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Run, Jump, Throw and Catch: How proficient are children attending English schools at the Fundamental Motor Skills identified as key within the school curriculum?

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Short Title: Run, Jump, Throw and Catch

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This study examined proficiency levels in fundamental motor skills (FMS) in children within Key Stage 1 and 2 of the English school system. Four hundred and ninety two children aged 6-9 years old (245 boys, 247 girls) from school years 2 (n = 130), 3 (n = 154) and 4 (n = 208) participated in this study. FMS for the run, jump, throw and catch were assessed using the Test of Gross Motor Development-2. The proportion of children who achieved mastery or near mastery of the skills was determined. For the whole sample, 18.5% (n = 91) did not achieve mastery in any of the four skills. A similar proportion (18.7%, n = 92) achieved mastery in all four of the FMS examined in this study. The proportion of children achieving mastery of all four skills was lower for Year Two children (0%) compared to children in Year Three (24%) and Four (25%). More boys (25.7%) achieved mastery in all four of the FMS compared to girls (11.7%). Individual behavioural components in skill performance were also examined. The results of the present study highlight that less than one-fifth of children aged six-nine years old have mastered the four key FMS identified by the physical education (PE) curriculum despite having the developmental potential to become fundamentally competent by six years of age. Fostering positive trajectories of FMS development presents a challenge for PE specialists given the association between FMS mastery in childhood with physical activity, weight status and health.

Keywords: Physical Education; Movement Skill; Mastery; Motor Competence

Introduction

Fundamental motor skills (FMS) are widely recognised as an important correlate of physical activity (PA), weight status, self-efficacy and educational attainment (Jaakola et al., 2015; Lubans et al., 2010). Over the last decade, these important benefits of motor competence have led to an accelerating research interest in the topic of FMS development, specifically as it relates to lifelong health, well-being and academic achievement (Logan et al., 2015; Robinson et al., 2015). Motor competence has been defined as the ability to perform a wide range of gross and fine motor skills in a proficient manner (Haga, 2008) with the terms motor competence and motor proficiency often used interchangeably (O'Brien et al., 2016). FMS refer to an aspect of motor skill considered to be the building blocks that lead to specialised movement sequences required for adequate participation in organised and non-organised sports and physical activities (Clark and Metcalfe, 2002; Gallahue, Ozman and Goodway, 2012; Logan et al., 2018). Globally defined as locomotor (e.g. running, jumping), object control (e.g. throwing, catching) and stability (e.g. balancing and twisting) movement categories (Clark and Metcalfe, 2002; Gallahue, Ozman and Goodway, 2012), these FMS are not naturally acquired during the process of maturation (Hardy et al., 2010a). In order to develop proficiency in FMS there is a need to implement developmentally appropriate activities, specifically teaching and learning activities (with feedback) during the provision of school-based physical education (PE), alongside sufficient opportunities to practice for children and youth made available (Logan et al., 2012).

As a consequence, developing proficiency in a range of FMS, has become prominent in school PE curricula worldwide (Australian Curriculum, Assessment and Reporting Authority, 2012; Department for Education, 2013; Society of Health and

Physical Educators, 2013). In the context of England, the most recent changes to the PE curriculum explicitly identified the development of FMS as a key outcome within Key Stage 1 (ages 5-7 years), and the development of fundamental sports skills as key within Key Stage 2 (7-11 years) (Department for Education, 2013). In the English National Curriculum for PE (Department for Education, 2013), the development of particular FMS is emphasised with the Key Stage 1 attainment targets, stating that pupils should: '*master basic movements including running, jumping, throwing and catching*,' and the Key Stage 2 attainment targets stating that pupils should: *'use running, jumping, throwing and catching in isolation and in combination'.*

Despite this focus on FMS, multiple research studies identify concerns that FMS competency among children is low, and that children are not mastering these FMS to their expected age-related developmental capability (Bryant et al., 2016; Foulkes et al., 2015; Morley et al., 2015; O'Brien et al., 2016; Okely and Booth, 2004). Suggestions relating to low FMS competency among British children appear to be largely based on studies conducted in other countries, particularly research in Australia (Hardy et al., 2010a), the United States (Goodway, Robinson and Crowe, 2010) and Ireland (O'Brien et al., 2016; O'Keefe et al., 2007), across a range of age groups from pre-schoolers to mid-age adolescence. For example, Hardy et al., (2010b) reported that, in Australian children aged 9-15 years old, skill mastery did not exceed 40% for five of the six FMS they examined, whereas Goodway et al., (2010) reported that 86% of pre-schoolers displayed developmental delays below the 30th percentile of norm values for the United States population (Ulrich, 2000). Likewise, O'Keefe et al., (2003) indicated that FMS performance of Irish adolescents (aged 15-16 years old) was low, and O'Brien et al., (2016) reported that only 11% of Irish adolescents (ages

12-13 years old) had ‘mastered’ or ‘nearly mastered’ the nine FMS they examined in their study.

