



Active play: perceived and actual motor performance among Ghanaian children

**Thesis Presented for the Degree of
Master of Science in Occupational Therapy**

In the Department of Health and Rehabilitation Sciences

Faculty of Health Sciences

UNIVERSITY OF CAPE TOWN

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February 2021

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ACKNOWLEDGEMENTS

I give thanks to the Almighty God for the gift of life, strength and wisdom to undertake my Master's Program. I acknowledge my late father; Mr. Christian Doe-Asinyo for believing in girl-child education and for his immeasurable support throughout my project. I appreciate his help in making data collection in the Eastern Region of Ghana possible and for the late-night checkups on my writing even on his sick bed. I hate to think that I will be graduating without you Dad; but I trust that you are well rested in the bosom of the Father.

Now to the best supervisors one can ever ask for; Professor Bouwien Smits-Engelsman, Dr. Pamela Gretschel and Dr. Bonney. Thank you all for being super supportive and for your encouragement, constructive criticism, words of wisdom and time invested in this project. Thank you Professor Bouwien for expert guidance in the PERF-FIT training, research methods and statistical analysis. I certainly could not have done this without you all.

To the Ghana Education Service, Review Committee of the Ghana Health Service, University of Cape Town Faculty of Health Sciences Human Research Ethics Committee, thank you for your approval to make this project possible.

To all children and caregivers of this study, you are greatly valued for offering your time to participate in this study. Administration of Pentecost Schools-Nkawkaw; La Anglican School and Arakan School, thank for allowing me to collect data in your schools and for all other support.

To my research assistants, Margaret Gyawu; Benedicta Tackie; Emmanuel Osei; Hafiz Abdul; Patrina Doe and Prince Mereku; to all supportive friends, colleagues and family; I'm lost for words. Your assistance during data collection and this project was beyond my expectation. The good Lord richly bless you and grant you success in all your endeavors.

I acknowledge the Ghana Education Trust Fund (GetFund) for the grant to allow me undertake my Masters program without any cause for financial burden. Thank you for the good you do for Ghanaian citizens.

ABSTRACT

Background: There is limited data on active play both in terms of perceived competence and actual motor performance in children living in low- and middle-income countries. Promotion of active play in children is crucial for enhancing participation in physical activity and reducing the burden of obesity. Regular engagement in active play is important for promoting optimal development and increasing physical activity levels in children. Despite the increased interest in active play and physical fitness worldwide, many children in low-resource settings are thought to be physically inactive due to the lack of physical activity-promoting resources and programmes. The 2018 Ghana Report Card on physical activity reports that a high proportion of Ghanaian children do not achieve recommended physical activity levels and a high percentage of these children have poor motor skills. To date, no published study has examined active play among school-aged children in Ghana. **Investigating the nature of active play by assessing perceived and actual motor performance among Ghanaian children can serve to increase our understanding of activity deficits, movement difficulties and associated factors in this population.**

Aim: The aim of this study was to investigate the nature of active play in children aged 6-12 years in Ghana.

Specific Objectives:

1. To determine children and caregivers' perceptions of children's motor performance in active play using the Motor Coordination Questionnaire (MCQ).
2. To determine children and caregivers' perceptions of the importance of active play.
3. To identify additional forms of active play and games (which are not listed on the MCQ) that children and caregivers perceive to be important and meaningful.
4. To determine the relationship between MCQ ratings by caregivers and children.
5. **To determine the relationship between children's MCQ and actual motor performance.**
6. **To determine the relationship between caregivers' MCQ and actual motor performance.**

Methodology: A cross-sectional descriptive and analytical design was used. Three primary schools were purposively selected for this study. The study recruited 406 children and their caregivers for this study. Ethical approval was sought from the Ethics Review Committee of the Ghana Health Service (GHS-ERC 052/05/19) and the University of Cape Town Faculty of Health Sciences Human Research Ethics Committee (HREC REF: 112/2020). Data was collected from both caregivers and children (aged 6-12 years) using questionnaires and the Performance and Fitness (PERF-FIT) test battery. The MCQ-caregivers and MCQ-children were used to assess perceived motor performance, and the PERF-FIT test was used to measure children's actual motor performance. In using the Statistical Package for Social Sciences (SPSS) version 24.0 (SPSS Inc, IBM Company, Armonk, NY), Pearson or Spearman's correlation coefficient was calculated to determine the relationship between children and caregivers' perceptions as well as the relationship between the perceptions and the actual motor performance of the children.

Results: Both children (75.6%-94.2%) and their caregivers (69.3%-95.4%) perceived good motor performance of the children during active play. Children (82.8%-96%) and their caregivers (83.2%-94.4%) also regarded active play as very important. Twenty-four additional games were found to be of importance to Ghanaian children and their caregivers. Weak negative, weak positive and sometimes moderate positive correlation between MCQ items and the PERF-FIT items were found.

Conclusions:

This study shows that we can't rely solely on perceptions, but need actual motor performance, to accurately measure motor performance during active play. We found that parents and children do not accurately estimate the actual level of motor performance. Further studies should be done to understand confounding variables that may have caused poor relationship between perceived and actual motor performance. There is a need for a valid tool like the PERF-FIT to help in accurate measurement of motor performance.

Keywords: *active play, motor performance, physical activity, children*

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LIST OF ABBREVIATIONS

AOTA: American Occupational Therapy Association.

BOT-2: Bruininks-Oseretsky Test of Motor Proficiency- Second Edition.

DCDQ'07: Developmental Coordination Disorder Questionnaire 2007.

FMS: Fundamental Motor Skills.

GES: Ghana Education Service.

MABC-2: Movement Assessment Battery for Children-Second Edition.

MCQ: Motor Coordination Questionnaire.

MVPA: Moderate- to Vigorous-intensity Physical Activity.

P.E: Physical Education.

PERF-FIT: Performance and Fitness.

SIS: Skill Item Series.

SPSS: Statistical Package for Social Sciences.

TGMD-2: Test of Gross Motor Development-2.

WHO: World Health Organization.

DEFINITION OF TERMS

Play: 'Play is generally defined as a pleasurable, self-initiated activity that children can control' (Solomon & O'Brien, 2014, p. 392). Play is recognized as the main occupation of childhood across all cultures. Through play, children develop physically, cognitively, emotionally and socially contributing to the overall wellbeing of children (Fisher, Hirsh-Pasek, Golinkoff, & Gryfe, 2008; Moore & Lynch, 2018; Rodger & Ziviani, 1999). Play provides a platform for enjoyment and satisfaction in children (Sutton-Smith & Williams, 1998; Uys, Ramugondo, & Cordier, 2016).

Active Play: Active play is a meaningful form of occupation in children, characterized by unorganized activities that are fun, freely chosen, self-directed, and often performed in open spaces or outdoors (Alexander, Frohlich, & Fusco, 2014; O'Dwyer et al., 2013; Truelove, Vanderloo, & Tucker, 2017). Active play involves total body movement or physical activity that produces energy expenditure above resting levels. Active play includes everyday activities such as running, jumping, throwing and catching balls, walking, and hopping (Brockman, Fox, & Jago, 2011; Truelove et al., 2017).

Caregiver: The term caregiver for purposes of this study implies anyone in charge of arranging, supervising or providing care for children. This included parents or guardians, as well as teachers.

Motor Performance: Motor performance for purposes of this study refers to the observable skills or a child's level of performance during the execution of motor tasks such as running, writing, dancing, jumping and walking (Sigmundsson & Haga, 2016).

Occupation: Occupation refers to the daily life activities of people taking place in different contexts. Occupation is influenced by the interplay among client factors, performance skills, and performance patterns. Occupations occur over time; have purpose, meaning, and perceived utility to the client; and can be observed by others or be known only to the person involved (AOTA, 2014).

Perception: Perception can be defined as the measurement or assessment of self-esteem or skill within a specific domain (Harter & Pike, 1984; Jones, Okely, Caputi, Cliff, & Sport, 2010). For purposes of this study, our specific domain will be motor performance during active play.

