



Is physical activity a pathway to culturally and linguistically diverse children's participation in early childhood education and care?

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ABSTRACT: The Finnish early childhood education's main principle is to guarantee all children's and families' rights, prevent segregation, and enhance equality, inclusion, diversity, participation, and communality. Physical activities are one significant way to support all children's well-being and participation. According to previous studies physical activities were also connected to participation among culturally and linguistically diverse children (Arvola, 2021; Arvola et al., 2020).

The study aims to find out if physical activity is a pathway to culturally and linguistically diverse children's participation. This study is a part of the large Progressive Feedback research results gathered in Finland (see <https://blogs.helsinki.fi/orientate/>). The main method of the study is systematic observation. According to these results, culturally and linguistically diverse children move enough during their day care day, but they were more often interrupted, less involved, and less participative in their activities. Physical activity was related to continuous involvement. The most increasing physical activity was in sustaining intense involvement: a third of all movement happened in high involvement. The observation results indicate that physical activity is related to increased involvement and building social processes among culturally and linguistically diverse children.

Keywords: *multicultural early childhood education and care, physical activity, linguistically and culturally diverse children, participation*

Introduction

This article focuses on the physical activity of culturally diverse children in Early Childhood Education and Care (ECEC). However, as important physical activity is, it may also have connections with children's other important development processes and social interaction. We hope that the results of the study help the ECEC staff to use physical activity to enhance, in addition to physical well-being, children's learning, and participation.

This research data is gathered in Finland. In the global world, migration flow is constantly increasing (Martikainen & Pietikäinen, 2020). We need active actions to support the inclusion and involvement of families and children coming to Finland and living here with different cultural and linguistical histories. At this moment, we are also having the biggest refugee crisis since Second World War (Ministry of the Interior, 2022).

We already have research of children and families with diverse background in Finnish ECEC (see Arvola & Lastikka, 2022; Arvola, 2021; Alisaari et al., 2019; Lamminmäki-Vartia et al., 2021; Lastikka, 2019; Rissanen et al., 2016; Ojala, 2020; Paavola, 2017; Poulter et al., 2021). We also have international research, especially comparative research in the Nordic countries (See for example Hellman et al., 2017), but it is still crucial to get more research on how to enhance all children's participation and dialogue in daily actions (Arvola, 2021; Kangas et al., 2021; Ministry of Education and Culture, 2019). Especially studies on how to increase culturally and linguistically diverse children's participation through physical activities in ECEC are still rare and need more evidence. In this article, we fill the research gap in this research area.

Finnish Early Childhood Education and Care highly promotes inclusion

The main principle of the Finnish Act on Early Childhood Education and Care (2018) and The Finnish National Core Curricula both for Pre-Primary Education and for ECEC (Finnish National Agency for Education, 2014; 2022) is to guarantee rights to all children and families, prevent segregation, and enhance equality, inclusion, diversity, participation, and communality. These principles are concretizing in daily actions between all children, guardians, and educators.

Inclusion is closely connected to children's involvement and participation in ECEC. It is based on the value that everyone has the right to be seen, heard, and noticed. (Felder, 2018). Values and attitudes are based on equality and guaranteeing the same rights to every child and family (Viitala, 2019). Inclusive education is seen as a process with open access for all, and where there is the possibility to see options instead of limits (Loreman, 2017; Mittler, 2012; Ragnarsdottir & Kulbrandstad, 2018; see also Kangas et al., 2021).

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Multicultural ECEC is a part of an inclusive understanding that the child is always valuable with the child's cultural, linguistical, and worldview backgrounds. The term diversity is often used when discussing the ethical, worldview, or linguistic backgrounds of children (Ragnarsdottir & Kulbrandstad, 2018). When researching cultural, linguistical, and worldview diversity in ECEC, it is still complex to find the exact and the most usable term to clarify the term (see for example Paavola, 2017). In this study, culturally and linguistically diverse children is used as a large term for all children living in Finland, no matter what is their cultural or linguistical background or if they are born in Finland or somewhere else, and who live in Finland with one or two immigrant guardians. The research data of this study consists of children and families, who belong to several different nationalities or ethnic groups (See also Arvola, 2021; Lastikka, 2019).

