How active can preschoolers be at home? Parents' and grandparents' perceptions of children's day-to-day activity, with implications for physical activity policy

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How active can preschoolers be at home? Parents' and grandparents' perceptions of children's day-to-day activity, with implications for physical activity policy

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ABSTRACT

Background: The importance of physical activity in early childhood for establishing long-term health is well understood, yet with the exception of recent WHO guidelines, public health initiatives rarely focus on children below school age. Moreover, little is known about how domestic spaces and day-to-day caring activities influence preschool-age children's physical activity. To examine this, we explore caregivers' perceptions of young children's activities within and outside the home, and we consider how lived experiences of caregiving align (or not) with current physical activity policy.

Methods: Semi-structured interviews with 49 parents and grandparents from 16 families were conducted in Oregon, USA; each family had a child aged 3–5 years. Questions focused on caregivers' perceptions of and involvement with children's body weights, activities, and food practices. The interviews were analysed using thematic analysis. Our analysis drew on a materialities framework, attending to relationships between children, caregivers, spaces in and around the home, and everyday activities.

Results: Four themes were developed: appropriateness of outside versus inside spaces for physical activity; making accommodations for physical activity in the home; active spaces of care, referring to relationships among space, activity type, and caregiver attention; and mundane movement, or the low-intensity movement of everyday life. Together, the results highlight that children's day-to-day activities cut across a spectrum of movement, mediated by available spaces and caregiving affordances.

Conclusions: Attending to the full spectrum of children's movements highlights how children's activities interlink with family routines, available indoor and outdoor spaces, and the intended uses of these spaces. These interplays between space, care, and physical activity enacted at the household level should inform an integrated, systems-level public health approach to increasing health and well-being for preschool-age children. Suggestions for improvement include coordinating policy development across multiple fields (e.g., housing design, urban planning) that structure the activities of children and their caregivers across 'home' and 'outside' spaces.

1. Introduction

Physical activity and movement in early childhood are important for cognitive development and for establishing long-term health. National and international guidelines for informing physical activity policy are well established (Klepac Pogrmilovid et al., 2020), but they have largely excluded preschool-age children (under five years old), focusing mainly on creating opportunities for physical activity in public settings such as schools (Chalkley and Milton, 2021). The World Health Organization has recently updated its global recommendations on physical activity for

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health to recommend 3 h of physical activity, of which at least an hour should be moderate to vigorous activity, for children under the age of five years, a group not previously covered by these guidelines (WHO, 2019). Similarly, national guidelines are starting to promote physical activity during the earliest years of life (UK Chief Medical Officers, 2019), and interventions to promote infant activity such as 'tummy time' have been evaluated as positive in terms of reducing screen time and increasing activity (Wen et al., 2020). However, the translation of guidelines and research into policies that lead to increased physical activity at the population level remains low (Chalkley and Milton, 2021). Although the WHO guidelines state that 'physical activity in young children is largely expressed in the form of active play' (2019, p. 15), analysis of contextual variations and potential barriers to such play are absent aside from the caveat that 'in some settings there may be additional resource requirements to ensure young children meet physical activity recommendations' (ibid.). As an example of these contextual variations in children's lives, a recent study has shown that infants and toddlers living in 'higher chaos households, characterized by noise, crowding, and disarray' have higher rates of screen time when compared with children in 'lower chaos households', highlighting the importance of both routine and household organization for meeting young children's target levels of screen time and physical activity (Kracht et al., 2021, p. 106). Low levels of physical activity and increases in sedentary activity and screen time across the life course has been clearly framed as a public health problem (Bull, 2010; Kohl et al., 2012; WHO, 2019), but applying existing public health policy based on a dichotomy between physical activity on the one hand and sedentary (in) activity on the other is particularly problematic for preschool-age children, whose activity patterns are fluid across activities and spatial contexts.

It is well-established through cross-sectional and qualitative studies that structural issues influence individual physical activity patterns (Bauman et al., 2012). Aspects of the wider built environment including land-use patterns, built and natural features (e.g., architectural details, quality of landscaping), and transportation systems shape human behaviours regarding physical activity (Ulijaszek, 2018; Brownson et al., 2009; Jackson et al., 2013). Previous research has identified environmental concerns, such as a lack of safe outdoor spaces and activities (Faulkner et al., 2015; Hesketh et al., 2017), as significant contributors to sedentarism among both young children and adolescents. These concerns and their relationships to physical activity can be observed as household-level factors, including the perceived appropriateness of housing and convenience/safety of neighbourhood facilities (Ball et al., 2001). Given these wider links, it is unsurprising that public health policy on physical activity potentially cuts across multiple government departments including health, sport and leisure, education, and transport, and engagement across different sectors for physical activity promotion remains an important task for national governments (Klepac Pogrmilovid et al., 2020). A system-wide policy approach is advocated by the International Society for Physical Activity and Health through its 'Eight investments that work for physical activity', which include whole-of-school programmes and active urban design (ISPAH, 2020).

