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Using a Participatory Approach to Explore What Young Girls and Their Teachers Want from Physical Activity Interventions in Primary School

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ABSTRACT

Evidence suggests that young girls are less likely than boys to be physically active at school and are less responsive to physical activity interventions. This study employs a participatory case study approach to explore what young girls and their teachers want from physical activity interventions during the school day. The project aims to distance itself from a hierarchical researcher-participant dynamic and make sense of the issues through a shared conceptualisation and co-researching partnership. One class of British Year 2 girls, their class teacher and their head teacher participated in this study. The girls and their teachers designed their own physical activity intervention, implemented it, measured changes in step count (using pedometers) pre- and post-intervention and reflected on the process. Qualitative data were gathered via focus groups with the girls and semi-structured interviews with their teachers. Key themes that emerged were a desire for choice in how they were active, and an interest in working together as a team within a social framework to increase activity.

KEYWORDS

physical activity, girls, primary school, interventions, participatory research

Introduction

"Are you going to suck the joy out of playtime?"

asked a 7-year-old as I explained my study to a class of Year 2 girls in a primary school in England. This simple question confirmed my desire to adopt a participatory approach and examine, through the child's eyes, how young girls want movement integrated into their school day while avoiding "*sucking the joy out of playtime."* What do young girls want to do to be physically active during the school day? How can teachers be supported to ensure they provide opportunities for physical activity at school? What do young girls' and their teachers do when asked to develop their own physical activity intervention?

This paper explores the experiences of young girls and their teachers in a primary school in England and investigates how they want physical activity to be structured during the school day. It reports on a small mixed-method case study – exploring their definitions of what physical activity is, how they want activity to occur within their specific context and what they want to do within this self-defined framework. The central tenet of this study is a participatory focus, stepping away from

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a prescriptive expert-led pedagogical approach towards a child-led enactive sense-making ideology rooted in the children's own experiences and desires (De Jaegher, 2021).

Social and Political Background to this Research

Physical activity is defined as any bodily movement produced by skeletal muscles that requires energy expenditure (WHO, 2020). Regular physical activity is known to provide significant benefits for both physical and mental health. Recent guidelines by the World Health Organisation (2020) suggest that, whilst moderate to vigorous or 'out of breath' activity is preferable, any physical movement is better than none.

Yet, despite this recommendation, there is a global recognition that most young people are not active enough to support good physical and mental health (Jansenn and LeBlanc, 2010). Governments have responded to this activity shortfall by recommending minimum levels of activity. For primary aged children in the UK, the government recommends that they should engage in one hour of '*out of breath'* activity every day, and that half an hour of this should occur during school hours (WHO, 2011).

Currently, UK children fall short of this recommendation. A recent report by Public Health England (2020) found that, in primary schools, only 20% of boys and 14% of girls were achieving the recommended 60 minutes a day of '*out of breath'* activity (NHS Digital, 2020). Given the extensive evidence that physically active children benefit from better strength, fitness, weight maintenance, executive function skills as well as showing more positive mental health than their less active counterparts (Donnelly et al., 2016; Ahn and Fedewa, 2011) - increasing activity is an important focus for the research community.

School-Based Physical Activity Interventions

In response to this deficit, multiple attempts have been made to increase the volume and intensity of physical activity that children engage in during the school day (Johnstone et al., 2018). Many of these studies are robustly designed as randomised controlled trials (RCTs) and clustered randomised controlled trials (CRCTs), following Medical Research Association guidelines with the aim of producing valid, reliable and generalisable data that can be applied at a population level (Montgomery et al, 2018).

Within this body of research, several features have emerged as contributing to higher levels of activity at school. Van Sluijs et al. (2007) and Kriemler et al. (2013) conducted extensive systematic reviews of school physical activity intervention studies and concluded that the most successful took a multicomponent approach - embedding the intervention into school life by combining educational, curricular and environmental elements, rather than isolated educational (Van Sluijs et al., 2007) or curricular changes (Salmon et al., 2007).