There are however some studies focusing on motor skill proficiency in British samples. Research by Foulkes et al. (2015) documented low levels of overall motor proficiency in a sample of pre-schoolers where performance of all skills examined was classed as ‘low’ with the exception of the run, leap and slide. While there were higher levels (>80%) of proficiency for individual behavioural components in the run, leap and slide, mastery in these skills was not achieved by any children in their study. Similarly, another British study with four-seven year old children and using the Bruininks-Oseretsky Test (BOT-2F) as a measure of motor skill, reported that average age standard skill score was 44.4 placing children’s proficiency as ‘below average’ (Morley et al., 2015).

Despite this, there are few studies (e.g. Foulkes et al., 2016; Morley et al., 2015) which empirically substantiate claims that British children’s FMS proficiency is ‘low’. There is also no data providing an indication of proficiency levels of the FMS identified by the National Curriculum for PE (Department for Education, 2013), for the ages where the FMS attainment targets apply. Such information is a necessary first step for teachers to understand where their pupils might ‘sit’ in terms of their FMS development. Furthermore, there is a lack of data documenting skill proficiency at the behavioural component level of performance. Examining which behavioural components of each FMS are more difficult to master is essential in enabling researchers and teachers identify emergent trends of motor skill deficiency. Such information can also be used to put in place appropriate strategies to assist pupils in meeting the attainment targets relating to FMS in the English PE Curriculum.

Recent research by De Meester et al. (2018) has demonstrated the importance of such understanding. In a sample of six-12 year old American children, De Meester et al. (2018) reported that almost 90% of children who were 'below average' for their motor proficiency did not achieve the recommended levels of moderate to vigorous physical activity (PA) for health. Seventy-six percent of children demonstrated low motor proficiency with an average percentile rank of 8% (De Meester et al., 2018). De Meester et al. (2018) concluded that the role of motor proficiency for children's PA engagement needs to be promoted. In order to act on the suggestions presented by De Meester et al. (2018) it is important to understand firstly how proficient a population is given curricula and cultural differences in PE between countries and, secondly, to ascertain which aspects of motor skills children may find more difficult to master. With such information, targeted intervention can then be put in place to enhance motor proficiency. This study therefore sought to address this issue by assessing proficiency levels of running, jumping, throwing and catching in children within Key Stage 1 and 2 of the English school system. A secondary aim of the current study was to assess FMS at the behavioural component level, between sex and school year groups, with a view to identifying weaknesses within performance across the FMS identified as key within the National Curriculum for PE.

Methods

Participants

Four hundred and ninety two children aged six-nine years old (245 boys, 247 girls; Mean = 7.9 years; Standard Deviation (*SD)* = 1.0) from six central England primary schools participated in this study, adhering to protocol approval from our

institutional ethics committee and following written informed parental consent. Children were recruited from school years two (n = 130, Mean = 6.4 years; *SD* = 0.5), three (n = 154, Mean = 7.5 years; *SD* = 0.5) and four (n = 208, Mean = 8.5 years; *SD* = 0.5) to span the two Key Stages in the English PE curriculum. From school records, ethnic classifications of these participants were: 86% 'Caucasian;' 11% 'South Asian;' 2% 'Black;' and 1% 'Other.' The schools were selected using convenience sampling; they were located in the areas that ranked within the top third of the most deprived within England as a whole, using the Index of Multiple Deprivation (APHO, 2008).