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CHAPTER 1: INTRODUCTION

1.1 Background

Active play is characterized by activities that are fun, freely chosen, self-directed and spontaneous. Active play involves whole body movement and results in energy expenditure above basal values. Examples of active play in children include everyday activities such as throwing and catching balls, running, walking, jumping and hopping (Alexander et al., 2014; Rivilis et al., 2011; Truelove et al., 2017). The fun and enjoyable nature of active play increases the level of activity among children, maximizing lifelong physical, social and cognitive skill development as well as helping in the prevention of childhood obesity and its adverse health complications (Alexander et al., 2014; Cermak et al., 2015; Howie, Campbell, & Straker, 2016). Active play participation is often measured using parent reports and questionnaires, as well as assessment and observation of the motor skills needed for active play using performance tests such as the Bruininks-Oseretsky Test of Motor Proficiency-second edition (BOT-2) and Movement Assessment Battery for Children-second edition (MABC-2). Whereas these tests measure children's motor skills and capacities such as muscle strength and agility, they do not measure anaerobic performance, an important attribute of physical fitness that enhances their ability to participate in everyday activities and sports. Furthermore, BOT-2 and MABC-2 tests lack normative values for low-income populations and they are expensive and difficult to access in many low-resource settings such as Ghana (Brown & Lalor, 2009; Deitz et al., 2007). The Performance and Fitness (PERF-FIT) test battery addresses these limitations as it was specifically designed for low-income contexts. The PERF-FIT assesses motor performance and normative values for children living in low-resource communities are currently being established (Smits-Engelsman, 2018). The PERF-FIT test battery consists of Power and Agility as well as Motor Performance Subscale (5 Skill Item Series) subscales. In this study, the PERF-FIT test battery was used to measure actual motor performance whereas the Motor Coordination Questionnaire (MCQ) (Adams et al., 2017) was used to assess caregiver and child perceptions of the child's motor performance.

Research shows that regular engagement in daily active play promotes physical, social and cognitive development in children (Fisher et al., 2008; Moore & Lynch, 2018; Truelove et al., 2017). Active play increases physical activity levels in children (Janssen, 2014; Sattelmair & Ratey, 2009). Decreased physical activity in children may result in the lifelong lack of skills necessary for participation in daily occupations. The United Nations (UN) regards play as a major occupation in children and declares play as a right and a primary indicator of health and

wellbeing in children (Alexander et al., 2014; United Nations, 1990). Despite the known benefits of active play, several factors limit children's participation in active play worldwide. These include caregivers and children's perception of motor performance and the value they place on active play, unsafe play environments, reduced access to physical play spaces and equipment, structured educational focus on play, and lack of national policies relating to active play (Alexander et al., 2014; Bartie et al., 2016; Fisher et al., 2008; Uys et al., 2016; Veitch, Bagley, Ball, & Salmon, 2006). Active play demands a high level of motor coordination and as such children who perceive themselves to have poor motor performance are less motivated to engage in this form of play (Davidson & Williams, 2000; Piek, Baynam, & Barrett, 2006; Veitch et al., 2006). Low motivation to engage in active play is closely linked to the availability of physical space, and safe and age appropriate play equipment (Alexander et al., 2014; Veitch et al., 2006). Caregivers who appreciate the importance of play in the development and learning of the child are more inclined to provide play opportunities to influence children's activities compared to those with limited knowledge about the benefits of active play (Sutton-Smith & Williams, 1998; Veitch et al., 2006). Again, caregivers' perceptions about their children's performance directly influence the perceptions children hold about themselves in that, children tend to use caregivers' perceptions to assess their performance (Estevan et al., 2018).

The World Health Organization (WHO) recommends that children aged 5-17 years should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity (MVPA) daily (WHO, 2010). The implementation of physical activity guidelines is a major challenge in low-resource communities. The Ghana Education Service (GES) recognizes active play as a major component of physical activity and recommends at least eighty (80) minutes per week of Physical Education in schools (GES, 2007; Nyawornota et al., 2018). Not only is this recommendation below the daily WHO recommendations; the 2018 Ghana Report Card on Physical Activity reveals that the GES recommendation is not achieved (Nyawornota et al., 2018). There is thus a need to monitor and advocate for increased opportunities for active play among children in Ghana.

High income countries have policies promoting the dissemination of evidence-based active play guidelines and workbooks for children (Brockman, Jago, & Fox, 2010; Truelove et al., 2017). Caregivers in these communities are recognized as the major influencers of children's development and are thus made responsible for reinforcing daily active play in their children (Alexander et al., 2014). There is a wealth of literature indicating that the limitations to active

play are maximized in children living in low socioeconomic areas. These areas are characterized by reduced access to open, well-equipped and safe spaces. Literature on active play reports that caregivers in low socioeconomic areas do not allow their children to play outdoor mostly due to unsafe playgrounds coupled with poor play equipment and safety concerns (Brockman, Jago, & Fox, 2011; Veitch, Salmon, & Ball, 2010). Caregivers in these areas also have limited time to create opportunities for active play due to the demanding nature of their employment (Bartie et al., 2016; Fisher et al., 2008). In low socioeconomic areas, children are known to have high rate of poor motor coordination due to low birth weight, limited play opportunities, low resources and unsafe environments (Dewey et al., 2011; Holsti, Grunau, & Whitfield, 2002; Montgomery, 2010). This in turn influences their perception of their motor performance and motivation to engage in active play (Rivilis et al., 2011). Ghana is categorized as a middle-income country by the World Bank (Orlandini & Adablah, 2016), but is not spared of these limiting factors (Agorinya et al., 2018; O'Leary et al., 2017; Veitch et al., 2006). To date, no published study has investigated active play in Ghanaian children. A greater understanding of the nature of active play in terms of perceived and actual motor performance can contribute to building on existing policies on daily active play as well as help in planning interventions to promote active play among Ghanaian children (Brockman, Fox, et al., 2011).

1.2 Problem Statement and Research Questions

The UN declares play as an important marker of health and wellbeing in childhood (Alexander et al., 2014; UN, 1990). Limited participation in active play reduces opportunities for refining developmental skills and increases the risk of childhood obesity (Alexander et al., 2014; Howie, Campbell, & Straker, 2016; Kottyan, Kottyan, Edwards, & Unaka, 2014). The WHO recommends that children engage in at least 60 minutes of MVPA daily (WHO, 2010). Many high-income countries have guidelines and policies designed to enhance caregivers involvement in the promotion of daily active play in children (Alexander et al., 2014; Tandon, Saelens, & Christakis, 2015; Truelove et al., 2017). Several limitations to active play have been documented in low-resource settings despite the existence of active play guidelines (Kottyan et al., 2014). In Ghana, the existing guideline developed by the Ghana Education Service requires children to engage in at least 80 minutes per week of active play in schools (GES, 2007; Nyawornota et al., 2018). This recommendation is below the WHO recommendations, and a recent national study reveals that children do not even achieve this recommendation (Nyawornota et al., 2018).

Although motor performance is an important determinant of the level of participation in active play among children; to date, there is no documented evidence regarding active play. Specifically, the relationship between perceived motor skills and actual motor performance among Ghanaian children has not been determined. This study sought to address this knowledge gap.

The **research questions** for this study were:

1. What are the perceptions of Ghanaian caregivers and children on the children's motor performance during active play?
2. What correlations exist between caregivers and children's perceptions, and between their perceptions and the actual motor performance of the children?
3. What level of importance do Ghanaian caregivers and children put on good motor performance during active play?
4. What types of active play do Ghanaian children and caregivers describe as meaningful other than the ones mentioned in the Motor Coordination Questionnaire (MCQ)?

1.3 Aim of the study

The aim of this study was to investigate the nature of active play in children aged 6-12 years living in Ghana.

1.4 Objectives

The specific objectives of this study were:

1. To determine children and caregivers' perceptions of children's motor performance in active play and games.
2. To determine children and caregivers' perceptions of the importance of active play and games.
3. To identify additional forms of active play and games (which are not listed on the MCQ) that children and caregivers perceive to be important and meaningful within the Ghanaian context.
4. To determine the relationship between caregivers and children's perceived motor performance in active play and games.
5. To determine the relationship between children's MCQ and actual motor performance.

6. To determine the relationship between caregivers' MCQ and actual motor performance.

1.5 Significance

In Ghana, the 2018 report on physical activity among school-aged children in Ghana indicates the underachievement of the physical activity recommendations proposed by the WHO (Nyawornota et al., 2018; WHO, 2010). Active play is known to increase physical activity levels among children. Thus, studies contributing to knowledge as to how to increase active play (and physical activity) among Ghanaian children should be a public health priority.

This study sought to help fill this gap by investigating active play common and relevant to children and their caregivers in Ghana. The study further investigated the perceived and actual motor performance of Ghanaian children. Healthcare providers in Ghana will be able to use results to inform contextually relevant and appropriate play-based assessments and interventions to promote active play opportunities for children. Results may also stimulate discussion, research, action, and policies around active play by government and caregivers and may have implication for active play promotion in all settings. This study represents an important first step in providing evidence to stimulate further research in this area in Ghana.