Against this background, existing public health policy strongly suggests that physical activity is something done outside the home – during travel to work, in open spaces, at school, at sports facilities, and in gyms and pools (Ulijaszek, 2017). WHO, in its framing of 'multiple ways to be active' within its *Global Action Plan on Physical Activity 2018–2030*, draws attention to walking and cycling as modes of transportation, participation in sport and active recreation, physical education in schools, and creating more active workplaces as loci for policy interventions promoting physical activity. Although the action plan suggests that physical activity can also occur 'as part of paid or unpaid domestic tasks around the home' (WHO, 2018, p. 14), domestic space is not suggested as an avenue for intervention. In parallel, an attention to domestic spaces is uncommon in physical activity research, which rarely penetrates the household. Most physical activity studies on preschool children in high-income countries focus on formal childcare environments on account of the substantial time children spend in such settings (O'Brien et al., 2018). Even when analyses are home-centric, physical activity is often treated as an outcome of relationships between the home, neighbourhood walkability, and the existence of parks and walk trails nearby (Drewnowski et al., 2020). Thus, the home is predominantly viewed from the outside, a black box within the wider built environment within which public health policy does not venture.

Studies involving children at home have highlighted an inside/outside divide in children's home activities, with the presence of spaces such as gardens or yards and outdoor sports equipment (e.g., pools, trampolines, basketball hoops) associated with physical activity (Hume et al., 2005; Spurrier et al., 2008). Such research has framed the domestic sphere as a contrasting space of inactivity, often as the locus of opportunities for leisure time television watching, napping, and snacking (Lee et al., 2018; Maitland et al., 2013; Sánchez-Villegas et al., 2002). However, as noted by Pink and Mackley (2016), the domestic sphere is more than a space of leisure and repose; it is continuously marked by the mundane movements of everyday living.

Turning our attention to these under-studied relationships between children's activities and domestic spaces, in this study, we analyse interviews with parents and grandparents of preschool-age children living in lower-income households in Oregon, USA. We approached our initial analysis through a materialities of care framework, which focuses on the relationship between materialities (or the things, materials, and spatial environment of the everyday) and care (Buse et al., 2018; Ivanova et al., 2016; Puig de la Bellacasa, 2011). This offered us a critical pathway into the material intimacies of parents' and grandparents' accounts of everyday caregiving in the home, specifically in relation to physical activity and food (see also Lavis et al., 2015). From there, analysis progressed to probe the strongly-emerging interplay between the young children's physical activities, as facilitated by their parents or grandparents, and the materiality of the spatial environment. Attending to the ways in which space mediates both children's and caregivers' everyday practices evinced relationships between people, places, and everyday patterns of activity and care that have profound implications for how we understand young children's physical activity. Buse et al.'s conceptualisation of 'spatialities of care' (2018) thereby set in motion an analytic process that offered key insights into how spaces come to bear on children's movement. Understanding these relationships between home space, caregiving activities, and children's everyday practice, we suggest, offers a new opening to meaningful, child-centred intervention at the intersection of public health policy and urban planning.

2. Methods

Data were collected as part of the *Grandparents Study*. Conducted in 2011 in Eugene and the Springfield metropolitan area, Oregon, the Grandparents Study included interviews with 49 parents and grandparents from 16 families; each family had a child aged between three and five years and at least one grandparent who was actively involved in the child's caregiving (this was defined as spending time with the child at least twice a month). Given the central role grandparents play in caregiving (Rutter and Stocker, 2014; US Census Bureau, 2013), the Grandparents Study aimed to understand grandparents' involvement in young children's eating and physical activity, and thereby inform childhood obesity research. Participants were treated independently (i.e., not as dependent family units) but the researchers were mindful of how responses converged and diverged within the families. As the study was designed to reach participants from lower-income households, participants were recruited through advertisements in the jobseekers' and volunteers' sections of Craigslist and a local newspaper, stating that the study would focus on families' 'lifestyle choices'. The study was reviewed and approved by the Oregon Social Learning Center, and all participants provided written informed consent. In addition to an interview, each participant completed a socio-demographic

questionnaire, including details about income, education, and self-reported height and weight, among others. Each of the 16 children in focus was also weighed and measured, and body mass Index (BMI) centiles were calculated by gender and age (Kuczmarski et al., 2000).

The semi-structured interviews were conducted by PN and a research assistant, with each parent and grandparent interviewed separately from their relatives. Questions focused on family members' perceptions of children's body weights, activities, and food practices, and on their own involvement in the children's eating and physical activity. Each interview took between 1.5 and 2.5 h, and was videotaped and transcribed. Additional details related to participant recruitment, participant characteristics, and data collection have been described in earlier publications (Eli et al., 2014; Eli et al., 2016). The full dataset of complete interview transcriptions from all participants was included in the analysis; this covered questions about diet and food habits, physical activity and exercise. Examples of relevant physical activity questions are included in Table 1.

