). The preschool instructors played an important role in refining data collection strategies when research staff faced challenges with recruitment and logistics in fieldwork. Children were important co-researchers (Clark 2005, Vaughn et al. 2013), especially in the context of understanding their perspectives of the spaces in which they spent their time (Cope 2009, Malone 2013).

Prior to participant recruitment, SCRPC partners reviewed the data collection protocols and helped to define better strategies to facilitate parents' and children's participation in the project, embedding the research activities within the preschools' schedules. Unsurprisingly,

further modifications in the protocol were required to accommodate unexpected programming events and to accommodate children's/instructors' absences and enrolment of new children in the programs. Reconciling different, and sometimes competing, priorities of instructors, managers, parents, and children in the project was crucial. SCRPC staff responded to these challenges and shared their strategies with the academics to ensure that modifications to the study protocols did not adversely impact data quality or consistency.

This flexibility in the study protocols was critical in Part 4, where the researchers provided instructors with a basic process template with activities for them to select from (as per instructors' request). Instructors had autonomy to choose the sequence and timing for performing the activities with children, and adapting them according to the preschool schedule, perceived children's interests, instructors' preferences, and teaching styles. All choices were previously discussed with and agreed to by the researchers (for compliance to ethics protocols, etc.). Although it worked well and caused less interference with the preschool schedule, this strategy came with challenges. Researchers only met children at the photobook sharing session (and not during earlier stages of the activity), given the changes in the activities made by instructors. As Darbyshire and colleagues (2005) found, having only a single opportunity for the researchers to talk with or watch children's presentations was not ideal. Having an embedded researcher, e.g., as a participant observer or preschool facilitator, throughout the course of Part 4 at each site would have helped to foster relationships between researchers and children, ensure sufficient time and opportunities for children to engage in the research activities, document the development of activities and children's reactions to them in detail, and better explore children's voices and experiences about their play environment. Future research concerned with child-friendly spaces can benefit from careful development of participatory approaches that not only

involve children, but that also understand and evaluate the power dynamics and shared control in the child-adult research enterprise (Cope 2009, Wong et al. 2010). This will help to address the structural complexity of bringing children's voices to the discussion of play and space in an authentic way.

Despite the strong support of SCRPC staff in recruiting parents for the Part 1 interviews, the relatively low participation rate in post-interviews suggested a drawback in the data collection strategy. Scheduling interviews with parents at this busy time of year proved challenging. Future studies using pre-post interviews that align with a typical school year should anticipate a very flexible interview schedule, including nights and weekends, along with the provision of child-minding to facilitate parent participation.

With respect to Part 2, this study revealed that the objective assessment of preschool spaces in multi-purpose facilities should be completed during programming hours when the space is setup for children. Although social interactions were not part of the space audit, the dynamics occurring in the space during observation facilitate assessment of what is available and readily accessible for children to play with. The after-hours program assessment conducted here proved to be sub-optimal for assessing these spaces because they were multi-purpose rooms in a public recreation facility and not all dedicated to preschool programs all the time. In the evenings, one preschool room was being regularly used for other recreation activities, while the other two were open to accommodate sporadic non-preschool activities by people of all ages. Equipment and other room characteristics were altered to accommodate these activities. Although critical to a dynamic recreation facility setting, this recommendation also may be applicable to the assessment of spaces housing other informal play/recreation education settings and more broadly to child-friendly spaces in the cityscape. Studying how children use the spaces

that adults create for them, as well as those created without children in mind, contributes to a better understanding of children's perspectives of their environments and is fundamental to creating vibrant child-friendly space (Cope 2009, Malone 2013). This is particularly important for those spaces that do not involve children in planning and development, as their perspectives and experiences may not be appropriately embodied in the resultant spaces.

Video observations, as in Part 3 of this study, can pose a number of ethical challenges (Heath et al. 2010). For instance, the exclusion of a child without parental consent to participate may raise issues of unfairness even when an alternative space with similar activities is provided to that child. If parents withdraw consent after the video recording, their child's images cannot be readily removed from the video file. However, the biggest challenges faced concerned data collection logistics. The room sizes varied across sites, ranging between 540 and 3870 square feet. While three video cameras were sufficient for small rooms, adding a fourth camera would have better captured children's play in larger rooms where blind spots were more common. To mitigate the anxiety some instructors were feeling with the video cameras, the team chose to not use sensitive microphones and rely solely on those in the video cameras, resulting in poor audio recordings. Thus, video data coding was based almost entirely on visual cues of play behaviours, which may be insufficient for future studies that require analyzing language. It was difficult, for example, to identify the dimensions of imaginative, socio-dramatic play in the children's space without sound. Effective audio capture will enhance future use of video observation for the assessment of children's interaction with – and within – child-friendly places.