1.6 Study Setting

The study was conducted in the La Dadekotopon of the Greater Accra Region of Ghana and Kwahu West Municipality of the Eastern Region of Ghana. La Dade-Kotopon Municipality covers an area of 36sqkm, representing almost 1.1% of the total land size of the Greater Accra Region. The Municipality is bounded on both North and West by Accra Metropolitan Assembly, on the East by Ledzokuku-Krowor Municipal Assembly and on the South by the Gulf of Guinea. The Municipality has a total household population 179,251. Children constitute the largest proportion of the household accounting for 35.2%, while grandchildren consist of 5.1% of household population. La Dade-Kotopon hosts a number of companies, financial, telecommunication, tourism, education, health institutions and other important establishments. In spite of the seemingly economic boom, there exist a number of challenges in the municipality: high unemployment levels estimated at 12% with its associated social vices. The Education District has been broken into seven (7) circuits in the Municipality. The basis of this breakdown is to facilitate easy monitoring thereby promoting quality teaching and learning among schools and

also to enhance efficiency and effectiveness in schools. La Dadekotopon municipality has 56 primary schools with 43 being public schools. The average age at which a child enters primary school is 6 years (La Dadekotopon Municipal assembly, 2016).

The Kwahu West Municipality is located in the Eastern region of Ghana, 241kms North-West of Ghana's Capital, Accra. It has Nkawkaw as its administrative Municipal Capital, which is the second largest urban town in the Eastern Region. The Municipality is bordered to the North by Kwahu South, to the West by Asante-Akim South Municipality and to the South by Birim North and to the East by Atiwa District. The Municipality has a total land size of 414sqkm representing 2.2% of the total land area in the Eastern Region. The total population of the municipality at 93,584. Children constitute for 37.8% of the population. More than half (51.3%) of the population are in urban areas while 48.3% reside in rural areas. Interestingly, all the urban population is located within Nkawkaw, the municipal capital and its suburbs with the rural population scattered in over one hundred localities.

More than half of the Municipality's population is engaged in business and trading activities. On manufacturing, quite a substantial number of people are involved in bakery, pottery, dressmaking, shoe making, artisanship and catering, which all have a direct application of business and trading skills. The strategic location (Modality) of the Municipal capital town coupled with a high population makes Nkawkaw one of the fastest growing and vibrant commercial towns with a high potential of promoting strong economic linkages with a number of Districts to promote economic growth through trade and investment (Kwahu West Municipal Assembly, 2016). Kwahu West Municipality has 122 primary schools with 82 being public. The average age at which a child enters primary school is 6 years (Kwahu West Municipal Assembly, 2013).

1.7 Dissertation Outline

Chapter One of this study provides the contextual background for this study. This chapter presents the problem statement, research aim, specific objectives and the significance of this study. The dissertation is further presented in five chapters. Chapter Two provides a critical synthesis of the extant literature and provides detailed information on what is known about perceived and actual motor performance with regards to active play. It discusses the effects of participation and lack of participation in active play. It contextualizes the need for investigating active play and motor performance in low resource settings by providing a review of literature on

the nature of active play and influential factors in both high and low-resource settings. It also summarizes information on tools used for assessing perceived and actual motor performance during active play. The chapter concludes by highlighting the gaps in the current body of knowledge. Chapter Three describes the research design, sampling methods, study population, data collection procedures, statistical analysis and ethical considerations. The results of the study are presented in chapter Four. Chapter Five presents detailed discussion of the study results. Finally, Chapter Six provides recommendations and conclusions based on the results of the study.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The literature review presents a critical synthesis of literature on motor performance of children during active play. The literature on the perceptions of children and their caregivers on the children's motor performance and their actual motor performance during active play were reviewed. Active play (including guidelines, opportunities, policies and participation factors for active play) was explored in both high and low resourced communities with a specific focus on Ghana.

EBSCOhost, Academic OneFile, Academic Search Premier, Google Scholar, ScienceDirect, SAGE, Open Journals, Medline and PubMed databases were explored for relevant literature, through Primo with a date range of 1990-2020. The following search terms were used: 'play', 'active play in children', 'assessment tools for motor skills in children', 'motor performance during active play (Ghana)', 'perceived motor performance in children (Ghana)', 'children's perceptions on motor performance during active play', 'caregivers' perceptions on motor performance during active play', 'actual motor performance in children', 'WHO global recommendation on physical activity', 'Ghana report card on physical activity', 'Ghana Education service guidelines on play', 'physical activity among children in Ghana'. Applicable cited references found in the relevant literature were also reviewed using the above method.

2.2 Participation and Non-Participation Effects of Active Play

From ancient times, active play has been a meaningful form of occupation in every child's life (Alexander et al., 2014). Active play is considered a critical component of child development and wellbeing as it has been linked to a myriad of benefits (Alexander et al., 2014; Brockman, Fox, et al., 2011; Tandon et al., 2015). The excitement drawn from active play leads to increased participation and thus, increases the level of physical activity in children (Janssen, 2014; Truelove et al., 2017). The development of physical skills in children such as motor coordination, endurance, strength, and adaptability is maximized during active play (Alexander et al., 2014; Sattelmair & Ratey, 2009). To prevent child obesity, active play is being used to increase physical activity levels in children in several countries (Janssen, 2014; Sattelmair & Ratey, 2009). During active play, children often engage with peers in play activities that they can identify with as a result of the cultural and traditional elements attached to these activities, which demonstrates belongingness to a particular group or community (Bartie et al., 2016; Sutton-Smith & Williams, 1998; Veitch, Salmon, & Ball, 2010). This maximizes social development

skills such as peer interaction, conflict resolution, conquering fears, building resilience to face future challenges, character, citizenship, and several other important life lessons (Alexander et al., 2014; Brockman, Fox, et al., 2011). Children who engage in active play often are known to be happy, confident and have increased self-esteem, thus highlighting the emotional benefits of this form of play (Alexander et al., 2014; Brockman, Jago, & Fox, 2011). The development of cognitive abilities such as academic learning, memory, creativity, problem-solving and decision-making, through engagement in play, has been reported throughout literature (Brockman, Fox, et al., 2011; Mendes et al., 2018; Sattelmair & Ratey, 2009). When children don't engage in active play, as they should, it leads to poor academic performance, poor social skills, and sedentary behaviors which can result in childhood obesity (Alexander et al., 2014).

2.3 Perceived Motor Skills and Actual Motor Performance during Active Play

Active play involves fundamental motor skills such as running, hopping, jumping, throwing and catching (Alexander et al., 2014). Children who have good motor skills engage more in active forms of play as compared to their peers with poor motor skills (Livesey, Lum Mow, Toshack, & Zheng, 2011; Nobre, Valentini, & Nobre, 2018; Robinson, 2011). Children who perceive themselves to be competent are more likely to engage in motor activities as compared to those with low perceived competence (Mancini, Rigoli, Roberts, Piek, & Heritage, 2018; Robinson, 2011). The relationship between perceived motor skills (both caregivers and children) and actual motor performance is regarded as primary influencers of children's participation in active play (Robinson, 2011; Zhang, Thomas, Gu, & Chu, 2016). Since perception is as a result of the development of cognitive processes, caregivers are known to be able to report on their children's motor performance more accurately than the children themselves (Estevan et al., 2018). The role of children's perceived performance in active play, their actual performance and caregivers' perception on their children's motor performance during active play has been emphasized throughout literature (Estevan et al., 2018; Lalor, Brown, & Murdolo, 2016). Results show the need to increase active play opportunities and the need to have accurate assessment of children's motor performance and not rely solely on perceptions (Barnett, Salmon, & Hesketh, 2016). Perceived and actual motor performance has been analyzed throughout literature and several factors such as parental influence, type of motor activity, age and gender have been reported to have impact on the motor performance of children (Barnett, Ridgers, Salmon, & Sport, 2015; Kottyan et al., 2014; LeGear et al., 2012; Sallis, Prochaska, & Taylor, 2000). According to the Global Observatory for Physical Activity (GOPA), the Ghana card shows low physical activity levels in the older population (18+) (Varela et al, 2018). This can directly

influence the physical activity levels in Ghanaian children, thus the need to investigate active play; a major source of physical activity in children. Research reports that children and caregivers in low resourced communities show limited perception about children's motor competence as compared to their actual motor performance, which in turn affects their level of participation in active play (Nobre et al., 2018). Limited perceptions are linked to lack of play opportunities, caregivers' inability to engage or observe their children's participation as a result of environmental factors, time constraints, employment factors, lack of a system to accurately grade children's performance during active play and lack of national policies promoting active play as critical for child development (Alexander et al., 2014; Brockman, Jago, et al., 2011). Literature assessing the actual motor performance of children during active play, report the need for accurate measurement and endorsed the impact perception has on children's motor performance (De Meester et al., 2016).