Physical activity promoting children's participation

According to recommendations, young children need at least three hours of physical activity and should engage in moderate-to-vigorous physical activity (MVPA) for at least 60 minutes per day throughout the day at home, at school, or in the ECEC (Kyhälä et al., 2018; Kyhälä et al. 2020). According to a recent Finnish research and development project, over 90 % of the children achieved the recommended three-hour level of light to vigorous-intensity physical activity, but only 46–85 percent of children reached the recommended level of one hour of moderate to vigorous-intensity physical activity (Sääkslahti et al., 2021.)

Children's active participation has been on the agenda in legislation and policy, the practical field, and in research on ECEC over the last 20 years, both in Finland and internationally. (Act on Early Childhood Education and Care, 2018; Brooker, 2017; Corsaro, 2018; Correia et al., 2021; Emilson & Johansson, 2018; Finnish National Agency for Education, 2018; Finnish Government, 2021; Heiskanen et al., 2021; Nivala, 2021; Turja, 2011; United Nations, 1989; Weckström et al., 2022.) In this article, the term participation is seen as an experience of being part of a group or a community, having meaningful social relations, and the experience of having the opportunity to influence matters that are relevant to you (Karlsson et al., 2018; Nivala, 2021). According to Kangas (2016), children's participation in ECEC is based on the child's experience of being listened to and being involved.

Understanding the meaning and connection of every child's physical activity and participation, research on the relationship between children's participation and physical activities in ECEC is still rare and needs more attention. According to previous results of Finnish children's physical activities and play it was seen that children were committed to the activity when they were having physical activities. When the child was deeply committed and the level of physical activity was moderate to vigorous, the child's participative social role was higher. Vigorous physical activity was connected to higher

levels of participation. Positive emotions like joy and happiness were also connected to physical activities. MVPA was connected to shared, common actions together. Other children were crucial to the children's actions and participation: togetherness with others correlated with a higher level of physical activity (Kyhälä & Reunamo, 2022).

According to previous Finnish studies, physical activities are a good way to increase participation and inclusion, especially among culturally and linguistically diverse children. The results also show that linguistically and culturally diverse children have more challenges connecting to the shared situation (Arvola et al. 2017; Arvola, 2021; Arvola et al., 2020). These results are similar to the results of Nordic studies (see for example Kibsgaard, 2017; Zachrise, 2015).

According to Laevers (2003; 2018) when a child is at the highest level of involvement, the action takes place in the zone of proximal development. Vygotsky's (1978) zone of proximal development (ZPD) is crucial when involving the child in the commitment and actions. Involvement is an indicator of deep processing of the activity the children attend to. A deeper processing and creative progression of the activity helps the children to learn during the activity and a deep involvement integrates children's processes.

Children have different roles in ECEC, and they see the possibility of social change differently. In this article, social orientations are contextualized and operationalized using the Vygotskian and Piagetian assimilation-accommodation process and it is based on Reunamo's theoretical model of children's orientations. The model, based on four different orientations, accommodative, participative, dominant, and withdrawn orientations, is used in observation (Reunamo, 2007). In participative orientation, the situation matters to the child; interaction with other children and a children's agency is crucial (Nikkola et al., 2022). Participation in this research means children's openness to others and at the same time impacting or changing the course of the activity. This orientation results in building social processes together with other children. The dominating role means that children have their closed ideas that they pursue without considering others' ideas. In practice, this means that these children spent more time without a shared connection to the changing situation. By observation definition, adaptation means openness to others in the situation but not impacting or changing the situation. These children are part of an interaction with other(s), but they do not act to change the course of events. Withdrawnness is defined as not considering others' ideas and at the same time not trying to change others' situations (see for example Reunamo, 2007; see also Arvola, 2021).

Study design

This study is based on extensive observation of children. The sample is large, consisting of more than half of Finnish early education. Because the observation includes all activities between 8:00 and 16:00 hours we can get a comprehensive picture of children's activities. The data has been collected in the Progressive Feedback project, which is an ECEC research and development project (See more about the project <https://blogs.helsinki.fi/orientate/>).

