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Physical Activity, Social Interaction and Children's Perspectives Across Two Recess Conditions

Magda Nuna Miranda de Sousa

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KEYWORDS: SCHOOL RECESS; PHYSICAL ACTIVITY; RECESS EQUIPMENT; SOCIAL INTERACTION; CHILDREN'S PERSPECTIVES

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Resumo

Este estudo teve como objetivo analisar os níveis de atividade física e as interações sociais das crianças em duas condições de recreio: recreio habitual não estruturado e recreio com disponibilização de equipamento, considerando também as perspetivas das crianças. Realizou-se um estudo de caso descritivo, não experimental numa escola do 1.º ciclo do ensino básico localizada no norte de Portugal. Utilizou-se metodologia quantitativa e qualitativa, tendo sido realizadas seis sessões de observação sistemática do recreio três em cada condição, não estruturado e com disponibilização de equipamentos. Foram utilizadas o SOPLAY e o SOCARP, com adaptações, na observação do recreio. Complementarmente, 15 crianças participaram numa atividade Draw-and-Tell. Procedeu-se a uma análise estatística descritiva dos dados da observação e a uma análise temática dos dados qualitativos. Os resultados revelaram uma percentagem superior de observações de atividade física no recreio com disponibilização de equipamento, comparativamente ao recreio não estruturado, respetivamente 78,2% e 48,1%. Nesta condição, observaram-se também mais interações sociais positivas, embora se tenha verificado um aumento dos conflitos. As crianças consideraram que os equipamentos facilitaram o início das brincadeiras e tornaram o recreio mais diversificado e motivador. Conclui-se que a disponibilização de equipamento pode promover a atividade física e a participação autónoma das crianças. Contudo, a organização do recreio deve igualmente considerar o prazer, a acessibilidade, as interações sociais e a gestão de conflitos.

Palavras-Chave: recreio escolar; atividade física; equipamentos no recreio; interação social; perspectivas das crianças.

Abstract

This study aimed to examine children's physical activity levels and social interactions across two recess conditions: unstructured recess and recess with equipment available. Children's perspectives were also considered. A descriptive, non-experimental case study using quantitative and qualitative approaches was conducted in a primary school in northern Portugal, comprising six systematic recess observation sessions, three during usual unstructured recess and three during recess with equipment available. SOPLAY and an adapted version of SOCARP were used to observe physical activity and social interaction during recess. In addition, 15 children participated in a Draw-and-Tell activity. Observational data were analysed using descriptive statistics, while qualitative data were examined through thematic analysis. The findings showed a higher percentage of active physical activity observations during recess with equipment available than during usual unstructured recess, at 78.2% and 48.1%, respectively. Higher levels of positive social interaction were also observed when equipment was available, although conflict was recorded more frequently. Children indicated that the equipment facilitated the initiation of play and contributed to a greater variety of recess activities. The findings suggest that providing equipment may support children's physical activity and autonomous participation during recess. However, recess provision should also consider enjoyment, accessibility, social interaction, and conflict management.

Keywords: school recess; physical activity; recess equipment; social interaction; children's perspectives.

Abreviaturas e Símbolos

AAP – American Academy of Pediatrics

CDC – Centers for Disease Control and Prevention

MVPA – Moderate-to-Vigorous Physical Activity

NCCOR – National Collaborative on Childhood Obesity Research

PA – Physical Activity

SHAPE America – Society of Health and Physical Educators

SOCARP – System for Observing Children's Activity and Relationships During Play

SOPLAY – System for Observing Play and Leisure Activity in Youth

TA – Target Area

WHO – World Health Organization

A – Alone / Area accessible

C – Conflict

E – Equipment provided

N – No Social Interaction

O – Organized Physical Activity

P – Positive Social Interaction

S – Sedentary / Area supervised

U – Area usable for physical activity

V – Very Active

W – Walking

Wo – With Others

n – Number of observations or records

% – Percentage

1. Introduction

School recess is increasingly understood as more than a break from classroom learning. It is a meaningful part of the school day in which children have opportunities to move, play, interact with peers, exercise choice, and experience autonomy within the school environment. From this perspective, recess should be approached as a multidimensional context in which physical activity, social interactions, agency, enjoyment, and inclusion are closely connected. Although physical activity remains an important dimension of recess research, activity intensity alone provides only a partial understanding of children's recess experiences. Measures of sedentary, walking, or very active behaviour can indicate how much children move during recess, but they do not fully explain how children participate socially, whether play opportunities are accessible, or how children experience the playground environment. A recess setting may therefore be physically active without necessarily being equally inclusive, meaningful, or socially supportive for all children. Important limitations remain in how recess quality is commonly examined. First, there is a need to move beyond physical activity intensity alone by also considering observable participation and peer interaction. Second, naturally occurring recess conditions, such as usual unstructured recess and equipment-supported recess without adult-led activities, require further contextualised examination to understand how they may shape children's opportunities for physical activity and social interaction. Finally, observational data alone cannot fully explain how children interpret recess opportunities, what they perceive as enjoyable or difficult, or what supports or constrains their engagement. These limitations justify a broader approach that combines physical activity observation, social interaction indicators, and children's own perspectives. Against this background, the present study examines children's recess experiences across two playground conditions: usual unstructured recess and equipment-supported recess without adult-led activities. The study focuses on three interrelated dimensions: children's physical activity levels across playground Target Areas, brief observational indicators of social interaction and peer interaction, and children's perspectives elicited through a draw-and-tell activity. By combining

systematic observation with child-centred qualitative data, the study seeks to provide a more holistic and context-sensitive understanding of recess. In doing so, this study responds to the limitation of examining recess primarily through activity intensity alone. It aims to describe how different recess conditions are associated with children's opportunities for physical activity, interaction, autonomy, and play engagement, while recognising children's perspectives as central to interpreting what recess means in practice. The following sections review the literature on recess as a context for physical activity and holistic development, present the methodological approach used to observe playground activity and social interaction, and integrate children's perspectives to support a broader interpretation of recess quality.

2. Literature review

2.1. Recess as a context for children's holistic development

School recess is widely recognised as a meaningful component of the school day, rather than merely a pause between lessons. It provides children with opportunities for physical activity, social interaction, emotional regulation, autonomy and recovery from the cognitive demands of classroom learning. Professional and public-health guidance therefore frames recess as part of children's holistic development, contributing to physical, cognitive, social and emotional well-being. From this perspective, recess should not be treated as expendable time that can be removed without educational or developmental consequences (American Academy of Pediatrics [AAP], 2013; Centers for Disease Control and Prevention [CDC] & SHAPE America, 2017b). The significance of recess extends beyond physical activity alone and is supported by recent synthesis evidence. In their systematic review of studies published between 2009 and 2020, Hodges et al. (2022) identified evidence associating recess with benefits across academic and cognitive outcomes, behavioural and emotional functioning, physical outcomes, and social outcomes. The review also noted that none of the included literature demonstrated negative impacts of recess, although the number of studies available to support strong

conclusions across all school levels remained limited. These findings strengthen the 'whole child' rationale by showing that benefits frequently cited in policy statements are also reflected in contemporary empirical research. Recess also provides a distinctive social context in which children interact with peers, negotiate activities, exercise choice and experience the school environment differently from the more structured classroom setting. It may therefore be understood as a developmental space in which children encounter opportunities for autonomy, social learning and emotional expression, alongside opportunities for physical activity. Consequently, recess quality should not be evaluated solely in terms of activity levels, but also in relation to the social and experiential conditions under which play takes place (AAP, 2013; CDC & SHAPE America, 2017b; Hodges et al., 2022). A narrow focus on physical activity may therefore obscure important dimensions of how children actually participate in the playground. From a broader developmental perspective, the quality of participation matters not only for immediate enjoyment and well-being, but also for whether recess becomes a meaningful and accessible opportunity for engagement (AAP, 2013; Kids Included Together, 2024; Cunningham Recreation, 2024). Simply providing time for recess may not be enough if the environment is unsafe, poorly supervised, exclusionary, or lacking meaningful activity options. Recess is a recurring context in which children may develop confidence to participate, increase physical activity through varied play experiences, and build positive dispositions toward being active with peers. Recess may therefore contribute not only to immediate activity, but also to the development of confidence and movement competence (Whitehead, 2010).

2.2. Importance of Physical Activity and Recess value within the school day

The benefits of physical activity for children and adolescents are multidimensional, encompassing physical health, psychological wellbeing, and broader developmental outcomes. As such, physical activity is widely recognised as essential for the health, growth, and development of children and adolescents. Evidence from systematic reviews indicates that, among children and adolescents aged 5–17 years, higher

levels and intensities of physical activity are associated with multiple health benefits, including improved cardiorespiratory and muscular fitness, healthier body composition, stronger bone health, more favourable cardiometabolic profiles, and potential benefits for mental health and wellbeing (Janssen & LeBlanc, 2010; Chaput et al., 2020). These findings are reflected in the World Health Organization's 2020 guidelines, which recommend that children and adolescents accumulate an average of at least 60 minutes per day of moderate-to-vigorous physical activity across the week, with vigorous intensity activities, and muscle and bone-strengthening activities, included on at least three days per week (Bull et al., 2020; World Health Organization, 2020). Regular participation in physical activity supports cardiometabolic health, musculoskeletal development, aerobic fitness, body composition, and the regulation of energy balance. Andersen et al. (2006), using objectively measured physical activity data from children and adolescents in the European Youth Heart Study, found that lower levels of physical activity were associated with a greater clustering of cardiovascular disease risk factors, including indicators related to blood pressure, blood lipids, insulin resistance, adiposity, and aerobic fitness. In addition, physical activity contributes to musculoskeletal development, particularly when children engage in weight-bearing, vigorous, and higher-intensity activities, which may support bone strength and skeletal development during the growing years (Larsen et al., 2018). These benefits demonstrate that physical activity is important not only for children's immediate health, but also for supporting healthy development and reducing future disease risk. Physical activity is also associated with psychological wellbeing and quality of life. Evidence from reviews and meta-analyses suggests that regular physical activity may contribute to better mental health outcomes in children and adolescents, including lower depressive and anxiety symptoms, improved self-esteem, enhanced self-concept, and greater life satisfaction (Biddle & Asare, 2011; Rodriguez-Ayllon et al., 2019). Lubans et al. (2016) further suggest that these benefits may be partly explained through psychosocial mechanisms, such as improved physical self-perceptions, perceived competence, social connectedness, and self-esteem. Recent

high-level review evidence suggests that physical activity interventions may contribute to improved psychosocial outcomes among children and adolescents, although the strength of evidence varies across outcomes, populations, and intervention designs (Purgato et al., 2024). Another important dimension of childhood physical activity concerns the development of active behaviours across the life course. Evidence from longitudinal studies suggests that physical activity behaviours established during childhood and adolescence may track into adulthood, meaning that more active children are more likely to maintain higher levels of physical activity later in life, although this relationship is not fixed and can be influenced by life transitions, environmental conditions, and opportunities for participation (Telama et al., 2005; García-Hermoso et al., 2025). The importance of physical activity for children's health and development highlights the need to consider the everyday contexts in which children's active behaviours occur. Schools are particularly relevant in this regard, as children spend a substantial proportion of their weekday time within the school environment. Although schools are often viewed as important settings for promoting children's physical activity, children's activity during the school day are characterised by a clear contrast between substantial sedentary time and relatively limited engagement in moderate-to-vigorous physical activity. This contrast is partly explained by the structure of the school day, as much of children's time is spent in classroom-based learning, where sitting is often the expected and dominant behaviour. Classroom-based studies indicate that lesson time can involve prolonged sitting and limited opportunities for movement, although changes to physical spaces, teaching routines, and active classroom practices may help interrupt sedentary time and increase light or moderate activity (Hartikainen et al., 2021). This pattern is supported by studies that have objectively measured children's activity levels during lessons. For example, Mooses et al. (2017), using accelerometer data across different school subjects, found that students spent a high proportion of lesson time sedentary, while average moderate-to-vigorous physical activity remained below 2.2 minutes per 45-minute lesson across subjects and school stages. These findings suggest that ordinary classroom lessons contribute

relatively little to children's daily physical activity and may instead represent one of the main sources of sedentary time during the school day. Similarly, Calvert and Turner (2019) reported that students spent most of the school day in sedentary behaviour and accumulated only modest amounts of MVPA, particularly on days without physical education. However, evidence from broader school-day studies shows that children's activity levels vary across different school segments, rather than being uniform throughout the day. Periods such as recess, lunch, and physical education tend to offer greater opportunities for movement than classroom lessons, although these opportunities do not always result in sufficient physical activity. For instance, Nettlefold et al. (2011) found that sedentary behaviour, light physical activity, and moderate-to-vigorous physical activity differed across class time, recess, lunch, and physical education, with girls generally accumulating less moderate-to-vigorous physical activity and more sedentary time than boys during several parts of the school day. These findings are supported by systematic review evidence showing that children and adolescents generally accumulate only a limited proportion of their daily MVPA during school hours, with fewer than one quarter reaching the commonly recommended target of 30 minutes of MVPA during the school day (Grao-Cruces et al., 2020). These findings suggest that, although schools have considerable potential to support children's physical activity, this potential depends on how opportunities for movement are embedded across the school day. Such opportunities are not limited to formal or structured activities, such as physical education or extra-curricular activities and clubs, but also include recess and lunchtime play, classroom-based movement breaks, active learning, active travel to and from school, and whole-school approaches involving staff, families, and the wider community. Systematic review evidence suggests that school-based strategies can support children's physical activity, with promising approaches including classroom activity breaks, active travel, recess-based interventions, and multi-component programmes (McDonald et al., 2015; Alalawi et al., 2024). Within the school environment, recess is particularly important because it represents a naturally occurring opportunity for children to be physically active. As recess is

embedded within the daily school timetable and usually allows greater freedom of movement than classroom-based learning, it has clear potential to contribute to children's overall physical activity levels. During this period, activities such as running, chasing games, climbing, ball games, skipping, and imaginative play may all contribute to children's physical activity and energy expenditure. Importantly, unlike physical education, which is typically structured, curriculum-based, and teacher-directed, recess offers a less formal context in which children can engage in physical activity in ways that are flexible, enjoyable, and child-led. This may support motivation, autonomy, and positive attitudes toward exercise, which are important for the development of active behaviours over time. A substantial body of research has therefore examined the extent to which children engage in sedentary behaviour, walking, and more vigorous forms of exercise during recess periods (e.g. Parrish et al., 2020; Saint-Maurice et al., 2011). Much of this literature has prioritised activity intensity, often expressed through moderate-to-vigorous physical activity (MVPA) or similar categories, as a principal outcome of interest. Although these measures are useful for identifying when and where children are physically active, they provide only a partial account of the recess experience. Intensity data can show what is happening at the level of physical activity, but they do not, on their own, explain why activity patterns differ across playground areas or conditions, why some children participate more readily than others, or whether play opportunities are experienced as accessible, enjoyable, inclusive, and socially supportive (Saint-Maurice et al., 2011; Willig, 2013). For this reason, recess should be understood not only as a period for increased physical activity, but also as a social and environmental context that can either facilitate or restrict children's participation in active play. Evidence suggests that access to facilities, portable equipment, and encouragement may support higher levels of physical activity during recess (Ridgers et al., 2012), while more recent evidence also highlights the role of age, gender, and adult engagement in shaping both physical activity and sedentary behaviour during this period (Zhu et al., 2025). Guidance on recess quality similarly emphasises not only the provision of recess itself, but also the conditions under which it is provided, including safe and

inclusive spaces, developmentally appropriate equipment, and adult supervision that supports positive play (AAP, 2013; CDC & SHAPE America, 2017b). Therefore, recess represents an important context for examining how everyday school routines, spaces, and social conditions can contribute to or limit children's opportunities for physical activity and increase physical activity. In light of these considerations, attention should be given to how recess and recess-based interventions are organised, as different levels of adult involvement, activity structure, and child-directed play may influence children's physical activity and play experiences in different ways.