2.4 Nature of Active Play in High and Low Resourced Communities

The surge of interest between active play and child health and development, has led to the development of guidelines for physical activity in the form of active play in both high and low resourced communities (Brockman, Fox, et al., 2011; GES, 2007; Nyawornota et al., 2018). There is a wealth of literature supporting that, high resourced countries have well implemented strategies aimed at improving active play in all settings of child engagement (Tandon et al., 2015). Countries like USA, Australia, Canada and UK have given the necessary attention to children's engagement in active play in the wake of the global call to increase physical activity in children (Alexander et al., 2014). Low resourced communities are however reported to lack policies and resources to enhance the implementation of active play strategies in all settings of child engagement (Kottyan et al., 2014). Ghana is ranked as a middle income country by the World Bank (International Monetary Fund Corporate, 2012; Orlandini & Adablah, 2016). In Ghana, the guidelines by Ghana Education Service (GES) recommends that children engage in at least eighty (80) minutes per week of active play (Nyawornota et al., 2018), at the times suitable for the teacher (GES, 2007). This requirement by the GES is suboptimal in ensuring the benefits of daily active play and is often not achieved among Ghanaian children (Nyawornota et al., 2018; WHO, 2010). Research indicates that the benefits of active play are best achieved when they are child-initiated and caregivers are well trained in strategies for implementing active play opportunities (Alexander et al., 2014; O'Dwyer et al., 2013; Tandon et al., 2015). Thus, investigating and providing knowledge on active play among Ghanaian children becomes essential to developing strategies to promote active play.

2.5 Assessment Tools Used for Perceived Motor Skills and Motor Performance

Given the cultural and traditional values placed on active play and the fact that culture varies from one country to another, it is plausible that assessment tools used in a particular setting should have norms representing that setting. In Ghana, there is currently no norm-referenced assessment tool for active play skills.

Several tools have been reported in literature to be used for assessing perceived motor skills and actual motor performance in active play. Several questionnaires like Self Perception Profile for Children (SPPC) (Mancini et al., 2018; Nobre et al., 2018), Pictorial Scale of Perceived Competence and Social Acceptance have been used in several studies to assess the perceived motor skills among children (De Meester et al., 2016; LeGear et al., 2012). The Pictorial Scale of Perceived Competence and Social Acceptance is similar to the MCQ in terms of the use of pictures to depict the activities that are being assessed to aid in the children's understanding (Barnett et al., 2015; Estevan et al., 2018). Unlike these questionnaires, the Motor Coordination Questionnaire (MCQ) assesses both caregivers' and children's perception of children's performance on 15 motor skills (Adams et al., 2017). Since caregivers are major influencers on the activities children engage in and thus, their perception on their children's motor skills and the importance of such skills is integral to active play participation (Alexander et al., 2014; Tandon et al., 2015). Thus, this study employed the use of the MCQ.

The BOT-2 and MABC-2 are widely used standardized motor tests for assessing performance of children in active play skills but fail to measure the anaerobic capacity needed to complete the skills making up active play (Brown & Lalor, 2009; Deitz et al., 2007; Livesey et al., 2011; Mancini et al., 2018). The Test of Gross Motor Development -2nd Edition (TGMD-2) is a well-validated tool used to assess the fundamental motor skills in children aged 3-10 years (Nobre et al., 2018; Robinson, 2011; Spessato, Gabbard, Robinson, & Valentini, 2013). TGMD-2 has been used in several studies together with the Pictorial Scale of Perceived Competence and Social Acceptance or the SPPC to investigate the correlation between perceptions and actual motor skills in children (Barnett et al., 2015; De Meester et al., 2016; LeGear et al., 2012). These tools have normative values developed in high resourced countries with different cultures and are costly for researchers and clinicians working in low resourced communities. The PERF-FIT test battery, used in the current study, is cost effective and was developed to suit low resourced communities (Smits-Engelsman, 2018).

2.6 Factors Affecting Participation in Active Play

Despite the numerous advantages of active play, several limitations are noted to be responsible for the decline in active play among children (Veitch et al., 2010). Childhood education has become very competitive and over scheduled with standardized requirements (Brockman, Fox, et al., 2011). In the quest to develop pre-academic and academic skills, parents and teachers prioritize indoor play such as puzzles and constructions as they are more structured with an educational focus as compared to outdoor active play (Alexander et al., 2014; Fisher et al., 2008). Caregivers, thus, do not attach much importance to active play due to perceived lesser academic benefits despite extensive research revealing the increase in academic performance gained from active play (Fisher et al., 2008; Sattelmair & Ratey, 2009). The vigorous and adventurous nature of active play has risen concern among caregivers and children about safety during active play (Brockman, Fox, et al., 2011). Also, caregivers and children have increased fears on the safety of play environments as a result of 'stranger danger', road safety and teenager bullying behaviors (Alexander et al., 2014; Brockman, Jago, et al., 2011). In addition, caregivers deprive children of active play opportunities due to time constraints linked to the nature of caregiver employment as well as the lack of knowledge on the many developmental benefits of active play in children (Veitch, Bagley, Ball, & Salmon, 2006). Although active play is a major occupation for every child, some children are unable to engage in active play and others perceive themselves to be less competent due to underlying neurodevelopmental factors and thus, are not likely to participate in recreational activities (Cairney, Kwan, Hay, & Faught, 2012; Rivillis et al., 2011). These children are often sidelined, missing out on the many benefits of being involved with their peers during games (Alexander et al., 2014; Bartie et al., 2016; Uys et al., 2016). Research shows that, in economizing physical spaces, recent design of communities provides little to no access to physical space and play equipment for children, leading to a decline in their active play engagement (Veitch et al., 2010). Also in recent years, children are drawn to electronic media such as game consoles, personal computers, mobile phones and television, rather than engaging with their peers on the playground (Brockman, Jago, et al., 2011; Kottyan et al., 2014; Veitch et al., 2006).

2.7 Participation Factors and Low Resourced Communities

Extensive research shows that, most of the limiting factors to active play are maximized in low resourced communities (Kottyan et al., 2014; Veitch et al., 2006). Low resourced communities are reported to have a high rate of motor coordination disorders as a result of increased low

birth weight in children, limited play resources and opportunities, as well as unsafe play environments (Dewey et al., 2011; Holsti, Grunau, & Whitfield, 2002). Children with neurodevelopmental disorders and other health problems find it difficult participating in active play (Alexander et al., 2014; Kottyan et al., 2014). In addition, low resourced communities are known to have high crime rate in their neighborhood and thus, both children and parents consider it unsafe for outdoor play, although it is one major facilitator of active play among children (Veitch et al., 2006; Veitch et al., 2010). Also, low resourced communities have limited access to open physical space for active play. Available play spaces are prone to road traffic accidents and are underdeveloped and poorly maintained (Alexander et al., 2014; Kottyan et al., 2014). Caregivers in these communities also report the financial burden of participating in active play in the neighborhood (Kottyan et al., 2014). Interestingly, research shows that, children from low resourced areas are exposed to more screen time than the opportunity to engage in active play due to the numerous limitations to outdoor play. Unsafe playgrounds, 'stranger danger' and lack of supervision reported in low resourced communities serve as top reasons why most caregivers rather have their children play computer and video games than play outside (Janssen, 2014; Kottyan et al., 2014).

2.8 Conclusion

Currently, there is no data on active play and level of motor performance among Ghanaian school-aged children. This study sought to fill the gap in literature by investigating the nature of active play in terms of perceptions of Ghanaian children and caregivers on motor performance in active play, additional valued active play among Ghanaian children, correlations between perceptions of caregivers and children as well as the correlation between the perceptions and the actual motor performance of the children. Understanding their perceptions towards and performance in active play will provide information integral to the establishment of strategies which improve the implementation of the current guidelines designed to increase active play among children (Veitch et al., 2010).

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter describes the methodology of this study. It begins by describing the research design used for this study. In addition, participants, settings, inclusion criteria, exclusion criteria, sampling method, sample size and recruitment are discussed in detail. Ethical considerations, measurement instrumentation and data management are further discussed. The chapter ends by describing the statistical analysis that was performed.

3.2 Research Design

The study employed a cross-sectional descriptive **and** analytical design. This type of design is best for the collection of information to determine the distribution of one or more variables (health related) as well as to determine the relationship between any two variables (Aggarwal & Priya, 2019). This design was chosen to describe participants' characteristics and the common active play among participants as well as determine the relationship between perceived motor performance and actual motor performance.