Yet, despite this raft of rigorously designed school-based interventions, overall success rates remain low (Van Sluijs et al., 2007). Translating interventions into real life school contexts is problematic, with few studies making a sustainable difference to children's activity levels over the long term. It seems that the effectiveness of interventions is mitigated by a range of external and internal factors including gender, socio-economic status, cultural and familial heritage, context and experience (Hyndman, 2013).

Gender Disparity in Physical Activity at School

The lower activity levels of girls at school is of particular interest to us. Health Researchers have explored this disparity by examining the activities that girls and boys choose to do and the contexts within which they do them (Hyndman, 2013; Ridgers et al., 2012; Brusseau et al., 2016). Hyndman and Lester (2015a) identified free time at school as a key differentiator. They suggest that, at school playtime, boys often take the opportunity to play group competitive games commonly using sports equipment associated with vigorous activity (Blatchford et al., 2003). In contrast, girls are more interested in socialising with their friends (Blatchford et al., 2003; Robbins et al., 2013). Connecting girls' desire to socialise with being physically active is currently an under-researched area, particularly within the school context.

This is important because evidence suggests that, for girls in particular, the school environment plays a unique role in encouraging physical activity. Despite mixed evidence, it seems that, by adolescence, girls are more active *during* the school day compared to evenings and weekends (Owens et al., 2019; Fairclough et al., 2012), linking activity levels to the structured nature of school and the opportunities it affords for physical movement. In contrast, boys are often more active after school and at weekends (Owens et al., 2019; Brazendale et al., 2021). In addition, Biddle et al. (2014), in their meta-analysis, suggested that girls respond better to physical activity interventions that are short in length and aimed specifically at them (although the number of studies included in the meta-analysis was small, so evidence should be viewed with caution).

Together, these findings have led researchers to acknowledge school as an important environment for targeting girls' physical activity levels. Given this evidence, situating physical activity interventions into existent behaviours that young girls already engage in seems to be an appropriate avenue for further investigation.

Establishing positive behaviours at an early age and raising their activity levels before they leave primary school may help increase overall physical activity behaviour amongst girls and, in addition, prevent the greater drop off in physical activity that occurs during their adolescent years (Minano et al., 2011; Biddle et al., 2014).

Purpose of the Present Study

In this study, we explore what young girls and their teachers want from a physical activity intervention at primary school using a mixed method case study approach. We asked three research questions:

1. How do young girls conceptualise physical activity at school?
2. What features do young girls and their teachers want to include in a physical activity intervention?
3. How do young girls and their teachers evaluate their own physical activity intervention?

To encourage self-expression and discovery (Skar et al., 2016), we adopted a participatory enactive sense-making approach (De Jeagher, 2020). A participatory approach refers to a process of 'cooperative inquiry' aimed at engaging participants as co-researchers throughout the research process from design to evaluation (Cumbo and Selwyn, 2022). Enactive sense-making (De Jaegher, 2020) is an approach originally designed for conducting research with the autistic community but is suitable for other populations. It proposes that a productive way to research the needs of individuals within a known context is to create shared meaning, allowing practice and ideas to be mutually generated

rather than imposed. De Jaegher (2020) summarises this approach as a process of 'letting it be', allowing everyone to bring their own experiences and desires to the table so interactions result in full and meaningful 'sense making'. This approach seemed appropriate to the current study where context and experience are key considerations.

We examined these issues via a four-phase research process which is outlined in Figure 1 below. The process began with Phase 1 (Design) which included a qualitative exploration of young girls' understandings and desires regarding how they wanted physical activity to occur at school. Semi-structured interviews with their class teacher and head teacher were also conducted to explore their views of how movement could be integrated into the school day with minimum disruption. Including teachers was a crucial element of the research design as teacher buy-in is an essential part of any initiative that requires a change in student behaviour (Weatherson et al., 2017). This initial phase (Phase 1) was used to develop ideas for a physical activity intervention that would make sense to them within their own experience and context. The ideas that they generated were implemented as an intervention in Phase 3.

