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From segregation to inclusion: children's engagement in urban public spaces

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ABSTRACT

This paper explores how urban segregation impacts children's ability to engage with and temporarily appropriate public spaces, a critical aspect of their spatial, social, and cultural development. Using a post-qualitative inquiry, we integrate Temporary Appropriation and the Speculative Pluriversal Imaginary Research Assemblage Loop (SPIRAL) to examine children's interactions in Auckland and Venice. While pristine playgrounds in cities like Auckland ensure safety, they isolate children (3–12 years old) from dynamic urban environments. In contrast, Venice's integrated spaces foster spontaneous play. We propose design interventions that balance safety and exploration, contributing to regenerative urbanism and equitable public spaces. The study concludes with open-ended questions to inspire future research.

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Temporary appropriation; children and urban design; playgrounds; urban segregation; regenerative urbanism; spatial inclusion

Introduction

Urban public spaces are essential for fostering inclusivity, social interaction, and community well-being. They are the quintessential space where urban identity is formed (Lalli 1992, Neill 2004), and socialisation between people of all ages takes place (Mitchell 2014, UN-Habitat 2018).

For children, public spaces are places of recreation, safety, and freedom of movement (Severcan 2012). Furthermore, they are environments where they learn, explore, and develop social and spatial awareness (Veitch *et al.* 2010, Ekawati 2015).

However, the increasing focus on structured and pristine environments, such as playgrounds, has created a paradox in urban design. While these spaces ensure physical safety, they often segregate children from the broader urban fabric, depriving them of the opportunity to engage with the vibrant, plural, and dynamic nature of public spaces.

This paper critically examines the impact of such segregation on children's developmental experiences in Auckland, New Zealand. It employs the concept of temporary appropriation, defined as the informal and transient use of public spaces, to highlight how children benefit from unstructured interactions with the urban realm (Lara-Hernandez *et al.* 2018). By comparing playgrounds with informal urban spaces like streets and plazas, this study reveals the limitations of controlled environments in fostering agency, creativity, and resilience among children.

This research aims to explore how children (3–12 years old) engage with their urban environment through the study of temporary appropriation of public spaces. In doing so, this paper contributes to the discourse on regenerative urbanism by advocating for cities that support children's well-being while promoting equitable and vibrant public spaces. Here, regenerative urbanism could be understood as a transdisciplinary framework for urban development that integrates ecological, social, and economic systems to actively restore and enhance ecosystem functions, promote social equity, and build resilience. It designs cities as living systems that contribute positively to the health and well-being of both people and the planet, moving beyond sustainability to regeneration (Girardet 1999, Camrass 2023).

This study adopts a post-qualitative inquiry to capture the relational dynamics of children's interactions with public spaces. This approach influences the paper's non-linear structure, prioritising fluid narratives over rigid frameworks to reflect the emergent nature of TA and urban identity.

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Research background

Designing for children's development

Children's interactions with public spaces are pivotal to their cognitive, social, and emotional development (Kosslyn *et al.* 1974). Traditional urban design often isolates children within defined areas, such as playgrounds, designed for structured play. Research by Shirtcliff highlights the limitations of such spaces in fostering creativity and social learning, emphasising the importance of dynamic environments that offer a broader range of stimuli (Shirtcliff 2019).

Children's engagement with unstructured urban spaces, such as streets, plazas and not overdesigned spaces, provides opportunities for exploration, problem-solving, and social interaction. These interactions enable children to develop a sense of agency and adaptability, which is critical for their overall growth. However, the increasing privatisation and regulation of public spaces have significantly reduced such opportunities, creating a 'spatial segregation' that limits their urban experiences (Woolley 2015).

The urban fabric has changed over the years in conjunction with social and political changes. Starting from the Industrial Revolution and the rapid urbanisation processes, the city has been under shocks that have raised concerns over social and spatial inequalities (Zhang 2016).

How the city is experienced directly impacts in children. Race, family income, the use of public or private transportation, and living in the city centre or suburbia make children experience different or unequal (Barbosa *et al.* 2023).

Recent research on children's interaction with urban environments highlights critical themes regarding independent mobility, physical activity, and urban design. Earlier studies, such as Witten et al., explored how urban intensification and inner-city housing in Auckland, New Zealand, affected families and children's well-being (Carroll *et al.* 2015). The findings underscored challenges like limited play spaces and safety concerns, questioning the social sustainability of such developments. Carroll et al. (Carroll *et al.* 2015) expanded on these issues, emphasising the 'child-blind' nature of urban planning, where car-centric designs limit children's freedom to engage with their environments. Oliver et al. (Oliver *et al.* 2016) advanced the discourse by investigating children's independent mobility and its association with active travel, stressing the health benefits of unstructured play. Studies like Badland et al. (Badland *et al.* 2016) introduced system models to better understand the complexities of children's independent mobility, identifying barriers posed by modern urban design and societal norms. Meanwhile, Kearns et al. (Kearns *et al.* 2016) and Witten et al. (Witten and Carroll 2016) highlighted the shrinking opportunities for informal active play due to increased urban traffic and safety concerns, pointing to a critical need for child-friendly planning. Subsequent research by Oliver et al. (Oliver *et al.* 2016) examined the interplay between neighbourhood attributes, walkability, and children's physical activity, suggesting that urban design has a profound impact on children's health and mobility. Across these studies, the recurring themes reveal a pressing need for urban design to balance safety, accessibility, and opportunities for unstructured play, fostering environments that support children's cognitive, social, and physical development sustainably.

Studies in Europe by Barbosa et al. (Barbosa *et al.* 2023) focused on childhood experiences compared two different contexts in the city of Porto, a private elementary school and a social centre in a public housing context.

Contemporary societies have led to the phenomena of restriction and constraint of children's right to the city. One of the most evident effects is the inequality of access and use of public spaces, diminished independence of mobility, and a sharp decrease in free and autonomous play time (Barbosa *et al.* 2023).

Life rhythms in cities have accelerated, bringing violence and marginalisation, and urban inequalities are growing. Instead of spaces for inhabitation, streets and squares have become spaces for circulation where people move between home, work and leisure spaces (Choay 2001, Barbosa *et al.* 2023). Additionally, the availability of green spaces within the city is decreasing and less common (UNICEF, 2012). Due to these changes, children have been the most affected. Their vulnerable condition and predominant discourse of 'paternalism, ownership and domestication' in conjunction with narratives of 'protection and control' have encouraged ideas and safety practices that diminish children's freedom and autonomy (Tomás 2013). As (Jenks 2005, pp. 74–75) claims, 'Erected by a gerontocratic hegemony and policed by discipline, the boundaries are legitimised through ideologies of care, protection and privacy'.