2.3. Unstructured and structured Recess

The distinction between unstructured and structured recess has become increasingly important in the literature, particularly in studies examining how playground provision may influence children's physical activity and play experiences. Structured recess refers to a recess period in which play activities are intentionally planned, organized, or guided, often with some level of adult involvement. Unlike free play, structured recess typically includes specific games, exercise routines, playground markings, or activity stations designed to encourage children's participation in physical activity. Research suggests that structured or semi-structured recess can increase children's engagement in moderate-to-vigorous physical activity by providing clear activity options and reducing uncertainty about what to play (e.g. Larson et al., 2014; Yan et al., 2025). Unstructured recess allows children to choose their own activities with minimal adult direction. During unstructured recess, children may engage in spontaneous games, imaginative play, informal sports, social conversations, solitary play, or simply move around the playground according to their own interests. This type of recess gives children opportunities to practice autonomy, creativity, decision-making, and peer negotiation. Studies on unstructured recess suggest that when children are given freedom to play without highly organized adult control, they can develop social skills and engage in self-directed forms of physical activity (e.g. Schwene, 2017; Massey

et al., 2018). The LiiNK project, for instance, emphasizes limited adult intervention and reduced reliance on equipment, suggesting that unstructured recess can support more equal activity levels among children by allowing them to create their own play experiences (Schwene, 2017). The main difference between structured and unstructured recess lies in the degree of organization and adult guidance. Structured recess tends to promote planned activities, organized games, and targeted physical activity outcomes, while unstructured recess supports child-led play, independence, and spontaneous social interaction. Observational research has shown that playground play patterns differ depending on whether recess environments include structured interventions or are left more open-ended, with structured settings often encouraging more organized activity types (Massey et al., 2018). However, both forms of recess have value. Structured recess may be especially useful for increasing physical activity and inclusive interaction, whereas unstructured recess may be particularly important for supporting creativity, autonomy, and peer relationship development (Bergmame, 2010; Massey et al., 2018). Studies on structured and unstructured recess show that recess can influence children's physical activity, social interaction, and classroom behaviour. Structured recess interventions have been found to increase children's participation in moderate-to-vigorous physical activity and vigorous physical activity, especially when activities are intentionally designed to be engaging and accessible. For example, Yan et al. (2025) found that structured recess activities, including Tabata exercise and playground game markings, have been associated with increased participation and higher levels of physical activity during recess. Similarly, Casolo et al. (2019) reported that structured active recess sessions were associated with improvements in weekday physical activity and cardiorespiratory fitness, although some differences between intervention and control groups were not statistically significant. These findings suggest that structured recess can be beneficial, but its impact may depend on how the intervention is designed, implemented, and supported within the school environment. Semi-structured recess also appears to be effective because it combines adult-provided activity options with children's freedom

of choice. In semi-structured recess, children are not required to participate in a single adult-directed activity; instead, they may choose from several available games or activities. This approach can preserve children's autonomy while still encouraging active engagement. Larson et al. (2014) found that semi-structured recess increased step counts and vigorous physical activity compared with unstructured recess. Cox (2024) also reported that semi-structured recess may be especially beneficial in schools with lower socioeconomic status, where children showed greater increases in step counts during semi-structured recess than during unstructured recess. These outcomes suggest that structured or semi-structured approaches may be particularly useful in school contexts where children have fewer resources, less equipment, or fewer organized opportunities for active play. Beyond physical activity, the literature shows that recess plays an important role in children's social and emotional development. Unstructured recess provides opportunities for children to interact with peers, negotiate rules, resolve conflicts, and develop independence through play. However, some children, including those with autism spectrum disorder, may find unstructured social situations challenging. Ziegler and Morrier (2022) found that a structured cooperative outdoor play curriculum increased social bids among preschool children with autism, suggesting that structured recess activities can support peer interaction and social communication for children who may need additional guidance. Koerner (2020) also found that recess can positively influence classroom behaviour, including children's focus, engagement, and readiness to learn after returning from play. Both structured and unstructured recess contribute to children's development, but they do so in different ways. Structured recess is particularly useful for increasing physical activity, promoting inclusive interaction, and supporting children who may benefit from guided social interaction. Unstructured recess, on the other hand, supports autonomy, creativity, peer negotiation, and child-directed play. Rather than viewing one type of recess as better than the other, the literature supports a balanced approach that includes both organized activities and opportunities for free play. Such a balance may allow schools to promote physical

activity while also protecting the social, emotional, and developmental benefits of child-led recess (Koerner, 2020; Larson et al., 2014; Yan et al., 2025).

2.4. The role of equipment

Building on the evidence that both types of recess can support children's physical activity, social interaction, and autonomy, a more specific area of interest is what happens when schools provide equipment during recess without necessarily adding formal instruction or adult-led activities. Equipment-based recess interventions sit between structured and unstructured approaches: children may still choose freely how to play, but the playground environment is modified by making active play resources available. In this way, providing equipment can encourage physical activity while preserving the child-led nature of recess. Research suggest that access to game or active play equipment can increase children's physical activity levels during recess, particularly moderate-to-vigorous physical activity (MVPA), by giving children more opportunities and prompts for active play (Ickes et al., 2013; Ridgers et al., 2010; Verstraete et al., 2006). Research examining equipment-only interventions has generally found positive effects on children's activity levels during school recess. Verstraete et al. (2006), for example, found that providing game equipment during elementary school recess increased children's moderate and vigorous physical activity during both morning and lunch recess periods. In the intervention group, moderate physical activity during lunch recess increased from 38% to 50%, while vigorous physical activity increased from 10% to 11%; in contrast, activity levels declined in the control group. These findings suggest that simply providing children with equipment can make recess more active and may help children accumulate more of their recommended daily physical activity during the school day (Verstraete et al., 2006). Other studies also support the role of active play equipment in promoting physical activity during unstructured recess. Ridgers et al. (2010), through the A-CLASS project, identified portable equipment and playground activity zones as factors associated with higher physical activity and lower sedentary behaviour during recess. Similarly, Nguyen et al. (2026) reported that children who

took part in daily free-play sessions with sports equipment showed significantly higher MVPA compared with children following standard recess routines. Together, these studies suggest that equipment provision may be a practical and modifiable school-based strategy for increasing physical activity without requiring a fully structured recess programme (Ridgers et al., 2010; Nguyen et al., 2026). In the present study, two recess conditions were defined: unstructured recess and recess with equipment available. Unstructured recess refers to the normal recess period in which children were free to choose their own activities, with no additional equipment intentionally introduced and no adult-led organisation of play. In this condition, children could engage in spontaneous play, informal games, social interaction, walking, running, or sedentary behaviours according to their own preferences. This definition is consistent with literature describing unstructured recess as child-led play with limited adult direction, where children independently decide how to use their recess time (Schwene, 2017; Massey et al., 2018). The second condition was defined as recess with equipment available. In this condition, children continued to have freedom to choose their own activities, and there was no adult-led instruction, organised games, or prescribed use of the equipment. However, a variety of play equipment was made available. This terminology was chosen because it reflects the specific nature of the condition: the recess environment was modified through access to equipment, while the play itself remained child directed. Previous studies have examined similar approaches by investigating how the availability or provision of game equipment, portable equipment, and active play equipment can influence children's physical activity levels during recess (Verstraete et al., 2006; Ridgers et al., 2010; Ickes et al., 2013; Nguyen et al., 2026).

2.5. Methodological considerations in the recess research

The literature reviewed suggests that recess should be understood not only as an opportunity for physical activity, but also as a socially and environmentally situated context in which children's participation is shaped by space, equipment, peer relations, rules, and adult presence. This broader framing has important

methodological implications. If the aim is to understand how different recess arrangements influence children's activity and social interaction, then recess cannot be reduced to physical activity counts alone. While measures of physical activity intensity are valuable, they need to be interpreted alongside the social and contextual conditions in which play occurs. This position is consistent with qualitative and interpretive perspectives that emphasise meaning, process, and lived experience. Willig (2013) argues that qualitative research is particularly appropriate when the aim is to understand how people make sense of events and what it is like to experience a particular situation in real-life contexts. Applied to recess research, this means that observations of physical activity and social interaction should be understood in relation to the playground environment, available resources, peer interaction, and the ways in which children experience and interpret their school recess. In the present study, observation aims to analyse children's visible engagement during two naturally occurring recess conditions within the same school setting. The study does not aim to compare ordinary recess with teacher-led physical education, nor does it compare free play with fully adult-directed games. Rather, it focuses on how children participate when the recess environment is either left as usual or modified through the availability of equipment, while children retain freedom of choice over whether and how to engage. Interaction is understood here in a deliberately modest and observable sense. It does not refer to a comprehensive measure of friendship quality, long-term inclusion, or social belonging over time. Instead, it refers to children's visible engagement in the playground at the moment of observation, including whether they are alone or with others and the apparent quality of the interaction taking place. This distinction is important because it aligns the conceptual meaning of interaction with what the study's observational data can legitimately support. Taken together, these methodological considerations support the use of direct observation to examine recess as it occurs in context, while also pointing to the importance of children's own perspectives for understanding how recess is experienced, interpreted, and negotiated. This methodological approach provides a bridge between observing children's social interaction in the playground

and recognising children's agency, voice, and meaning making within recess research.

2.5.1. Direct observation to understand recess in context

Direct observation is particularly suitable for studying recess because it allows behaviour to be examined as it unfolds in the natural school environment. Although systematic observational tools provide data on physical activity levels, these data should be interpreted in relation to the environmental and organisational context in which the observed behaviour occurs. This is especially useful when analysing different recess conditions, as it links observed physical activity patterns to the immediate environmental and organisational affordances of the playground (Saint-Maurice et al., 2011). Consistent with the NCCOR Measures Registry User Guide: Individual Physical Activity (Welk, Morrow, & Saint-Maurice, 2017), physical activity assessment requires a balance between feasibility and validity, since no single method captures all dimensions of behaviour equally well. Combining complementary instruments can therefore strengthen interpretation and support the triangulation of findings (Welk et al., 2017). This is particularly relevant in school recess contexts, where activity is brief, dynamic and often changes in small but meaningful increments. Self-report alone is unlikely to detect modest intervention effects, especially among younger children, whose recall and interpretation capacities may reduce accuracy. Accordingly, measure selection should be aligned with the population, the activity outcome, the research purpose and available resources, consistent with NCCOR's PARR principles: Population, Activity Outcome, Research Type and Resources (Welk et al., 2017). In the present study, this rationale supports a feasible yet sensitive observational approach. The System for Observing Play and Leisure Activity in Youth (SOPLAY) will provide target-area scans for estimating recess activity levels, commonly categorised as sedentary, walking, or very active. Scan-level contextual indicators, such as supervision and equipment availability, will support the interpretation of the two observation conditions: unstructured recess and recess with equipment available (McKenzie, 2006;

McKenzie et al., 2000). To complement these physical activity data, an adapted version of the System for Observing Children's Activity and Relationships During Play (SOCARP) will be used to capture visible social aspects of play, including group size and social interaction (Ridgers et al., 2010). These observations will be treated as brief, situational indicators of peer interaction rather than as comprehensive measures of children's broader social experiences. Finally, qualitative methods will provide essential insights into children's perceived enjoyment, exertion, and experiences of inclusion, capturing dimensions that observational data alone cannot fully represent (Goodwin et al., 2023; Literat, 2013).