Research question

The main research question of this study: Is physical activity a pathway to culturally and linguistically diverse children's participation? In this research, participation means that the child is connecting with others and impacts the social context (see observation instructions below).

1. How physically active are linguistically and culturally diverse children?
2. What kind of involvement do the linguistically and culturally diverse children have in physical activities?
3. What kind of social roles do the linguistically and culturally diverse children have in physical activities?

Participants

There were 938 linguistically and culturally diverse children participating in the study. The physical activity and involvement of these children have been compared with native Finnish children (N = 4998). Altogether, there were 25 064 observations of linguistically and culturally diverse children and 134 898 observations of children with Finnish background. The mean age for the linguistically and culturally diverse children was 51.9 months (SD = 18.8 months) and for the children with Finnish background 53.9 months (SD = 19.7 months).

Of the linguistically and culturally diverse children, there were 48.5% (N = 455) male, 51.0% (N = 478) female, and 0.5% (N = 5) other children. Of the children with native background, there were 51.9% (N = 2594) male, 47.7% (N = 2384) female, and 0.4% (N = 20) other children. The linguistically and culturally diverse children had been present in the observed ECEC unit on average 18.1 months (SD = 14.4 months) and the children with native background had been present on average 19.2 months (SD = 14.1 months). Of the linguistically and culturally diverse children, 10.2% had special needs and of the children with native background, 5.3% of the children had special needs. The participants were from twenty different municipalities mainly from southern Finland. The municipalities

were mainly larger cities, not small municipalities with fewer linguistically and culturally diverse children.

Methods

All children's activities were observed by systematic observation. The groups, days, and times of observation were randomized. The educators and guardians were informed about the research beforehand and during the data collection. The core ethical principles (reliability, honesty, respect, and accountability) of the European Code of Conduct for Research Integrity (All European Academics, 2017) and Research in the Humanities and Social and Behavioural Sciences and Proposals (Finnish National Board on Research Integrity TENK, 2019) have been noticed in this. Participants had a right to participate or refuse to take part in the research project at any time. The Ethical Review Board in the Humanities and Social and Behavioural Sciences at the University of Helsinki evaluated the research instruments and procedures (45/2018).

The observation method reliability has been tested with other observation method and accelerometers on the wrist and on the hip (Mehtälä et al., 2021). Observation is more costly than other measures, but the positive aspect is that the observed PA can be connected with the context of the observed PA. The reliability was good with another observation method (OSRAC-P). The reliability between observation and accelerometer used on the hip was good, but accelerometer on the wrist produced higher PA in comparison to observation (Mehtälä et al., 2021). The observation tool has been used in different research contexts (for example, Arvola, 2021; Reunamo et al., 2014; Rintakorpi & Reunamo, 2016). All the observers were ECEC volunteers and ECEC professionals from the municipalities. The observers were trained for the observation. There were more than 200 observers who were trained by mostly one trainer with the help of two other trainers. Each observer participated in one day observation training including observing videos from different early education settings. Then the observers practiced the observation in their own groups. After approximately two months the observers had another training day with videos checking the reliability of the observations. The actual observation did happen in another day care center. Each observation period was four hours at four-minute intervals. One observation lasted 30 seconds, including two minutes for orientation and 1.5 minutes for coding. The children were observed systemically, and children were not aware of being observed. The observation time has varied somewhat during the years. For example, in 2015 the observation time was one minute (Nikkola et al., 2022). However, young children can be very fast, and their activities may change several times during a one-minute observation. Thus, to increase reliability, the observation time was shortened to 30 seconds in 2017. The reliability analysis of the paired observation is reported below.