Currently, in developed countries such as New Zealand, most children's daily routine is spent in structured activities in organised spaces, regulated and controlled by adults, thus continuing their domination and power (Tonucci 1994, 2009, Woolley 2015).

In a certain way, children are being transported from island to island (home, school, playground, park, extracurricular activities), often in private transport. Therefore, the experience of the city is fragmented and limited, reduced to enclosed and passing spaces. Their experience of the urban landscape is what they can see from the car window (Malone 2007).

Watching children roaming the streets on their own or playing with their peers has become a rare event to see in the city. There is an ongoing trend striving for hyper-protection and infantilisation of childhood that gets underlined in the middle and high classes (Machado Barbosa 2001, Barbosa *et al.* 2023).

Mistrust and discrimination have found fertile ground in a society where there is a widespread and subjective perception of the risk and danger of the city, fuelled by isolation and crime perception.

Consequently, one of the effects of the latter is a decrease in independent mobility (Fyhri *et al.* 2011, Kyttä *et al.* 2015, Waygood and Susilo 2015). Studies conducted in sixteen countries between 2010-2012 gathered data from forty years earlier, pointing out a "complete erosion of children's independence (Shaw *et al.* 2015). There are several consequences of this situation, such as low physical activity and, consequently, health problems; lack of skills to act independently and solve problems; less resilience and a weakened sense of self-effectiveness; reduced geographical knowledge and spatial orientation; fragile emotional bonds with the neighbourhood and the city; and limited opportunities for socialise (Malone 2007). Ironically, the more 'protected' the children are, the more danger since they are not able to move freely around the city to learn how to manage the opportunities and challenges.

Middle and middle-upper classes tend to overprotect, institutionalise and promote hyper-activities in their children (Chin and Phillips 2004).

According to Barbosa et al. (Barbosa *et al.* 2023), children who spend more time indoors under excessive domestication are at greater risk than their counterparts. Their study refers to 'group a' to children of middle and high income, while context b refers to children of low income. On the one hand, children of middle and high-income groups relate to friends and family in school or extracurricular activities, have an organised context, and are always supervised by adults. They showed more autonomy when at home, too and did not show interest in exploring outdoors spaces or other parts of the city. On the other hand, children of the lower classes expressed more opportunities for socialisation outside institutionalised contexts and in public spaces. These groups of children are exposed to more intragenerational contact, playing with people of different ages; they play games driven and invented by them; they utilise and transform different spaces within the neighbourhood depending on the game they are performing; they show more solidarity and group protection; and enjoy more freedom and independence. The latter aligns with previous research. In contrast, they do not enjoy playing indoors as their high social strata counterparts.

For children in this context, the street is more than a place for circulation; it is a place to 'be', a place to discover others and the world around them.

The prioritisation of safety in urban design has led to the proliferation of pristine, controlled environments for children. While these spaces mitigate physical risks, they often neglect the psychological and social benefits of unstructured play. Scholars argue that the dominance of safety-focused designs reinforces a culture of risk aversion, which can hinder children's ability to navigate and adapt to complex urban settings (Grayling *et al.* 2003). (Pellegrini and Bjorklund 2004) highlight that unstructured play fosters societal development through extended plasticity, yet regimented environments increase perceived risks across generations.

The concept of 'playgrounds of segregation' emerges as a critique of urban spaces that isolate children from the broader community. Such environments limit intergenerational and cross-cultural interactions, reducing opportunities for children to engage with diverse perspectives and experiences. Studies comparing structured playgrounds with informal urban spaces reveal the latter's superior potential for fostering inclusivity and resilience (Melis 2020).

However, to date, there is a lack of studies focused on the role of children towards the formation of urban identity. The following section describes the concept of temporary appropriation as an indicator of urban identity.

Temporary appropriation as an indicator of urban identity

Temporary appropriation of public spaces represents a dynamic interaction between individuals and their urban surroundings, forming a significant link to urban identity. Rooted in environmental psychology, Temporary appropriation emerges as a vital human necessity, where individuals adaptively use spaces for activities beyond their intended design (Lara-Hernandez and Melis 2018). Temporary appropriation

leverages affordances – environmental features that enable actions (Gibson 1979). The act of temporary appropriation is intertwined with cultural, social, and spatial dimensions, reflecting the identity and collective memory of urban dwellers.

Temporary appropriation extends beyond informal or spontaneous activities to encompass culturally and socially meaningful practices that shape and are shaped by the urban landscape (Lefebvre 1992). The prioritisation of safety in urban design, while well-intentioned, reinforces a culture of risk aversion that limits children's exposure to diverse urban experiences (Carroll *et al.* 2015). This paradox underscores the need for designs that integrate safety with opportunities for exploration. Scholars have identified temporary appropriation as a medium through which residents negotiate their presence and establish a sense of belonging within a city. As noted by Lefebvre (Lefebvre 1992) and others, temporary appropriation not only facilitates individual and collective activities but also plays a role in the production of urban space, empowering citizens to redefine and reimagine their environment.

Central to the concept is the idea that temporary appropriation contributes to inclusivity and social sustainability by encouraging diverse interactions within public spaces. For example, in contexts like Mexico City Centre, temporary appropriation demonstrates how spaces can accommodate a variety of activities – from economic practices to leisure and sacralisation – reflecting the layered identities of the city's inhabitants (Lara-Hernandez 2019). This dynamic is further enriched by the cultural landscape and legal frameworks that influence the manifestations of temporary appropriation (Melis *et al.* 2024).

Urban identity, as supported by temporary appropriation, is not static but evolves through the interplay of cultural expressions, spatial configurations, and regulatory mechanisms. It underscores the fluid and multifaceted nature of public spaces, where the activities and relationships fostered by temporary appropriation serve as living indicators of a city's identity, vibrancy, and inclusivity (Lara-Hernandez *et al.* 2019).

Temporary appropriation through assemblage theory

Assemblage theory is a conceptual framework that provides a way to understand how complex entities-whether cities, communities, social groups, or even natural systems-are formed and transformed through the coming together of diverse, heterogeneous elements (Deleuze and Guattari 1989).

Assemblage theory, as applied by DeLanda (DeLanda 2016), provides a framework to understand temporary appropriation as a multidimensional phenomenon influenced by cultural, legal, and design factors. In this context, public spaces become arenas of negotiation, where temporary activities emerge as a response to the formal and informal dynamics of urban environments (Lara-Hernandez 2019). It follows that temporary appropriation can be conceptualised as an assemblage which is, in turn, a product of other assemblages, particularly local culture, the legal environment, and urban design. While temporary appropriation has been extensively discussed concerning informal economies (Roy and AlSayyad 2004, McFarlane and Waibel 2012, García-Canclini 2017, Lara-Hernandez *et al.* 2020), and marginalised communities (Boer *et al.* 2017, Sarmiento and Tilly 2018, Risom and Madriz 2018, ILO 2021), its implications for children remain underexplored.