2.5.2. Children's perspectives and interpretive approaches to recess research

Children's perspectives are not peripheral to the study of recess, they are theoretically central to understanding why physical activity levels and social interaction may change across recess conditions. If children experience recess as a space in which they can choose, negotiate, invent games and decide with whom and how to participate, then their sense of ownership may influence whether they engage actively or remain on the margins. Agency can therefore provide a bridge between the physical and social dimensions of recess: children's physical activity levels are shaped not only by the availability of equipment, space, facilities, and perceived safety, but also by how children experience these opportunities as enjoyable, accessible, socially accepted, and possible within peer cultures (Parrish et al., 2012; Pawlowski et al., 2016, Stanley et al., 2012). A child-centred and participatory approach to recess research therefore needs to create space for children's own perspectives, using methods that are developmentally appropriate and sensitive to power relations in adult–child research encounters. Recent research has emphasised that children's views should be sought through meaningful, safe and ethically attentive processes that support agency and minimise pressure. Methods such as drawing, elicitation prompts and small-group discussion may broaden participation by enabling children to communicate in ways that extend beyond conventional verbal interviewing (Barblett et al., 2024). Drawing-based methods are

particularly relevant in this context. Angell et al. (2015) argue that approaches such as draw, write and tell should place children's verbal explanations at the centre of interpretation so that adults do not impose meanings on drawings that children themselves did not intend. This point is especially important in recess research, where drawings may portray nuanced social experiences, preferred spaces, rules, exclusions or feelings that are not self-evident from the image alone. The value of such methods lies not in treating drawings as self-explanatory psychological texts, but in using them as elicitation prompts that help children articulate meanings in their own terms (Angell et al., 2015; Barblett et al., 2024). Using a Write, Draw and Tell approach, Fitton Davies et al. (2025) explored what 5- to 6-year-old children liked and disliked about physical education. Their findings showed that even very young children can articulate nuanced views when research methods are developmentally appropriate, such as when drawing is combined with brief, supportive discussion. The children's perspectives provided insight into factors they perceived as facilitating or hindering their enjoyment of physical education. This aligns with wider literature highlighting the importance of understanding young children's enjoyment to inform the design of high-quality, meaningful interventions that prioritise positive experiences and support beneficial outcomes. Drawing on Willig's (2013) account of interpretation in qualitative research, interpretation is understood in the present study as a central feature of qualitative inquiry rather than as an optional or additional stage of analysis. Qualitative data do not simply "speak for themselves"; rather, meaning is produced through the interaction between participants' accounts, the research question, and the analytic lens adopted. In the present study, the aim is to remain close to children's own narratives of recess by examining how they describe their experiences, what they identify as enjoyable or difficult, and what they perceive as facilitating or constraining their interaction. Thematic analysis was selected as an appropriate methodological approach because it provides a flexible means of identifying, analysing, and interpreting patterned meanings within qualitative data (Braun & Clarke, 2006, 2021). This flexibility is particularly valuable in research concerned with children's voices, as it allows attention to be given to how children

make sense of their experiences, environments, opportunities, and constraints. In line with Braun and Clarke's reflexive approach to thematic analysis, themes are not treated as simply emerging from the data, but as constructed through sustained, active, and reflective engagement with participants' narratives. Willig's (2013) discussion of qualitative interpretation further supports this position by highlighting the researcher's role in producing meaning through analysis. Accordingly, thematic analysis supports a rigorous yet context-sensitive interpretation of children's perspectives, generating findings that are grounded in participants' meanings while also recognising the active role of the researcher in knowledge production.

3. Research Objectives

3.1. General Objective

To analyse children's physical activity levels and social interactions across two recess conditions and complement these findings with children's perspectives.

3.2. Specific Objectives

. Describe differences in children's physical activity levels across playground during two recess conditions: unstructured recess and recess with equipment available;
. Describe group size and social interactions across two recess conditions;
. Elicit children's perspectives on recess through a draw-and-tell activity supporting children's agency and voice.

4. Methodology

This section presents the study design, setting, participants, data collection procedures, observation coding scheme, analytical approach, methodological quality considerations, and ethical procedures. Method selection was guided by the study aim and objectives, and by the type of evidence required to study children's physical activity, brief social interaction and children's perspectives on the recess experience. In line with the need to align methods with the questions that can reasonably be addressed by the data, the study combines systematic playground

observation with a child-centred qualitative activity to produce a descriptive and practice-oriented account of recess interaction. The study used a descriptive, non-experimental mixed-methods case-study design within a single primary-school playground. It does not seek to evaluate the effectiveness of an intervention or establish causal relationships. Instead, it described physical activity and brief social interactions across playground Target Areas under two recess conditions and considered those observations alongside children's perspectives to support a more contextualised interpretation of the observational findings. Two recess conditions were examined: usual unstructured recess and recess with equipment available without adult-led activities. During equipment-supported recess, selected loose play and sports equipment was made available, but no adult-led games, proposed activities, or participation requirements were introduced. Children retained freedom to decide whether and how to participate. This distinction is important because the study does not analyse a formal adult-led intervention, but rather naturally occurring variation in recess opportunities. The methodological approach comprised two complementary components. First, systematic playground observations were conducted to describe area-level patterns of physical activity and document children's social interaction across predefined playground Target Areas. Second, a draw-and-tell activity was conducted in which children created drawings and discussed their experiences of recess. The children subsequently participated in focus groups, where they described and explained the meanings represented in their drawings. Together, these components enabled the study to study both what occurred in the playground and how children experienced and interpreted the opportunities available during recess. The two sources of data were integrated to broaden and enrich the interpretation of the findings.

4.1 Participants

The observed recess participants comprised pupils aged approximately 5 to 10 years who shared access to the playground during the lunch-recess period under routine school supervision. For the systematic observation component, pupils were not

individually recruited, identified, or tracked over time. Instead, all visible pupils present within each predefined Target Area at the time of each scan were recorded as non-identifiable aggregate counts. The observational sample therefore comprised repeated, setting-level observations of playground use rather than a sample of individual pupils followed over time. For the Draw-and-Tell component, 15 pupils were invited to participate during the after-school care period, all of whom chose to take part. All participants had experienced both recess conditions included in the study. Participants were recruited through convenience sampling based on their availability and willingness to participate. The activity was explained to the children in age-appropriate language, and no identifying or sensitive personal data were collected. Participation was voluntary, and children could choose not to answer any question or withdraw from the activity. Where practicable, participants were organised into five focus groups of three, with consideration given to school year and gender composition. Participants in the Draw-and-Tell component could not be individually linked to and were not assumed to be the same pupils as, those represented in the systematic playground observations.

4.2 Setting and recess context

The study was conducted in the primary section of a non-identifiable school in northern Portugal. Although the wider institution comprised both primary and secondary sections, the present study focused exclusively on primary-school pupils. The pupil population was diverse in terms of country of origin, ethnicity, and gender, and was broadly socioeconomically advantaged. Recess formed part of the regular school day and comprised a morning break of 20 minutes and a lunch-recess period of one hour. Systematic observations were conducted during lunch recess because its longer duration provided pupils with greater opportunities to move, play, and interact with their peers. During wet-weather conditions, pupils remained in their classrooms; therefore, no playground observations were conducted. The recess area was mapped into three main Target Areas (TA), which represented the principal outdoor spaces available to pupils during lunch recess. To preserve the anonymity

of the school, the recess spaces are described according to their physical characteristics rather than by specific school facility names. TA1 was a large grassed open area of approximately 45 m × 30 m. TA2 was a hard-surfaced outdoor play area typically used for court-based and ball-game activities. TA3 was an enclosed synthetic-surface play area of approximately 40 m × 26 m, suitable for small-sided active games. The study analysed two recess conditions: unstructured recess and recess with equipment available. Unstructured recess referred to the school's usual lunch-recess period. Pupils were free to select their own activities, play spaces, and play partners. No additional loose-play or sports equipment was made available by the researcher. Recess with equipment available referred to lunch-recess periods during which a variety of loose-play and sports equipment was made available to pupils. The equipment comprised one football, one basketball, one volleyball, two frisbees, four skipping ropes, ten cones, six balloons, six coloured Physical Education bibs, one set of chalk, four hoops, and five soft balls. Pupils remained free to decide whether, where, and how to use the available equipment. No games or activities were introduced, organised, or led by adults. Therefore, the provision of equipment did not alter the child-directed nature of recess. In both conditions, school staff continued to perform their usual supervisory roles.

4.3 Data collection

Data were collected using two complementary methods: systematic playground observations and a child-centred Draw-and-Tell activity. The systematic observations combined SOPLAY target-area scans with selected categories from an adapted version of SOCARP (McKenzie, 2006; McKenzie et al., 2000; Ridgers et al., 2010). The Draw-and-Tell activity explored children's perspectives on their recess experiences. The complete observation form and Draw-and-Tell protocol are presented in Appendices A and B, respectively. The recess area was divided into three Target Areas (TA1, TA2, and TA3), representing the outdoor spaces available to pupils during recess. Because TA1 contained higher pupil density and fast-moving activity, it was subdivided into two consistent scan spaces, TA1.1 and TA1.2. These

were scanned separately and later summed when results for the main TA1 area were required. This subdivision was adopted solely for data-collection purposes. Target Area 1 remained a single Target Area within the study design and subsequent area-level analysis. The playground therefore comprised three main Target Areas per complete observation cycle: TA1 (TA1.1 and TA1.2), TA2, and TA3. During the unstructured recess condition, no loose play equipment was routinely available in these areas. Equipment was introduced only during the second condition. A fixed observation point was established during the pilot phase. From this position, all scan spaces could be viewed by changing visual orientation without relocating. The observer completed scans in a constant order, TA1.1, TA1.2, TA2, and TA3, throughout each recess session.

4.3.1 Systematic Direct Observation

Systematic observations were conducted during six lunch-recess sessions across six observation days. Data collection was organised into two observation periods corresponding to the two recess conditions examined in the present study. The first period comprised three sessions conducted during usual unstructured recess. The second period comprised three sessions conducted during recess with equipment available. Each observation session lasted 60 minutes. Observations were conducted from a predetermined observation point across the three Target Areas. Before each session, the observer prepared the standardised observation form, a separate mechanical counter for each physical activity category and the time-recording tools. The operational status and contextual conditions of each Target Area were checked during the observation process. The observer then completed repeated, time-stamped cycles through the scan spaces in a constant order. Each complete observation cycle covered the four scan spaces and lasted four minutes. Fifteen complete cycles were conducted during each 60-minute session, producing 60 operational scan records per session. Across the six observation sessions, a total of 360 operational scan records were completed. Of these, 180 were collected during unstructured recess and 180 during recess with equipment available. When three

pupils were available during every operational scan, the social interaction observation procedure permitted a maximum of 1,080 individual pupil-observation records across the six sessions, comprising a maximum of 540 observations per recess condition. All observations and coding were completed live and in real time using the standardised recording form. No video, audio, or other audiovisual recordings were made.

4.3.1.1. Pilot Phase and Observer Preparation

Before formal data collection, a pilot phase was conducted to assess the feasibility of the observational procedures and prepare the observer for their consistent application. The pilot observations enabled the observer to become familiar with the SOPLAY and adapted SOCARP procedures, practise applying the coding criteria, and assess the suitability of the adapted data-collection form under real playground conditions. The location of the observation points, Target Area boundaries, scan order and direction, scan pace, and data-recording procedures were also tested and refined during this phase. The pilot phase provided an opportunity for observer training and for assessing consistency in the application of the coding criteria and use of the adapted data-collection form. Attention was given to distinguishing between the observational categories and recording the required physical activity, social interaction, contextual, and predominant activity-type data within the time available. Any uncertainties regarding the interpretation or application of the coding criteria were reviewed and addressed through further practice. Formal data collection commenced only after the observer had become familiar and comfortable with the observation process, could use the adapted data-collection form consistently, and could apply the coding criteria without unresolved uncertainty. Adjustments arising from the pilot phase were incorporated into the final procedures, including refinements to the scan sequence, pace, and number of scan cycles that could feasibly be completed during each observation period. Data collected during the pilot phase were used exclusively to refine the observational procedures and were not included in the final dataset. All pilot and formal observations were

conducted live and in real time, without video or other audiovisual recording. Consequently, formal intra-observer reliability based on repeated coding of the same observed events was not assessed. Instead, the pilot phase focused on observer preparation, procedural standardisation, and the consistent application of clearly defined coding criteria.

4.3.1.2 SOPLAY Target Area scans

The SOPLAY protocol followed the present study, retained several core features of the original method, including the use of predetermined Target Areas, systematic area scans, the recording of each visible pupil once per scan, the established physical activity categories, selected contextual indicators, and the predominant activity type. During each scan, pupils were classified as Sedentary, Walking, or Very Active, in accordance with the original SOPLAY activity-level categories. Other elements of the protocol were adapted to align with the study's aims and the school context. Specifically, pupils were counted collectively rather than through separate scans by gender, as gender-based comparisons were beyond the scope of the study. Environmental temperature was not recorded, and the observation schedule was adjusted to correspond with the school's lunch-recess period. Table 1 summarises the elements of the original SOPLAY protocol that were retained, omitted, or adapted.

Table 1. Relationship between standard SOPLAY elements and the study-specific implementation.

Protocol element	Use in the present study
Predetermined Target Areas and systematic area scans	Retained from SOPLAY
Classification of each visible pupil once per scan	Retained from SOPLAY
Sedentary, Walking, and Very Active classifications	Retained from SOPLAY
Area accessibility, usability, supervision, organised activity, and equipment availability	Retained from SOPLAY
Predominant activity-type coding	Retained from SOPLAY
Separate scans by gender	Omitted; all visible pupils were counted in aggregate
Environmental temperature	Omitted
Observation timing	Adapted to the school's lunch-recess period
Target Area 1 (TA1)	Adapted; TA1 was subdivided into two scan spaces to facilitate systematic scanning
Social interaction observation	Adapted SOCARP protocol

For the physical-activity component, each completed scan of one scan space generated one scan record. Each record contained the aggregate numbers of pupils classified as Sedentary, Walking, or Very Active within that scan space at that observation time. The scan record therefore constituted the primary unit of observation for the physical-activity component. For each scan space, the observer first recorded the relevant contextual conditions, including whether the area was accessible, usable for physical activity, supervised, used for organised activity, and

whether equipment was provided. A systematic left-to-right physical-activity scan was then completed from the predetermined observation point. During the scan, each visible pupil was counted once and classified as Sedentary, Walking, or Very Active. The observer maintained a consistent scanning direction and did not backtrack once the visual sweep had passed a section of the area. Pupils entering an area after the scan had passed their location were not added retrospectively and could instead be recorded during a subsequent scan. A pupil who reappeared within the observer's field of view during the same scan was not counted more than once. If no pupils were present within an operational scan space, the physical-activity categories were recorded as zero. After completing the physical-activity scan, the observer recorded the predominant activity type, transferred the tally counts to the observation form, and reset the counters before proceeding.