The observed items were the general action in the day care: children's action; children's object of attention; children's nearest peer contact; children's physical activity; children's involvement and social roles (Laevers, 2003); the nearest educator's action; and whether the nearest educator was concentrating on the observed child or not. In this article, we concentrate on children's involvement and social roles, especially participation, and physical activity, explained below. Physical activity is based on the estimate of energy consumption (OSRAC-P, The Observational System for Recording Physical Activity in Children-Preschool Version, see Brown et al., 2009; Finn et al., 2002; Kyhälä & Reunamo, 2021; Pate et al., 2004). The categories include: (1) no movement (for example, sleeping, standing, sitting in a pram). (2) stationary movement, light movement of the body, for example, getting up, moving light objects. (3) slow and light movements, for example, walking, light swinging. (4) some physical exertion, for example, walking uphill at least two hops, climbing in the climbing frame, hanging and speeding with legs. (5) fast physical exertion, for example, running, at least three hops, boarding stairs, hanging with legs moving. The reliability of the paired observation (intraclass correlation coefficient, one-way random) for physical activity was .868 (CI 847, 885, $p < .0005$).

The observation of children's social roles was classified as follows: (1) the child is adapting and open during observation, accepts, and acknowledges. The child is in contact with other(s) but does not change the context of the social situation. (2) the child is participative and open during observation, interactive, and cooperative. In participation, the child is both connecting socially with others and impacting the social context. (3) the child is self-centered and insistent during observation, pushy, and dominant. The child focuses on his/her own idea and impacts the social context. (4) the child is withdrawn from the situation, maybe non-social and non-interactive. The child is not either in contact with others or does not change the social context. (5) cannot be identified. (See more about data collection <https://blogs.helsinki.fi/orientate/>). The reliability of the categories was estimated by paired observation, where two observers observed the same child at the same time without knowing each other's categories. The Kappa for the social orientation was 40.5% (CI 38.1%, 45.3%, $p < .0005$).

Analysis

In the analysis, SPSS 27 was used. The main method of analysis has been cross-tabulation. For statistical significance for comparing the column proportions available at the SPSS Crosstabs menu, the Z-test with adjustment to p-values made with the Bonferroni method. To evaluate the reliability of the observation (paired observation) Cohen's kappa has been applied. Cohen's kappa measures the agreement between the evaluations of two raters when both are rating the same child. For the ordinal level scales of physical activity and involvement, the intraclass correlation coefficient (one-way random) has been used. The

level of statistical significance in this article is .05 throughout the article. The level of statistical significance in this article is .05 (two-sided) throughout the article.

Results

Physical activity in ECEC

Linguistically and culturally diverse children were observed to include more vigorous physical activity in their daily activities in comparison to Finnish background children (statistically significant difference). Children with Finnish background were observed to be not moving at all in their activities more often in comparison to linguistically and culturally diverse children (Table 1). This kind of activity mostly happened during resting and while sitting at a table but could happen in all kinds of activities. Even though the difference in vigorous physical activity between groups was only 1.7 percent, the linguistically and culturally diverse children were having high physical exertion 1.5 times more in comparison to children with Finnish background.

It is worth noticing, that linguistically and culturally diverse children were observed to include 12.5 percent moderate-to-vigorous physical activity (MVPA) in their activities, which in eight hours amounts to exactly one hour and means that these children, on average, meet the recommendations. As it is, from a purely physical activity viewpoint, the amount of physical activity is sufficient for these children. According to these results, children with Finnish background had moderate-to-vigorous physical activity (MVPA) in 10.6 percent of their activities, which, if children are in ECEC eight hours a day, is 51 minutes a day, which does not meet the recommendations for having at least 60 minutes of physical exertion per day.

TABLE 1 Comparison of physical activity between children with Finnish background and linguistically and culturally diverse children, statistically significant ($p < .05$) percentages in bold.

<i>PHYSICAL ACTIVITY</i>	<i>CHILDREN WITH FINNISH BACKGROUND</i>	<i>CULTURALLY AND LINGUISTICALLY DIVERSE CHILDREN</i>	<i>TOTAL</i>
No movement	22.2 %	20.4 %	21,9 %
Stationary movement	43.7 %	44,9 %	43,9 %
Light movement	23.5 %	22,2 %	23,3 %
Some physical exertion	7.4 %	7,6 %	7,5 %
Fast, physical exertion	3.2 %	4,9 %	3,5 %
Total	100.0 %	100,0 %	100,0 %

Children's involvement and linguistically and culturally diverse children's involvement in physical activity

Linguistically and culturally diverse children were observed statistically significantly to be more often frequently interrupted in their activities in comparison to children with Finnish background (Table 2). At the same time, these children were observed to be having less sustaining and intensive involvement in their activities in comparison to children with Finnish background.