Temporary appropriation and children's development

Incorporating temporary appropriation into urban design for children addresses the limitations of segregated play environments. Unstructured public spaces enable children to engage in creative and adaptive activities, essential for their development. For instance, street corners, vacant lots, and interstitial spaces often serve as impromptu playgrounds, fostering a sense of ownership and belonging among children (Mews *et al.* 2024).

Examples from cities like Mexico City Centre, Southsea and Venice illustrate how children's temporary appropriation of public spaces contributes to vibrant urban life (Lara-Hernandez 2019). These informal practices highlight the need to balance safety with inclusivity, ensuring that public spaces cater to the developmental needs of children while remaining accessible to all.

To bridge the gap between safety and inclusion, urban design must adopt strategies that integrate playgrounds into the broader urban fabric. This includes creating hybrid spaces that combine structured and unstructured elements, encouraging children to explore beyond defined boundaries. Such designs not only enhance children's experiences but also promote community interaction and social cohesion (Dempsey 2006, Zamorano 2007, Prakash 2023).

Furthermore, the inclusion of participatory planning processes, where children and their caregivers contribute to the design of public spaces, ensures that these environments meet their diverse needs (Malone and

Crinall 2023). By leveraging the design principles that enable temporary appropriation, urban planners can create spaces that are both safe and dynamic, fostering equitable access and holistic development for children. This study extends the work of Mews, Lara-Hernandez, and Sbarra by adopting a relational perspective informed by non-duality, nonlinearity, and more-than-human approaches. This framework challenges linear urban design paradigms and emphasises the dynamic interactions shaping children's engagement with public spaces (Mews *et al.* 2024). This perspective invites the use of pluriversal methodologies, which challenge established development paradigms and enable us to envision fluid post-structural epistemologies (see (Bathla 2024)). These methodologies offer insights into the complexity and diversity of social worlds, both human and non-human, moving beyond traditional frameworks. Given the pressing timeline to address irreversible planetary changes, which threaten progress on the New Urban Agenda and the Sustainable Development Goals, this approach becomes particularly critical. Bathla (Bathla 2024) highlights various pluriversal methodologies that align with the principles of One Health while also questioning i) the presumed neutrality of researchers, ii) the dominance of verbal and textual methods, iii) anthropocentric biases, iv) the rejection of pluriversal onto-epistemologies, including disembodiment and secular ontologies; v) the dynamics of participation and knowledge restitution; and the neglect of the creative and imaginative potentials of research.

The Speculative Pluriversal Imaginary Research Assemblage Loop (SPIRAL) is a conceptual framework designed to explore foundational questions about how phenomena emerge (Mews 2022). Drawing on DeLanda's (DeLanda 2016) notion of assemblage, SPIRAL examines relationships between material and immaterial entities that interact externally yet maintain their independent reality, as clarified by Harman (2011, p. 19). Each entity is seen as a real, emergent object that does not rely on external objects or any fundamental essence (Howdyshell 2020). Second, we apply the SPIRAL framework to both case studies concerning children and health, situated in distinct spatial-material and socio-cultural contexts, to uncover pathways for creating regenerative, health-oriented urban environments for both human and non-human life. Third, instead of a conventional conclusion, we propose a set of open-ended questions, inviting collaboration to expand upon radical imaginaries and urban health research. To explore children's TA of public spaces, this study employs a post-qualitative inquiry guided by the Speculative Pluriversal Imaginary Research Assemblage Loop (SPIRAL) framework (Mews *et al.* 2023). This approach captures the fluid, relational dynamics of children's interactions, moving beyond linear methodologies to uncover emergent urban narratives and design possibilities. The following section outlines SPIRAL.

Speculative pluriversal imaginary research assemblage loop (SPIRAL)

While this description may seem linear, it is essential to emphasise that each element operates within an ongoing and interconnected flow. Narratives, policies, materialities, and politics are considered part of a broader post-qualitative inquiry, constantly shifting about one another. Writing itself imposes certain limitations on conveying these interdependencies, but SPIRAL's design highlights the dynamic interplay among its elements. To emphasise this fluidity, each component of SPIRAL is represented by a unique colour and movable dot, signifying its shifting position within the assemblage. This framework serves as a research entry point to uncover hidden dimensions of universal realities and their processes of becoming.

SPIRAL is a radical conceptual tool designed to frame inquiry, recognising the need to establish boundaries while maintaining fluid connections. Inspired by Hancock's (Hancock 1993) Mandala of Health, SPIRAL adopts circularity as a symbol of interconnectedness within the universe and public health. Health is conceptualised as an individual (social world) experience encompassing body, mind, and spirit, situated in a relational flow with all other SPIRAL components (see Figure 1).

Mews, Lara-Hernandez and Sbarra (Veddeler *et al.* 2023) highlight five realms of SPIRAL, which affect reality. First, stories, they are deeply embedded in the transdisciplinary exploration of meaning-making and human experience. Universally, stories provide rich cultural insights, connecting individual and collective understandings of the world. As Italo (Calvino 1972, p. 142) wrote in *Invisible Cities*: 'Cities, like dreams, are made of desires and fears… everything conceals something else'. Situated within ongoing social relations, stories influence our proximity to and interactions with others, both territorially and deterritorially (Bogue 1991). Second, narratives encompass functions such as education, entertainment, cultural transmission, and identity formation. Sennett's (Sennett 1970) research on place identity highlights the connection between narrative and spatial practices, demonstrating how shared narratives foster collective identities,