This project's greatest success was how academic and community partners came together to collectively develop strategies to overcome the afore-mentioned challenges. Aligned with a participatory research approach, this team subscribed to the principles of joint governance,

shared decision-making, and maintaining a respectful environment where power differentials among partners and participants were constantly interrogated throughout every stage of the project (Israel et al. 1998). As expected, changes in the preschool environments occurred during the project. The study protocol adapted to those changes while maintaining methodological rigour and respecting team members' areas of practice or research expertise. Ongoing communication ensured everyone was aware of important decisions on mechanisms for data collection and analysis, allowing the team to maintain openness to unexpected findings. The shared, common interests in this collaboration served interrelated and complementary purposes with mutual benefits for all partners. The community partners wanted to produce meaningful findings to support decision-making around allocation of financial resources and time into the development of future recreation preschool programs based on free play. The academics wanted to gain a nuanced understanding of the impact of the space and program on children's play, adding to the discourse on child-friendly spaces and early childhood environments, including consideration of how to collaborate with young children to create spaces that structurally and systematically include them (Cope 2009, Langhout and Thomas 2010). While this study focused on early childhood, the perspectives of older children and youth – as dreamers and critical agents of change – must be considered in the design, implementation, and evaluation of child-friendly spaces (Woolcock et al. 2010, Malone 2013), and in impact assessments of those spaces on children's social and developmental wellbeing.

The variety of expertise on the team allowed for the use of multiple, innovative data collection methods and examination of results from different perspectives for better conceptualization and interpretation. In turn, the institutional and structural knowledge brought by preschool programmers was essential for contextualizing the findings in relevant practice and

policy recommendations. The preschool programmers gained a deeper understanding of the research process (particularly regarding scientific rigour and the purpose of research ethics protocols) and the academics learned new skills related to fielding data collection in the face of municipal operational and programming realities: an important methodological concern for applied child-friendly city research. Ultimately, this partnership resulted in a stronger study design with appropriate methodologies taking into account contextual specificities revealed by insider perspective of the community partners. This collaboration has enriched the ongoing interpretation of findings and contributed to sharing findings in a more accessible and meaningful way with other stakeholders and decision-makers. More importantly, it has generated knowledge that has practical and social relevance to the community. Thus, the participatory mixed methods approach generated findings that can better inform decision-making regarding the effectiveness of the free play-based preschool spaces and programming and the feasibility of extending child-friendly principles to other municipal spaces. With respect to scholarship, this collaborative, multi-component study design has produced in-depth knowledge of the impact of a free play-based recreation preschool program and space on children's play, revealing complexity that would not have been captured otherwise.

Conclusions

Child-friendly communities are inclusive of children, promote their well-being in society and are "*committed to the fullest implementation of the Convention on the Rights of the Child*" (UNICEF 2004, p.1). Children are the canaries in the ecological coalmine of our communities. Every decision and investment directly impacts their right to experience a healthy, playful childhood; the ecological social and physical determinants of their health; and their propensity, as equal citizens, to be included in and fully participate in their society. Free play is touted as a

hallmark of childhood and has recently been afforded dedicated attention by national and international bodies interested in promoting positive health and developmental outcomes among children. This recognition necessitates a deliberate and nuanced understanding of how to foster play in those spaces dedicated to, and inclusive of, children. This paper offered a detailed example of a participatory mixed methods study and discussion of the value that this design can bring to understanding complex community-based early learning and care practices. Lessons learned from studies of child-centered spaces, like this one on play-based preschool programs offered by a municipal recreation department, can be used to enhance the physical and social environments of a community more broadly, purposefully reorienting them as inclusive, child-friendly places.