4.3.1.3. Adapted SOCARP

In the present study, SOCARP was adapted to align with the scan-based observation system and the study aim of capturing brief, directly visible social interactions within each operational scan space. This adaptation was necessary because the original SOCARP procedure involves observing predetermined focal pupils across successive intervals, whereas the present study used the spatial scanning approach. Although SOCARP was developed specifically for use during recess on school playgrounds, the original protocol allows the system to be modified and applied across a range of structured and unstructured play settings. Previous studies have also modified SOCARP to address specific research objectives, participant populations, and observational contexts (e.g. Foweather et al., 2021; Naish et al., 2023). For the present study, two dimensions were coded independently for each selected pupil: group size and social interaction. The original group-size categories were consolidated into *Alone* and *With Others*, while the original social-interaction categories were aggregated into *No Social Interaction*, *Positive Social Interaction*, and *Conflict*. These adaptations reduced the level of behavioural detail required during each brief observation while retaining the distinctions most relevant to the

study aim. The adapted SOCARP procedure was incorporated into the SOPLAY scanning process. Following each physical-activity scan, up to three clearly visible pupils were selected from the corresponding scan space and observed individually for 10 seconds. Where possible, the selected pupils were distributed across the scan space to provide broader spatial coverage. If fewer than three pupils were clearly visible, only those available for observation were coded. The relevant group-size and social interaction codes were entered immediately after each individual observation. When three pupils were available, the adapted SOCARP component required 30 seconds per operational scan space. Accordingly, the complete observation cycle for each operational scan space consisted of a physical-activity scan followed by the adapted SOCARP observations. After both components had been completed, the observer proceeded to the next operational scan space.

4.3.1.4. Coding categories

4.3.1.4.1. Physical activity

During each SOPLAY scan, every visible pupil was counted once and classified into one of three activity categories: Sedentary (S), Walking (W), or Very Active (V). Sedentary included lying down, sitting, or standing. Walking referred to walking at a normal pace. Very Active referred to activity more vigorous than ordinary walking, including running and vigorous play. The scan produced area-level counts rather than individual pupil records.

4.3.1.4.2. Group Size

The original SOCARP group-size categories of alone, small, medium, and large were consolidated into two categories:

Alone (A): The pupil was not participating in an activity or group with another person during the observation interval.

With Others (Wo): The pupil was participating in an activity or group with one or more other people, irrespective of the total group size. This category referred to group participation rather than necessarily indicating a directly observable interaction. A

pupil could therefore be coded as With Others (Wo) for group size and No Social Interaction (N) for social interaction if the pupil was participating alongside others but did not visibly interact with them during the observation interval.

4.3.1.4.3. Observable social interaction

The adapted social interaction categories were recorded as follows:

No Social Interaction (N): No observable physical or verbal social interaction involving the selected pupil occurred during the observation interval. Physical proximity to other pupils, without visible engagement, was not considered sufficient evidence of social interaction.

Positive Social Interaction (P): An observable positive or pro-social interaction involving the selected pupil, whether physical or verbal. This category combined the original SOCARP categories of Physical Sportsmanship and Verbal Sportsmanship. Examples included helping, cooperating, encouraging, consoling, agreeing, organising play, positive gestures, and friendly physical contact.

Conflict (C): A clearly observable conflictual or antisocial interaction involving the selected pupil, whether physical or verbal. This category combined the original SOCARP categories of Physical Conflict and Verbal Conflict. Examples included hitting, pushing, grabbing, hostile arguing, name-calling, teasing, hostile gestures, and deliberate exclusion from an activity. Conflict (C) was coded only when conflictual behaviour was clearly observable. Physical contact forming a normal part of a game or play activity was not coded as conflict unless the context clearly indicated a conflictual interaction. This decision rule was intended to avoid classifying ordinary game-related contact as antisocial behaviour.

4.3.1.4.4. Contextual conditions and predominant activity type

In addition to the physical activity and social interaction categories, contextual information was recorded for each Target Area scan in accordance with the SOPLAY protocol. The observer documented whether the Target Area was accessible, usable for physical activity, supervised, used for organised activity, and whether equipment

was provided. The predominant activity taking place within each Target Area was also recorded using the alternative physical activity codes for young children specified in the SOPLAY protocol and reproduced in the observation form. The activity code identified the predominant activity observed within the designated area at the time of each scan; it did not necessarily represent the activity of every child counted. The recorded activity types comprised no specific activity, fitness/aerobics, baseball/softball, basketball/volleyball, dance/gymnastics, soccer/football, climbing/sliding, jumping games, manipulative games/racquet activities, sedentary games/activities, tag/chasing games, and none of the other specified categories.

4.3.2. Draw-and-Tell activity

The Draw-and-Tell activity was used to support children's agency and elicit their perspectives on recess. Drawing functioned as an elicitation prompt rather than as an object interpreted solely by adults. Interpretation relied primarily on children's own verbal explanations of their drawings, including their accounts of what they perceived as enjoyable, enabling, difficult, or constraining in relation to play, equipment, peers, space, and interaction. The activity generated complementary visual, verbal, and contextual data, allowing pupils to communicate through both drawing and discussion. This activity was conducted during the after-school care period at two data-collection points corresponding to the two recess conditions. The first data-collection point followed the usual unstructured recess observation period, while the second followed the period in which equipment was made available. The activity took place between 3-5 p.m. in a quiet area of the after-school care room. Fifteen pupils were invited to participate based on their availability during the after-school care period, and all chose to take part. Participation was voluntary, and assent was sought each time the activity was offered. Pupils were informed in age-appropriate language that there were no right or wrong responses, that they could choose not to draw or answer a question, and that they could stop participating at any time. Participation at one data-collection point did not require participation at the other. Pupils were provided with A4 paper and colouring pencils. The researcher introduced the activity

using a standardised, neutrally delivered explanation and invited each pupil to draw what recess looked like to them, including where they were, what they were doing and, if they wished, who they were with. Pupils could add words or labels to their drawings if they wished. The researcher did not interpret the drawings while they were being produced and used neutral acknowledgements to minimise influence on their content. The drawings were completed individually where practicable. Pupils were subsequently organised into small focus groups, normally comprising three participants, in which they were invited to describe and explain their drawings. The discussion began with open prompts, such as asking pupils to describe their pictures and explain what was happening. Follow-up questions explored the activities, spaces, equipment, and people represented in the drawings, as well as aspects of recess that pupils liked or disliked. Pupils were also invited to suggest what they would like to have more of or what they would change to improve future recess experiences. The drawings guided the discussion, and the researcher avoided assigning meanings to visual elements without first considering the pupils' own explanations. No predetermined time limit was imposed for either component of the activity. Pupils were given sufficient time to complete their drawings at their own pace and proceeded to the explanation and discussion stage when they indicated that they had finished. The subsequent discussion was also conducted without a fixed time limit, allowing pupils sufficient opportunity to describe their drawings, discuss follow-up prompts, and suggesting how future recess experiences could be improved. Pupils could choose not to respond to a particular question or could end their participation at any time. In all cases, both components were completed within the available after-school care period. No audio or video recordings were made. Pupils' verbal explanations and relevant contextual information were documented as closely as practicable through written notes. The completed drawings and accompanying notes were anonymous and contained no names, participant codes, or other information that could identify individual pupils. Each drawing was assigned a numerical identifier. Notes were recorded under the corresponding identifier to document the child's explanation of the drawing and, where relevant, the child's

exact words. This procedure enabled the visual and verbal data to be linked during analysis while preserving participant anonymity. The drawings were subsequently scanned to create digital copies for secure storage, data management, and analysis. They were analysed alongside pupils' verbal explanations and used as complementary visual data to support and contextualise the themes identified through the Draw-and-Tell activity. The drawings were not interpreted independently, as their meaning was considered in conjunction with the explanations provided by pupils during the discussion. Selected drawings were reproduced in the findings chapter to illustrate and support relevant themes. As no personal identifiers were collected, the Draw-and-Tell data could not be linked to individual pupils or matched with the anonymous systematic playground observation data. The complete Draw-and-Tell protocol, including the verbatim introduction and assent script, drawing prompt, core and optional discussion questions, materials checklist, step-by-step administration procedure, anonymous document-pairing and file-naming conventions, and scanning and data-management procedures, is provided in Appendix B.

4.4. Data analysis

4.4.1. Physical activity and contextual data

Completed recording forms were transferred to a dataset in which each row represented one scan space. Fields included date, condition, start time, operational scan space, physical-activity counts, contextual indicators, and predominant activity type. Data entries were verified against the original recording forms to ensure completeness and internal consistency. Descriptive statistical analyses were subsequently conducted, with frequencies calculated for the Sedentary, Walking, and Very Active physical activity classifications, stratified by recess condition and Target Area. For selected summaries, Walking and Very Active were combined and labelled Active (Walking + Very Active); the component categories were retained elsewhere to preserve information about intensity. TA1.1 and TA1.2 were summed for analyses concerning the three main Target Areas. Predominant activity types

were used to contextualise area-level activity patterns and not to assign activities to individual pupils.

4.4.2. Social Interaction data

Group size and observable social interaction codes were analysed separately using frequency of pupil-observation records by recess condition and Target Area. Denominators were the number of coded pupil-observation records, not the number of unique pupils. Because the same pupil could have been sampled repeatedly and selection was non-random, results were presented as descriptive distributions among sampled observation records rather than prevalence estimates for the pupil population. A cross-tabulation of group size and observable social interaction codes was used as an internal coherence check and to clarify how the independently coded dimensions combined. Any combination was interpreted in relation to the operational definitions and the brief observation window. The analysis did not infer individual behavioural change between conditions.

4.4.3. Draw-and-tell data

Data generated through the draw-and-tell activity were analysed using inductive thematic analysis. The analysis comprised three sources of data: the children's drawings, the written notes of the conversations in which children explained their drawings, and the researcher's field notes. This approach was appropriate because thematic analysis enables the researcher to identify, organise and interpret recurring patterns of meaning within qualitative data. Willig (2013) describes thematic analysis as a method concerned with recognising and organising patterns in both content and meaning and notes its flexibility across different forms of qualitative material. Similarly, Braun and Clarke (2006) describe thematic analysis as a flexible method for identifying, analysing and reporting patterns within data, while Joffe (2012) highlights its usefulness for exploring shared meanings and representations in qualitative research. The analysis was inductive**,** meaning that codes and themes were developed from the data rather than determined in advance. This was

particularly important because the purpose of the draw-and-tell activity was to access children's own meanings and interpretations of their recess experiences, rather than to impose pre-existing adult categories onto their drawings or explanations. Willig (2013) distinguishes between deductive approaches, in which categories are shaped by existing theory, and inductive approaches, where the researcher works from the data upwards to identify participant-generated meanings. This approach is also consistent with a "big Q" qualitative orientation, which is open-ended, exploratory and concerned with meanings generated by participants themselves (Willig, 2013). The first phase of the analysis involved familiarisation. During this stage, the researcher reviewed the children's drawings, their verbal explanations and the field notes several times to gain an overall sense of the material. No fixed categories were applied at this initial stage. Instead, the aim was to become immersed in the data and to note early impressions, repeated ideas, emotional expressions, visual elements and contextual observations that appeared relevant to the research aims. This stage of familiarisation is important in qualitative analysis, as it allows the researcher to engage closely with the data before beginning the process of coding and interpretation (Willig, 2013). It also reflects Bardin's (2016) notion of "floating reading", whereby the researcher approaches the material openly before developing categories or codes. The second phase involved initial coding**.** Meaningful units were identified across the visual, verbal and observational data. These included recurring ideas in the children's explanations, repeated elements in the drawings, references to friends, places or activities, and relevant observations recorded in the field notes. Codes were generated inductively and remained as close as possible to the children's own meanings. For example, where a drawing showed a group of children playing and the child described this as "I like playing with my friends", the code was informed by both the visual representation and the child's explanation. In this way, coding was not based solely on what appeared visually in the drawing, but on the relationship between the drawing, the child's verbal account and the contextual notes recorded by the researcher. Following this, related codes were grouped into candidate themes. These themes represented broader patterns

in the ways pupils described, represented and made sense of their recess experiences. This process involved moving between individual data items and the wider data set, looking for similarities, differences and connections across the drawings, children's explanations and field notes. In line with Willig's (2013) discussion of thematic analysis, themes were understood as patterns of meaning that captured something significant about the data in relation to the research question, rather than simply as repeated words or general topics. This stage therefore involved both organisation and interpretation, as the researcher considered how individual codes connected to wider meanings about pupils' experiences of recess. The candidate themes were then reviewed and refined. This involved returning to the original drawings, conversation records and field notes to examine whether the themes accurately reflected the data. Some codes were reorganised, and some candidate themes were merged, renamed or refined where necessary. This helped to ensure that the themes remained grounded in the data and reflected the children's accounts of recess, rather than the researcher's assumptions. Willig (2013) emphasises that qualitative analysis requires systematic engagement with the data and that the researcher's interpretative role should be made transparent. For this reason, the analysis also involved ongoing reflexive consideration of how the researcher's position, assumptions and interpretations may have shaped the development of codes and themes. The final phase involved the interpretation and write-up of the themes. The themes generated through the analysis were interpreted in relation to the aims of the study and written up as an interpretative narrative in the findings chapter. At this stage, attention was given to how the different sources of data complemented one another. The children's verbal explanations were central to the interpretation, while the drawings, the field notes and the PA data recorded, provided additional visual and contextual detail. This is consistent with Willig's (2013) view that qualitative data do not simply "speak for themselves" but require interpretation through a clear and reflexive analytic process.