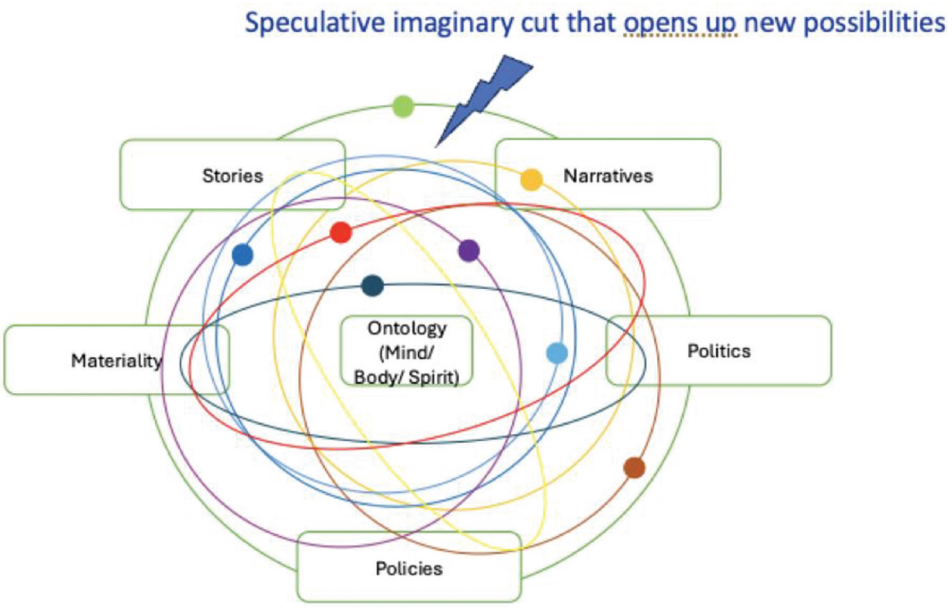

Figure 1. A visualisation of SPIRAL. Source: G. Mews (Mews *et al*. 2024).

cultural rituals, and spatial practices that establish belonging. Third, politics, narratives often intersect with politics, as tensions arise between individual social worlds and collective narratives. Mouffe's (Mouffe 2007) work on the spatial politics of public spaces demonstrates how narratives can distribute power unequally. Within governance frameworks, politics influence policies that determine how cities can create inclusive conditions for all inhabitants. Fourth, policies, when situated within SPIRAL's focus on children, health, and spatial politics, they gain particular relevance. Scholars such as Gleeson and Sipe (Gleeson and Sipe 2006) and Freeman and Tranter (Freeman and Tranter 2012) have contributed to child-friendly urban policy frameworks, though these often lack a more-than-human perspective. Building on these foundations, Malone, Tesar, and Arndt (Malone *et al*. 2020) explore posthuman childhoods, challenging anthropocentric assumptions and advocating for spatial-material practices that integrate human and non-human agencies. Lastly, materiality encompasses the sensory properties of objects and phenomena that shape human experience. Policies, when supported by funding and material resources, transform into actionable energy that shapes urban spaces and the stories associated with them. Cities, as dynamic arenas of materiality, offer opportunities to reimagine spatial and social practices.

The speculative, imaginary cut of SPIRAL proposed by Mews, Lara-Hernandez and Sbarra (Mews *et al*. 2024) introduces a creative element within SPIRAL, symbolised by a blue flash (see Figure 1). This speculative element invites researchers to escape linear inquiry and imagine alternative urban futures grounded in performative epistemological visions. These visions open new SPIRAL pathways, enabling a reimagining of children's roles in cities and their regenerative potential for human and non-human health. The speculative cut, however, remains relationally tethered to SPIRAL's other elements, ensuring its tangibility through socialisation and shared meaning.

Methodology

This study adopts a qualitative approach to explore the intersection of temporary appropriation, children's engagement, and urban design. This study focuses on children aged 3-12 years, spanning early to middle childhood, as their cognitive, social, and motor development is particularly influenced by interactions with public spaces. Children's development and lack of unstructured play is a problem that requires a fluid methodology to understand the phenomena. The research focuses on Auckland and Venice as case studies due to their contrasting urban layouts and approaches to integrating children within the urban realm. Auckland, with its structured and segregated playgrounds, contrasts with Venice's organic, integrated urban environment where children actively participate in urban life. One neighbourhood in each city were studied, Santa Croce in Venice and Sandringham in Auckland. Drawing on Groat and Wang's framework for qualitative architectural

research, this study employs ethnographic methods, including participant observation and activity mapping, to explore temporary appropriation (Groat and Wang 2002).

Given the emergent, relational nature of temporary appropriation and children's engagement with public spaces, this study adopts an open-ended, post-qualitative approach rather than predefined research questions. Instead, it is guided by the SPIRAL framework to explore how urban design influences children's unstructured play and agency, aiming to uncover fluid narratives and speculative design possibilities.

Contextual analysis of Venice and Auckland draws on historical literature, urban policy documents, and demographic data to understand the socio-cultural and political factors shaping children's access to public spaces (Carroll *et al.* 2015, Bon 2024).

Temporary appropriation principles guide the methodology by focusing observations on informal, transient activities that reflect children's adaptive use of public spaces, aligning with the relational dynamics of the SPIRAL framework.

A comparative analysis of temporary appropriation activities in Venice and Auckland aims to highlight how urban design influences children's engagement with public spaces, informing design interventions.

Observations in playgrounds in Auckland, and campo in Venice, and surrounding streets focused on children's interactions to identify patterns of play and appropriation. Figure 2 and Figure 3 illustrate the study area. This method draws inspiration from Paajanen et al. (Paajanen *et al.* 2023), emphasizing the importance of observing normative practices and everyday behaviours that shape spatial appropriation. These observations are complemented by a contextual analysis of urban layouts, considering both physical and socio-cultural factors influencing children's spatial practices (Freeman and Tranter 2012, Carroll *et al.* 2015).

Observations in Venice was conducted between October and November 2023, while October and November 2024 in the case of Auckland.

In both cases for the first two weeks, the first author participated sporadically in the daily life of all two playgrounds in both city areas. Campo Nazario Sauro and Campo San Giacomo dal Orio for the case of Venice (Figure 2), while Taumata Reserve and Sandringham Playground in Auckland (Figure 3). Activities where children used playground equipment, such as sliding on a slide or swinging on a swing, were not recorded, as these do not qualify as examples of temporary appropriation.

The ethnographic data were collected during 70 observation periods, of which 32 (about 50 hours; 0-3 days per week) were on the playgrounds. Playgrounds were regularly observed during their organised activities in the mornings and early afternoons, and each research visit lasted about three hours.

To analyse temporary appropriation occurring at the streets this study uses a technique known as 'activity mapping' that has been developed to analyse the ground floor in relation to street uses and physical elements (Francis 1984). This technique is used to understand the 'temporal city' that takes place in the urban space. The theoretical aspect of this technique stresses the process of interactions between people and

Figure 2. Campo San Giacomo del Orio and Campo Nazario Sauro in sestiere Santa Croce, Venice. Source (Lara-Hernandez *et al.* 2024).

Figure 3. Taumata reserve and Sandringham Playground.

the physical environment (an assemblage). The period of observation in Santa Croce, Venice was from 7 to 27 November 2023, while for Sandringham, Auckland was 8 to 28 October 2024. The observations took place during weekdays and at the weekend, as well as at three different times during the day, each for a period of two hours. The activities were be counted as an expression of temporary appropriation. The observation was carried out as shown in Table 1.