References

Active Healthy Kids Canada, 2012. *Is Active Play Extinct? The Active Healthy Kids Canada 2012 Report Card on Physical Activity for Children and Youth* [online]. https://www.participaction.com/sites/default/files/downloads/Participaction-2012FullReportCard-ActivePlayExtinct_0.pdf [Accessed 7 February 2018].

Akbari, E., & McCuaig, K. (2017). Early Childhood Education Report. Retrieved from http://ecereport.ca/media/uploads/2017-report-pdfs/ece-report2017-en-feb6.pdf

Alexander, S.A., Frohlich, K.L., and Fusco, C., 2014. Playing for health? Revisiting health promotion to examine the emerging public health position on children's play. *Health promotion international,* 29 (1), 155-164.

Berkhout, L., Hoekman, J., and Goorhius-Brouwer, S., 2012. Observation instrument of play behavior in a classroom setting. *Early Childhood Development and Care,* 182 (10), 1325-1333.

Berris, R. and Miller, E., 2011. How design of the physical environment impacts early learning: educators and parents perspectives. *Australasian Journal of Early Childhood,* 36 (4), 1-17.

Björk-Willén, P. and Cromdal, J., 2009. When education seeps into 'free play': how preschool children accomplish multilingual education. *Journal of Pragmatics*, 41(8), 1493-1518.

Brady, L.M., Gibb, J., Henshall, A., and Lewis, J., 2008. *Play and exercise in early years: physically active play in early childhood provision.* London, UK: Department for Culture, Media and Sport.

Brown, W.H., Pfeiffer, K.A., McIver, K.L., Dowda, M., Almeida, M.J., and Pate, R.R., 2012. *Observational System for Recording Physical Activity in Children-Preschool (OSRAC-P): OSRAC-P training manual for observers.* Columbia: University of South Carolina.

Brussoni, M., Brunelle, S., Pike, I., Beate Hansen, E., Herrington, S., Turner, H., Belair, S., Logan, L., Fuselli, P., and Ball, D.J., 2015. Can child injury prevention include healthy risk promotion? *Injury Prevention,* 5, published online.

Cargo, M. and Mercer, S.L., 2008. The value and challenges of participatory research: strengthening its practice. *Annual Review of Public Health,* 29, 325-350.

Children's Play Council, Playlink, and National Playing Fields Association, 2000. *Best play: What play provision should do for children*. London, UK: Children's Play Council.

Christenson, P. and Prout, A., 2005. Anthropological and sociological perspectives on the study of children. *In:* S. Greene & D. Hogan, eds. *Researching Children's Experience*. London, UK: Sage, 42-60.

Clark, A., 2005. Listening to and involving young children: a review of research and practice. *Early Child Development and Care,* 175 (6), 489-505.

Clark, A., 2011. Multimodal map making with young children: exploring ethnographic and participatory methods. *Qualitative Research,* 11 (3), 311-330.

Clark, A. and Moss, P., 2011. *Listening to young children: The Mosaic Approach.* 2nd ed. London, UK: National Children's Bureau.

Cope, M., 2009. Challenging adult perspectives on children's geographies through participatory research methods: insights from a service-learning course. *Journal of Geography in Higher Education,* 33 (1), 33-50.

Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A., and Sheikh, A., 2011. The case study approach. *Bmc Medical Research Methodology,* 11, 100-108.

Danniels, E. and Pyle, A., 2013. Defining play-based learning. *In* R.E. Tremblay, M. Boivin, RDeV. Peters, eds. P.K. Smith, topic ed. *Encyclopedia on Early Childhood Development* [online]. http://www.child-encyclopedia.com/play-based-learning/according-experts/defining-play-based-learning. [Accessed 7 February 2018].

Darbyshire, P., MacDougall, C., and Schiller, W., 2005. Multiple methods in qualitative research with children: more insight or just more? *Qualitative Research,* 5 (4), 417-436.

De Long, A.J., Tegano, D.W., Moran, J.D., Brickey, J., Morrow, D., and Houser, T.L., 1994. Effects of spatial scale on cognitive play in preschool children. *Early Education and Development,* 5 (3), 237-246.

Dublin City Childcare Committee, 2007. *We like this place...:guidelines for best practice in the design of childcare facilities*. Dublin, IE: Government of Ireland.