4.4.4 Triangulation and trustworthiness

Triangulation refers to the deliberate integration and comparison of evidence generated through different methods in order to develop a more comprehensive and nuanced understanding of the phenomenon under investigation (Denzin, 1978; Mathison, 1988). In the present study, methodological triangulation was undertaken by integrating findings from the systematic observation and draw-and-tell components during analysis, theme development, or the presentation of findings. This approach was appropriate because the study sought to understand physical activity both as an observable behaviour and as a subjective experience shaped by children's perceptions, preferences, and social and environmental contexts. Systematic observation provided structured evidence of children's spontaneous behaviour within natural physical activity settings, whereas the child-centred visual and verbal draw-and-tell method elicited children's perspectives and the meanings they associated with their experiences, which may not have emerged through more traditional methods alone (Anguera et al., 2017; Noonan et al., 2016). The two datasets were compared to identify areas of convergence, complementarity, elaboration, inconsistency, and contradiction. For example, the draw-and-tell findings were used to clarify or extend the interpretation of behaviours identified through systematic observation, while the observational findings provided contextual evidence through which children's accounts could be considered. The purpose of triangulation was therefore not to establish the validity of one dataset by confirming it through another. Instead, it was used to deepen interpretation by examining how the different forms of evidence complemented, extended, clarified, or challenged one another. This approach is consistent with mixed-methods literature, which recognises that the integration of datasets can generate a richer and more complete interpretation, including through the identification of divergent or contradictory findings, rather than necessarily producing agreement across methods (Fetters et al., 2013; Greene et al., 1989; Mathison, 1988). Trustworthiness was supported through methodological triangulation and the transparent and systematic application of the data collection and analysis procedures. The integration of systematic

observation and draw-and-tell data enabled interpretations developed from one dataset to be examined, contextualised, and extended through the other, while also allowing convergences, complementarities, inconsistencies, and contradictions to be retained. In addition, a thick description of the study context, participants, methodological procedures, and analytical decisions is provided to support transferability by enabling readers to assess the potential relevance of the findings to other settings. Nevertheless, the findings are situated within the specific context in which the study was conducted. Therefore, the study does not seek to make generalisations; rather, it offers contextually grounded insights and inferences that may inform future research in this area.

4.5. Ethical considerations

Prior to data collection, authorisation to conduct the playground observations and the Draw-and-Tell activity was obtained from the school leadership. The study was conducted in accordance with the educational institution's approved policies and procedures. The playground observations took place within the children's usual school environment. The pupils were not individually recruited, interviewed, named, or tracked across observation periods, and no personal or identifiable information was collected. Observational data were recorded anonymously and reported only as aggregated totals or anonymised pupil observation records. The school leadership confirmed that no additional parental or guardian consent was required, as consent for children's participation in the Draw-and-Tell activity and related observations had already been obtained by the institution through its standard enrolment procedures. Before the Draw-and-Tell activity, the children received an age-appropriate explanation of the study and provided informed assent to participate. They were informed that participation was voluntary, that there were no right or wrong answers, and that they could decline to answer any question or withdraw from the activity at any time without consequence. All research materials were stored securely and accessed only for research purposes. Neither the pupils nor the educational institution was identified in the reporting of the findings. Contextual details that could

have enabled indirect identification were omitted or generalised. Ethical considerations also informed the analysis, interpretation, and representation of the data. Observed behaviour was described cautiously, without unsupported assumptions about the children's experiences or relationships. Being observed alone was not interpreted as evidence of loneliness, social exclusion, or rejection, just as being observed with others was not automatically interpreted as evidence of friendship, acceptance, or belonging. Similarly, the children's drawings were interpreted in conjunction with their own explanations rather than solely through adult assumptions. This approach supported a cautious and child-centred interpretation of the findings, reflecting the importance of consent, assent, confidentiality, and responsible representation in research involving children (Willig, 2013).

5. Results

5.1 Physical Activity

A total of 360 scan records were included in the physical activity analysis. Observations were collected across six days and three main target areas (Table 2). As outlined in the methodology, Target Area 1 was subdivided into two scan spaces, TA 1.1 and TA 1.2. For the area-level analysis reported in this section, counts from TA 1.1 and TA 1.2 were summed to produce overall totals for Target Area 1. The remaining playground zones were analysed as Target Area 2 and Target Area 3. Across these scans, 4,569 pupil activity observations were recorded. Of these, 2,855 pupils were classified as active, meaning they were either walking or very active. This represented an overall weighted active percentage of 62.5%. The remaining 37.5% of pupils were recorded as sedentary. In terms of activity intensity, 33.0% of pupils were recorded as walking and 29.5% as very active. The mean cumulative pupil count per scan record was 12.69.

Table 2. Overall physical activity profile.

Measure	Result
Scan space records	360
Observation dates	6
Main Target Areas	3
Scan spaces	4
Total pupils observed	4,569
Total active pupils	2,855

Physical activity levels were then analysed according to recess condition (Table 3). Observations without equipment were classified as unstructured recess, while observations with equipment available were classified as recess with equipment. There were 180 scan records in each condition. Descriptively, physical activity levels were higher during recess with equipment than during unstructured recess. The weighted active percentage, comprising the Active category (Walking and Very Active), was 48.1% during unstructured recess and 78.2% during recess with equipment. The percentage of sedentary pupils was lower during recess with equipment (21.8%) than during unstructured recess (51.9%). The proportion of pupils recorded as very active was also higher during recess with equipment (35.8%) than during unstructured recess (23.7%). These findings indicate differences between conditions but do not establish causality.

Table 3. Physical activity levels by recess condition.

Recess condition	Equipment availability	Sedentary	Active
Unstructured recess	No equipment	51.9%	48,1%
Recess with equipment	Yes	21.8%	78,2%

Physical activity levels were further analysed by Target Area within each recess condition (Table 4). Percentages in this analysis were weighted using the total number of pupils observed within each condition and Target Area as the denominator. This allowed differences in activity levels across playground zones to be compared descriptively between unstructured recess and recess with equipment.

Table 4. Physical activity levels by recess condition and Target Area.

Condition	Target Area	Sedentary	Active
Unstructured recess	TA 1	45.3%	54,7%
Unstructured recess	TA 2	74.8%	25.2%
Unstructured recess	TA 3	43.8%	56.2%
Recess with equipment	TA 1	20.9%	79.1%
Recess with equipment	TA 2	28.2%	71.8%
Recess with equipment	TA 3	17.9%	82.1%

Overall, the results show clear descriptive differences in children's physical activity levels across playground Target Areas and between recess conditions. During unstructured recess, Target Area 2 had the lowest active percentage and the highest sedentary percentage. During recess with equipment, active percentages increased in all Target Areas, with the largest absolute increase observed in Target Area 2, where active category (Walking and Very Active) increased from 25.2% to 71.8%. Target Area 1 increased from 54.7% to 79.1%, while Target Area 3 increased from 56.2% to 82.1%. These findings suggest that the recess condition with equipment was associated with higher levels of active behaviour across the playground, particularly in the area that was least active during unstructured recess. To provide further context for the differences in physical activity levels between recess conditions, physical activity classifications were summarised by predominant activity

code and recess condition. The activity codes represented the predominant activity observed within each scan space and were used descriptively to characterise the activities recorded under each condition (Table 5). The frequency of each predominant activity code was calculated using the 180 scan records collected in each condition as the denominator. Sedentary and Active percentages were calculated separately using the cumulative pupil count recorded within each combination of recess condition and predominant activity code as the denominator. The Active percentage comprised the combined Walking and Very Active intensity categories.

Table 5. Physical activity by predominant activity type and recess condition.

Recess condition	Predominant activity type	Scan records, *n*	Scan records, %	Sedentary %	Active %
Unstructured recess	No specific activity	85	47.2	48.8	51.2
	Tag/chasing games	39	21.7	38.4	61.6
	Dance/gymnastics	39	21.7	76.9	23.1
	None of the above	17	9.4	41.5	58.5
Recess with equipment	Football	45	25.0	17.9	82.1
	Jumping games	30	16.7	24.6	75.4
	Basketball/volleyball	30	16.7	25.6	74.4
	Tag/chasing games	27	15.0	17.4	82.6
	No specific activity	27	15.0	22.7	77.3
	Manipulative games/racquet activities	12	6.7	26.0	74.0
	Dance/gymnastics	6	3.3	35.1	64.9
	Fitness/aerobics	3	1.7	10.0	90.0

The distribution of predominant activity codes differed descriptively between the two recess conditions. During unstructured recess, *No specific activity* was the most frequently recorded code, accounting for 85 of the 180 scan records (47.2%). *Tag/chasing games* and *dance/gymnastics* were each recorded in 39 scan records (21.7%), while *None of the above* was recorded in 17 scan records (9.4%). During recess with equipment, *football* was the most frequently recorded predominant activity code, accounting for 45 of the 180 scan records (25.0%). *Jumping games* and *basketball/volleyball* were each recorded in 30 scan records (16.7%). *Tag/chasing games* and *No specific activity* were each recorded in 27 scan records (15.0%). Active percentages also varied according to predominant activity code. During unstructured recess, *tag/chasing games* had the highest Active percentage (61.6%), while *dance/gymnastics* had the lowest Active percentage (23.1%) and the highest Sedentary percentage (76.9%). Overall, 48.1% of cumulative pupil counts recorded during unstructured recess were classified as Active, while 51.9% were classified as Sedentary. During recess with equipment, Active percentages ranged from 64.9% when *dance/gymnastics* was the predominant activity to 90.0% when *fitness/aerobics* was predominant. However, the fitness/aerobics results were based on only three scan records and should therefore be interpreted cautiously. Among the more frequently recorded activity codes, *tag/chasing games* had the highest Active percentage (82.6%), followed by *football* (82.1%). Overall, 78.2% of cumulative pupil counts recorded during recess with equipment were classified as Active, while 21.8% were classified as Sedentary. Overall, recess with equipment was descriptively characterised by a greater variety of predominant activity codes and a higher Active percentage than unstructured recess. These findings describe patterns across scan records and cumulative pupil counts. They should not be interpreted as individual-level activity choices or as evidence that every pupil counted within a scan space was participating in the activity coded as predominant.

5.2 Social Interaction

The adapted SOCARP sample procedure comprised 1,080 pupil-observation records collected across 360 scans. This procedure generated 12 pupil-observation records per complete scan cycle, 180 records per observation day, 540 records per recess condition, and 1,080 records across the six observation sessions, as shown in Table 6. As pupils were not individually identified or tracked across successive scans, the 1,080 records should be understood as repeated pupil-observation records rather than observations of 1,080 unique pupils (Table 6). Of the sampled pupil-observation records, 66.5% were coded as *With others*, while 33.5% were coded as *Alone*. Regarding observed social interaction, 66.4% of records were coded as *Positive Social Interaction*, 29.8% as *No Social Interaction*, and 3.8% as *Conflict*. Overall, most observed pupils participated with others, with positive social interaction being the predominant form recorded.

Table 6. Overall group-size and observable social-interaction profile.

Measure	**Count/ Percentage**
Total pupil-observation records	1080
With others	66.5%
Alone	33.5%
Positive Social Interaction	66.4%
No Social Interaction	29.8%
Conflict	3.8%

As shown in Table 7, observed social interaction was also examined descriptively by recess condition. Each condition comprised 540 pupil-observation records. During usual unstructured recess, 64.8% of observations were coded as *With others*, while 35.2% were coded as *Alone*. During recess with equipment available, 68.1% were coded as *With others*, while 172 observations, corresponding to 31.9%, were coded as *Alone*. The distribution of observed interaction codes also differed descriptively

between the two conditions. During usual unstructured recess, 61.3% of observations were coded as *Positive Social Interaction*, 37.0% as *No Social Interaction*, and 1.7% as *Conflict*. During recess with equipment available, 71.5% were coded as *Positive Social Interaction*, 22.6% as *No Social Interaction* and 5.9% as *Conflict*. Compared with usual unstructured recess, the recess with equipment was characterised by higher proportions of observations coded as *With others* and *Positive Social Interaction*, together with a lower proportion coded as *No Social Interaction*. However, the proportion of observations coded as *Conflict* was also higher when equipment was available. These findings describe differences in the distribution of observed social interaction categories across the two recess conditions. They should not be interpreted as evidence that individual pupils changed their participation or interaction patterns between conditions, because pupils were not individually identified or followed across observation sessions. Furthermore, the descriptive differences do not establish that the availability of equipment caused the observed patterns.

Table 7. Group size and observable social interaction by recess conditions.

Recess condition	Pupil-observation records	With others	Alone	Positive Social Interaction	No Social Interaction	Conflict
Unstructured recess	540	64.8%	35.2%	61.3%	37.0%	1.7%
Recess with equipment	540	68.1%	31.9%	71.5%	22.6%	5.9%

Social interactions were further examined by target area, as presented in Table 8. To maintain consistency with the area-level analysis of physical activity, data from TA1.1 and TA1.2 were combined to produce the results for Target Area 1 (TA1). As TA1 comprised two separate scan spaces, it contributed 540 pupil-observation records, whereas Target Areas 2 and 3 each contributed 270 records. In TA1, 63.7% of observations were coded as *With others*, while 36.3% were coded as *Alone*. With respect to observed social interaction, 60.9% of observations were coded as *Positive*

Social Interaction, 37.4% as *No Social Interaction*, and 1.7% as *Conflict*. TA2 had the highest proportion of observations coded as *Alone*. In this area, 48.9% of observations were coded as *With others*, compared with 51.1% coded as *Alone*. Despite the comparatively high proportion of solitary social interaction, TA2 also had the highest proportion of observed interactions coded as *Positive Social Interaction*, at 80.0%. The remaining 20.0% were coded as *No Social Interactions*, and no observations were coded as *Conflict*. The absence of recorded conflict should not, however, be interpreted as evidence that conflict never occurred within this area. Rather, it indicates that no instances of conflict were identified during the observation periods included in the analysis. TA3 had the highest proportion of observations coded as *With others*. In this area, 89.6% of observations were coded as *With others*, while 10.4% were coded as *Alone*. Regarding observed interaction, 63.7% of observations were coded as *Positive Social Interaction*, 24.4% as *No Social Interaction*, and 11.9% as *Conflict*. TA3 therefore combined a particularly high level of participation with others with the highest proportion of observations coded as conflict. This finding suggests that a greater prevalence of participation with others did not necessarily correspond to an absence of conflict within the observed interactions.

Table 8. Group size and observable social interaction by Target Area.