For this study, we re-analysed and coded all 49 interview transcripts with a focus on materiality and spatiality. Using thematic analysis, SP—a doctoral candidate in anthropology with training in thematic analysis—coded the transcripts to identify relationships between mentions of eating and physical activity and mentions of objects and spaces. Following the methodology of thematic analysis, we intentionally did not set a threshold for the number of participants needed for each theme. According to Braun and Clarke (2006), it is best practice to avoid quantification when analysing data thematically, as 'the "keyness" of a theme is not necessarily dependent on quantifiable measures but rather on whether it captures something important in relation to the overall research question' (p. 82). This initial coding showed frequent discursive associations between physical activity and spaces. The second stage of coding focused on probing this relationship further, with SP developing a preliminary coding scheme focused on identifying discursive relationships between indoor spaces, outdoor spaces (private, public, and unspecified), and types of activity.

Using the coding scheme developed by SP, 16 of the 49 transcripts (32%) were randomly selected (using Random.org) for intercoding and verification by KE, AL, CMP, and SU, with each co-author independently coding four transcripts. The final coding framework, based on the full dataset, was reviewed and agreed upon by the co-authors through intercoding and discussion. The themes were then developed jointly through in-person meetings and email communication, with all co-authors discussing their interpretations, resolving disagreements, and achieving consensus on the findings.

Coding was performed using NVivo12 and intercoding was performed using Word. To maintain confidentiality, participant IDs are used throughout the manuscript: *Gp* stands for family group number, *P* for parent, and *GP* for grandparent.

Table 1
Questions in the interview guide relating to physical activity.

Topic	Questions
State of the child's activity	What are the child's activity levels? Is the child more sedentary or active? How does the child spend their time during the day? What physical activities do they do? Do you encourage the child to be more active? If so, how? Do you discuss the child's activity with the parents/grandparents?
Views about the child's activity	What do you think about how much your child/grandchild plays and is active? How do you think a child should spend time at their age? What do you think is the most challenging thing for today's parents as relates to physical activity and children?
Sedentary activities	Many parents say their children put pressure on them to be able to spend a lot of time in front of the TV or computer. Does this happen in your household? If so, how do you deal with it? Do you have a limit on how much television or screen time the child can have?
Reflections on participants' own physical activity	What were your activity levels like when you were a child? What was your parents'/grandparents' role in shaping your physical activity?

3. Results

Twenty-two parents (14 mothers and eight fathers) and 27 grandparents (21 grandmothers and six grandfathers) took part. Parents ranged in age from 24 to 49 years old, with an average age of 32 years, while grandparents ranged from 43 to 78 years old, with an average age of 57 years. The participants' socio-demographic details appear in Table 2, and information about the children is presented in Table 3.

Four themes were developed through our analysis: (1) Appropriateness of outside versus inside spaces for physical activity; (2) making accommodations for physical activity in the home; (3) active spaces of care; and (4) mundane movement. A summary of the four themes appears in Table 4.

3.1. Appropriateness of outside versus inside spaces for physical activity

Participants widely associated children's physical activity with spaces outside the home. Both parents and grandparents frequently stated that children were naturally active and that being outdoors was good for children, and anticipated that children would be vigorously physically active outside.

One grandparent suggested that, for children to be healthy, one needed to '*just kick them outdoors and play*' (Gp10GP03). Here, as in other interviews, 'play' was key. Parents and grandparents spoke of children's physical activity as distinct from exercise. For example, when speaking about physical activity outdoors, one parent stated that '*physical activity needs to be fun … it's not exercise at this age. It's not about a regime of not eating and lifting weights, it's about kicking a ball and getting into the sunlight*' (Gp04P01). This association between the outdoors and active play – as opposed to exercise – was also apparent in this

Table 2
Socio-demographic details of the study participants (adapted from Neuman et al., 2019).

	Parent ($n = 22$)	Grandparent ($n = 27$)
Mean age (range)	32.2 (22.7–49.5)	56.9 (43.0–77.9)
Gender:		
Female	14 (64%)	21 (78%)
Male	8 (36%)	6 (22%)
Race/ethnicity		
White	20 (91%)	23 (84%)
Native American	1 (4.5%)	0
Asian American	1 (4.5%)	1 (4%)
African-American	0	1 (4%)
Mixed	0	2 (8%)
Highest school grade completed		
High school	18 (82%)	20 (74%)
College/University	4 (18%)	7 (26%)
Marital status		
Married	6 (27%)	10 (37%)
Separated	1 (4.5%)	1 (4%)
Divorced	7 (32%)	14 (51%)
Single (never married)	7 (32%)	1 (4%)
Engaged	1 (4.5%)	0
Widowed	0	1 (4%)
Employment status		
Full time	7 (32%)	8 (30%)
Part time	4 (18%)	4 (15%)
Not employed	11 (50%)	15 (55%)
Annual household income		
Less than 14.999 USD	8 (36%)	7 (26%)
15.000–24.999 USD	6 (27%)	6 (22%)
25.000–39.999 USD	4 (18%)	6 (22%)
More than 40.000 USD	4 (18%)	8 (30%)

Table 3
Descriptive statistics of the children (n = 16) from the interviewed families (adapted from Eli et al., 2016).