Given the focus on children and public spaces, this study adhered to strict ethical protocols to ensure the privacy and safety of all participants. Observational methods were anonymised, avoiding direct interaction with or identification of children. The observer recorded behavioural patterns and spatial use without linking them to identifiable individuals. This anonymised approach, common in urban ethnography (Clark and Clark 2006), aligns with ethical guidelines for research involving vulnerable populations, safeguarding participants while ensuring the validity and reliability of findings. Observations were conducted in public spaces, ensuring transparency and accountability in the research process. As a researcher and parent of two young daughters, the first author approached observations with a nuanced understanding of children's behaviours in public spaces, ensuring naturalistic and ethically sensitive data collection. This perspective facilitated unobtrusive observation while adhering to strict anonymisation protocols.

Regarding the urban layout of playgrounds, Table 2 illustrates the urban layout characteristics of the study areas.

The urban layout of playgrounds and campos is analysed through the lens of affordances, which describe how environmental features enable specific actions (Gibson 1979, Storli and Hagen 2010). This perspective complements temporary appropriation by highlighting how spaces invite children's creative and adaptive interactions.

The post-qualitative inquiry followed a fluid process, iteratively integrating ethnographic observations, activity mapping, and SPIRAL-guided reflections to uncover relational narratives. This approach allowed emergent themes, such as children's agency and urban inclusivity, to shape the study's findings and speculative interventions.

Results overview

This study provides a comparative analysis of temporary appropriation activities in the playgrounds and streets of Santa Croce in Venice and Sandringham in Auckland. Observations reveal stark contrasts in the quantity and diversity of temporary appropriation activities between the two cities, underscoring the influence of urban design and cultural practices on children's engagement with public spaces.

Table 3, Tables 4, 5 and Table 6 detail the activities observed in playgrounds and streets within the selected areas. In Venice, the streets of Santa Croce exhibited a total of 2,607 recorded instances of temporary appropriation, while playgrounds in the same area added 3,764 activities, showcasing high diversity

Table 1. Observation analysis. Source.

Days of observation	Time of observation	Observation technique	Diversity analysis
Monday and Sunday	1. 7.00-9.00 am: The first period of observation is selected according to "rush hour" in MCC. Offices, shops and schools usually start their operation at this time of the day. 2. From 2.00-4.00 pm: The second period will be lunch time. Many people use this time to take a break, to go out, and have lunch, therefore the chances of observing a diversity of activities in public spaces are higher. 3. From 6.00-8.00 pm: The third period is when the majority of people finish their daily working routines.	Three-Round observations of two- hour periods were carried out each day. Each two hour period consisted of 2 rounds of 15 minutes walking (to and from, totalling 30 minutes in each hour); i.e. 4 rounds per 2-hour slot. These rounds of observations were conducted in 6 snapshots in two 15 minutes walking snap- shots, per hour, per area in a day of observation.	Shannon-Weiner diversity index $H' = -\sum piln$

Table 2. Urban layout of Sandringham playgrounds and campos in Santa Croce.

Area of Study	Surface area sqm	Amenities	Pavement	Shade area
San Giacomo dell'Orio	3340	–8 Benches –6 Trees –2 wells –1 Orchard –1 flagpole	Stone	Yes
Campo Nazario Sauro	1660	–4 Benches –2 Trees	Stone	Yes
Taumata Reserve	4317	–1 UFO –3 Swings –1 Slide -Tunnel Slide –4 Slides –1 Table and seats –6 trees	Grass	Yes
Sandringham Playground	982	–1 Slide –1 Seesaw -Climb ramp -Bridge wood -Toilets –1 Table and seats –1 Bench –2 trees	Grass	Yes

Table 3. Temporary appropriation observations in the selected 'campo' in Santa Croce, Venice.

Santa Croce, Venezia Temporary Appropriation activity	#	Pi	Pi*(LN(Pi))
Playing football	263	0.07	–0.186
Playing hide and seek	209	0.056	–0.161
Drawing	45	0.012	–0.053
Scooter	146	0.039	–0.126
Dolls	13	0.003	–0.02
Playing with toys	274	0.073	–0.191
Reading	12	0.003	–0.018
Frisbee	132	0.035	–0.117
Skateboarding	28	0.007	–0.036
Racing	894	0.238	–0.341
Playing cards	2	0.001	–0.004
Playing music	21	0.006	–0.029
Dancing	32	0.009	–0.041
Singging	28	0.007	–0.036
Painting	12	0.003	–0.018
Acrobatics	2	0.001	–0.004
Playing with pets	384	0.102	–0.233
Watering plants	28	0.007	–0.036
Reciting	2	0.001	–0.004
Eating	698	0.185	–0.312
Resting	455	0.121	–0.255
Photo Session	64	0.017	–0.069
Reading/studying	3	0.001	–0.006
Elastic	2	0.001	–0.004
Doing homework	1	0	–0.002
Watching insects	14	0.004	–0.021
	3764		
		SW Div	**2.325**

and intensity of usage. This cumulative data highlights the integrative role of public spaces in Venice, where children engage fluidly with their environment. In contrast, Sandringham in Auckland demonstrated a stark disparity. Temporary appropriation activities totalled only 33 in the playgrounds and 102 in the streets, reflecting a fragmented engagement with public spaces.

Urban layout of playgrounds in study areas

Table 2 provides a comparative overview of the urban layout characteristics of the study areas, specifically the playgrounds and campos in Sandringham and Santa Croce. Key attributes such as surface area, available amenities, pavement type, and shaded areas are presented to highlight the structural and functional differences.

Table 4. Temporary appropriation observations in the streets in Santa Croce, Venice.

Santa Croce, Venezia Temporary Appropriation activity	#	Pi	Pi*(LN(Pi))
Playing football	1144	0.439	−0.361
Playing hide and seek	372	0.143	−0.278
Drawing	21	0.008	−0.039
Scooter	38	0.015	−0.062
Dolls	23	0.009	−0.042
Playing with toys	86	0.033	−0.113
Reading	12	0.005	−0.025
Frisbee	2	0.001	−0.006
Skateboarding	1	0.000	−0.003
Racing	41	0.016	−0.065
Playing cards	1	0.000	−0.003
Playing music	52	0.020	−0.078
Dancing	1	0.000	−0.003
Singing	12	0.005	−0.025
Painting	1	0.000	−0.003
Acrobatics	1	0.000	−0.003
Playing with pets	8	0.003	−0.018
Watering plants	2	0.001	−0.006
Reciting	12	0.005	−0.025
Eating	429	0.165	−0.297
Resting	279	0.107	−0.239
Photo Session	2	0.001	−0.006
Reading/studying	9	0.003	−0.020
Elastic	48	0.018	−0.074
Doing homework	7	0.003	−0.016
Watching insects	3	0.001	−0.008
	2607		
		SW Div	**1.814**

Table 5. Temporary appropriation observations in selected playgrounds of Sandringham, Auckland.