3.3 Study Participants

Participants for this study comprised of 406 Ghanaian school children aged 6-12 years attending three mainstream schools in Ghana and their caregivers. **The study had a 100% response rate from the caregivers of the 406 children.**

3.3.1 Study Setting

Three schools were used as research sites. In the La Dadekotopon Municipality of Greater Accra Region, La Anglican Basic School and Arakan School; which falls under the supervision of the Ghana Armed Forces was used. In the Kwahu West Municipality of Eastern Region, Pentecost Preparatory School, which falls directly under the supervision of the Pentecostal Church of Ghana, was used as the third school for this study. **The inclusion of this one school in the Eastern Region aimed to ensure that there was representation of the Ghanaian population, not represented by the participants drawn from the Greater Accra Region. Parents of all socioeconomic status enroll their children in these schools because of the high discipline and academic standards. These school settings were representative of all social classes in Ghana.**

3.3.2 Inclusion Criteria

Children aged 6-12 years, enrolled in the selected schools, and their caregivers, were included in the study.

3.3.3 Exclusion Criteria

Children with intellectual disability, visual impairments and neurological conditions like Cerebral Palsy were excluded from the study, as determined through caregiver reports, observation by the research team and any existing, verified diagnosis.

3.3.4 Sampling Method

Sampling was done at two levels, that is, schools and participants. Maximum variation purposive sampling was used to choose the three participating schools. Population-based sampling was used to recruit children for the study. The total estimated population of the children within the age group for this study within the Arakan School, La Anglican Basic School and the Pentecost Preparatory school was 200, 100 and 400 respectively.

3.3.5 Sample Size

Since the study was a population-based study, all participants who fell within the inclusion criteria were recruited. The sample size estimate was computed using G-Power. Based on data derived from prior research that investigated active play, inactivity and perceived barriers to active play (Kottyan et al., 2014) and with effect size of 0.4, power of 0.95 and an alpha of 0.05, a total sample size of 328 was required. The study recruited a total sample of 406 participants.

3.3.6 Recruitment Procedures

The heads of the education districts were approached requesting permission to conduct research in schools in their districts (**Appendix II**). Once this permission was gained, the school principals/head teachers were sent formal letters requesting permission to conduct research within the school sites (**Appendix III**). Following receipt of written permissions from these bodies, a general meeting was then held for parents or legal guardians. This was planned in consultation with the Parent Teacher Association and teachers. At these meetings the details of the study, and participation in the study were shared with the parents/legal guardians verbally in English, Twi and Ga. The information sheets and informed consent declarations, drafted in English, the official language of Ghana (**Appendix V**) were also be given to each parents/legal guardian. Parents or legal guardians who provided consent to participate were given the relevant questionnaires and return to researcher in person at the meeting, or later through their children. At these meetings, help desks were set up to attend to parents or legal guardians

concerns sensitively and to assist parents in completing the forms. Children were also given information letters, consent forms and questionnaires for their parents or legal guardians who could not attend these meetings (**Appendices V, VII and IX**). Following the process of obtaining consent from parents/legal guardians, children were approached to participate in the study. The researcher coordinated this process in collaboration with the relevant school personnel. The grade teachers assisted the researcher with the distribution and collection of information letters and informed consent forms. Each child was well informed about the study and was asked to give a written informed assent before participation (**Appendix VI**). Copies of the information letter and signed informed consent and assent forms were given to the study participants.

3.4 Ethical Considerations

Ethical approval was sought from the Ethics Review Committee of the Ghana Health Service (GHS-ERC 052/05/19). With consideration that this study is registered at the University of Cape Town, ethical approval was also sought from the University of Cape Town Faculty of Health Sciences Human Research Ethics Committee (HREC REF: 112/2020) (**Appendix I**). The study adhered to the World Medical Association Declaration of Helsinki (World Medical, 2013) ethical principles throughout the research process.

3.4.1 Permissions, Informed Consent and Assent

Please refer to the paragraph titled: recruitment procedures for a detailed description of gaining permissions, informed consent and assent.

3.4.2 Autonomy

Participants were made aware that their participation depended entirely on their informed consent and they could withdraw consent at any time during the study with no ill consequences. They were given the option to decide if the data obtained from them could be used, should they have chosen to withdraw. The contact details of the University of Cape Town Faculty of Health Sciences Human Research Ethics Committee; (021) 4066338 and the Administrator for the Ghana Health Service Ethics Review Committee Research Development Division, (+233) 0507041223; were made available for participants if they had any questions regarding their rights and welfare as research subjects of the study.

3.4.3 Beneficence and Non-Maleficence

The possible health benefits were discussed with the participants. They were made aware of the low risk linked to participation as well as the measures that were put in place should any

negative incidents had occurred. The research testing took place in a safe, child friendly and affirming environment. The research assistants established ground rules that stated that all attempts by any child were praised and that teasing was not to be accepted. All research assistants were trained in basic first aid provision to provide assistance to children who may have incurred minor injuries. A first aid kit was available at all times. Referral processes for any significant injuries were established prior to data collection. All children who took part in the study were provided with intervals of rest, when needed. They all received healthy snacks at the end of the test period and water was made available at all times. The options for the healthy snacks were guided by the dietary information gained from their parents or legal guardians in the demographic questionnaire. Information on children who performed very poorly was handled sensitively. The researcher met with the parents or legal guardians and referred them to the appropriate health professionals (as guided by each school support body).

3.4.4 Privacy and Confidentiality

Only the research team (Rosemary Xorlanyo Doe-Asinyo, Prof. Dr. B.C.M. Smits-Engelsman, Dr. Pam Gretschel and Dr. Emmanuel Bonney) had access to the research materials. Data obtained were used for purpose of this study only. Codes were used to identify each participant and no name will be disclosed in this study's report or any publications that will emerge out of this project.

3.4.5 Research Procedures

Prior to **PERF-FIT** testing, written informed consent was gained from the parents/legal guardians and written assent from the children. **Questionnaires were also retrieved from children and their parents/legal guardians prior to PERF-FIT testing.** The **PERF-FIT** testing took place at school grounds during the times approved by the school for 30-40 minutes each per child. The data collection took place over six months.

3.4.6 Training of Researcher and Research Assistants

The researcher is a licensed Occupational Therapist in Ghana since the year 2016 working primarily with children. The researcher also assists in both lecturing and pediatric practical sessions at the Occupational Therapy Department, University of Ghana. The researcher received hands on training from January 2019-April 2019 on the assessment tools under the supervision of her supervisor, Professor Bouwien Smits-Engelsman. The researcher has also undertaken research methodology courses and has prior experience in researching a similar population at the University of Ghana. Six Occupational Therapists and Physiotherapists who work with children in Ghana were recruited as research assistants by the researcher.

Comprehensive training sessions on measurement protocols and procedures were held for research assistants prior to data collection. They assisted the researcher in recruitment and data collection. The researcher was responsible for coordinating the activities of this study.

3.5 Measurement Instrumentation

3.5.1 Background Information Questionnaire

A well-designed questionnaire for caregivers, combining demographics, child development and health history and questions relating to the child's motor coordination was used to reduce the burden of having to complete different sets of questionnaires (**Appendix VII**). Information on child's motor coordination was collected using the Developmental Coordination Questionnaire 2007 (DCDQ'07). The DCDQ'07 is a parent report measure developed with a population-based sample with a large age range. It has strong psychometric properties meeting standards for internal consistency, concurrent, and construct validity, and has improved sensitivity and specificity (Wilson et al., 2009). The questionnaire was reviewed for face validity by three occupational therapists and three physiotherapists who have expertise of at least three years in area of child health, development and participation in active play.

3.5.2 Motor Coordination Questionnaire

This is a well-designed questionnaire of 15 motor skills, with a caregiver and a child's version. The MCQ shows certain levels of validity and responsiveness for a parent and child questionnaire (Adams, Smits-Engelsman, Lust, Wilson, & Steenbergen, 2017). Several questionnaires like Self Perception Profile for Children (SPPC) (Mancini et al., 2018; Nobre et al., 2018), Pictorial Scale of Perceived Competence and Social Acceptance (Robinson, 2011; Spessato, Gabbard, Robinson, & Valentini, 2013) have been used in studies to assess the perceived motor skills among children. Unlike these questionnaires, the Motor Coordination Questionnaire (MCQ) assesses both caregivers' and children's perception of children's performance. Caregivers are major influencers on the activities children engage in and thus, their perception on their children's motor skills and the importance of such skills is integral to active play participation (Alexander et al., 2014; Tandon et al., 2015). Children and caregivers were asked to provide information on their perception of the children's motor performance during the motor skill activities outlined in the MCQ. The first part of MCQ asked how well the child was at performing the motor skills and the second part asked how important it was for the child to perform well on the motor skills. Answers were filled on a 5-point Likert Scale. The score

on the MCQ served as an evaluation of the perceived motor performance of the children in active play. The motor items on the children's questionnaire were presented in picture format for each child to aid in understanding as names of games vary from culture to culture (**Appendices VIII and IX**). Children and caregivers complemented the questionnaire with motor skills that were not present on the questionnaire, but were important for the child to do. This study looked into perceptions of active play, thus, the information from the questionnaires were used to gain a sense of characteristics of the sample and to gain understanding of confounding variables that may influence active play in the sample.