TABLE 2 Comparison of children's involvement in their activities between children with Finnish background and linguistically and culturally diverse children, statistically significant ($p < .05$) percentages in bold.

<i>INVOLVEMENT</i>	<i>FINNISH CHILDREN</i>	<i>CULTURALLY AND LINGUISTICALLY DIVERSE CHILDREN</i>	<i>TOTAL</i>
Simple	22.1%	20.6%	21.8%
Frequently interrupted	10.6%	14.7%	11.4%
Mostly continuous	24.6%	25.8%	24.9%
Continuous	31.5%	30.3%	31.3%
Sustaining, intensive	11.1%	8.6%	10.6%
Total	100,0 %	100,0 %	100,0 %

For the reader not familiar with subscript letters denoting statistical differences between groups in Table 3, the same letter in a row means that the percentages in the cells do not differ statistically significantly from each other. In this case, all the percentages in every row differ from each other statistically significantly. This means that children with simple activities included almost a third of the observed stationary movement, but less than one percent of the observed movement with exertion. During frequently interrupted and mostly continuous activities moderate movements included the largest proportions of the observed movement in their categories.

However, when children's involvement increases to continuous activity, children's physical activity level increases, and most frequently movement with at least some exertion is related to continuous involvement. The most dramatic increase in physical activity was in sustaining intense involvement, where almost a third of all movement with at least some exertion was observed to happen in high involvement. The results indicate that physical activity is related to increased involvement concerning linguistically and culturally diverse children.

TABLE 3 The involvement in activities with different levels of physical activity for culturally and linguistically diverse children.

<i>INVOLVEMENT</i>	<i>NO MORE THAN STATIONARY MOVEMENT (1-2)</i>	<i>MODERATE MOVEMENT (3)</i>	<i>MOVEMENT WITH AT LEAST SOME EXERTION (4-5)</i>	<i>TOTAL</i>
Simple	32.5% ^a	2.8% ^b	0.6% ^c	22.1%
Frequently interrupted	9.0% ^a	16.6% ^b	7.2% ^c	10.6%
Mostly continuous	21.9% ^a	35.5% ^b	17.6% ^c	24.6%
Continuous	28.5% ^a	34.1% ^b	44.2% ^c	31.5%
Sustaining, intensive	8.1% ^a	11.0% ^b	30.4% ^c	11.1%
Total	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of physical activity categories whose column proportions do not differ significantly from each other at the .05 level.

Children's social roles and linguistically and culturally diverse children's social roles in physical activity

As we can see in Table 4, the largest statistically significant difference between groups was that linguistically and culturally diverse children were less participatory in ECEC in comparison to Finnish background children. By proportion, the largest statistically significant difference was in dominating role, where linguistically and culturally diverse children were observed to be almost twice as often in comparison to Finnish background children. Adaptation was statistically significantly more frequent with linguistically and culturally diverse children and they were statistically significantly less likely to withdraw from social interaction.

Table 4 Comparison of social roles between children with Finnish background and linguistically and culturally diverse children, statistically significant ($p < .05$) percentages in bold.

<i>SOCIAL ROLE</i>	<i>CHILDREN WITH FINNISH BACKGROUND</i>	<i>LINGUISTICALLY AND CULTURALLY DIVERSE CHILDREN</i>	<i>TOTAL</i>
Adapts	29.6%	32.8%	30.2%
Participates	37.4%	32.3%	36.4%
Dominates	3.7%	6.7%	4.3%
Withdraws	16.2%	14.6%	15.9%
Other role	13.2%	13.6%	13.2%
Total	100.0%	100.0%	100.0%

As we can see in Table 5, children's movement with at least some exertion mostly occurred during participation. The difference is statistically significant. This means that children's high physical activity was related to building social processes together with

others. A less frequent, but still clear and statistically significant result was that during low physical activity the dominating social role was less frequent than during high physical activity. The proportion of adaptation was statistically significantly lower in high physical activity. The proportion of withdrawn role in high physical activity was less than half in comparison to low physical activity.