Sandringham, Auckland Temporary appropriation activity	#	Pi	Pi*(LN(Pi))
Drawing	1	0.030	−0.106
Playing with toys	1	0.030	−0.106
Reading	0	0.000	0.000
Playing with pets	8	0.242	−0.344
Eating	7	0.212	−0.329
Resting	14	0.424	−0.364
Reading/studying	1	0.030	−0.106
Doing homework	1	0.030	−0.106
	33		
		SW Div	**1.460**

Table 6. Temporary appropriation observations in the streets of the selected area of Sandringham, Auckland.

Sandringham, Auckland TA activity	#	Pi	Pi*(LN(Pi))
Playing football	3	0.029	−0.104
Playing rugby	9	0.088	−0.214
Drawing	3	0.029	−0.104
Playing with toys	23	0.225	−0.336
Frisbee	13	0.127	−0.263
Playing with pets	14	0.137	−0.273
Eating	18	0.176	−0.306
Resting	19	0.186	−0.313
	102		
		SW Div	**1.912**

In the case of Venice (San Giacomo dell'Orio and Campo Nazario Sauro), these spaces are paved with stone, featuring benches, trees, and additional amenities like wells and an orchard. Both campos provide shaded areas, creating multifunctional environments conducive to diverse activities beyond structured play.

While in Auckland (Taumata Reserve and Sandringham Playground), these playgrounds predominantly feature grass surfaces and include structured play equipment such as slides and swings. Taumata Reserve, being larger in surface area, offers more diverse play structures and natural features like trees. Sandringham Playground, despite its smaller size, includes basic amenities like seating and toilets. Both playgrounds provide shaded areas for comfort.

Diversity of activities in playgrounds

In the *campo* of Santa Croce, Venice, children engaged in a diverse array of activities, including playing football, hide-and-seek, drawing, scooter riding, and playing with pets. Notably, activities such as 'racing' (894 instances) and 'eating' (698 instances) underscore the multifunctional use of playgrounds, transcending their conventional roles. The Shannon-Weiner Diversity Index (H') for these playgrounds is 2.325, indicating a rich variety of interactions. In Sandringham's playgrounds, however, the activities were limited predominantly to resting (14 instances), playing with pets (8 instances), and eating (7 instances). The diversity index of 1.460 reflects a narrower spectrum of activities, emphasising the structured and isolated nature of these spaces.

The streets of Santa Croce serve as extensions of playgrounds, fostering a seamless transition between formal and informal spaces. Children appropriated streets for activities like playing football, hide-and-seek, and playing music. The absence of vehicular traffic in Venice enables this fluidity, allowing children to explore and engage with their surroundings without rigid spatial constraints.

In contrast, the streets of Sandringham exhibited a moderate diversity of activities. While activities like playing rugby (9 instances) and frisbee (13 instances) were observed, the overall engagement remained subdued compared to Venice. The Shannon-Weiner Diversity Index for Sandringham's streets, 1.912, illustrates a slight improvement over playgrounds but still lags significantly behind Venice.

One notable finding in both cities pertains to the playground devices. Activities strictly tied to playground equipment, such as sliding on slides or swinging, were excluded from temporary appropriation observations. In Venice, playgrounds were used as dynamic spaces for communal and creative activities, whereas in Auckland, their role was confined to predefined, equipment-centred interactions.

The integration of playgrounds within the broader urban fabric in Venice contrasts sharply with Auckland's segregated approach, where playgrounds are isolated from surrounding streets, reducing opportunities for spontaneous and diverse engagement.

The high diversity of temporary appropriation activities in Santa Croce's campos (H' = 2.325) reflects Venice's integrated urban fabric, where children fluidly appropriate spaces for creative and communal activities (e.g. racing, eating). Through the SPIRAL lens, these activities form narratives of belonging and agency, shaped by the city's pedestrian-friendly design and cultural practices. This aligns with post-qualitative inquiry's focus on relational dynamics, revealing how material (stone pavements, benches) and immaterial (community norms) elements foster inclusive spaces.

In Sandringham's playgrounds, the low diversity of TA activities (H' = 1.460) underscores the segregated nature of Auckland's urban design. Activities like resting and eating dominate, reflecting these spaces' structured, equipment-centric focus. SPIRAL highlights how car-centric policies and safety narratives limit children's agency, constraining temporary appropriation to predefined interactions. Post-qualitative inquiry reveals the need for hybrid spaces that integrate unstructured elements to enhance developmental opportunities.

The 3,764 temporary appropriation instances in Santa Croce's campos, compared to 33 in Sandringham's playgrounds, highlight Venice's integrated design. Children's diverse activities (e.g. playing football, drawing) reflect SPIRAL's materiality element, where stone pavements and open spaces afford creative play.

Figure 4 and Figure 5 further illustrate how SPIRAL's realms frame TA activities in Venice and Auckland, respectively, highlighting the role of urban design in fostering or limiting children's agency.

Venice and children

Venice serves as a distinctive example of urban design, characterised by two key features of its built environment that align closely with the SPIRAL framework: its human scale and double fractal urban fabric. Venice's double fractal urban design, characterised by self-similar patterns at multiple scales (e.g. narrow alleys and *campi*), facilitates social interactions and temporary appropriation (Batty 2008). The human scale reflects the design attribute that facilitates social interactions within the urban environment. Venice is widely recognised as a global tourist destination and one of the cities most impacted by over-tourism, largely driven by government policies and political agendas (González-Pérez 2020).

The intricate urban fabric of Venice, combined with its cultural landscape and regulatory policies governing the use of public spaces (see (Lara-Hernandez 2023), (di Venezia 2024)), creates a fertile ground for emerging and contested narratives.