During Phase 1, pedometers were selected as the most appropriate tool for measuring activity levels at school. Pedometers have the advantage of being simple to use providing an easy to understand metric of 'total steps'. They are also known to encourage children to engage in higher levels of activity. A disadvantage of pedometers is that they cannot measure activity intensity, only total output. This is an accepted shortfall of using pedometers given their other advantages. Phase 2 (Control) began with the participants wearing pedometers every day at lunchtime play to establish a baseline of how active the girls were. In the following week (Phase 3), the ideas that were generated by the girls and their teachers in Phase 1 were implemented as an intervention and a second week of pedometer data was collected to assess how implementing their design ideas impacted their activity levels. Phase 4 involved another focus group with students and a semi-structured interview with the class teacher to gain their qualitative reflections on their experience.

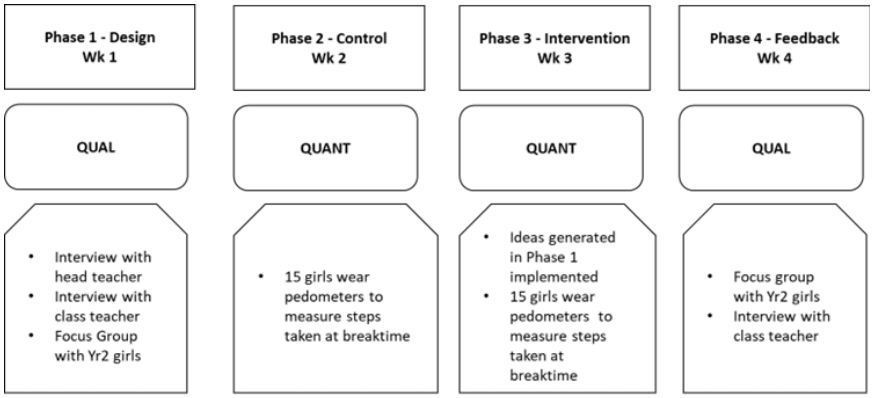

Figure 1: *Research Design*

Method

A single sex primary school in England agreed to participate in this study. A single-sex environment seemed important, as it allowed the girls to express their views without influence (Hughes, 2006). Convenience also played a part as we had an existing relationship with the head teacher who had expressed an interest in exploring ways in which activity levels could be supported during the school day.

We consulted the British Educational Research Association Guidelines (BERA, 2018) and sought ethical permission from the University of Cambridge. We also applied for a Disclosure and Barring Service check (DBS). Written informed consent was obtained from the head teacher and class teacher. We also sought informed consent from the girls' parents via a letter sent home (both by school email and physically in their school bags). All parents agreed to their child taking part in the study. Before proceeding, we explained the study to the participating girls, seeking their verbal consent and informing them that they could withdraw at any time without consequence.

Sample

The sample included 15 Year 2 girls. Ages ranged from 6 years and 5 months to 7 years and 5 months, and the mean age was 6 years and 10 months. Ethnically, 11 of the 15 participants were White British, 3 were British Asian and 1 was Chinese. None of the participants had taken part in a similar study before. The class teacher was very experienced, having taught at the school for 20 years. The head teacher had been recently appointed but was an experienced teacher, who had been qualified for eight years and had worked at the school for three years prior to being promoted to head.

Design and Results of Phase 1

The four stages of the mixed method case study are explained in greater detail below.

As mentioned, Phase 1 began with two semi-structured interviews with the head teacher and class teacher to explore their perspectives on physical activity in the school day and how it could be supported effectively within their context. The interview schedule was deliberately loosely structured and open-ended to add to the sense of partnership between researcher and participant (Pickerill et al., 2021). Three key questions were used to stimulate discussion. Firstly, how do you think physical activity could be supported in your class/school? Secondly, how could physical activity be used to support your teaching practice/governance? And thirdly, what features of physical activity in school are of interest to you?