Measures

Process measurements of FMS were employed in the present study using the Test of Gross Motor Development 2 (TGMD-2, Ulrich, 2000). Process oriented movement skill assessment is concerned with how the skill is performed (Burton and Miller, 1998). Four specific movement skills (two locomotor, two object control) were employed as part of the existing FMS using the TGMD-2 (Ulrich, 2000). In the current study, the following skills were assessed: run, horizontal jump, catch, overam throw. These FMS are the key skills identified for development by the UK National Curriculum for PE for children of the age participating in the current study (Department for Education, 2013). Each movement skill comprises of three-four behavioural components and the TGMD-2 assesses whether each component of the skill was performed or not performed to determine the mastery of the skill.

Procedures

All skills were video-recorded (Sony video camera, Sony, UK) and subsequently edited into single film clips of individual skills on a computer using Quintic Biomechanics

analysis software v21 (Quintic Consultancy Ltd., UK). The skills were then analysed using this software and a process oriented checklist, enabling the videos to be slowed down, magnified, replayed and scored. All children performed a familiarisation trial of each skill followed by two performance trials as recommended when using the TGMD-2 (Ulrich, 2000). Scores from the two performance trials of each FMS assessment were summed to obtain a raw score for each skill. The combination of all four FMS were then summed to create a total motor competence (or gross motor skill proficiency) score (scored 0-30). Scores from the run and the horizontal jump were summed to create a locomotor skill score (0-16) and the catch and throw summed to create an object control skill score (0-14), following the recommended manual protocol for the administration of the TGMD-2 (Ulrich, 2000). Two researchers experienced in the assessment of children's movement skills (having previously assessed movement skills in the context of a previous research study) analysed the videos. Both raters had been trained previously by watching videoed skills of children's skill performances and rating these against a previously rated 'gold standard' rating in two separate training sessions (lasting approx. 120min). Congruent with prior research (Barnett et al., 2014), training was considered complete when each observer's scores for the two trials differed by no more than one unit from the instructor score for each skill (>80% agreement). Inter- and intra-rater reliability analysis were performed for all the motor skills between the two researchers. Intra-class correlation coefficients for inter- and intra-rater reliability were .925 (95% CI = .87 - .95) and .987 (95% CI = .94 - .98) respectively, demonstrating good reliability (Jones et al., 2010).

Data analysis

Descriptive statistics and frequencies for each FMS and their associated behavioural components was calculated. Using previously established procedures (O'Brien et al., 2016, Ven Beurden et al., 2002), 'mastery' was defined as correct performance of all skill components on both trials. 'near mastery' was defined as correct performance of all components but one on both trials and 'poor' was defined as any score below these two categories (i.e. if the performance was incorrect in two or more of the components on both trials). The percentage of children who achieved mastery in each of the four skills was also determined. A binary variable composed of mastery and near mastery was created for each skill and is reported in this paper as 'advanced skill proficiency' (Booth et al., 2005; O'Brien et al., 2016). Raw scores for each FMS were collapsed into categorical variables with mastery/near mastery coded as '1' and poor coded as '0'. The percentage of children who achieved mastery in each of the four skills was also determined.

Data for total FMS, locomotor FMS and object control FMS were non-normally distributed, as identified by Kolmogorov-Smirnov tests (all $P < 0.01$). As a consequence, gender differences in these variables were examined using the Mann-Whitney U test and differences in total FMS, locomotor FMS and object control FMS according to school year were examined using the Kruskal-Wallis test. The Statistical Package for Social Sciences (Ver 25, IBM Corp Armonk, NY, USA) was used for all analysis.

Results

For the whole sample, 18.5% (n = 91) did not achieve mastery in any of the four skills, while a similar proportion (18.7%, n = 92) achieved mastery in all four of the FMS examined in this study. The proportion of the whole sample, boys, girls and children in

school Year Two, Three and Four who achieved mastery in none, one, two, three or all four of the FMS examined are presented in Figure 1.

Figure 1 about here

The proportion of children achieving mastery of all four skills was lower for Year Two children (0%) compared to children in Year Three (24%) and Year Four (25%). Likewise, the proportion of children achieving mastery in all four of the FMS examined was higher for boys (25.7%) compared to girls (11.7%).

The percentage of boys and girls and children in Year Two, Three and Four rated as ‘poor’, ‘near mastery’ or ‘mastery’ in each of FMS of the run, jump, throw and catch are presented in Figures 2 and 3 respectively. In regard to the individual skills, the poorest performance was for the overhand throw where 62.9% of boys and 75.7% of girls were rated as ‘poor’. This was mirrored for the different school year groups, where no child in Year Two achieved ‘mastery’ in the overhand throw and 87.7%, 64.3% and 61.5% of children in Year Two, Three and Four respectively were rated as ‘poor’. To examine this in further detail, the percentage of boys and girls and children in school Year Two, Three and Four below mastery level failing to execute each of the behavioural components in each of the FMS examined are presented in Table 1.