Historically, like many other medieval cities, Venice's streets were vibrant stages of daily urban life. Today, however, its population has dwindled to under 50,000, a significant decline from a peak of

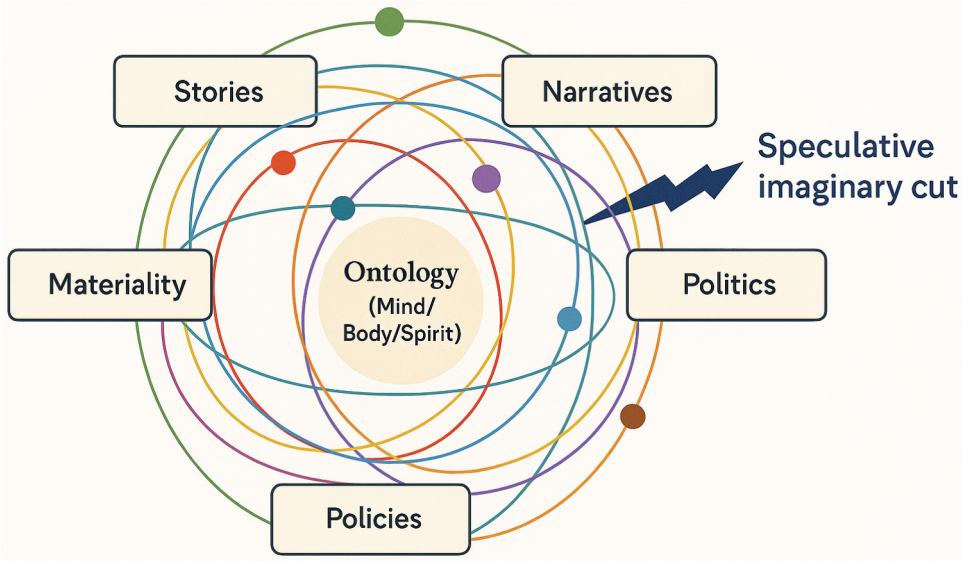

Figure 4. SPIRAL in Venice. Adapted from (Mews *et al*. 2024).

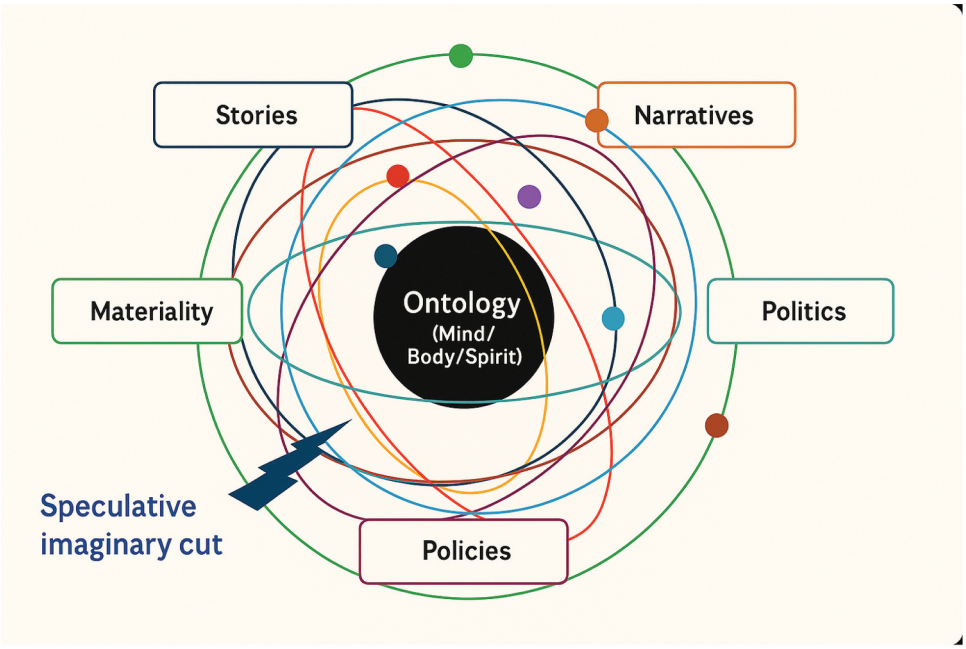

Figure 5. SPIRAL in Auckland.

175,000 in the 1970s, and its streets primarily serve as transit paths for tourists. Additionally, research shows a positive correlation between the Tourism Services Index and demographic decline, as well as an increase in unoccupied dwellings (Ignaccolo *et al.* 2023). Venice, like many European city centres, is experiencing depopulation and an aging population (Larraz and García-Gómez 2019). If the population falls below 40,000, there are concerns that Venice will no longer function as a viable, living city (Hosany 2023).

Regarding children, Venice's unique and peaceful ambience encourages their appropriation of public spaces, as promoted by the Venice Council (). However, public space usage is also highly regulated () with some squares designated as 'off limits' for children under Urban Police and Security Regulations (Bon, 2019). Such policies deprive residents, including children, of their right to fully inhabit their city, creating a contradictory stance on public space usage. Despite these restrictions, a strong sense of community persists among Venice's residents, who

continue to assert their right to appropriate public spaces, even during crises (Lara-Hernandez 2023). Many squares have witnessed a resurgence of liveability, where entire families gather for celebrations, reclaiming these spaces in line with longstanding traditions (Bon 2024).

Venice exemplifies what pre-industrial cities used to be – a place where parents are not the constant 'drivers' of their children's activities. The absence of cars or vehicles allows children to roam freely, gather, play, learn, and explore, fostering their temporary appropriation of public spaces.

Our speculative intervention aligns with the connection between Narratives and Politics (Figure 4), highlighting how residents, particularly children, reappropriate public spaces despite restrictive policies. The city's design inherently encourages social encounters in public spaces, strengthening community ties. These interactions form assemblages of material and immaterial practices that both shape and are shaped by cultural narratives (Simmel 1969). In such scenarios, 'customary law' often wields more influence than formal state law, enabling the creation of alternative narratives (McAuslan 2006). The SPIRAL framework helps uncover these narratives, demonstrating how they inform politics and, eventually, policies that remain invisible to outsiders, yet significantly impact materiality.

Auckland and children

Auckland presents a contrasting paradigm of urban design, characterised by its sprawling suburban layout and emphasis on safety-oriented planning. Unlike Venice, Auckland's urban environment is defined by a decentralised structure and a reliance on private transportation, which profoundly shapes children's interaction with public spaces. The city's suburban character is underscored by the prevalence of fenced playgrounds and designated recreational areas, often isolated from the broader urban fabric. These features align with risk-averse planning strategies that prioritise physical safety over experiential diversity (Hanrahan 2023).

Historically, Auckland's urban development has been shaped by car-centric policies that segregate residential, commercial, and recreational zones (Bozovic *et al.* 2021, Mohammadzadeh 2022). This spatial fragmentation limits children's opportunities to engage with dynamic urban environments, restricting their mobility and agency. Research highlights that Auckland's playgrounds, while meticulously maintained, reinforce a culture of spatial segregation, wherein children's activities are confined to specific, regulated zones. Consequently, children experience the city as a series of disconnected 'islands', reducing their ability to explore and adapt to diverse urban settings.