Target Area	Pupil-observation records	With others	Alone	Positive Social Interactions	No Social Interactions	Conflict
Target Area 1	540	63.7%	36.3%	60.9%	37.4%	1.7%
Target Area 2	270	48.9%	51.1%	80.0%	20.0%	0.0%
Target Area 3	270	89.6%	10.4%	63.7%	24.4%	11.9%

In summary, descriptive differences in physical activity and observed social interaction were identified across recess conditions and target areas. Recess with equipment available was associated with higher proportions of observations coded as *Walking*, *Very Active*, *With others*, and *Positive Social Interactions*, but also with a higher proportion coded as *Conflict*. Differences were also evident across target areas, with TA2 showing the highest proportion of solitary interaction and TA3 showing the highest proportions of interaction with others and conflict. These findings reflect area-level physical activity scans and separate pupil-level situational observations. They should not be interpreted as evidence of individual behavioural change or as demonstrating causal effects of equipment availability.

5.3 Children's Perspectives from the draw-and-tell focus

The following themes present children's perspectives on recess across the two conditions. Themes are organised comparatively to show how children described recess without equipment and recess with equipment. Three main themes were identified from the analysis of the draw-and-tell activity and accompanying notes, which comprised notes from focus group discussions about the drawings and field notes, including informal conversations with children.

1. Equipment as a prompt for play initiation and motivation
2. Recess as a social experience
3. The prominence of football in children's recess experiences

Theme 1: Equipment as a prompt for play initiation and motivation

The first theme identified through the draw-and-tell activity, supported by field notes documenting the children's accompanying verbal accounts, relates to the role of equipment in prompting play initiation and supporting children's motivation to participate. Children represented equipment not simply as a collection of physical objects available in the playground, but as a resource that made recess appear more interesting, enjoyable, and easier to engage with. Balls, hoops, cones, skipping

ropes, rackets, and other items of equipment appeared in several drawings, while children's accompanying accounts frequently associated this equipment with having fun and knowing what to do during recess. Children's representations suggested differences in how play was initiated across the two recess conditions. During unstructured recess, opportunities for participation sometimes appeared to depend on children already having an idea for an activity, having peers with whom to play, or being able to join an ongoing game. Some children described this condition in relatively general terms, referring to walking around, talking with friends or looking for something to do. Although unstructured recess provided children with freedom and autonomy, the absence of visible play equipment may have made recess more open-ended and, for some children, less immediately engaging. In contrast, children's drawings and explanations relating to recess with equipment represented more specific possibilities for play. The availability of balls, hoops, ropes, cones, and rackets provided visible resources around which activities could be initiated and organised. Children's accounts indicated that equipment helped them decide what to do and contributed to recess feeling more varied, enjoyable, and engaging. One child explained, "When the equipment is there, it makes it easier, and we can start straight away." This account suggests that the availability of equipment may have reduced uncertainty about how to use recess time by providing an immediate focus for activity. Children's positive responses to recess with equipment available were also documented in the researcher's field notes. Children repeatedly asked, "When can we have the equipment back?" Such comments suggest that the return of the equipment was anticipated and that its availability was valued by at least some participants. They also suggest that the importance of the equipment may have extended beyond its practical use, as its presence may have positively influenced children's expectations of recess and their motivation to participate. The observational findings reported in Section 5.2 provided complementary context for this theme. The proportion of observations categorised as active, defined as walking or being very active, increased from 48.1% during usual unstructured recess to 78.2% during recess with equipment. These descriptive findings are consistent with

the children's accounts of equipment making it easier to initiate an activity and engage in play. However, the findings should not be interpreted as demonstrating that equipment alone caused the observed increase in physical activity. Rather, the qualitative and observational findings together suggest that the availability of equipment was associated with clearer opportunities for play initiation and greater observable engagement. Overall, the draw-and-tell findings positioned equipment as both a physical resource and a facilitator of play initiation. Equipment provided children with visible starting points for play, supported decisions about what to do, and created opportunities around which activities could be organised. Children's accounts therefore suggest that providing equipment may support engagement by making opportunities for play more immediately recognisable and accessible. Nevertheless, children's experiences were not necessarily uniform, and the findings do not establish whether all pupils engaged with or benefited from the available equipment to the same extent.

Theme 2: Recess as a social experience

The second theme identified through the draw-and-tell activity, supported by field notes documenting the children's accompanying verbal accounts, refers to the importance of recess as a social experience. Children frequently represented recess as a time for being with peers and participating in shared activities. Several drawings illustrated groups of children playing together, while others showed children standing, sitting, or talking with friends. In their accompanying accounts, children frequently referred to peers using expressions such as "my friends," "we," "us," "team," and "playing together." This language emphasised the collective nature of their recess experiences and the importance they attributed to peer relationships.

One child described recess as "the best part of the school day," explaining that it was a time when children could "run, be wild, be with friends, and have fun" (Drawing 5). This account linked physical freedom and enjoyment with opportunities for social interaction. Recess was therefore represented not only as an opportunity to promote

physical activity but also as a valued period in which children could spend time with friends, initiate shared activities, and participate in the social life of the playground.



Figure1. Child's representation of friendship and shared activities during recess.

As illustrated in Figure 1, one child represented recess through participation in different activities with peers. In the accompanying account, the child associated the drawing with friendship, enjoyment, and the opportunity to engage in a range of activities. The drawing therefore provided a visual representation of the wider theme identified across the children's accounts: recess was valued as both an activity-based and a socially shared period of the school day. The children's accounts also suggested that the social experience of recess involved more than physical proximity to other pupils. Their references to teams, playing together, and shared activities indicated processes of joining, organising, and negotiating play. Figure 2, for example, illustrates several peers participating in different activity stations created using the available equipment. In the accompanying account, the child referred to the participants collectively as "we," further emphasising the shared nature of the activity (Figure 2).

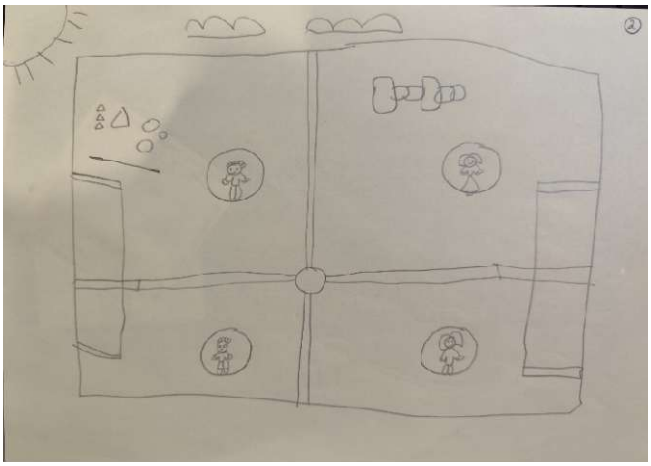


Figure 2. Child's representation of organised group activities during recess with equipment available.

Although companionship and cooperation were prominent in the children's representations, the wider dataset indicated that peer social interaction was not uniformly cooperative. Moments of disagreement and contested participation also formed part of the social organisation of recess. These more complex dimensions of shared play are examined further in Theme 3. The observational findings reported in Section 5.2 provided complementary context for this theme. Most sampled pupil-observation records involved participation with others, and *Positive Social Interaction* was the most frequently recorded interaction category. The recess with equipment condition also showed descriptively higher proportions of observations coded as *With others* and *Positive Social Interaction* than usual unstructured recess. Nevertheless, observations coded as *Conflict* were also recorded, indicating that interaction with others was not invariably cooperative or inclusive. Overall, the draw-and-tell findings positioned recess as an important setting for children's everyday social interaction. Children represented recess as a time to be with friends, engage in shared play, talk, and organise activities. Their accounts highlighted the value they attributed to the social dimensions of recess, while also indicating that shared participation involved processes of joining, organising, and negotiating play.

However, these situational representations do not establish how included individual children felt or how peer relationships developed over time.

Theme 3: The prominence of football in children's recess experience

The third theme identified through the draw-and-tell activity refers to the prominence of football in children's recess experiences. Football appeared in several drawings relating to both usual unstructured recess and recess with equipment available. It was also frequently mentioned in the children's accompanying verbal accounts. Several children described football using positive expressions such as "fun," "the best," and "my favourite," indicating that it was a preferred recess activity for a few participants. The children's explanations provided further insight into the reasons for this preference. For some, the appeal of football was associated with playing with friends and organising competitions. One child explained, "We love football because it is the best sport and we always do tournaments against other years" (Figure 3). This account associated football with enjoyment, shared participation, and inter-year competition. Children also referred to friends, teams, matches, and goals, positioning football as an organised social activity that involved forming teams and coordinating play. Other accounts connected children's preference for football with developing their skills and participating in football beyond the school setting. One child stated, "When I play football, I am practising for when I go to my club" (Figure 4). For this child, recess football provided an opportunity to practise skills that were also relevant in a football club. Other indications of football's importance included children asking whether it could be available every day and identifying the football area as their favourite playground area. Together, these accounts suggest that football was valued for enjoyment, social interaction, competition, and skill development.

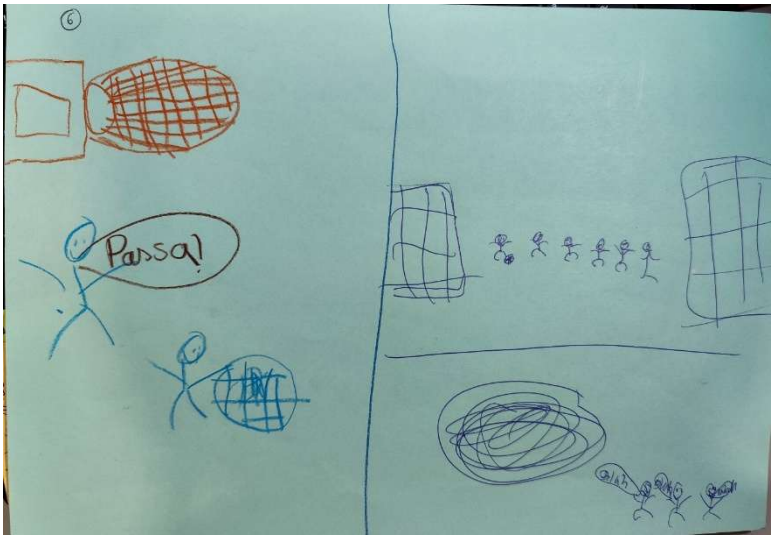


Figure 3. Child's representation of playing football with peers during recess.



Figure 4. Child's representation of football as an opportunity to practise skills.

The drawings provide evidence that football formed part of some children's usual recess experiences, despite not being recorded as a predominant activity in the observational scans conducted under that condition. Its appearance in drawings relating to both conditions indicates that football was meaningful to children before equipment was introduced and remained prominent when equipment was available. The observational data provided complementary evidence of football's prominence

during recess with equipment. Football was identified as the predominant activity in 45 scan records, representing 25.0% of the 180 scan records collected under this condition. It was therefore the most frequently recorded predominant activity during recess with equipment. In football-predominant scan records, 82.1% of recorded physical activity was classified as *Active*, while 17.9% was classified as *Sedentary*. Football therefore combined frequent occurrence with a high proportion of active observations. The qualitative and observational findings provide different but complementary perspectives. The drawings and accompanying verbal accounts show that football was memorable, frequently discussed, and preferred by several children. They also indicate that children valued football for several reasons, including enjoyment, friendship, competition, team participation, and opportunities to practise their skills. The observational data, in turn, show that football was the most frequently recorded predominant activity during recess with equipment and that football-predominant scans were characterised by a high proportion of active observations. These findings do not, however, demonstrate that football caused pupils to be more active. The scans were classified according to the predominant activity observed within the scan space, and the active percentage may have included pupils who were not directly participating in football. Similarly, the prominence of football in the drawings should not be interpreted as evidence that all children preferred or participated in the activity. Rather, the combined findings indicate that football was particularly salient in the recess experiences of the children who represented and discussed it. Overall, football emerged as a prominent physical and social feature of recess. Children represented it as a preferred activity associated with enjoyment, friendship, competition, teamwork, and skill development. Its appearance in drawings relating to both recess conditions suggests that football was already meaningful during usual unstructured recess, while the observational data indicate that it became especially visible as a predominant activity when equipment was available.

6.Discussion

This study examined children's physical activity and observable social interaction across two recess conditions: usual unstructured recess and recess with equipment available. Children's perspectives were also elicited through a draw-and-tell activity to provide further insight into how they experienced and interpreted recess. Overall, recess with equipment available was associated with higher proportions of active behaviour across all playground Target Areas. The social interaction observations and children's accounts also indicated that recess could not be understood solely as an opportunity for physical activity. Children's recess experiences were shaped by the availability of play opportunities, the ease with which activities could be initiated, peer interaction, enjoyment, autonomy, and the social organisation of playground spaces. The integration of systematic observation and children's perspectives therefore supported a more contextualised interpretation of the findings. This approach is consistent with Saint-Maurice et al. (2011), who emphasised that recess assessment can be strengthened by combining information about children's physical activity with observations of the contexts in which that activity occurs.