Early Childhood Education Mapping Project (ECMap) Alberta, 2011. *Early Childhood Development (ECD) community information: Strathcona – Rural ECD Community*. Edmonton, AB: Alberta Education.

Edwards, C., Candini, L., and Forman, G., 2011. *The hundred languages of children: The Reggio Emilia experience in transformation.* 3rd ed. Santa Barbara, CA: Praeger.

Einarsdottir, J., 2007. Research with children: methodological and ethical challenges. *European Early Childhood Education Research Journal*, 15 (2), 197-211.

Evans, G.W., 2006. Child development and the physical environment. *Annual Review of Psychology*, 57, 423-451.

Fiorelli, J.A. and Russ, S.W., 2012. Pretend play, coping, and subjective well-being in children: a follow-up study. *American Journal of Play,* 5 (1), 81-103.

Fisher, K.R., Hirsh-Pasek, K., Golinkoff, R.M., and Gryfe, S.G., 2008. Conceptual split? Parents' and experts' perceptions of play in the 21st century. *Journal of Applied Developmental Psychology,* 29, 305-316.

Fitzgerald, A., Hackling, M., and Dawson, V., 2013. Through the viewfinder: reflecting on the collection and analysis of classroom video data. *International Journal of Qualitative Methods,*12, 52-64.

Fleer, M., 2015. Pedagogical positioning in play–teachers being inside and outside of children's imaginary play. *Early Child Development and Care*, *185*(11-12), 1801-1814.

Fletcher, A.J., MacPhee, M., and Dickson, G., 2015. Doing participatory action research in a multicase study: a methodological example. *International Journal of Qualitative Methods,* 14 (5), 1-9.

Flicker, S., 2008. Who benefits from community-based participatory research? A case study of the Positive Youth Project. *Health Education & Behavior,* 35 (1), 70-86.

Gill, T., 2008. Space-oriented children's policy: creating child-friendly communities to improve children's well-being. *Children & Society,* 22(2), 136-142.

Ginsburg, K.R., 2007. The importance of play in promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics,* 119(1), 182-191.

Graham, K.L. and Burghardt, G.M., 2010. Current perspectives on the biological study of play: signs of progress. *Quarterly Review of Biology,* 85(4), 393-418.

Gray, P., 2009. Play as a foundation for hunter-gatherer social existence. *American Journal of Play,*1(4), 476-522.

Gray, P., 2011. The decline of play and the rise of psychopathology in children and adolescents. *Journal of Play*, 3(4), 443-463.

Hanley, G.P., Tiger, J.H., Ingvarsson, E.T., and Cammilleri, A.P., 2009. Influencing preschoolers' free-play activity preferences: an evaluation of satiation and embedded reinforcement. *Journal of Applied Behavior Analysis*, 42(1), 33-41.

Harper, L.V. and McCluskey, K.S., 2003. Teacher–child and child–child interactions in inclusive preschool settings: do adults inhibit peer interactions? *Early Childhood Research Quarterly*, 18(2), 163-184.

Hatcher, B., Nuner, J., and Paulsel, J., 2012. Kindergarten readiness and preschools: teachers' and parents' beliefs within and across programs. *Early Childhood Research & Practice,* 14(2), 1-17.

Heath, C., Hindmarsh, J., and Luff, P., 2010. *Video in qualitative research: analysing social interaction in everyday life.* Thousand Oaks: Sage.

Henricks, T.S., 2009. Orderly and disorderly play: a comparison. *The American Journal of Play*, 2(1) 12-40.

Hewes J., 2010. Voices from the field – Learning through play: A view from the field. *In:* R.E. Tremblay, R.G. Barr, R. Peters, and M. Boivin M, eds. *Encyclopedia on Early Childhood Development* [online]. Montreal, Quebec: Centre of Excellence for Early Childhood Development, 1-6.

Holloway, S.D. and Reichhart-Erickson, M., 1988. The relationship of day care quality to children's free-play behavior and social problem-solving skills. *Early Childhood Research Quarterly*, 3(1), 39-53.

Homan, R., 1991. *The ethics of social research.* London: Longman.

Hughes, B., 2017. *An evaluation of preschool children's physical activity within indoor preschool play environments*. Thesis (MSc). University of Alberta.