Mean age (range)	4.6 (3.1–5.7)
Gender	
Female	8 (50%)
Male	8 (50%)
Weight status	
Underweight	0
Normal weight	7 (44%)
Overweight	4 (25%)
Obesity	5 (31%)

Table 4
A summary of the four themes.

Themes	Description	Example Quotes
Appropriateness of outside versus inside spaces for physical activity	Participant assessments of where children's physical activity should be done	Grandparent: '*A house isn't a place you run. I told her one day: "If you want to run, go outside!"*' (Gp01GP02).
Making accommodations for physical activity in the home	Conditions under which vigorous physical activity can be done in the domestic space and ways in which these accommodations are made	Grandparent: '*…kids in particular, they need that large motor activity every day. And a lot of times you have to make accommodations for that to be indoors and not outdoors*' (Gp10GP01).
Active spaces of care:	Relationship between caregiver's available time and energy and access to space for the child's physical activity	Grandparent: '*… there's really no place where he can be outside sort of by himself, like a little patio or a small yard or something like that without one of his parents being outside directly supervising him*' (Gp10GP01).
Mundane movement	Low-impact movement occurring in the course of daily life	Parent: '*They are constantly doing things and my mom lives in two stories so that's activity just going up and down the stairs*' (Gp09P01).

grandparent's statement: '*I think that a lot of what we need to see is a lot of us being more active, being in nature. I think that we have a major deficit in this country and I think that if we could get back into nature, you're just automatically more active in nature*' (Gp07GP01). Ideas of physical activity in outdoor spaces alluded to what interviewees interpreted as children's 'natural' propensity to move, and to enjoy movement, as a seamless part of everyday life, implicitly (and sometimes explicitly) contrasting with notions of exercise as a regime that disrupts everyday routines.

Although 'outside', 'outdoors', and 'in nature' were often expressed as *the* place for physical activity, any space outside the confines of the home fell under this umbrella of appropriate space. This was inclusive of institutional *indoor*, non-domestic places, such as schools, day-care centres, gyms, and recreation centres, which participants perceived as purposefully designed for children's active play, physical education, and sports. During the wintertime, when Oregon experiences substantial rainfall, these institutional spaces rose in importance. One grandmother expressed that, when unable to take her grandchildren to the park due to rain, instead of letting them run around the house, '*what I'll do is usually throw them in the car and we'll go to the mall and play on the inside playground*' (Gp01GP03). Similarly, another grandparent said that although the child should have outdoor play, since the family '*don't have swings or a play structure, they did go to Tiny Tots quite a bit—that's an indoor gym.* […] *I'll encourage Tiny Tots or the pool*' (Gp14GP01). Rather than dividing space into 'indoors' and 'outdoors', participants across the sample spoke of a division between 'inside the home' and 'outside the home', which could be either institutional or outdoors.

As a counterpoint to the association of 'outside the home' with physical activity, participants expressed very clear ideas of what counted as 'indoor activities'. These were largely sedentary and quiet activities such as colouring, doing puzzles, reading, watching television or playing video games. Importantly, these were described in positive terms as appropriate indoor activities. Carers recognized that 'quiet time' and the discipline of such activities such as learning to sit and read were developmentally important, especially in advance of attending school. As one parent of a five-year-old explained, it is important for children to have a mix of physical and sedentary activities, as

> *they need to be able to get their energy out but they also need [to] know how to do quiet time and learn. At her age, especially, she's got to learn how to sit down and be quiet for a certain period of time and focus stuff just because of school, that's what they expect from kids in school but they also expect them to go out on recess and play too.* (Gp01P01)

Participants often described children's energy and physical activity within the domestic space as troubling expectations of, and efforts to maintain, domestic order. Many participants said their domestic spaces were small and/or crowded, a situation attributable to their low socioeconomic status, and that such spatial restrictions made indoor physical activity impractical or uncomfortable. As children grew older, the limitations of domestic spaces were felt more acutely, as this father explained: '*When they were toddlers and up to two, the apartment's a pretty big area. But when you got a five-year-old that can ride a bike to [a nearby town] and back, you need some space and an apartment can't cut it*' (Gp03P02). Although children were active inside the home, this activity needed to be managed and contained, leading to the possible curtailment of indoor activity. For example, one grandparent said: '*I mostly like to be outdoors with him. That's when he mostly runs and I don't have to constantly calm him down.* […] *We have to [play outside] or they won't calm down in the house*' (Gp16GP01).

Many families implicitly defined physical activity as inappropriate in the home. Yet, the participants who reported specific prohibitions on physical activity within the home were primarily grandparents. Some had specific rules against certain types of physical activity in the home, as is the case with a grandfather who noted that his grandson '*needs outdoor time every day*' because without it he needs to '*encourage him for the 95*th *time that we don't use the furniture for a trampoline. He would throw himself from couch to couch, from chair to chair all day if you would let him*' (Gp12GP02). Another grandparent described the particular rules around physical activity in the house, saying: '*Well, see, we don't allow any running in the house […] A house isn't a place you run. I told her one day: "If you want to run, go outside!" The whole patio in the back, the whole length of the house is a cement patio* […] *If you want to run, run outside. A house isn't a place to run*' (Gp01GP02).