Recess as an opportunity for physical activity within the school day

Recess is a naturally occurring period during which children generally have greater freedom of movement than during classroom time. It therefore has the potential to support active play and reduce sedentary behaviour. This is consistent with Suga et al. (2021), who identified school recess as an important context for physical activity promotion because it provides opportunities for free play and self-selected activity within the school environment. In the present study, the proportion of observations categorised as active, comprising Walking and Very Active, was higher during recess with equipment available than during usual unstructured recess, increasing from 48.1% to 78.2%. The proportion of observations classified as Sedentary decreased from 51.9% to 21.8%, while the proportion classified as Very Active increased from 23.7% to 35.8%. These descriptive patterns suggest that the physical activity potential of recess was more fully realised when the playground environment

included additional resources for play. The findings also indicate that simply providing time for recess may not be sufficient to support consistently high levels of physical activity. Rather, activity appeared to vary according to the resources, play possibilities, and spatial characteristics available within the playground environment. This interpretation is consistent with evidence indicating that environmental strategies, including equipment provision, playground markings, and activity zones, may support physical activity during recess (Suga et al., 2021). Behrens et al. (2019) similarly reported that an unstructured recess approach involving increased access to equipment was associated with increased moderate and vigorous physical activity and reduced sedentary behaviour. The area-level findings further demonstrated that physical activity was not distributed evenly across the playground. During usual unstructured recess, the proportion of active observations ranged from 25.2% in TA2 to 56.2% in TA3. In contrast, during recess with equipment available, the proportion of active observations ranged from 71.8% in TA2 to 82.1% in TA3. Active behaviour increased across all three Target Areas, with the largest absolute increase occurring in TA2, where the proportion classified as Active increased from 25.2% to 71.8%. The increase observed in TA2 is particularly notable because it was the least active area during usual unstructured recess. This suggests that the relationship between equipment availability and observed physical activity may depend partly on the existing characteristics and usual functions of a playground area. Areas that provide fewer immediately recognisable play opportunities under usual conditions may show more marked descriptive changes when loose equipment becomes available. However, the present data cannot determine whether particular pieces of equipment, changes in peer composition, or other contextual factors accounted for the observed pattern. The distribution of predominant activity types also differed between the two conditions. During usual unstructured recess, No specific activity was the most frequently recorded predominant activity, accounting for 47.2% of scan records. During recess with equipment available, the observed activity profile was more varied and included football, jumping games, basketball or volleyball, tag or chasing games, manipulative or racquet activities, dance or gymnastics, and fitness or

aerobics. This greater variety is consistent with the possibility that equipment expanded the range of visible play opportunities available to children. These findings are especially relevant because the equipment-supported condition did not include adult-led games, prescribed activities, or participation requirements. Children retained the freedom to decide whether, where, and how to use the available materials. Consequently, the higher proportions of active observation should not be interpreted as an outcome of direct adult instruction. Instead, the findings suggest that modifying the playground environment through equipment provision was associated with expanded opportunities for self-directed active play. Nevertheless, the predominant activity codes described the main activity visible within each scan space and did not indicate that every pupil counted in that area was participating in that activity. Similarly, the area-level activity counts did not track individual pupils. The findings therefore describe differences in the overall distribution of observed playground behaviour and should not be interpreted as evidence that every child became more active when equipment was available.

Equipment as a physical activity opportunity

The findings suggest that equipment shaped recess not only by increasing opportunities for physical activity, but also by influencing how children initiated, organised, and engaged in play. During recess with equipment available, higher proportions of both Walking and Very Active observations were recorded than during usual unstructured recess. Active behaviour also increased across all Target Areas. This pattern suggests that equipment availability was associated with a broader activation of playground behaviour, reflected in more vigorous activity as well as walking and general movement within the playground. This interpretation is consistent with previous research showing that playground equipment and environmental design can influence children's physical activity during recess. Delidou et al. (2016), for example, found that pupils were more physically active in adequately equipped schoolyards than in partially or inadequately equipped schoolyards. Baquet et al. (2018) also reported that playground markings and

environmental design could positively influence children's recess physical activity over time. In addition, studies of equipment-based recess approaches have indicated that providing game or portable equipment can support moderate-to-vigorous physical activity without requiring fully adult-directed activities (Behrens et al., 2019; Ickes et al., 2013). The draw-and-tell findings provided further insight into how equipment may have supported engagement. Children's drawings included balls, hoops, cones, skipping ropes, rackets, and other materials. Their explanations suggested that equipment made play opportunities more readily recognisable and helped them decide what to do. One child explained, "When the equipment is there, it makes it easier, and we can start straight away." This account suggests that equipment may have reduced uncertainty about how to use recess time by providing an immediate focus around which play could begin. Children's positive responses to the equipment condition were also documented in the researcher's field notes. Children repeatedly asked, "When can we have the equipment back?" These comments suggest that the return of the equipment was anticipated and that its availability was valued by at least some participants. However, the comments should not be treated as evidence of internal motivation in a psychological sense, as motivation was not examined through a specific measure. Instead, they provide evidence that the equipment condition was noticed, remembered, and positively discussed by some children. Equipment therefore appeared to operate as a visible prompt for engagement and a facilitator of play initiation. By making possible activities more apparent, equipment may have helped children move from open-ended recess time into purposeful play. The materials offered practical starting points around which children could initiate activities, establish rules, form groups, and decide how to participate. This interpretation is important because the equipment-supported condition maintained the child-directed nature of recess. Equipment provided a degree of environmental structure without prescribing a particular activity or removing children's autonomy. Rather than replacing free play with organised physical activity, the materials appeared to enrich the playground environment by providing resources that children could use and adapt according to

their interests. The findings align with Lodewyk and McNamara's (2020) research, which linked recess enjoyment and positive affect with factors including equipment, space, opportunities for physical activity, game organisation, and free time. In the present study, children's drawings and explanations similarly positioned equipment as contributing to enjoyment, engagement, and the initiation of play rather than merely increasing the opportunity for physical movement. The findings also resonate with research on unstructured and self-directed play. Lee et al. (2020) suggested that open-ended play materials may support physical activity, self-directed play, social engagement, and children's broader experience of play. In the present study, the equipment did not prescribe a single way of participating. Instead, it appeared to support children in generating ideas, organising activities, and engaging with peers. Equipment may therefore have contributed to physical activity and to the experiential and social dimensions of recess. At the same time, the relationship between equipment and activity should be interpreted within the wider recess context. Previous research has shown that recess interventions do not produce automatic or uniform effects across all settings or groups of children. Parrish et al. (2020) found that interventions involving equipment, playground markings, and structured play opportunities could increase physical activity in some contexts, but that outcomes varied according to intervention design and implementation. In the current study, equipment was one element within a broader recess environment that also included playground layout, peer dynamics, school routines, supervision, novelty, and children's individual preferences. Football was particularly prominent during the equipment-supported condition. It was recorded as the predominant activity in 25.0% of the scan records collected during this condition, making it the most frequently observed predominant activity. Football-predominant scans also had a high proportion of Active observations, at 82.1%. However, this does not demonstrate that football caused the higher activity levels. The proportion included all pupils counted within scan spaces in which football was predominant, including pupils who may not have been participating directly in the game. The qualitative findings also showed that football was memorable and meaningful to several participants.

Children associated it with enjoyment, friendship, competition, teamwork, and opportunities to practise their skills. Its representation in drawings relating to both recess conditions suggests that football was already an important element of some children's recess experiences before the additional equipment was introduced. The availability of equipment may therefore have made an existing preference more visible within the observational findings. However, the prominence of football also raises questions about whether equipment-supported opportunities were equally accessible or attractive to all children. A frequently occurring activity may support physical activity and shared participation for some pupils while limiting space or opportunities for pupils with different preferences. The findings do not establish that this occurred, but they highlight why equipment provision should be considered in terms of variety, accessibility, and spatial distribution rather than simply the number of materials offered. Taken together, the observational and qualitative findings suggest that equipment functioned as both a physical resource and a facilitator of play initiation. It provided materials for active play while also helping children recognise possible activities, organise games, and engage with peers. Nevertheless, children's experiences were unlikely to have been uniform, and the findings do not establish whether every pupil accessed or benefited from the equipment to the same extent.

Physical activity intensity alone is insufficient to define recess quality

Although the higher proportion of physical activity observed during recess with equipment available is an important finding, physical activity intensity alone is insufficient to define recess quality. The area-level observations showed higher proportions of Active behaviour during the equipment condition and across all three Target Areas. However, these findings do not, by themselves, explain how children experienced the available opportunities or how social interaction unfolded within the playground. This distinction is important because systematic physical activity observation provides valuable but necessarily partial evidence. The SOPLAY scans described the distribution of Sedentary, Walking, and Very Active behaviour and

selected contextual conditions within Target Areas. However, they could not establish whether children experienced the available activities as enjoyable, accessible, inclusive, or socially supportive. Consequently, higher levels of observed activity should not automatically be interpreted as evidence of better-quality recess for every pupil. The social interaction findings support a multidimensional interpretation. During usual unstructured recess, 64.8% of sampled pupil-observation records were coded as With others, compared with 68.1% during recess with equipment available. Positive Social Interaction also increased descriptively from 61.3% to 71.5%, while No Social Interaction decreased from 37.0% to 22.6%. These patterns suggest that the equipment-supported condition coincided with higher proportions of visible social engagement as well as higher physical activity. However, the proportion of observations coded as Conflict also increased from 1.7% during usual unstructured recess to 5.9% during recess with equipment available. Rather than indicating a straightforward improvement or deterioration in social interaction, these results may reflect an increase in clearly observable social engagement, including positive social interactions alongside occasional disagreement. Equipment may have provided visible starting points for shared play and supported the organisation of group activities. At the same time, equipment use may have required children to negotiate possession, sharing, turn-taking, rules, team formation, and the use of playground space. The observational findings therefore suggest that equipment availability was associated not only with differences in physical activity, but also with changes in the social situations through which play was organised. It is important not to interpret every observation coded as With others as evidence of friendship, inclusion, or positive interaction. Group size and social interaction were coded independently. A child could be observed participating with others while showing no visible social interaction during the brief observation interval. Similarly, being observed alone should not be interpreted as evidence of loneliness, exclusion, or rejection. Solitary participation may have reflected preference, the type of activity, movement between groups, or the brief timing of the observation. The overall social interaction findings therefore describe visible and

situational aspects of playground participation, rather than children's longer-term relationships or sense of belonging. The observation categories cannot establish how children felt about an interaction, whether participation was voluntary, or whether access to a particular group or activity was equitable. These distinctions reinforce the need to interpret the social interaction results cautiously and alongside children's accounts.

7. Strengths and Limitations

This study combined systematic playground observations with a child-centred Draw-and-Tell activity, providing complementary evidence about physical activity, social interaction, and pupils' perspectives on recess. The use of predefined Target Areas, operational definitions, standardised recording procedures, and a five-day pilot phase supported the feasibility and consistent implementation of data collection. Several limitations should be considered when interpreting the findings. As a descriptive case study conducted in a single school, the findings were context-specific and should not be generalised to other settings. In addition, the two recess conditions occurred sequentially and were not randomly allocated or counterbalanced. Differences between usual unstructured recess and recess with equipment available may therefore have been influenced by daily or contextual variation and should be interpreted as associations rather than causal effects of equipment. All observations were conducted live by one researcher, without video recording or a second observer. Interobserver and intraobserver reliability were therefore not formally assessed, and observer judgement or coding error cannot be excluded. Furthermore, the SOPLAY procedure produced area-level physical activity counts rather than individual pupil profiles. It was therefore not possible to determine whether individual pupils changed their physical activity between conditions, and the measurement properties of the original SOPLAY protocol cannot be assumed to apply fully to the modified procedure. The social interaction observation procedure used non-random spatial selection and brief observation periods of ten seconds. As pupils were not individually identified or followed across

scans, the same pupil may have contributed more than one observation. These findings represent pupil-observation records rather than unique pupils and should not be interpreted as estimates of individual behaviour or change over time. The social interaction categories described brief, visible behaviour and did not constitute measures of friendship, loneliness, inclusion, exclusion, belonging, or relationship quality. The Draw-and-Tell activity involved a small convenience sample of pupils available during after-school care. Children's explanations were documented through written notes rather than audio-recorded transcripts, which may have resulted in some detail being omitted. Although the drawings were interpreted alongside the children's explanations, the analysis remained interpretative. Despite these limitations, the study provided a systematic and contextually grounded account of recess within the selected school. Its findings may inform reflection on playground provision and provide a foundation for future research involving multiple settings, independent observers, validated interaction measures, and more robust comparative designs.

8. Implications for practice

The findings suggest several practical implications for the organisation of recess. First, schools should ensure that equipment is accessible before recess begins. In the present study, equipment appeared to help children decide what to do and initiate play more quickly; therefore, making materials visible and available from the start of recess may support more immediate engagement in active play. Second, equipment provision should be varied rather than centred mainly on football or other highly competitive activities. A diverse range of materials, such as balls, hoops, skipping ropes, cones, rackets and open-ended play resources, may create more inclusive opportunities for children with different interests, abilities and preferences. This is important because the findings indicated increases in both walking and very active behaviour, suggesting that equipment can support different forms and intensities of physical activity. Third, schools should monitor not only how active children are during recess, but also how they participate socially. The TA3 findings showed that

high levels of physical activity and participation “with others” could coexist with higher levels of conflict. This suggests that more active recess is not automatically more inclusive. Schools should therefore identify areas or activities where conflict occurs more frequently and consider how equipment distribution, space organisation or adult support could reduce exclusion and support fairer participation. Fourth, adult supervision should support, rather than replace, children’s self-directed play. Since the equipment-supported condition did not involve adult-led games, children retained autonomy over whether and how to participate. However, adults may still play an important role in helping children share equipment, negotiate rules, resolve conflict and re-enter play after exclusion. Finally, children’s perspectives should be included when planning recess provision. The draw-and-tell findings showed that children could identify what made recess enjoyable, easier to organise and more engaging. Consulting pupils about preferred equipment, difficult playground spaces and experiences of inclusion or exclusion may help schools create recess environments that are not only more physical active, but also more meaningful and socially supportive. Overall, these implications suggest that recess should be treated as part of whole-child educational space rather than simply as free time between lessons. Schools should aim to support physical activity, enjoyment, autonomy and peer interaction while also attending to conflict, exclusion and children’s own perspectives.