A focus group with the 15 girls also took place. The group began with each girl drawing pictures of how they viewed physical activity. Examples of the pictures are shown in Figure 2 below. They were invited to draw one or multiple pictures, depending on their preference. The pictures clearly demonstrated their conceptualisations of physical activity as sport, often related to the use of equipment. The majority showed images of running, skipping, playing rounders, playing frisbee, jumping and games of football. Next, they were asked what they thought 'being physically active' meant to them. Again, they referred to a limited conceptualisation of organised sports and games. Their answers included *"running", "jumping", "playing with the skipping ropes", "frisbee", "playing football"* - activities related to traditional physical activities rather than a more adaptive view of movement and active play. When prompted by the interviewer to think of other definitions they mentioned "*playing with your friends"*, "*walking"* and "*tidying your classroom."*

This was followed by a group discussion exploring how they would like physical activity to occur within the school day. Such a large group can be difficult to moderate but, given their familiarity with each other, and a remit of generating ideas and stimulating discussion, it seemed an appropriate method for this age group (Adler et al., 2019). Again, the topic guide was kept open and loose in structure. The key questions used to stimulate discussion were, 'How do you think about physical activity at school?'; 'When would you like to be active at school?'; 'How do you like to be active?' and 'What features of being physically active interest you?' Both interviews and the focus group were audio

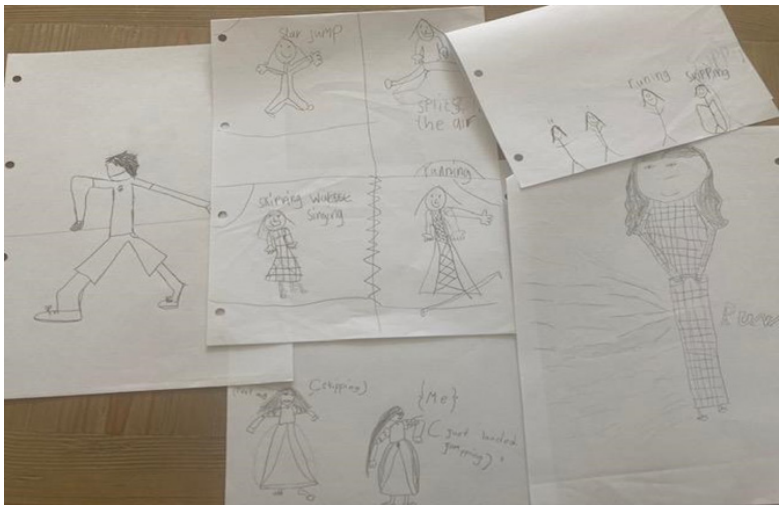

Figure 2: *Some examples of the pictures drawn to depict physical activity*

recorded with the permission of the participants and transcribed. The ideas generated by the class teacher, head teacher and students are documented in Tables 1 and 2 below.

Table 1: *Phase 1 feedback from class teacher (CT) and head teacher (HT) - How do you want physical activity implemented into the school day?*

Source	Phase 1: Design Ideas	Feedback
CT / HT	Fitting into the existent school day	"*It has to be something that fits in with what we are doing with them anyway.*" *"It makes more sense if it's integrated into an existent activity with a focus on making something they do already more active."*
CT / HT	Different to Physical Education lessons (PE)	*"It mustn't feel like PE."* *"One or two girls that are never interested in PE and sit on the side, chat and don't try very hard.. they would benefit most."*
CT	Piggybacking on existent activities such as playtime	"*Something that they could be doing anyway… that they don't have to make a special effort for… like focusing on increasing activity at playtime."*
HT	Measurement	*"It would be good to know how active the children really are."* *"It would be nice to know how active they are and if any intervention actually makes a difference."*
CT / HT	Clear and understandable feedback	*"They would love feedback… like using a pedometer,"* but it also needed to be *"understandable and clear."* *"It needs to measure but be something simple that they can easily understand and relate to."*
CT	Ownership	*"They love new kit or anything that gives them responsibility for something."*
CT / HT	Competition and comparison	"*I would rather it didn't make them compete with each other."* *"It would be nice if it encouraged them to work together as a team and feel part of something."*
CT	Encouraging teamwork and peer support	"*If we could try and encourage the more active ones to help or work with the less active it might be positive for all of them."*

Table 2: *Phase 1 feedback from Students (S) - How do you want physical activity implemented into the school day?*