Figures 2 and 3 about here

The results from the Mann-Whitney U test also indicated that boys had significantly higher scores for total FMS (U = 23.4, P = .0001), locomotor FMS (U = 23.1, P = .0001) and object control FMS (U = 24.7, P = .0001) compared to girls. Kruskal-Wallis tests examining differences between school year also indicated significant differences in total FMS (H = 64.2, P = .0001), locomotor FMS (H = 23.5, P = .0001) and object control FMS (H = 80.7, P = .0001). Bonferroni adjusted post-hoc pairwise comparisons indicated that total FMS scores were significantly higher for children in Year Four compared to Year Two (P = .0001) and for children in Year Three compared to Year Two (P = .0001). Similarly, this pattern was repeated for both locomotor FMS and object control FMS scores, whereby there were significantly higher scores for children in Year Four compared to Year Two and for children in Year Three compared to Year Two (all P = .0001). The Mean ± SD, median and 95% Confidence Intervals (CI) of total FMS, locomotor FMS and object control FMS scores are presented in Table 2.

Discussion

The National Curriculum for PE in England (Department for Education, 2013) emphasises the importance of children ‘mastering’ running, jumping, throwing and catching in Key Stage 1 and using these same skills in sports situations effectively in Key Stage 2 of the curriculum. It is somewhat surprising that, to date, no study has documented the proficiency level of British children in these specific FMS skills. The present study addresses this issue, and presents original data documenting proficiency levels in the run, jump, throw and catch for children in Key Stages 1 and 2 of the English school curriculum. The results of the present study highlight that less

than one-fifth of children aged six-nine years old have mastered the four key FMS identified by the PE curriculum.

Despite leading textbooks citing that children having the developmental potential to become fundamentally competent in FMS by six years of age (Gallahue, Ozmun and Goodway, 2012), no child in Year Two was fundamentally competent across any of the four skills. While texts suggest children have potential to become competent by the age of six (Gallahue, Ozmun and Goodway, 2012), our empirical data suggest that British children aged six-seven years are typically only at the elementary stage of FMS development. The data presented in the current study for primary school age children agree with assertions made by Foulkes et al. (2015) in relation to pre-schoolers. The suggestion that children have potential to master their FMS by the age of six persists in the literature despite evidence, including that presented in the current study, that mastery of FMS is less likely to occur by this age, and evidence that for some children (20-25%) mastery does not occur until adolescence (Butterfield, Angell, and Mason, 2012). For the Year Two children in the current study, at best, only two of the four skills required by the national PE curriculum had been mastered. There was a marked increase in overall FMS proficiency for children in school Year Three and Four, where 24% and 25% respectively were fundamentally competent in all Four skills.

Previous research has suggested British children's FMS proficiency is low but without explicitly examining proficiency (e.g. Bryant et al., 2016), whilst other work outside of the UK has suggested similar low levels of FMS proficiency using objective measurement criteria (e.g. O'Brien et al., 2016; Okely and Booth, 2004). The results of the present study would align with these aforementioned studies in terms of the prevalence of mastery being low. The current findings add to the body of literature in

that it is the first study to provide proficiency level data indicating that FMS proficiency is very poor in British children in relation to the four FMS specified by the National Curriculum for PE in England. This is of great concern given that children are required to master these skills in order to be able to develop more complex sport specific skills at a later stage, and to be able to engage in lifelong sport and PA (Gallhue, Ozmun and Goodway, 2012).

One important aspect of the present study is the identification of the individual behavioural components in the four FMS that children were unable to exhibit from the TGMD-2 process-related criteria. This is key in guiding strategies for teachers to facilitate mastery of the FMS required by the school curriculum. Prior research has also suggested that movement practitioners need to be aware of which of the behavioural components tend to be failed by a large proportion of participants (O'Brien et al., 2016). Low skill proficiency was evident in the locomotor skills at the behavioural component level, as there was a high failure of specific behavioural components in the run (non-support leg bent to approximately 90 degrees) and the horizontal jump (extending the arms forcefully forward and upwards reaching full extension above the head and arms thrust downwards on landing). Similarly, for the object control skills, low skill proficiency was evident in the overarm throw for follow-through beyond ball release diagonally across the body towards the non-preferred side, and to a lesser extent, rotating the hip and shoulder to a point where the non-throwing side faces the wall. For the catch, there was also a high fail rate for catching the ball with the hands only.