9. Conclusions

This study examined physical activity and observable social interaction across two recess conditions within a single primary-school playground: usual unstructured recess and recess with equipment available. It also incorporated children’s perspectives through a draw-and-tell activity, enabling the observed patterns of physical activity and social interaction to be interpreted alongside children’s accounts of play, equipment, peers, and playground participation. The observational findings showed clear descriptive differences between the two recess conditions. The proportion of observations classified as Active, combining Walking and Very Active,

increased from 48.1% during usual unstructured recess to 78.2% during recess with equipment available. Correspondingly, the proportion classified as Sedentary decreased from 51.9% to 21.8%. Active behaviour was also higher during recess with equipment across all three Target Areas, although the extent of this difference varied spatially. TA2 showed the largest absolute increase in Active observations, from 25.2% during usual unstructured recess to 71.8% during recess with equipment available. These findings suggest that the availability of equipment was associated with expanded opportunities for physical activity across the playground. The predominant activity findings provided further context for these differences. Usual unstructured recess was characterised by a high proportion of scans coded as No specific activity, whereas recess with equipment available involved a greater variety of predominant activities. Football was the most frequently recorded predominant activity during the equipment-supported condition and was also prominent in several children's drawings and explanations. However, the findings do not demonstrate that football or any particular item of equipment caused the higher levels of observed activity, as predominant activity codes described the main activity visible within a scan space rather than the activity of every pupil present. The draw-and-tell findings helped to explain how equipment may have supported children's engagement. Children's accounts suggested that equipment made play opportunities more visible, helped them decide what to do, and provided practical starting points around which activities could be initiated and organised. Equipment therefore appeared to function both as a physical resource and as a facilitator of play initiation. At the same time, children's experiences were not necessarily uniform, and the findings do not establish whether all pupils accessed or benefited from the available equipment to the same extent. The findings also reinforce the importance of understanding recess as a social experience. Most sampled pupil-observation records involved participation With Others, and Positive Social Interaction was the most frequently recorded social interaction category in both conditions. Compared with usual unstructured recess, recess with equipment available had descriptively higher proportions of observations coded as With Others and Positive Social Interaction,

together with a lower proportion coded as No Social Interaction. However, the proportion coded as Conflict was also higher when equipment was available. The Target Area findings added important spatial context to this pattern. TA3 combined high levels of Active behaviour and participation With Others with the highest proportion of observed Conflict. This finding demonstrates that higher physical activity and greater participation with others do not necessarily correspond to an absence of disagreement. Greater engagement in shared activities may create opportunities for positive interaction while also requiring children to negotiate equipment, teams, rules, turn-taking, and the use of space. The findings do not establish that equipment or any specific activity caused conflict, but they indicate that physical activity intensity alone is insufficient to define recess quality. Taken together, the observational and qualitative findings support a multidimensional interpretation of recess. Physical activity is an important outcome, but it should be considered alongside autonomy, enjoyment, access to meaningful play opportunities, play initiation, observable social interaction, and the negotiation of shared activities and resources. Being observed With Others should not automatically be interpreted as evidence of friendship, inclusion, or belonging. Similarly, being observed Alone should not be interpreted as evidence of loneliness or exclusion. The social interaction findings represent brief, visible, and situational aspects of playground participation rather than comprehensive measures of children's relationships or experiences. These conclusions should be interpreted in light of the study's descriptive and context-specific design. The findings represent repeated area-level and pupil-observation records within one school and should not be interpreted as evidence of individual behavioural change or as demonstrating that equipment caused the observed differences. Nevertheless, the integration of systematic observation and children's perspectives provided a broader understanding of recess than physical activity data alone. In conclusion, accessible and varied equipment may represent a practical means of supporting active and self-directed recess while preserving children's freedom to decide whether and how to participate. However, equipment provision should form part of a broader approach

that considers activity variety, accessibility, playground space, peer interaction, and the management of occasional conflict. Recess should therefore be recognised as a whole-child educational context in which physical activity, autonomy, enjoyment, play initiation, social participation, and children's perspectives are interconnected.

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Appendix A

SOPLAY Playground Observation Form with Adapted SOCARP

Condition: □ Unstructured □ Recess with equipment **Date:**

START TIME	**AREA**	**Contextual conditions**					**Intensity Codes**			**Activity type code**	**Adapted SOCARP Categories**					
											Pupil 1		**Pupil 2**		**Pupil 3**	
		A	U	S	O	E	S	W	V		Group Size	Social Interaction	Group Size	Social Interaction	Group Size	Social Interaction
	TA 1.1										A Wo	P N C	A WO	P N C	A WO	P N C
	TA 1.2										A Wo	P N C	A WO	P N C	A WO	P N C
	TA 2										A Wo	P N C	A WO	P N C	A WO	P N C
	TA 3										A Wo	P N C	A WO	P N C	A WO	P N C

Contextual Conditions
A = Area is accessible
U = Area is usable for physical activity
S = Area is supervised
O = Organized physical activity
E = Equipment provided

Intensity Codes:
Sedentary (S): lying down, sitting, or standing
Walking (W): walking at a normal pace
Very Active (V): running or vigorous activity

Activity Type Code
0. no specific activity
1. fitness/aerobics
2. baseball/softball
3. basketball/volleyball
4. dance/gymnastics
5. soccer/football
6. climbing/sliding
7. jumping games
8. manipulative games/racquet activities
9. tag/chasing games
10. none of the other categories

Group Size Code:
A Alone
Wo With others

Interaction Code:
P Positive social interaction
N No Social interaction
C Physical or Verbal Conflict

Scan protocol

A single scan is conducted from the fixed observation point ("coding station") using the Appendix A recording form.

Observer position and materials

- The observer stands at the fixed coding station, from which all Target Areas (TA1, TA2 and TA3) are visible by turning the head.
- The Appendix A data recording sheet is held on a clipboard.
- The observer follows a constant rotation order: TA1.1 → TA1.2 → TA2 → TA3, repeated throughout recess. The Field was divided into two sub-areas, TA1.1 and TA1.2, which were scanned separately and summed to produce total Field counts.
- The observer attaches three hand tally counters to the clipboard and labels them S, W, and V.

Step 1 — On the observation form, enter the Date, the condition (unstructured or recess with equipment Available) and enter the Start Time for each Area scan.

Step 2 — Record contextual conditions (rapid checklist) before counting activity,

Observer checks whether:

- **A** = Area is accessible (e.g., not locked or rented to others).
- **U** = Area is usable for physical activity (e.g., is not excessively wet or windy).
- **S** = Area is supervised by designated school or adjunct (e.g., YMCA) personnel (e.g., teachers, playground supervisors, volunteers). The supervisor must be in or adjacent to that specific area (i.e., available to direct students and respond to emergencies), but does not have to be instructing, officiating, or organizing activities.
- **O** = Organized physical activity (i.e., scheduled, with leadership by school or agency personnel apparent) is occurring in the area (e.g., intramurals, interscholastic practices, fitness stations).
- **E** = Equipment provided by the school or other agency is present (e.g., balls, jump ropes). The observer does not code 'Yes' if the only equipment present is permanent equipment or equipment owned by pupils.

Step 3 — Conduct the physical activity scan (left-to-right; no backtracking): The observer scans each entire target area, using the hand tally counters to record the number of Sedentary, Walking, and Very Active observations. Classify the predominant type of Activity occurring using the activity type codes at the bottom of the recording sheet. Empty Target Areas are recorded as 0 (zero). Transfer this data to the observation Form and reset the counter.

Step 4 – The observer enters the activity code for the most prominent physical activity in within designated area

0. no specific activity (sit, stand, walk)
1. fitness/aerobics (dance/step aerobics)
2. baseball/softball
3. basketball/volleyball
4. dance/gymnastics
5. soccer/football
6. climbing/sliding
7. jumping games
8. manipulative games/racquet activities
9. tag/chasing games
10. other / none of the above

Step 5 — Complete the social interaction observation immediately after the activity scan for each Target Area. Up to three clearly visible pupils are and observed individually for 10 seconds. If fewer than three pupils were clearly visible, only those available for observation were coded.

For each sampled pupil, the observer records:

- **Group size:** Alone / With others
- **Social Interaction:** Positive Social Interaction / No Social Interaction / Conflict

The codes are recorded immediately after the 10-second observation. The observer then moves to the next Target Area in the fixed rotation order.

Appendix B

Draw-and-Tell Activity Protocol

B1. Materials Checklist

The following materials were prepared for the activity:

- A4 drawing paper;
- colouring pencils;
- researcher note sheets;
- pens for recording pupils' explanations and contextual notes;
- the standardised assent and introduction script;
- the drawing prompt and discussion-question guide;
- folders for the secure collection of completed drawings and accompanying notes;
- access to a scanner for creating digital copies of the completed drawings and notes; and
- secure digital storage for the scanned materials.

B2. Verbatim Introduction and Assent Script

The researcher delivered the following introduction using neutral, age-appropriate language:

"Hello. I am going to ask you to make a drawing about recess.

There are no right or wrong drawings. Stick figures are fine, and you can draw in whatever way you want.

You do not have to draw or answer anything that you do not want to. You can skip a question or stop the activity at any time.

Taking part will not change what happens at recess or during after-school care. I am collecting pupils' ideas to understand what recess looks like to them.

Would you like to take part?"

Verbal assent was obtained each time the activity was offered. Pupils were reminded that participation was voluntary and that they could decline to draw, decline to answer an individual question, or stop participating at any stage.

Neutral acknowledgements were used throughout the activity. The researcher did not evaluate the quality of the drawings or interpret their content while pupils were drawing.

B3. Drawing Prompt

The following drawing prompt was delivered using consistent wording:

"Please draw what recess looks like to you.

Draw where you were and what you were doing.

If you want, you can also draw who you were with."

Pupils were informed that they could include words or labels in their drawings if they wished.

No predetermined time limit was imposed. Pupils were allowed to complete their drawings at their own pace and informed the researcher when they were ready to proceed to the explanation and discussion component.

B4. Core Discussion Questions

After the pupils had completed their drawings, the explanation component began with broad, open-ended questions. The following questions were used to guide the discussion:

1. Can you tell me about your picture?
2. What is happening in your picture?
3. Where are you in the playground?
4. What are you doing?
5. Who else is in your picture?
6. What are they doing?
7. Who are you with?
8. Why did you draw this part?
9. What do you like about what is happening in your picture?
10. Is there anything else in your picture that you would like to tell me about?

Questions were asked only where relevant to the content of each drawing. Pupils were not required to answer every question, and the order of the questions could be adapted to maintain the natural flow of the discussion.

The researcher did not assign meaning to any person, object, place, colour, or activity represented in a drawing. Pupils' own explanations were used to understand what they intended the content of their drawings to represent.

B5. Alternative and Optional Follow-Up Prompts

The following neutral prompts were available when further clarification was required:

- Can you tell me more about that?
- Does this usually happen at recess?
- Why was this part important to you?

- Is there anything else you would like to add?

These prompts were used only when relevant and were not necessarily asked of every pupil. The researcher avoided leading questions that suggested a preferred response or assigned a predetermined meaning to the visual content.

B6. Future-Focused Question

After pupils had explained their drawings, the following future-focused question was asked:

"If you could make recess better in the future, what would you like to have more of or do differently?"

The following optional prompts were used where appropriate:

- Is there any equipment you would like to have?
- Is there another activity you would like to do?
- Is there anything you would change about the playground?

Pupils were informed that their suggestions were being collected for research purposes and would not necessarily result in immediate changes to recess provision.

B7. Step-by-Step Administration Procedure

Step 1: Preparation of the activity space

Before the activity began, the researcher:

1. identified a quiet space agreed with after-school care staff;
2. prepared the drawing and note-taking materials;
3. arranged the materials so that they were accessible to participating pupils;
4. identified the relevant data-collection point and recess condition;
5. prepared the sequential document numbers for pairing drawings with their corresponding note sheets; and
6. ensured that the activity would not interfere with pupils' collection arrangements or after-school care routines.

Step 2: Introduction and assent

The researcher:

1. delivered the standardised introduction;
2. explained that there were no right or wrong drawings or answers;
3. explained that participation was voluntary;

4. informed pupils that they could skip any question or stop participating at any time;
5. obtained verbal assent before beginning the activity; and
6. avoided recording pupils' names or other personal identifiers.

Step 3: Drawing activity

The researcher:

1. provided each pupil with drawing paper and drawing materials;
2. delivered the standardised drawing prompt;
3. informed pupils that they could include words or labels if they wished;
4. allowed pupils to complete their drawings at their own pace;
5. used neutral acknowledgements during the drawing activity;
6. avoided evaluating or interpreting the drawings while they were being produced; and
7. proceeded to the discussion when pupils indicated that they had finished.

Step 4: Organisation of the group discussion

Following completion of the drawings, pupils were organised into groups. Each pupil retained their own drawing during the discussion and was invited to describe and explain it.

The discussion began with broad questions before proceeding to relevant follow-up prompts. No predetermined time limit was imposed, allowing each pupil sufficient opportunity to explain their drawing and respond to the questions.

Step 5: Recording pupils' explanations

No audio or video recordings were made. The researcher documented pupils' explanations as closely as practicable through written notes.

Each written note sheet related to a specific drawing. The drawing and corresponding note sheet were assigned the same anonymous sequential document number. This allowed the visual and verbal records to be considered together during analysis without identifying the pupil who had produced them.

Relevant contextual information was also recorded where necessary, including instances in which a pupil pointed to or referred to a particular part of the drawing. Interpretative assumptions about pupils' non-verbal behaviour were not recorded.

Step 6: Completion of the activity

At the end of the discussion, pupils were asked whether there was anything else they wished to explain or add. Pupils were thanked for their participation using neutral, non-evaluative language.

The completed drawings and corresponding written notes were collected and prepared for secure storage.

B7. Anonymity and Document Labelling

The drawings and accompanying written notes were anonymous from the outset. No names, initials, pupil numbers, participant codes, or other personal identifiers were recorded on the drawings or note sheets.

The materials were labelled only according to:

- the relevant data-collection point;
- the corresponding recess condition;
- the type of record, such as drawing or written notes; and
- an anonymous sequential document number.

The sequential document number was used to pair each drawing with its corresponding written note sheet. It identified the research documents rather than the pupil and was not connected to a participant list, school register, consent record, or any other source of personal information.

B8. Scanning, Cropping, and Checking Procedure

Following data collection, the drawings and corresponding written notes were scanned to create digital copies for secure storage, data management, and analysis. The following procedure was applied

B9. Secure Storage, Data Management and Analysis

The original drawings, accompanying written notes, and scanned digital copies were stored securely in accordance with the study's data-management arrangements. Access to the research materials was restricted to the researcher and authorised academic supervisors, where applicable.

The files were organised by data-collection point and recess condition. No separate identification key was created because no names, participant identifiers, or other personal information were collected.

The drawings were analysed alongside pupils' verbal explanations and used as complementary visual data to support and contextualise the themes identified through the Draw-and-Tell activity.

Selected drawings were reproduced in the findings chapter to illustrate and support relevant themes. Before inclusion, each selected drawing was checked to ensure that it contained no information that could identify an individual pupil. The drawings were used to complement and contextualise the thematic findings rather than as stand-alone evidence detached from pupils' explanations.