The cultural narrative surrounding child safety in Auckland exacerbates this segregation. Public spaces are perceived as potentially hazardous, leading to the proliferation of hyper-structured environments where children's play is closely monitored. This narrative is particularly evident among middle- and upper-income families, who often rely on private transport to shuttle children between home, school, and extracurricular activities (Prakash 2023). As a result, children's experience of the urban landscape is frequently limited to views from car windows, fragmenting their spatial awareness and diminishing their connection to the city.

Despite these challenges, Auckland's natural landscapes offer opportunities for unstructured play and temporary appropriation. Parks, beaches, and green corridors provide pockets of respite within the city's suburban sprawl. However, access to these spaces is often mediated by socioeconomic factors, with children from lower-income families facing greater barriers to participation (Prakash 2023). This disparity underscores the need for inclusive urban planning that integrates natural and built environments to create equitable opportunities for all children.

A speculative intervention within the Auckland context would involve reimagining its playgrounds and public spaces as hybrid zones that blend structured and unstructured elements (Figure 5). By incorporating natural features, interactive installations, and opportunities for open-ended play, these spaces could foster children's creativity, resilience, and social engagement. Such an approach aligns with the SPIRAL framework by recognising the interdependence of material, cultural, and policy dimensions in shaping children's urban experiences. Ultimately, Auckland's transformation into a child-friendly city requires a shift from risk-averse planning to design strategies that prioritise inclusivity, exploration, and the holistic development of children.

Discussion and conclusion

The comparative case studies reveal how contrasting urban layouts influence children's access to and interaction with public spaces. The prioritisation of safety in Auckland's playgrounds, evidenced by low temporary appropriation diversity (H' = 1.460), limits children's exposure to dynamic environments, unlike Venice's integrated spaces (H' = 1.814). In Auckland,

the city's emphasis on safety and order has resulted in pristine, well-maintained playgrounds. These playgrounds, however, are often segregated from the broader urban realm, limiting opportunities for children to engage with dynamic and diverse environments. Physical barriers, such as fences and dedicated pathways, reinforce a spatial separation that isolates children from everyday urban life.

In contrast, Venice offers an integrated urban layout where children interact seamlessly with the city's streets, piazzas, and canals. The organic design of the city encourages spontaneous play and exploration. Without the rigid boundaries of fenced playgrounds, Venetian children often appropriate public spaces for creative and adaptive activities. This integration fosters a deeper connection with the urban fabric and promotes intergenerational and intercultural interactions, enriching the city's collective identity.

Findings from participant observation underscore the role of normative practices in shaping children's use of public spaces. In Auckland, structured routines imposed by playground schedules discourage flexibility and spontaneity. These schedules align with adult-centric urban rhythms, often marginalising children's autonomy in choosing when and where to play.

Conversely, Venice demonstrates how the absence of rigid norms enables children to develop a sense of agency. Observations reveal children playing in alleys, on bridges, and in small squares, temporarily appropriating these spaces for their activities. Such unstructured engagement supports cognitive, social, and emotional development while contributing to the vibrancy of the urban environment. Assemblage theory provides a useful lens to interpret these findings, highlighting how Venice's material and immaterial interactions foster a dynamic urban landscape.

Post-qualitative inquiry's relational focus enables a nuanced understanding of children's temporary appropriation, capturing emergent interactions that linear methods overlook. This study uncovers how material and immaterial elements shape inclusive spaces by integrating SPIRAL. While post-qualitative inquiry offers rich insights into relational dynamics, its fluid approach may limit generalisability to other urban contexts. The non-linear structure may also challenge readers accustomed to traditional methodologies, necessitating clear explanations of the study's emergent design.

Safety vs. Exploration: a double-edged sword

The prioritisation of safety in Auckland's urban design has led to environments that, while physically secure, lack the diversity and complexity necessary for holistic development. Parents and caregivers often perceive these spaces as safe havens, yet this perception comes at the cost of children's exposure to challenges that foster resilience and creativity (Prakash 2023). These findings resonate with critiques in the literature, which highlight the limitations of overly controlled play environments that prioritise risk aversion at the expense of exploration and growth (Soto Caro *et al.* 2022).

Venice offers a compelling counterpoint, where safety is balanced with opportunities for exploration. The city's design inherently encourages careful navigation of spaces, teaching children to assess risks and adapt to their surroundings. This balance is reflected in the spontaneous play observed across various public settings, from climbing statues to navigating small boats with adult supervision. By fostering measured exposure to risks, Venice equips children with critical life skills, such as problem-solving, adaptability, and self-confidence.

The findings underscore the need for urban design strategies that integrate children into the broader urban realm. In Auckland, this could involve creating hybrid spaces that blend structured playgrounds with open, multifunctional areas. For instance, incorporating natural elements, interactive public art, and flexible play zones into playgrounds could enhance their appeal while promoting inclusivity. Such designs would not only accommodate children's developmental needs but also encourage intergenerational interactions and community cohesion.

Venice offers valuable lessons for designing child-friendly cities. Its integrated approach illustrates the benefits of fostering shared urban spaces where children, adults, and the elderly coexist. Replicating elements of Venice's design – such as accessible squares, pedestrian-friendly streets, and spaces free from vehicular traffic – can help mitigate the spatial segregation observed in cities like Auckland.

Moreover, participatory planning processes that involve children and their caregivers in the design of public spaces could ensure these environments meet their diverse needs. Such approaches align with the concept of temporary appropriation, empowering children to engage with urban spaces on their own terms.

Proposed design intervention

Based on the findings, we propose hybrid public spaces that blend structured and unstructured elements, such as interactive installations and natural features, to foster temporary appropriation. In Auckland, integrating playgrounds with adjacent streets through pedestrian

zones could enhance inclusivity. Venice's model of open campi suggests accessible, multifunctional squares as a blueprint for child-friendly design.

While this study provides valuable insights, it is limited to two case studies with distinct urban typologies. Future research could expand on this work by examining additional cities with varying socio-cultural contexts and urban morphologies. Quantitative studies focusing on measurable outcomes, such as the long-term impact of unstructured play on resilience and creativity, would further enrich this discourse.

Additionally, exploring children's perspectives more directly through interviews or participatory workshops could deepen our understanding of how they experience and perceive public spaces. Such studies could bridge the gap between academic research and urban policy, advocating for designs that truly reflect children's needs and aspirations.

Open-ended questions for future research

- How can urban design balance safety and exploration across diverse socio-cultural contexts?
- What role do children's voices play in co-designing public spaces through participatory planning?
- How can post-qualitative inquiry and SPIRAL inform scalable interventions for child-friendly cities globally?

Disclosure statement

No potential conflict of interest was reported by the author(s).

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