Few studies have identified the behavioural components in the individual FMS, which are more difficult to achieve, thus making the results of the present study difficult to compare to other work. Of note, the behavioural components that were the most

difficult to achieve for the run and horizontal jump in the present study, are similar to those identified by O'Brien et al. (2016) in their study of Irish adoelscents. Apart from the run, the components children found more difficult to execute were not the introductory components. Rather children found follow through actions more difficult to execute and master. Not only are these components important in executing FMS they are also the behavioural components that relate to product outcomes in sport specific scenarios (Langendorfer et al., 2013). Thus, without mastering these FMS in Key Stage 1, attempts to move children onto the development of sport specific skills in Key Stage 2 may be akin to building a castle on a foundation of sand and likely result in an inability to execute the movement patterns needed in the primary and secondary school PE curricula.

Rate of 'mastery' in each of the skills was higher for boys and children in Key Stage 2 (Year Three and Four), when compared to girls and children in Key Stage 1 (Year Two). Scores for total FMS, locomotor and object control subtests were also significantly higher for boys compared to girls and children in Year Three and Four compared to Year Two. Boys are considered to be more competent at object control skills (Bolger et al., 2018; Hardy et al., 2013); however mixed findings have been observed for locomotor differences between genders with girls sometimes performing better and other times no differences being observed (Hardy et al., 2013; O'Brien et al., 2016). Research by Morley et al. (2015) reported that British girls (aged four-seven years) outperformed boys in fine motor tasks whereas boys outperformed girls in catch and dribble skills. Likewise, one of the only other studies to assess gender differences in British children found that pre-school age girls were more proficient at run, hop and gallop than boys (Foulkes et al., 2015). Another study (Foweather et al., 2015), that was part of the same project as Foulkes et al. (2015) also reported higher proficiency

in object control skills for boys compared to girls. In the context of locomotor skills, the current study only assessed run and jump and this might be why boys performed better than girls, contrary to Foulkes et al. (2015) work with pre-schoolers. The mechanisms for gender differences are not completely understood but may reflect differences in socio-cultural or environmental factors such as participation in differing games/ physical activities (Barnett et al., 2013), PA levels (Foweather et al., 2015), or interest in particular activities. The UK government has invested £320 million into the PE and Sport premium for primary age pupils (Department for Education, 2014). Schools receiving this funding are required to report the spending of this alongside its impact and sustainability in school for the current and longer term benefit for children's sport and PA potential. Given the findings presented here, it would seem sensible for schools to use this funding to offer targeted support for children focusing on the specific components of the FMS that are harder to master for different gender and year groups.

Collectively, the findings of the present study suggest that observed levels of proficiency are only at initial or elementary stages of development for most of these FMS (Gallahue, Ozmun and Goodway, 2012). Such skills therefore require further practice, encouragement and instruction to reach mature patterns in line with the aims of the PE curriculum (Clarke and Metcalfe, 2002). Importantly, the results of the current study suggest that children do not have the building blocks to develop more complex movements and thus may be experiencing a proficiency barrier, minimising their ability to participate in sport and PA throughout the lifespan (De Meester et al., 2018). From a theoretical perspective, these motor delays may be explained by Newell's (1986) dynamic theory of motor skill development, whereby development is based on the interaction between the individual, the task constraints and the surrounding

environment and thus the findings may highlight constraints in these areas. While a range of successful interventions to improve FMS proficiency based on facilitating this dynamic development exist in the academic literature (Morgan et al., 2013; Logan et al., 2012), the findings of such interventions show that the impact of these FMS interventions in the community are limited. Further work is therefore needed to explore ways in which such work can be translated to practice.