Israel, B., Schulz, A.J., Parker, E.A., and Becker, A.B., 1998. Review of community-based research: assessing partnership approaches to improve public health. *Annual Review of Public Health,* 19(1), pp. 173.

Jenvey, V.B., 2013. Play and disability. *In* R.E. Tremblay, M. Boivin, RDeV. Peters, eds. P.K. Smith, topic ed. *Encyclopedia on Early Childhood Development* [online]. http://www.child-encyclopedia.com/play/according-experts/play-and-disability. [Accessed 7 February 2018].

Karsten, L., 2005. It all used to be better? Different generations on continuity and change in urban children's daily use of space. *Children's Geographies,* 3(3), 275-290.

Keating, P. and Hertzman, C., 1999. *Developmental health and the wealth of nations.* New York, NY: Guilford Press.

Kontos, S., 1999. Preschool teachers' talk, roles, and activity settings during free play. *Early Childhood Research Quarterly,* 14(3), 363-382.

Langhout, R. and Thomas, E., 2010. Imagining participatory action research in collaboration with children: an introduction. *American Journal of Community Psychology,* 46(1), 60-66.

Lee, H., Tamminen, K.A., Clark, A.M., Slater, L., Spence, J.C., and Holt, N.L., 2015. A meta-study of qualitative research examining determinants of children's independent active free play. *The international journal of behavioral nutrition and physical activity,* 12(5).

Malone, K., 2013. The future lies in our hands: children as researchers and environmental change agents in designing a child-friendly neighbourhood. *Local Environment,* 18(3), 372-395.

Mashburn, A.J., 2008. Quality of social and physical environments in preschools and children's development of academic, language, and literacy skills. *Applied Developmental Science,* 12(3), 113-127.

Maxwell, L.E., 2007. Competency in child care settings - the role of the physical environment. *Environment and Behavior,* 39(2), 229-245.

Minkler, M. and Wallerstein, N., eds., 2008. *Community-based participatory research for health: From process to outcomes (2nd ed.)*. San Francisco, CA: Jossey-Bass.

Moore, G.T., 2010. *The Children's Physical Environment Rating Scale (CPERS)*. Sydney: Environment, Behaviour & Society Research Group, University of Sydney.

Nykiforuk, C.I.J., Belon, A., Stenberg, K., and Edgington, B., 2015. *Love to Play: Evaluation of a play-based preschool recreation program and space. Preliminary research findings.* Edmonton, AB: Policy, Location and Access in Community Environments (PLACE) Research Lab.

Olsen, B. D. and Jason, L.A., 2015. Participatory mixed methods research. *In* S. Hesse-Biber and B. Johnson, eds., *The Oxford handbook of multimethod and mixed methods research inquiry*. Oxford, UK: Oxford University Press, 393-405.

Ostrov, J.M. and Keating, C.F., 2004. Gender differences in preschool aggression during free play and structured interactions: An observational study. *Social development*, 13(2), 255-277.

Pascal, C. and Bertram, T., 2009. Listening to young citizens: the struggle to make real a participatory paradigm in research with young children. *European Early Childhood Education Research Journal*, 17(2), 249-262.

Play England, 2008. *Design for play: a guide to creating successful play spaces.* London: The Department for Children, Schools and Families (DCSF) and the Department for Culture, Media and Sport (DCMS).

Play Wales, 2012. *Play spaces: planning and design*. Cardiff: Play Wales.

Prochner, L., Cleghorn, A., and Green, N., 2008. Space considerations: materials in the learning environment in three majority world preschool settings. *International Journal of Early Years Education,* 16(3), 189-201.

Ranz-Smith, D., 2007. Teacher perception of play: in leaving no child behind are teachers leaving childhood behind? *Early Education and Development,* 18(2), 271-303.

Read, M.A., 2007. Sense of place in child care environments. *Early Childhood Education Journal,* 34(6), 387–392.

Sandseter, E.B.H., 2014. Early childhood education and care practitioners' perceptions of children's risky play; examining the influence of personality and gender. *Early Child Development and Care,* 184(3), 434-449.

Singer, D.G., Singer, J.L., D'Agostino, H., and DeLong, R., 2009. Children's pastimes and play in sixteen nations: is free-play declining?. *American Journal of Play,* 1(3), 283-312.