Source	Phase 1: Design Ideas	Feedback
S	Peer support	*"We like doing things together as a whole class so we can help each other."*
S	Teamwork	*"Can we be active as a team?"*
S	Non-competitiveness	*"I like doing things together but not as winners and losers."*
S	Enjoyment and friendship	*"Can we make it about doing things with our friends? Things you do with friends make it more fun."*
S	Choice / No formalised activity	*"Can we choose what we do in our own way, so we don't have someone telling us how to be active, but we do it ourselves?"* *"I do not want it to be like PE where you must do what you are told and keep quiet when the teacher's talking. Can it be something that we do ourselves… like playing games and jumping together?"*
S	Feelings and emotions	Two participants suggested that they would like to know how being more active *"makes us feel"* to see if *"it makes us happy or sad."* *"I want to know if being more active makes me happy."*
S	Measurement and feedback	They unanimously agreed that they would like to '*know*' how active they were. One girl volunteered that she would like to know *"how far we go and how many steps we take. My mum has a Fitbit, and she knows what she does every day."*
S	Group identity	*"Can we have a team name that we get to choose so we can call ourselves that name every time we want to be active."* *"I'd like a team outfit that we wear at play time, so we know we're a team together."*
S	Playtime	*"Can we do this at playtime as it's hard in the day as we sit down for lessons, and we're not meant to get up and down?"*

The ideas generated in Phase 1 and documented in the previous two Tables were amalgamated into Table 3 below by the Researcher to summarise how suggestions made at Phase 1 were integrated into the Intervention designed to take place in Phase 3. The data was amalgamated then discussed with the class teacher, head teacher and girls to ensure their design ideas were accurately represented. The ideas generated by the girls were the starting point for this discussion, with the ideas generated by the class teacher and head teacher in a supportive role. Interestingly, most ideas generated by the teachers

aligned closely with the students' suggestions.

Table 3: *Linking Design Ideas generated at Phase 1 to Intervention Design*

Source	Phase 1 Suggestions	Phase 3 Intervention
HT/CT/S	Measure activity levels. Provide *proof* of effectiveness of any intervention. Measurement tool that school could self-administer again if desired.	Use pedometers (Yamax Digi walkers) to measure steps taken at lunchtime play and note changes pre- and post-implementing the intervention designed by the girls.
HT / CT HT S	Fit into existent school culture. Minimal burden on staff. Not PE / free to do as they choose.	Participants free to choose how to be active at school playtime.
CT / S	Define their own movement.	Participants generate own ideas of how to increase their movement.
HT / S CT	Make it meaningful to them. Integrate into learning and the curriculum.	Explain to participants why they are being asked to do this. Integrate concept of movement into KS1 lesson on ‘Healthy Living’ later in the term.

Design of Phase 2

Once the features of the Intervention were agreed, the Control week (week 2) began. On day 1 of week 2, each child was issued with their own pedometer and shown how to attach it correctly. They were instructed to wear their pedometer on the dominant side of their body, attached to their waistband in line with procedures outlined by Fontana et al. (2015) every day at lunchtime play. This allowed a free playtime of approximately 50 minutes, which was recorded daily by the class teacher. They were asked to play normally, consistent with standard behaviour. We were aware that this approach was a potential limitation in our research design. Given evidence that using pedometers tends to encourage more active behaviour (Xiangli Gu, 2018) it was unlikely that we truly measured 'normal' behaviour during the Control week. However, given our interest was in a pre- and post-intervention comparison to assess whether the implementation of the participant designed intervention impacted step count activity, this was not a significant concern.

Design of Phase 3

In week 3, the ideas generated and agreed by the participants in Phase 1 were initiated. The intervention features that the participants suggested are outlined in detail in Table 3. They included the freedom to choose how they were active during playtime with no prescribed agenda for how movement occurred. They also wanted to use pedometers to measure step count which would be fed back to them daily as a class average to avoid individual competition. In line with their desire to feel united as a team, a poster was drawn with their designated Team Name (the 'Year 2 Ninja Warriors') and stuck to their classroom door. Active caps with #ThisGirlCan were issued to each participating child which they wore at lunchtime play every day to increase their sense of togetherness. The caps are shown in Figure 3 below.