There are of course limitations to the current study. The research deliberately focused on four key FMS identified within the National Curriculum for PE in England, as these are the nationally identified curricular skills that children should master by the end of Key Stage 1. This focus provides key information for teachers and practitioners working within the National Curriculum for PE in England. Consequently, the scope of the current study is limited to the run, jump, throw and catch. However, while these aforementioned skills form the basis of the majority of tests of FMS, other studies (e.g. O'Brien et al., 2016) have presented similar data in older children and on a wider range of FMS, including kicking and dribbling. This potentially provides a more holistic overview of children's FMS proficiency, whereas the present study examines those FMS explicitly identified through the attainment targets within the English PE curriculum. Furthermore, we also recruited participants straddling Key Stage 1 and 2. This was deliberate to provide an indication of FMS proficiency for children at the age where FMS development is purported to be mastered (Gallahue, Ozmun and Goodway, 2012). Despite this, providing an indication of FMS proficiency levels for a wider spread of age ranges would potentially be useful in targeting when FMS are expected to be mature, and when remedial action may be needed if mastery levels have not been achieved.

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Figure 1. The proportion of the whole sample, boys, girls and children in school Year 2, 3 and 4 who achieved mastery in none, 1, 2, 3 for all four of the FMS examined in the current study

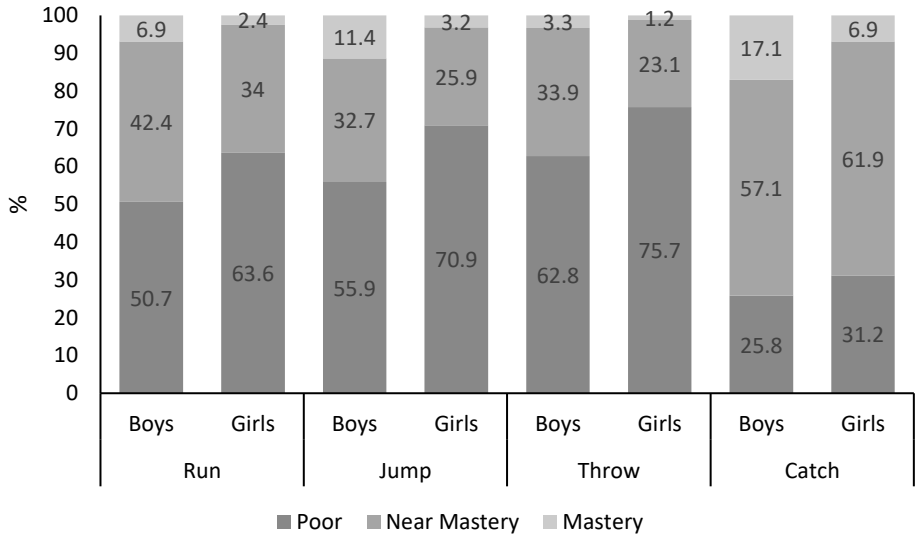

Figure 2. The percentage of boys and girls classed as ‘poor’, ‘near mastery’ and ‘mastery’ in run, jump, throw and catch.

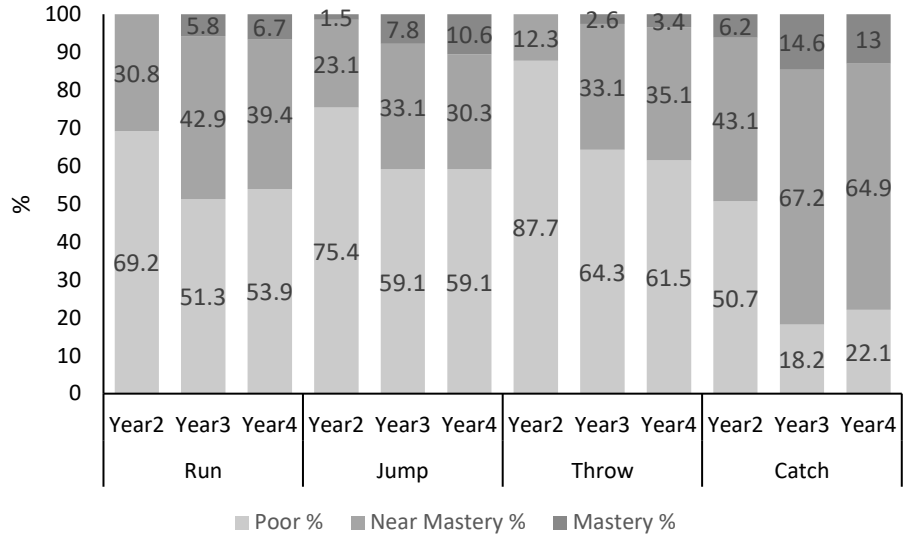

Figure 3. The percentage of children in Year 2, 3 and 4 classed as ‘poor’, ‘near mastery’ and ‘mastery’ in the run, jump, throw and catch.