3.5.3 PERF-FIT Test

The PERF-FIT test battery provides a set of valid, reliable, feasible, and cheap field-based motor performance items for the assessment of health-related physical fitness in children in low resourced communities (Smits-Engelsman, 2018). Various studies have and are taking place to develop the PERF-FIT. One study (HREC ref 139/2019) was conducted in Cape Town, to establish whether separate gender norms were needed. A second study (NWU ref 00491-19-A1) is being conducted in the North-West Province (SA) to determine the concurrent validity. A third study was conducted in Brazil to determine the construct validity. The fourth study was also conducted in Brazil to determine the feasibility and validity. A fifth study (HREC ref 598/2019) is being conducted in Ghana to determine the physical fitness levels of school children aged 6 to 12 in a low income urban area in Ghana and examining the concurrent validity and predictive validity of the PERF-FIT. This study, together with the listed studies also contributes to further developing the PERF-FIT.

PERF-FIT meets standards for validity, reliability and responsiveness (Smits-Engelsman, Cavalcante Neto, Draghi, Rohr, & Jelsma, 2020; Smits-Engelsman, Bonney, Neto, & Jelsma, 2020). The test has two subscales: Power and Agility and Motor Skill Performance (**Appendix X**).

A. Power and Agility

This subscale contains five items intended to measure a child's level of performance in Long jump, Overhand throw, Running, Stepping, Side jump. Children of all age groups complete these items and they have two trial attempts for each item. Children get at least 15 seconds rest between trials.

Running, Stepping and Side Jump are performed using a 4-meter agility ladder. For running and stepping, the child is asked to start with both feet behind the starting line (in front of the first bar of the agility ladder). At a starting signal the child runs, putting one foot in each square (for running) or stepping with two feet in each square without jumping (for stepping), then runs around the bottle and runs back through the squares of the ladder till the end. Time is scored in 0.01 seconds and time is stopped at the end of each trial when the child's two feet are over the starting line and on the floor). Children's mistakes are counted and recorded. A mistake is counted if the child steps on a bar, outside the square, makes the wrong running pattern (for instance 2 feet in 1 square or skipping a square), makes the wrong stepping pattern (for instance only 1 foot in the square or skipping a square) or loses balance. The child is scored fail if he or she falls or is with 2 feet outside the ladder. If the child makes 3 (or more) mistakes or fails, an extra trial (third trial) is given.

For side jump, the child is asked to jump sideways in the same three squares of the agility ladder and on both feet; one foot per square. The number of correct landings (=both feet in the correct squares) while not stepping on the yellow bars is counted in 15 seconds.

For long jump, the child stands with the toes just behind a starting line. The child is asked to jump as far forwards as possible without falling. Scoring is done by measuring the distance in centimeters between the starting line and the heel of the foot that landed closest to the starting line. An extra trial is given if a child fails (falls).

For overhand throw, the child kneels just behind a starting line. The child is asked to throw a sandbag (2kg), held in the middle (not by the corners!) and thrown from a starting position behind the head (flexed elbows) as far forwards as possible. Scoring is done by measuring the distance in centimeters between the starting line and the landing part of the sandbag closest to the starting line.

B. Motor Skill Performance

This subscale contains 5 series of tasks with increasing difficulty, called Skill Item Series (SIS). For the SIS (Bounce ball, Throw ball, Balance, Jumping, Hopping), all children start at the easiest level of the series. If they perform first trial with no mistakes, no second trial is given but they proceed to next level of the task. If a child does not obtain maximum score in the first test trial a second trial is given. If the child does not score more than half of the maximum points in

either of the two test trials for a SIS item then that series is discontinued. So, the rest of that series is not tested in that child, except for the static balance items.

For bounce ball and throw ball, the child is asked to bounce the ball or throw the ball ten times each in five steps of increasing difficulty. The child is asked to 1) Bounce the ball on the floor or throw the ball in the air and catch it with two hands, 2) Bounce the ball on the floor or throw the ball in the air with the preferred hand and catch with the preferred hand, 3) Bounce the ball on the floor or throw the ball in the air with the non-preferred hand and catch with the non-preferred hand, 4) Bounce the ball on the floor or throw the ball in the air with the preferred hand, clap and catch with the preferred hand and 5) Bounce the ball on the floor or throw the ball in the air with the non-preferred hand, clap and catch with non-preferred hand.

Both bounce ball and throw ball are scored 1 point per correct catch is given. No points are given if the child 1) doesn't catch with the (indicated) hand or secures the ball with other parts of the arm or against the trunk, 2) misses the ball or touches the ball with the hands in flight but doesn't catch it and 3) if the ball is dropped immediately after the "catch" (not well secured).

The SIS balance item involves 2 static balance and 3 dynamic balance tasks for each leg. The task includes; hug knee, grasp foot, and can items. The child is asked to start with the preferred leg and finish the static task with both legs. The child is then asked to do the dynamic task of the same static task before moving to the next static task so it is presented as the "same task" for the child.

For hug knee, time is started when the knee is put in the inside of the hands of the extended arms (maximum score 15 s per leg). The time is stopped if any of the following occurs: 1) The whole of the non-supporting knee loses contact with the hands or the hands come loose, 2) The non-supported foot or leg is fixated to or supported by the standing leg 3) The child is making correction hops on the supporting foot in any direction 4) The child loses balance/falls.

For grasp foot, the time is started when the child gets hold of the fore foot (maximum score 15 s per leg). The time is stopped if any of the following occurs: 1) The hand loses contact with the foot, 2) The child is making correction hops or moves the supporting foot around in the square (so the foot is on other spot on the floor), 3) The hand touches the wall or floor or the child loses balance/falls.

For both hug knee and grasp foot, the number of correct steps (maximum score 8) is counted and if the child loses balance/falls, only the correct steps are counted before the loss of balance don't continue.

For the can items, count the number of correctly moved cans (max score 4 per leg). A correct movement is counted when 1) the can is picked up and put down (without dropping it or it is falling/rolling away), 2) the child is not making correction hops on the supporting foot in any direction, 3) the child does not touch the floor with the hands or non-supporting leg and 4) the child is able to regain balance and stand upright after each can has been put away.

The jumping series involves jumping 1) in each square (start in number 1 and do 8 jumps), 2) in every other square (red crosses are put on squares to skip), 3) over four 5 cm foams which are put on red crosses and 4) over four 10 cm foams which are put on red crosses. The child is asked to start the jumping series standing in square 1. The correct jumps (max score 8 or 4) are counted when 1) the child jumps inside the correct square with 2 feet (or on the fore foot) and 2) the child does not make small extra jumps in the square, or adjustments to get closer to the bars.

The hopping series involves hopping 1) in each square (start in number 1 and do 8 hops and hops out), 2) in every other square (red crosses are put on squares to skip), 3) over four 5 cm foams which are put on the red crosses and 4) over four 10 cm foams which are put on red crosses. The child asked to start the hopping series standing on one leg in square 1. The correct hops (max score 8 or 4 per leg) are counted when 1) the child hops in the correct square on one foot and does not hop on the bar or against the foam, 2) the child is not making correction hops on the supporting foot before or after landing and 3) child does not put the non-supporting leg on the ground.

For both jumping and hopping, if the child hops on the foams (so they scatter and this blocks continuation of the task), jumps or hops totally outside the agility ladder to regain balance in between jumps or hops, and loses balance/falls, only the correct jumps or hops before the loss of balance are counted.

Full assessment time per child was estimated to be about 30-40 minutes. **Requests of the parent/legal guardian and children were made to take videos of some of the tests of the PERF-**

FIT for scientific purposes. They were only taken when consent was provided and they were destroyed straight after data analysis.

3.6 Data Management

The researcher saw to the whole data management process. Following on site data collection, hard copies of all data were kept in a locked location on site and were only accessible to the research team. These hard copies were assigned codes to protect participants' identities. Personal identifiers were removed from research-related information for dissemination purposes. Data was uploaded to a central, password protected electronic platform (VULA). Data were only made available to researchers involved in the study, who were assigned access passwords. All research assistants involved in the study were required to sign confidentiality statements agreeing to protect the security and confidentiality of participant information. Data will be stored for five years after which it will be destroyed.