Figure 3: *Caps worn by girls at lunchtime play during the Intervention*

In line with their desire to understand how being active made them feel, an Affect Chart (see Figure 4 below) was designed and produced collaboratively with the girls and put up on the notice board in the classroom. Each morning, they documented their mood by adding their name to 'the sunny side' if they were in a good mood, 'the cloudy side' if they were in a bad mood or the 'blue sky' if they were feeling neutral. They were asked to move their name at the end of the school day if they felt their mood had changed as the day had progressed.

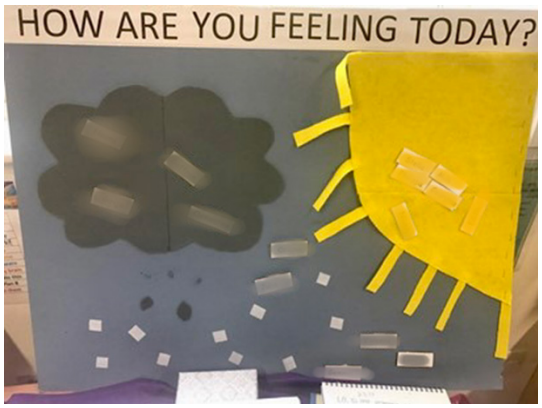

Figure 4: *Affect chart showing how the girls moved their names to the sun or the cloud depending on how they were feeling*

In week 3, a quantitative assessment of steps taken at lunchtime play was initiated for a further week to assess any changes in step count between weeks 2 and 3 to assess any changes in activity levels post-implementation.

Design of Phase 4

In week 4, qualitative feedback was sought from participants so that they could evaluate and reflect on the process and their experiences. Feedback was gained via a semi-structured interview with the class teacher and a focus group with the students.

Results

Establishing whether the concepts and design ideas generated by the teachers and girls were 'effective' at increasing the children's desire to be active at playtime was not a key outcome objective of this study. The main objective was to explore what features young girls would want to include in a physical activity intervention and how they would want them integrated into their school context. The purpose of this was to gain insight into physical activity interventions that would make sense to them and be meaningful, with the view that behaviours that are relevant are more likely to be sustained over time.

However, changes in step count between the control and intervention week were of interest to the participants, and in line with a participatory approach, the results were shared and discussed. Overall step count at lunchtime increased between week 2 (control) and week 3 (intervention). During the control week (baseline) the class took a total of 173,171 steps during lunchtime play, and in week 3 (intervention) this increased to 205,868 steps – an increase of 19%. At the individual level, each child walked a mean 2,922 steps each day at lunchtime play in week 2 (control), and 3,431 steps in week 3 (intervention week) - a mean increase of 509 daily steps (+ 17%). In total, 14 out of 15 children increased their total weekly lunchtime activity levels between the control and intervention weeks. The range of increase varied significantly (from +2 to +6035 steps). Consistent with previous research (Metcalf et al., 2012), 2 out of 3 of the least active children in the control week showed the biggest increase in step count (+6035, +3704 respectively) even though differences were small. Given the small sample size and case study approach, these results are not statistically significant. However, they do open a conversation about the importance of contextually embedding interventions into the existent structure and distancing the intervention from a pedagogy of expertise and control.

Data from the post-intervention semi-structured interviews and focus group were analysed thematically by the main researcher (Braun and Clark, 2021). Four key themes emerged, and data is reported within this thematic framework - although it should be noted that the themes are not mutually exclusive.