	%Failure									
	Boys		Girls		Year2		Year3		Year4	
	Poor	Near Mastery	Poor	Near Mastery	Poor	Near Mastery	Poor	Near Mastery	Poor	Near Mastery
Run										
(1) Arms move in opposition to legs, elbows bent	34.8	8.2	28.2	7.8	51.5	23.8	10.9	3.8	35.2	3.7
(2) Brief period where both feet are off the ground	8.5	2.4	12.1	1.8	4.5	5.0	11.8	6.0	10.3	0
(3) Narrow foot placement landing on heel or toe	55.3	11.1	65.7	14.3	81.6	15.0	82.9	18.2	54.5	3.7
(4) Non-support leg bent approximately 90 degrees	87.5	40.5	88.2	54.5	89.8	38.8	84.8	37.8	87.9	57.3
Jump										
(1) Preparatory movement includes flexion of both knees with arms extended behind body	31.2	3.0	29.5	7.4	55.1	6.7	26.6	2.0	26.0	2.4
(2) Arms extend forcefully forward and upward reaching full extension above the head	49.2	16.3	55.6	16.6	71.9	31.2	29.7	4.9	26.6	8.8
(3) Take off and land on both feet simultaneously	32.5	5.7	36.8	6.25	12.3	5.0	70.3	7.9	31.7	4.8
(4) Arms thrust downward during landing	72.7	57.5	76.7	73.5	68.9	43.3	91.2	70.6	74.0	69.8
Throw										
(1) Wind-up is initiated with downward movement of hand/arm	34.4	6.0	23.4	6.2	58.8	31.3	3.0	2.0	6.8	4.1
(2) Rotates hip and shoulder to a point where the non-throwing side faces the wall	57.4	15.6	55.6	12.3	83.2	25.0	34.3	17.6	46.1	6.8
(3) Weight is transferred by stepping with the foot opposite the throwing hand	41.2	8.4	44.2	5.3	28.9	12.5	65.7	11.8	40.6	6.8
(4) Follow-through beyond ball release diagonally across the body towards the non-preferred side	76.0	53.6	82.9	72.8	74.6	37.5	80.8	51.0	78.9	51.2
Catch										
(1) Preparation phase where hands are in front of the body and elbows are flexed	35.9	3.3	32.5	3.9	57.6	7.1	17.9	6.9	13.0	7.0
(2) Arms extend while reaching for the ball as it arrives	57.9	11.1	59.1	8.2	42.4	5.4	47.1	12.7	69.6	8.9
(3) Ball is caught by hands only	92.1	68.6	86.3	72.5	92.4	80.4	89.3	64.7	87.0	67.4

Table 1. Prevalence of failure (%) amongst participants below mastery level (participants rated as ‘Poor’ and ‘Near Mastery’) the four FMS’ behavioural components for boys and girls and children in school Year 3, 4 and 5.

	Boys			Girls			Year 2			Year 3			Year 4		
	Mean (SD)	Median	95%CIs	Mean (SD)	Median	95%CIs	Mean (SD)	Median	95%CIs	Mean (SD)	Median	95%CIs	Mean (SD)	Median	95%CIs
Total FMS (0-30)	19.7 (4.9)	19	19.1-20.3	17.8 (4.6)	18	17.2-18.4	15.9 (3.7)	16	15.3-16.6	19.8 (4.3)	20	19.1-20.5	19.8 (5.1)	20	19.4-20.4
Locomotor FMS (0-16)	10.8 (2.9)	11	10.4-11.1	9.7 (2.7)	10	9.3-9.9	9.1 (2.4)	9	8.7-9.5	10.6 (2.6)	11	10.2-11.2	10.6 (3.1)	10	10.1-11.0
Object Control FMS (0-14)	8.9 (2.7)	9	8.5-9.2	8.2 (2.4)	8	7.8-8.5	6.8 (2.4)	7	6.4-7.2	9.2 (2.2)	9	8.8-9.5	9.2 (2.4)	9	8.8-9.5

Table 2. Mean ± SD, median and 95% Confidence Intervals (CI) of total FMS, locomotor FMS and object control FMS scores split by gender and school year.

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