3.7 Statistical Analysis

The raw scores/results for participants from the test and questionnaires were entered using Microsoft Excel 2016 after each day of data collection. Data was entered in double and checked for accuracy by the research team. Data analysis begun after all tests and questionnaires were completed for each participant. Descriptive statistics including frequency distributions, medians, means and standard deviations were used to summarize numeric data. Pearson and Spearman correlation coefficient were used to determine the relationship between the MCQ caregivers and children as well as between MCQ and actual measured performance level by the PERF-FIT. Correlation values <0.40 were considered weak, $> 0.4-0.7$ moderate and >0.70 strong (Schober, Boer, & Schwarte, 2018). Statistical Package for Social Sciences (SPSS) version 24.0 (SPSS Inc, IBM Company, Armonk, NY) was employed to analyze the data at a significance level of $p<0.05$.

3.8 CONCLUSION

This chapter highlighted that cross-sectional study design was chosen as the best design to address the research questions. Sample size estimation determined that a least a sample of 328 participants were needed. The study recruited a total of 406 participants from both the Greater Accra Region and Eastern Region of Ghana.

CHAPTER 4: RESULTS

4.1 Introduction

This chapter describes the results of the study. It begins with a presentation of the demographic characteristics of the participants. The perceptions of children and caregivers of motor performance during active play, and the importance of active play are described. Also, additional games that are common and relevant to Ghanaian children and caregivers are described. Further, correlation between children and caregivers' perceptions on motor performance during active play is presented. The chapter also documents the correlation between PERF-FIT scores (actual motor performance) and perceived motor performance of children and caregivers.

4.2 Demographic Characteristics of Children

Table 1a and 1b show the demographic and anthropometric characteristics of participants according to gender and grade. A total of 406 children were recruited for this study. 209 participants (51%) were females and 197(49%) were males as illustrated in Figure 1. Children aged 6-12 years were recruited from Kindergarten-2 (K-2) to Grade 6 as illustrated in Figure 2.

Table 1a. Characteristics of participants by gender (N=406)

	Male		Female	
	(M)	(SD)	(M)	(SD)
Age(yrs.)	9.42	1.68	9.24	1.79
Height(m)	138.05	11.11	138.10	12.57
Weight(kg)	31.48	8.51	32.66	10.52
BMI(kg/m ²)	16.34	3.15	16.75	3.24
WC(cm)	59.72	7.61	61.51	7.53

Table 1b. Characteristics of participants by grade (N=406)

	Grade K-2(M±SD)	Grade 1(M±SD)	Grade 2(M±SD)	Grade 3(M±SD)	Grade 4(M±SD)	Grade 5(M±SD)	Grade 6(M±SD)
Age(yrs.)	7.33±0.58	6.93±1.00	7.35±1.00	8.66±1.00	9.74±1.19	10.52±0.96	11.10±0.78
Height(m)	116.00±1.00	122.02±7.35	129.14±12.28	133.44±7.56	141.52±7.56	144.57±7.30	148.06±8.33
Weight(kg)	18.77±0.40	22.69±4.67	26.80±6.44	27.40±6.46	33.87±7.54	37.09±10.54	38.97±8.67
BMI(kg/m ²)	13.95±0.52	15.13±1.82	16.11±3.29	15.31±2.85	16.80±2.88	17.58±4.12	17.62±2.67
WC(cm)	53.33±3.06	55.23±4.30	57.79±7.48	57.97±6.95	62.66±7.65	63.11±7.64	63.57±6.60

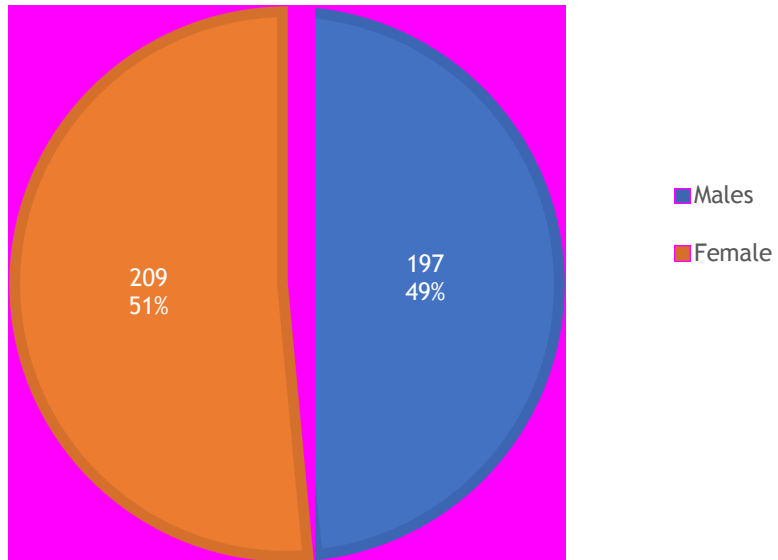


Figure 1. Gender distribution of participants (N=406)

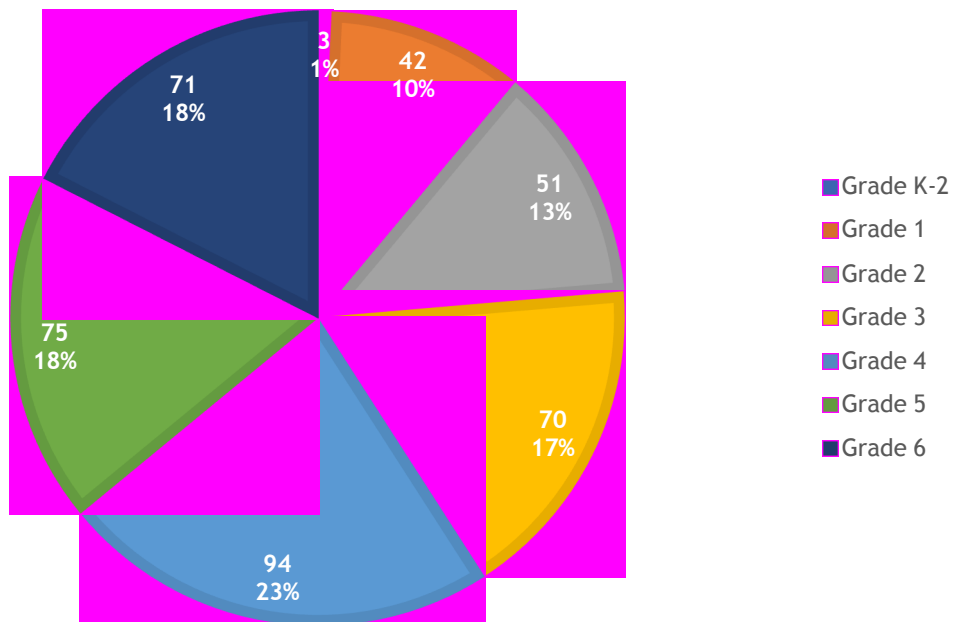


Figure 2. Grade distribution of participants (N=406)

4.3 Children's Perceptions on their Motor Performance

A high proportion (75.6%-98%) of children perceived themselves to be good to super good at all items. More than half of the participants perceived themselves to be super good at 'running' (56.7%) and 'hopping' (54.2%); motor activities often performed during active play. More than half of the participants also perceived themselves to be super good at three items on the MCQ which are related to good motor performance, that is, 'writing neatly' (51.5%), 'household chores' (64.5%) and 'self-care' (73.2%) but are not active play. Results from the MCQ-children are presented in Table 2.

Table 2. Children's perception of performance in active play (MCQ-Child) (N=406)

Variable name	Not good at all (%)	Not so good (%)	A little good (%)	Good (%)	Super good (%)
ACTIVE PLAY					
Kicking a ball	6.4	6.2	18.2	26.1	43.1
Bouncing a ball	3.0	5.2	16.3	37.2	38.4
Aiming at a target	9.6	13.5	22.2	25.4	29.3
Catching	2.0	5.2	20.4	25.9	46.6
Hitting a ball	10.3	8.6	24.4	26.8	29.8
Throwing a ball	3.0	5.7	14.5	28.3	48.5
Running	3.0	3.0	12.1	25.4	56.7
Hopping	3.2	3.4	12.8	26.4	54.2
Riding a bicycle	16.5	7.9	11.8	19.7	44.1
Climbing	10.1	9.4	16.7	26.4	37.4
Playing team sport	6.9	6.9	14.5	22.2	49.5
Dancing	5.7	5.4	15.0	26.6	47.3
NOT ACTIVE PLAY					
Writing neatly	1.2	4.4	16.3	26.6	51.5
Household chores	2.0	2.2	8.9	22.4	64.5
Self-care	1.0	1.0	3.4	21.4	73.2

4.4 Caregiver's Perceptions on Children's Motor Performance

Table 3 shows a high proportion (69.3%-95.4%) of caregivers perceiving children to have good to super good performance in all items in the MCQ. Only one activity; 'self-care' had more than half of the children (50.5%) to be super good as perceived by caregivers.