3.2. Making accommodations for physical activity in the home

At times the organizing principle that indoors was the incorrect place for physical activity was challenged. Participants spoke about specific circumstances in which indoor physical activity could be acceptable. The physical environment, as relating to geography and the weather, was frequently mentioned as interfering with spaces where activity would be ideally performed. Doing physical activity indoors was often directly contrasted with playing outside, and something that had to happen when weather was inclement, as in this example from a parent who said that to maintain a healthy life one needs to be '*[e]ating healthy in moderation, getting outside and playing. Even if it's rainy, be dancing around the house*' (Gp14P01).

Western Oregon, where the study data were collected, has a rainy climate, which was often mentioned as a reason why children could not

play outside and get as much physical activity as desired. One parent linked the inclement weather directly to television watching, saying,

> '*It's hard to stay away from the television in Oregon because of the weather's really crappy all the time. Like I said, letting the babies go out in the weather, it's not dry enough in the weather it's way too cold, and then they get cold all the time and they get sick and not feeling well*' (Gp05P02).

Similarly, a grandparent expressed, '*Here in Oregon it's really tough to try and get a kid active when it's either pouring down rain or you step outside and it's colder than you-know-what!*' (Gp01GP02).

Although physical activity outdoors was preferable, and people often had indoor spatial limitations, as one grandmother explained, sometimes one had to make concessions:

> *Most people don't have the space to accommodate large, physical activity inside … I worked with pre-school/grade-schooled aged kids for a number of years up in Alaska, and realized that kids and adults too, but we skip it as adults unfortunately, but kids in particular, they need that large motor activity every day. And a lot of times you have to make accommodations for that to be indoors and not outdoors.* (Gp10GP01)

Accommodating physical activity in the home, however, was challenging to most participants, as this mother described: '*If it's raining, activities are kind of limited. We'll try to run around the house and play tag and stuff but it's kind of hard*' (Gp09P01). Of note, the one substantial deviation from the pattern of indoors being inappropriate for vigorous physical activity was a household with a young child whose BMI was very high. In this household, the parents encouraged their children to be physically active. Physical activity and active play were allowed indoors at all times, but there was also a recognition of an uptick when the weather was particularly poor:

> *We let them jump on the furniture, it's better than doing stuff they shouldn't be doing (Laughs). You know, it's not the best couch anyways … the bed, our king-size bed is the wrestling mat in the house … we constantly are wrestling … If we're trapped inside due to weather or whatever, or we just, you know, it's not the day where it's just too cold to go outside. […] If it's really bad, we'll let them bring skateboards in and roll around on the hard wood floors. It's better than leaving them bored is how I look at it.* (Gp03P02)

3.3. Active spaces of care

Both children's physical activity and caregiver involvement in that activity were mediated by the specific space(s) available. The availability or lack of private outdoor space, such as an enclosed garden or yard, was a key mediator of caring activity. Separately, a parent and grandparent from one family drew attention to the fact that their homes had very little outdoor space. This was a limiting factor in the child's activity, creating a situation that required extra attention from the caregiver. As the father explained,

> '*We live in a condo so […] they just can't go play in the backyard because they're still too young. There isn't a backyard and we have a front yard but it's everybody's front yard, so letting the 5- or 3-year-olds go run around outside isn't the best scenario. So we have to be pretty active in their activity*' (Gp04P01).

A grandparent from the family compared life in the condo to the space previously available in a house with a yard, noting that

> *[their own] kids were always in sports from kindergarten on and they rode their bikes and did stuff so I think that the fact that we lived in a house rather than a condo, it was even easier for us. We always had a swing set out back and it was probably easier to say, "Okay, there's 15 minutes with no rain, get outside!" and the kids would go outside and play. But it's not as easy in this condo and you have to go with them and they don't have a backyard, so I think my kids were easier to make sure that they got exercise.* (Gp04GP01)

Despite spatial constraints, some parents and grandparents focused more on their own roles in children's sedentary or active engagement. Specifically, these participants linked children's activities to the amount of attention and energy they had available to facilitate activity. These concerns over attention and energy were often linked with concerns over the safety of available space: Parents and grandparents felt there was no safe space for children to play outside unsupervised, but were also limited in the time they could spend supervising children outside. Reflecting on the space available for her grandchild, a grandmother noted this problem of space and supervision, saying that '*[t]hey live in a pretty tiny apartment and there's really no place where he can be outside sort of by himself, like a little patio or a small yard or something like that without one of his parents being outside directly supervising him. So I think that's kind of hard*' (Gp10GP01).

Preschool-age children's activity was often adult-dependent and required not only direct adult supervision but also adult activity on its own. Participants noted that very young children joined adults in household activities like gardening or cleaning, but also in sedentary activities, such as watching television. One mother explained that, in their low-income housing complex, they '*don't have a backyard so we don't have a huge opportunity to let him go run*,' which she believed contributed to her son being '*definitely more sedentary at home*' than at day care. Later in her interview, she expressed how her commitments as a student intersected with this issue of available outdoor space to increase sedentary activities. She noticed that '*the times that we are sedentary is when I'm sitting on the couch* […] *I'm a student so a lot of times I'll get into doing schoolwork and my kid will sit for two hours in front of the TV. And it's because I'm not involved. I need to close my computer and go be involved*' (Gp06P01). Caregivers' involvement and attention (both inside and outside the home), then, were identified as key components of children's activities, particularly during their early years.