TABLE 5 The social roles in activities with different levels of physical activity for linguistically and culturally diverse children.

<i>SOCIAL ROLE</i>	<i>NO MORE THAN STATIONARY MOVEMENT (1-2)</i>	<i>MODERATE MOVEMENT (3)</i>	<i>MOVEMENT WITH AT LEAST SOME EXERTION (4-5)</i>	<i>TOTAL</i>
Adapts	30.0% ^a	33.4% ^b	24.1% ^c	30.2%
Participates	25.1% ^a	45.1% ^b	55.7% ^c	33.2%
Dominates	3.5% ^a	6.2% ^b	9.1% ^c	4.7%
Withdraws	20.1% ^a	13.0% ^b	10.0% ^c	17.3%
Other role	21.4% ^a	2.3% ^b	1.1% ^c	14.5%
Total	100.0%	100.0%	100.0%	100.0%

Each subscript letter denotes a subset of E3 categories whose column proportions do not differ significantly from each other at the .05 level.

Discussion

The main aim of the study was to study the connection of physical activity to children's participation. The research questions were how physically active children with diverse lingual and cultural backgrounds are, how involved they are and what kind of social roles the linguistically and culturally diverse children have in physical activities. According to the results, PA with exertion was on average one hour per day (Table 1), which is in line with national recommendations. Young children should, according to the recommendations, engage in moderate-to-vigorous physical activity (MVPA) for at least 60 minutes per day throughout the day at home, at school, or in the ECEC. (Kyhälä et al., 2018; Kyhälä et al. 2020). The Finnish JOYPAM research and development project's results show that participating 4–6-year-old children were physically active for an average of four hours per day. The results also showed that almost all the children achieved the recommended three-hour level of light to vigorous-intensity physical activity, but only 46–85 percent of children reached the recommended level of one hour of moderate to vigorous-intensity physical activity. (Sääkslahti et al., 2021.)

However, linguistically, and culturally diverse children were observed statistically significantly to be more often frequently interrupted in their activities in comparison to children with Finnish background. In practice, this means that with a short time span the

processes do not have time to integrate and affect children in their development as much as other children.

Physical activity was related to continuous involvement. The most increasing physical activity was in sustaining intense involvement. As a conclusion, these results indicate that physical activity is related to increased involvement and with linguistically and culturally diverse children, indicating deeper learning processes and better integration with the zone of proximal development.

It is worth noticing, that the largest statistically significant difference between groups was the results where linguistically and culturally diverse children were less participatory in ECEC in comparison to children with Finnish background. By proportion, the largest statistically significant difference was in dominating role, where linguistically and culturally diverse children were observed to be almost twice as often in comparison to other children. As described in the observation definitions, the dominating role means that children have their closed ideas that they pursue without considering others' ideas. In practice, this means that these children spent more time without a shared connection to the changing situation. These children pursue their own goals, not those that are produced together. This orientation increased even more during high physical activity.

A good example of children's dominating role happened in a play situation where the children have no common or shared language, but still the hope for a shared play situation together. Two children are playing with dolls and there is only one play car seat in the ECEC play corner. One of the children goes to pick up the baby doll's clothes and put the doll's car seat on the floor waiting for her to come back and pick up the seat. At the same time, the other child comes to pick the same seat for her doll, without knowing that the other child is going to pick the same seat. When the children meet each other, without a common language - they act lively, they run and shout at each other. The play situation and corner are suddenly full of action, movement, shouting, and yelling – physical activity with lots of noise. The good news is the activity level of physical activity, but the other news – and a challenge for ECEC professionals - is to use supported play for the children to find a common frame for the role play to continue and make the play more intensive. This is worth noticing in daily ECEC situations; how do ECEC professionals support a child's physically active but dominant role to be more participative? Another aspect worth considering is that communicating emotions, and acting on them, vary between cultural contexts. A Finnish child showing dominant behaviour has different implications from the same behaviour of children from e.g., African, Arabic or Mediterranean countries.