Group Identity

Having a sense of group identity emerged as an important theme. When asked which aspects they felt encouraged higher levels of activity, wearing active caps and their group name were mentioned - "*I loved us all wearing our active caps together. It made us feel like a team and we could find each other in the playground easily."* The sense of being part of a team and having a group name helped remind them to stay active through a shared identity - *"I really liked being Year 2 Ninja Warriors and felt like I wanted to run around more when I thought of our name." However,* there were some negative connotations. Their shared identity resulted in social pressure to be active even when they did not want to. One child commented that "*being a Ninja Warrior… I had to keep going and sometimes I did not want to run around as much as that... I wanted to sit and talk to my friends."*

The class teacher also felt that active caps were beneficial in enabling a common goal. She mentioned that *"they had lots of fun, and all came rushing in after lunch to put their caps and pedometers on."* She also felt they encouraged more cohesive play as they *"played together as a class more than normal… they provided a shared identity which I think helped."*

Collaboration and Teamwork

Throughout this intervention, children were required to be collaborative through combining their efforts in a way that was different to their normal school experience. When asked if they felt that the intervention changed the way that they played, the children commented that co-operation between them had improved. They commented that *"we did more games together this week"* and *"it made us play together more."* The intervention also provided the children with authentic opportunities to play with children that they had not previously played with. As one child stated, *"I don't normally play with (name), but we did this week and we had fun."* It also encouraged them to include children who were left out because of a shared goal, stating, "I *asked (name) to play with me, as she was sitting on the buddy bench, and nobody was playing with her, so she wasn't doing her steps…."*

Feelings and Emotions

Making the connection between how they felt and how active they were that day was also of interest to the girls. In the discussion, one girl commented that "*my feelings changed on days when we did more… one morning I was on the cloudy side when I came into school and we had a really busy playtime that day and when I came back in, I moved myself to the sunny side."*

Another positive was that the girls *"were proud of what they had achieved"*and were keen to share what they had done with their parents. The class teacher commented that the girls were keen to present this study to their parents in a school assembly. She said *"when I told them we were doing an assembly for their parents and asked them what they wanted to cover… they all said they wanted to do this research… They wanted to wear their caps and talk about what they did."*

Contextual Integration

The importance of situating any intervention within an existent context and 'letting it be' was raised by the participants and the class teacher. One girl commented that *"I liked that it was our playtime,*

and we could choose… if we wanted to jog on the spot and chat, we could." The class teacher also commented on the importance of embedding the intervention into the lived experience of Year 2, saying "*I liked that it was meaningful in terms of learning, asking them to work together… the group discussions… and they always love things that mean they have to leave the classroom and go outside".*

Discussion and Conclusions

A limitation of this research is that it is a case study conducted in one British school with a small number of participants using data collected over a brief time frame. Further research is required before results could be generalised to a wider population. However, it fulfilled its purpose of exploring how young girls conceptualise physical activity and how they make sense of physical movement within their own specific context and experience. Typically, school based physical activity interventions have taken a more structured approach, introducing formal activity breaks in lessons or adding additional physical education (PE) classes to the curriculum (Love et al., 2019). In comparison, this study has taken an unstructured child-led approach allowing the participants to decide when and how they are active at school. Its intention is to spark a conversation about participant-led, implemented and evaluated physical activity interventions in comparison to expert-led pedagogies. By enabling young girls and their teachers to generate their own ideas of how they wanted to be active at school, it is hoped that this could provide an avenue for investigating more sustainable interventions in the future.

It also spotlights the incidental nature of movement that girls choose to engage with during the school day. They wanted an intervention that took place at playtime when they were free to move as they wanted. They wanted feedback and to understand how active they were each day whilst avoiding competition between them. The themes that emerge support existent evidence that young girls tend to be more open to activities that allow them to be sociable, collaborative and to spend time with their peers. This was also supported by their desire to feel like part of a group or team. They also expressed an interest in exploring their emotional response to movement and how it felt to be active at school. It would be interesting to explore if this is replicated in other studies with young girls. Autonomy and control were also important - allowing the participants to choose how and when they were active within their own context. A participatory approach was used to encourage an open dialogue between participant and researcher and to move away from an expert-led pedagogy towards participant-led sense-making. This approach is in line with the goals of this study, and it is hoped that, through participation, a more nuanced view of how girls want to be physically active at school has been achieved. In terms of intervention design, involving girls in the decisions that affect them seems to be a productive approach. It is hoped that through '*letting it be'* and beginning the design process with the school context and culture at the centre, this research will contribute to our understanding of what young girls want from physical activity at primary school. It certainly seems an interesting avenue for further research.

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