3.4. Mundane movement

Although participants described many activities occurring within the home as sedentary, they did not always clearly demarcate children's 'quiet time' from movement. Rather, children continually flowed through a spectrum of movement behaviours in the home, with more physically active play transitioning into quieter activities and then back again. Even though rough-and-tumble play was discouraged by most families in the home, there was an acceptance that children move about even when doing otherwise 'sedentary' activities. This mundane movement of everyday life, which largely mapped onto what guidelines such as the WHO's classify as 'light physical activity' (WHO, 2019), was accommodated within the home space even if it was not understood by caregivers as physical activity *per se*. This was expressed by the mother who previously described her child as '*definitely more sedentary at home*' (Gp06P01). Describing how her child moves even while doing a seated activity, she said: '*When he watches videos he is quite often bouncing, you know. He doesn't necessarily sit still, but yeah, we don't do a lot of gross motor activity at home*' (Gp06P01).

Parents and grandparents recognized that children were physically active throughout the many acts of daily living. Walking up and down stairs, carrying laundry baskets, or even getting up from the sofa to let the dog in were some of the examples called upon by parents and grandparents who recognized the presence and importance of movement outside the bounds of exercise or unstructured free play. Referring back to the weather in Oregon, one mother noted how activity could be done in the home:

> *I'm not too fond of taking her out in the rain but my mom has and I told her that I'm not going to say no, as long as you put a jacket on her and*

keep her protected. They are constantly doing things and my mom lives in two stories so that's activity just going up and down the stairs. (Gp09P01)

Another parent also spoke to this sentiment, saying: '*I don't want them to feel like you have to[,] they have to go get activity, I want them to do it. Biologically that is how we are made anyway, our bodies want to move. I try to let as much of that happen as possible. Basically, if there is not a TV on, they are up and moving around anyway*' (Gp04P02).

Participants described how their children or grandchildren followed them around the home and accompanied them on errands outside the home, as part of the range of movement the children enacted in the course of their normal days. Describing her daughter's regular activities, one mother said:

'*She only has preschool two mornings, but when she's home with me, I'll let her lay in bed if she wants and I'll do my homework, and then we'll get ready, and then just leave somewhere, we'll run errands, so she'll be in and out of the car seat with me, walk around, go to the store. So she's pretty active for the most part*' (Gp08P01).

Similarly, another parent described their child's physical activities as '*… not so much working out. But doing things that require physical activity. Like we try to make chores fun for [name of child]. Just to get him up and moving around*' (Gp10P01).

These examples of children's everyday activities with parents and grandparents challenged assumptions of home as a space for sedentary activities only. Although caregivers perceived outdoor space as preferable for more vigorous activities (particularly if secure yard spaces allowed for a sense of safe, unsupervised play), the range of activities shared with children in the home showed the potential for home-based caring experiences to encompass a full range of activity levels – from 'quiet time' to busy chores to (managed) rough-and-tumble play.

4. Discussion

This analysis of interviews with parents and grandparents of preschool-age children in lower-income households in Oregon, USA, has considered the relationships between children's day-to-day physical activities and the spatial environments in which such activities are conducted, with particular emphasis on the ways in which domestic space is used. Our findings indicate complex relationships between space, care, and everyday activity among preschool-age children. Parents and grandparents framed locations outside the home as the most appropriate spaces for children's movement forms that have traditionally been framed as 'physical activity', like jumping and running. Inside the home was the space where mundane movement occurred in the course of children's daily life; outside the home was the preferred location for active play. Notably, 'outside' encompassed not only 'natural' outdoor spaces but also indoor recreation structures designed for children's active play, in public spaces such as shopping malls.

Although our results align with studies showing that time outdoors relates positively to increased physical activity (Gray et al., 2015) and protects against childhood obesity (Larouche et al., 2019), our analysis elucidates how indoor spaces outside the home were also seen by participants as enabling greater physical activity. Further complicating this perceived spatial division were enclosed yards, which comprised a liminal (in-between) space between 'home' and 'outside the home'. As a private outdoor space that was held to be bounded and safe, parents and grandparents aspired to provide yard access to the children in their care so that children had the appropriate space to engage in active play, without necessitating significant management by the caregiver. A lack of a safe outdoor space in which a child could play unsupervised amplified moments in which parents and grandparents could not give their full attention to children's activities, leaving them with the feeling they were not meeting the standards of caregiving to which they aspired. The participants' emphasis on yards as spaces of safety and care maps onto discursive constructions of dangerous and diffuse geographies of childhood (Horton and Kraftl, 2018; Spilsbury, 2005). The yard as a liminal space, where physical activity was domestic yet still outside the house, opens an avenue for critical inquiry into planning, design, and physical activity, and the classed assumptions of what one can and cannot do in the domestic and neighbourhood space available (Bauman et al., 2012; Sharpe et al., 2020).