Also Ylikörkkö (2022) highlights the responsible role of ECEC professionals when developing more participative ECEC actions. Teachers' pedagogical professionalism, choices, and roles when facing the child are crucial for developing participative situations (see also Puroila & Estola, 2012; Ree & Emilson, 2019; Vuorisalo et al., 2018). ECEC

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professionals should be very aware of the meaning of every facing and situation and how they act toward the child. These results are similar to previous studies about the importance of supporting especially linguistically and culturally diverse children's play (Arvola, 2021; Arvola et al., 2020a; Kibsgaard, 2017; Zachrise, 2015).

When linguistically and culturally diverse children were highly physically active, their participative role was observed more frequently. Physical activity integrates the children into the common context with others. Thus, high physical activity may be an important way to help linguistically and culturally diverse children in their participation to create social processes together with other children. Maybe using feet and hands instead of a language is an easier way to share the common context?

Adaptation was statistically significantly more frequent among linguistically and culturally diverse children. Adaptation means openness to others in the situation but not impacting or changing the situation. These children were part of an interaction with other(s), but they did not act to change the course of events. The adaptive role was less frequent during high physical activity.

Linguistically and culturally diverse children were statistically significantly less likely to withdraw from social interaction. Withdrawnness was defined as not considering others' ideas and at the same time not trying to change others' situations. This result means that linguistically and culturally diverse children were less likely to be separated from social situations. The withdrawn role was even less likely when these children were highly physically active.

Children's movement with at least some exertion mostly occurred during participation. This means that children's high physical activity was related to building social processes together with others. A less frequent, but still clear and statistically significant result was that during low physical activity the dominating social role was less frequent than during high physical activity. The proportion of adaptation was statistically significantly lower in high physical activity. The proportion of a withdrawn role in high physical activity was less than half in comparison to low physical activity. Both adaptation and withdrawnness are roles that do not contain impacting others. This means that children with diverse linguistic and cultural backgrounds with lower physical activity engage less in changing the ECEC culture and activities. At the same time, linguistically and culturally diverse children were observed to be having less sustaining and intensive involvement in their activities, which indicates less developing involvement processes for these children.

However, when children's involvement increases to continuous activity, children's physical activity level increases, and most frequently movement with at least some exertion is related to continuous involvement. The most dramatic increase in physical activity was in sustaining intense involvement, where almost a third of all movement with

at least some exertion was observed to happen in high involvement. The results indicate that physical activity is related to increased learning concerning linguistically and culturally diverse children. This puts the previous result of sufficient physical activity in a new light.

These research results are similar to the earlier studies of Kyhälä and Reunamo (2022), where they noticed that children in Finnish ECEC were more committed to ECEC actions when they were on the move. Faster physical activities were connected to a better participation level. According to Vygotsky (1978), the zone of proximal development (ZPD) is crucial when involving the child in the commitment and actions. When the child was deeply committed and moderate-to-vigorous physically active, the child's participative social role was higher. The MVPA was connected to shared, common actions together. Other children were crucial to the children's actions and participation level. Being together with others is correlated to more physical activity levels.

It is worth noticing, that the study is only from the Finnish research context. It would be essential to study the connection between linguistically and culturally diverse children's social roles and participation also internationally. Thus, there are similarities to multicultural Nordic ECEC research, where the studies have highlighted the positive effects and importance of physical activities when enhancing inclusive pedagogy in ECEC (see Hellman & Lauritsen, 2017; Ragnarsdottir & Kulbrandstad, 2018).

In this article, participation is seen as an experience of being part of a group or a community, having meaningful social relations, and the experience of having the opportunity to influence matters that are relevant to you (Karlsson et al., 2018; Nivala, 2021). In this study design, participation is observed and analysed as one aspect of children's social orientation and involvement in the ECEC context. In the observation data, it would be important to study linguistically and culturally diverse children's participation in more detail. Furthermore, also qualitative study design is needed in the future study design.

In final words, in this article's results, we can see that physical activity correlates with culturally and linguistically children's involvement and participative role. It is not clear whether participation increases physical activity or if physical activity increases participation, but these two clearly belong together.

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