Sorin, R., 2005. Changing images of childhood – reconceptualizing early childhood practices. *International Journal of Transitions in Childhood,* 1, 12-21.

Strathcona County 2012. *Municipal Census Report*. Sherwood Park: Strathcona County.

UNICEF, 2004. *Building child friendly cities: a framework for action.* Florence: Innocenti Publications.

United Nations General Assembly, 1989. *Convention on the Rights of the Child.* New York: UN General Assembly.

Vaughn, L.M., Wagner, E., and Jacquez, F., 2013. *A Review of Community-Based Participatory Research in Child Health. MCN: The American Journal of Maternal/Child Nursing,* 38(1), 48-53.

Veitch, J., Bagley, S., Ball, K., and Salmon, J., 2006. Where do children usually play? A qualitative study of parents' perceptions of influences on children's active free-play. *Health & place,* 12(4), 383-393.

Wallerstein, N. and Duran, B., 2010. Community-based participatory research contributions to intervention research: the intersection of science and practice to improve health equity. *American Journal of Public Health,* 100, S46.

Wang, C. and Burris, M.A., 1997. Photovoice: concept, methodology, and use for participatory needs assessment. *Health Education & Behavior,* 24(3) 369-387.

Wong, N., Zimmerman, M., and Parker, E., 2010. A typology of youth participation and empowerment for child and adolescent health promotion. *American Journal of Community Psychology,* 46(1), 100-114.

Woolcock, G., Gleeson, B., and Randolph, B., 2010. Urban research and child-friendly cities: a new Australian outline. *Children's Geographies,* 8(2), 177-192.

October 16th, 2018

Dear Commissioning Editor,
Edition ‘The child-friendly city’
Cities & Health

Re: **Manuscript Number:** RCAH-2017-0028R2
Title: Evaluating Child-Friendly Spaces: Insights from a Participatory Mixed Methods Study of a Municipality's Free-Play Preschool and Space

We are pleased to resubmit the revised version of our manuscript *Evaluating Child-Friendly Spaces: Insights from a Participatory Mixed Methods Study of a Municipality's Free-Play Preschool and Space*. We are happy to hear the changes we have made in the manuscript met both reviewers’ expectations. We would like to thank the anonymous reviewers for their time, careful reading, and valuable feedback.

In this present revised version, we have gone through your own recommendations for improvement and have made the appropriate changes. Attached below are our point-by-point responses to own comments. Our responses are in blue color. In the new version of the manuscript, our revisions are also highlighted in blue color.

We hope that, with these revisions, the editorial board finds our manuscript suitable for publication in *Cities & Health*. We are willing to undertake further revisions, as necessary, to finalize the paper for publication. We look forward to hearing your decision on this revised manuscript.

Yours sincerely,

Candace I. J. Nykiforuk (Corresponding Author)
CIHR/PHAC/Alberta Innovates Applied Public Health Chair in Public Policy & Community Environments
Associate Professor, School of Public Health

Cities & Health

Caroline Brown, PhD
Commissioning Editor

Title: Evaluating Child-Friendly Spaces: Insights from a Participatory Mixed Methods Study of a Municipality's Free-Play Preschool and Space

Date: October 16th, 2018

1. Please review the title of the article - the second part of the title is a little unclear, e.g. do you mean free play-space, free-play space, or something else?
   We thank you for your comment. We have changed to 'free-play'.

2. We are keen to include some images or photos in the manuscript. The journal was an international reach, and it is useful to give readers some ideas about the setting for your study. The editorial style is to group images together in blocks (e.g. of two or four), so please consider providing several images for the manuscript. Guidance about the format of image files is on the journal website.
   We have included two figures (each one with four pictures) of the Love to Play preschool space.

Figure 1 (a)

Figure 1 (b)

Figure 1 (c)

Figure 1 (d)

Figure 2 (a)

Figure 2 (b)

Figure 2 (c)

Figure 2 (d)

Figure 1. The Love to Play space at Ardrossan Recreation Complex. Strathcona County, Alberta, Canada.
Photo credit: Strathcona County Recreation, Parks, and Culture.

Figure 2. Photos of the Love to Play space taken by preschoolers during the photovoice activities (Part 4). Strathcona County, Alberta, Canada.
Photo credit: Participants of the Love to Play project.