We note the cultural situatedness of this interpretation of appropriate spatial use: single-family homes and yards remain an aspirational norm in the United States (Charles, 2019), yet it may not be the case elsewhere. Similar associations between yard spaces and preschoolers' physical activity were reported in a recent Sweden-based study (Ek et al., 2019), where both teachers and parents cited indoor spaces as limiting young children's activities and outside spaces, including yards, as facilitating them. Notably, because young children in Sweden spend much of their time in preschool, the Swedish study focused primarily on the affordances of the environment in and around the preschool (Ek et al., 2019). Thus, it is important to add structural, geographical, and cultural nuance when considering how caregivers understand and facilitate children's physical activity in relation to space, even when they seemingly endorse similar spatial ideals (Nordström, 2017; Wales et al., 2020).

The boundaries between indoor and outdoor activities were drawn more strictly in the grandparent interviews, many of whom reported restricting physical activity in the home. Although this pattern could be interpreted as a generational shift around the ways domestic space is utilized and maintained, the participating grandparents were relatively young; several grandparents still had minor children of their own living at home. Both the oldest parents and the youngest grandparents were in their 40s, indicating that we should perhaps consider the division not as generational but as reflecting the roles, functions, and social identity of grandparents compared to parents (Breheny et al., 2013; May et al., 2012). As previous research using this dataset indicates (Neuman et al., 2019), grandparents play an important role in modelling good parenting skills regarding feeding and food provisioning; our current analysis suggests that this extends also to modelling how domestic space should be appropriately used, as seen through grandparents' more specific restrictions on physical activity and the use of indoor space. Additionally, in a recent systematic review, Sadruddin et al. (2019) have offered a conceptual framework that captures different forms and contexts of grandparental care, suggesting that grandparents' influence on children's well-being takes multiple pathways. The literature is still divided on whether grandparents negatively or positively impact children's eating habits (Sadruddin et al., 2019; Young et al., 2018), but all of this material together indicates the complexity of grandparental roles and identities.

Although it is established that children's activities (from mundane movement to active play) are dependent at least in part on engagement from adult caregivers, our findings show how relationships between caregiving and activity are mediated by space. Activities that participants felt demonstrated care were child-focused and had either active adult participation or adult supervision. Such activities could be either indoors or outdoors, encompassing quiet play, active play, and household activities such as chores. Additionally, participants recognized children's mundane movements as physically active, albeit of light intensity. This suggests that although participants seemed to construct a spatial binary between inside and outside the home, their experiences of everyday caregiving offered a more nuanced understanding of what constitutes children's physical activity and where it takes place. Such caregiver-led understandings of the full spectrum of children's activities need to be incorporated into public health and policy conceptions of physical activity and health for young children.

Current public health policy on physical activity hinges on an assumption that population-level increases in physical activity will be achieved through widespread uptake of moderate-to-vigorous exercise (e.g., brisk walking or cycling) or organised sport – types of movements that occur overwhelmingly outside the home. The COVID-19 pandemic

has drastically exposed the limits of that assumption, and thus the limitations of policy itself. With the sudden implementation of stay-at-home orders around the world, the home environment began to play a singularly dominant influence in all aspects of daily life. For children and caregivers spending more time at home or having limited access to safe outside spaces for play, previous physical activity policy that focused exclusively on public spaces (e.g., schools) is not enough to prompt meaningful and sustained change. Emerging research on the impact of the COVID-19 pandemic shows a dramatic reduction in children's physical activity (Bates et al., 2020; Moore et al., 2020), but this decline is not inevitable: Aguilar-Farias et al. report that during Chile's lockdowns, those preschoolers who had 'a space to play at home and those living in rural areas had a smaller decline in physical activity and sleep quality, and less marked increase in screen time compared with their peers' (Aguilar-Farias et al., 2020, p. 5). As COVID-19 may be expected not to disappear entirely but recur annually at lower rates (Torjesen, 2021), our research can inform ongoing policy dialogue on how to 'build back better' with respect to physical activity and health as we shift to endemic COVID-19 (Draper et al., 2021). Our results suggest that public health campaigns should not stop at the front door, but should consider how use of domestic space could be promoted to improve health and well-being among all age groups including preschool-age children.

Alongside an increased reliance on domestic space for health and well-being, COVID-19 has brought to the fore many deeply entrenched social inequalities. Although schools, communities, and governments have made various resources available to children and carers while at home during the pandemic (such as online gym or yoga classes), the successful use of such resources requires domestic space in which to do the recommended vigorous physical activity—space that many do not have. Structural approaches to health policy have gained traction in recent years, notably the redesign of food systems and neighbourhood environments for obesity prevention (Hawkes et al., 2015; Warin and Zivcovic, 2019). Application of Bourdieu's theory of practice (1990) has similar relevance for physical activity policy (Nettleton and Green, 2014), in highlighting that everyday activities (which ultimately lead to good or poor health outcomes) are socially structured by forces that are both gendered and classed. Following Collyer et al. (2015) in recognising that 'choices' made in healthcare contexts are embodied 'capacities' enacted in response to unequal power distribution (Collyer et al., 2015), we call for recognition of how diverse material and socioeconomic contexts differentially shape patterns of children's everyday activities within their home environments.

Draper et al. have stressed a need to 'consider how our messages about physical activity and sedentary behaviour are communicated in a way that takes contextual realities into consideration' (Draper et al., 2021, p. 149). The absence of incorporating lived context within the home into policy formulation has yielded generic physical activity recommendations (e.g., '60 minutes of moderate- to-vigorous-intensity physical activity... each day' (World Health Organization, 2019), p. 1) that for many households do not easily fit with the ongoing flux of child-led play constrained by caregivers' competing responsibilities and spatial limitations. A joined-up, systems-level approach to physical activity policy as advocated by ISPAH (2020) is an essential step towards addressing these inequalities, but its 'eight investments in physical activity' could go further on how urban planning should be used to create environments to promote physical activity more equally (e.g., housing-specific policies on minimum space standards). D'Alessandro et al. (2020) articulated several aspects of integrated health and housing policy that were urgently needed in light of COVID-19, including 'visible and accessible' green spaces, reduced overcrowding, and improved air quality within buildings. Our results align with these recommendations, which would also have implications for enabling increased physical activity within the home. Our study highlights the limits of physical activity policies developed solely for sport or educational settings and further strengthens the call for coordinated policy development across multiple 'fields' that structure everyday activity (e.g., housing design, urban planning).

4.1. Strengths and limitations

The strength of this study lies in its inclusion of both parents and grandparents, thereby highlighting variations in practices of care *and* caregiving dynamics, as well as contributing to an emerging body of work that acknowledges the role extended family members play in children's eating and physical activity (Neuman et al., 2019). The grandparents included in this study were active in providing childcare and were important individuals in these children's lives; moreover, that the children spent substantial time in the grandparents' homes in addition to their own homes reveals children's activity across multiple domestic spaces. This study also has some limitations. Because children were not interviewed, the analysis relies on parents' and grandparents' descriptions of children's activities, and as such might not fully reflect how children experience physical activity. Despite the challenges involved in including preschool-age children in research, it would be important for future studies to capture children's perspectives as well. Moreover, interviewees were both ethnically and economically homogeneous, reflecting both the ethnic makeup of the town in which the research was conducted and that the call for participants specifically sought out lower-income families. Findings, therefore, may not capture fully the divisions and use of space among people of different ethnic groups or socioeconomic status. Additionally, the location of the study (Eugene, Oregon, USA) requires an assessment of whether these findings are applicable outside the United States, or even in more urban areas within the country. This potentially restricted context of children's everyday practices in relation to their health and well-being presents limitations to applicability to policy on both national and global scales, such as those in line with United States (US Department of Health and Human Services, 2018) or WHO guidelines (World Health Organization, 2019). Further research conducted in different economic, social, and national settings is necessary in order to establish a robust framework of spatial use and childhood physical activity. Finally, as the data were collected in 2011, it is possible that they do not fully reflect contemporary perceptions, particularly given how the ongoing COVID-19 pandemic continues to change relationships to domestic space.

5. Conclusion

This qualitative analysis of children's activities within and outside the home, as experienced by both parents and grandparents who provide childcare, highlights limits in current policy for increasing physical activity and well-being in children. Children's day-to-day activity flows do not fall within discreet categories of 'active' (outdoor) versus 'sedentary' (indoor) activity, but rather cut across a full and fluid spectrum of movement that includes mundane activities alongside caregivers. Limitations in caregivers' time to focus solely on the children can lead to disconnects between carers' aspirations for children to 'go outside' and their need to fulfil their caring roles in other ways (e.g., managing the home environment and keeping children safe). Attending to the spectrum of children's activities and movement reveals how these activities link not only to a family's routine and activities of care, but also to the categories of domestic and outside space. Liminal spaces such as yards/private gardens emerge as important places for managing these competing responsibilities and need more explicit consideration in planning, housing, and environmental policy. The interplay between space, care, and physical activity as enacted at the household level must inform a more robust, system-wide policy approach for increasing the health and well-being of preschool-age children. This can be achieved by coordinating policy development across the multiple fields that structure the everyday activity of both young children and caregivers, in order to focus less on increasing physical activity levels *per se* and more on creating home contexts across society where caring activities and

healthy living are concurrently enabled.

Credit author statement

SP analysed the data, drafted the manuscript and made a substantial contribution to the interpretation of findings and the critical revision of the manuscript. AL, CP, and SU made a substantial contribution to the study design, data analysis, interpretation of findings, manuscript writing and critical revision of the manuscript. PN conceptualised and designed the Grandparents Study, coordinated data collection, collected data, and made a substantial contribution to the interpretation of findings and critical revision of the manuscript. KE supervised the writing of the manuscript, coordinated the data analysis and made a substantial contribution to the study design, data analysis, interpretation of findings, manuscript writing and critical revision of the manuscript.

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