Table 3. Caregiver's perception of performance in active play (MCQ-Parent) (N=406)

Variable name	Not good at all (%)	Not so good (%)	A little good (%)	Good (%)	Super good (%)
ACTIVE PLAY					
Kicking a ball	4.2	7.6	18.0	41.6	28.6
Bouncing a ball	7.4	12.3	20.4	36.2	23.6
Aiming at a target	6.9	18.0	24.6	33.0	17.5
Catching	2.0	8.9	22.4	40.1	26.6
Hitting a ball	10.1	16.3	26.8	33.0	13.8
Throwing a ball	2.2	8.1	18.0	42.1	29.6
Running	0.7	3.9	12.6	37.2	45.6
Hopping	3.4	9.4	18.2	43.1	25.9
Riding a bicycle	15.3	15.5	17.5	25.9	25.9
Climbing	9.9	18.0	20.4	32.0	19.7
Playing team sport	8.6	11.3	19.7	34.2	26.1
Dancing	3.4	8.1	16.0	34.7	37.7
NOT ACTIVE PLAY					
Writing neatly	2.7	6.7	15.3	40.9	34.5
Household chores	2.2	4.7	17.2	37.9	37.9
Self-care	2.7	2.5	11.3	33.0	50.5

4.5 Children's Perception on the Importance of Active Play

Results from Table 4 shows high value of importance (82.8%-96%) placed on the items on the MCQ by Ghanaian children. More than half of the children (51.5%-78.3%) perceived 11 items out of the 15 items on the MCQ to be very important. Self-care was perceived as most important by the highest number of children (78.3%), followed by household chores (72.9%) and writing neatly (64%) which are all not active play items.

Table 4. Children's perception on importance of active play (MCQ-Child) (N=406)

Variable name	Not at all important (%)	Not so important (%)	A little important (%)	Important (%)	Very Important (%)
ACTIVE PLAY					
Kicking a ball	4.9	4.7	11.3	18.2	60.8
Bouncing a ball	3.9	3.2	14.3	34.0	44.6
Aiming at a target	8.9	7.9	19.2	25.6	38.4
Catching	2.7	2.7	11.6	23.9	59.1
Hitting a ball	7.9	9.4	18.0	29.6	35.2
Throwing a ball	2.7	4.7	11.3	25.1	56.2
Running	2.2	1.7	10.6	20.9	64.5
Hopping	3.0	4.7	11.8	27.8	52.7
Riding a bicycle	11.6	5.4	10.8	20.7	51.5
Climbing	9.4	7.4	19.2	22.7	41.4
Playing team sport	5.7	5.9	10.3	22.2	55.9
Dancing	5.2	5.4	13.1	22.2	54.2
NOT ACTIVE PLAY					
Writing neatly	2.0	3.4	11.1	19.5	64.0
Household chores	3.2	2.2	5.4	16.3	72.9
Self-care	2.2	1.7	3.2	14.3	78.3

4.6 Caregiver's Perception on the Importance of Active Play

As seen in Table 5, caregivers of the children in this study placed a high value (83.2%-97.8%) on the importance (important to very important) of the MCQ items. More than half of caregivers perceived 'Writing neatly (67.7%)', 'running (56.4%)', 'household chores (64.8%)' and 'self-care (71.9%)' as very important for the children to be good at. Interestingly, three non-active play items, namely, self-care (71.9%) writing neatly (67.7%) and household chores (64.8%) were perceived as important by the highest number of caregivers.

Table 5. Caregiver perceptions on importance of active play (MCQ-Parent) (N=406)

Variable name	Not at all important (%)	Not so important (%)	A little important (%)	Important (%)	Very Important (%)
ACTIVE PLAY					
Kicking a ball	4.4	6.9	16.5	32.8	39.4
Bouncing a ball	4.2	9.1	22.2	34.2	30.3
Aiming at a target	3.9	7.9	20.0	33.3	35.0
Catching	2.0	5.4	15.5	38.7	38.4
Hitting a ball	4.4	10.1	19.2	38.2	28.1
Throwing a ball	2.2	6.7	15.8	36.9	38.4
Running	2.2	3.4	9.4	28.6	56.4
Hopping	3.2	6.9	18.7	35.0	36.2
Riding a bicycle	5.4	5.4	17.2	32.0	39.9
Climbing	6.2	10.6	23.6	32.3	27.3
Playing team sport	4.2	6.9	12.3	34.2	42.4
Dancing	2.2	5.4	14.3	34.5	43.6
NOT ACTIVE PLAY					
Writing neatly	1.7	1.5	6.9	22.2	67.7
Household chores	1.0	2.5	7.1	24.6	64.8
Self-care	1.7	0.5	4.7	21.2	71.9

4.7 Additional Active Games Described as Important by Participants

Table 6 shows 24 additional play and games considered to be important by children and caregivers. 'Ampe'" (a game that demands jumping, clapping and good coordination of hands and feet) had the highest frequency, followed by skipping and then Ludu (a board game that demands good fine motor skills, mathematical skills, good posture and concentration). In all three games, the frequency of the children were higher than the caregivers (Ampe: 177 children; 55 caregivers); (Skipping: 140 children, 56 caregivers); (Ludu: 87 children; 22 caregivers). Another game 'Oware' (a traditional pit and pebble board game) had a high frequency in importance to the children (69) but not caregivers (7).

Table 6. Additional Games Perceived as important by participants (N=406)

Game	Children (n)	Caregivers (n)	Total (N)
Ampe	177	55	232
Oware	69	7	76
Skipping	140	56	196
Ludu	87	22	109
Video	37	10	47
Hide and Seek	20	12	32
Checkers	4	1	5
Handball	2		2
Headball	1		1
Card Games	2	1	3
Police and Thief	3		3
High Jump	2	2	4
Jungle Gym	1		1
Netball	3	1	4
Volleyball	4	2	6
Swinging	1		1
Tagging	1		1
Swimming	3	2	5
Dancing	1	1	2
Drawing/Art	1	4	5
Hiking	1		1
Softball	1		1
Long Jump		1	1
Toys		6	6
Chess		1	1

4.8 Correlation between Caregivers and Children's Perceived Motor Performance

To determine relationship between the perceptions of all participants we compared values from MCQ-children to the MCQ-caregivers. We grouped the children into two age groups (6-10 years) depicting younger children and (11-12 years) depicting older children based on our data. According to literature, younger children show poor judgment of their perceptions as compared to older children and adolescents due to the development of cognitive abilities (De Meester et al., 2016). Correlation was found to be positively weak and sometimes moderate as seen in Table 7. For children age group 1 (6-10 years), all items correlated weakly except for riding a bicycle, which had moderate correlation between children and their caregivers. "Kicking a ball", "Hitting a ball", "Riding a bicycle", "Playing team sport" and "dancing" were moderately correlated between children age group 2 (11-12 years) and their caregivers. All other items showed positive weak correlation with most close to moderate correlation for the children aged 11-12 years. Overall, significant positive correlation was found between caregivers' perception and children's perception on motor performance.

Table 7. Pearson correlation co-efficient values for the relationship between caregivers and children's perceived motor performance (N=406)

MCQ Items	Correlation Co-efficient (r)	
	6-10 years (N=277)	11-12 years (N=129)
Kicking a ball	.357**	.647**
Bouncing a ball	.131*	.356**
Aiming at a target	.160**	.344**
Catching	.138*	.266**
Writing neatly	.230**	.341**
Hitting a ball	.114	.425**
Throwing a ball	.082	.272**
Running	.270**	.360**
Hopping	.145*	.293**
Riding a bicycle	.413**	.668**
Climbing	.211**	.312**
Playing team sport	.231**	.556**
Dancing	.264**	.528**
Household Chores	.088	.310**
Self-Care	.050	.267**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

4.9 Relation between Children's Perceived Motor Performance and Actual Motor Performance

To determine the relationship between the children's perceived motor performance and actual motor performance, we compared values from MCQ-children to the items on the PERF-FIT. Table 8a and 8b show the correlation between the children's perceived motor performance (MCQ items) and their actual motor performance (PERF-FIT items). In the young children, no relation between reported competence and actual motor competence was found. If a (weak) significant correlation did occur, it went consistently in the opposite direction (negative correlations, that is, children have better scores on the PERF-FIT if young children reported to be less good on the MCQ).

Interestingly, for children age group 2 (11-12 years), another picture emerged as seen in table 8b. Overall, correlations were with weak to moderate values between children's perceived motor performance and the children's actual motor performance. Notably, "kicking" and "riding" showed positive moderate correlation with the PERF-FIT items; "bounce" and "throw" as shown in table 8b. Weak positive correlation was found on all the other items as shown in table 8b. Three correlations did not go in the expected direction; the score on "household chores" correlated negatively with hopping and "writing neatly" with static balance.

Table 8a. Correlation co-efficient values for the relationship between PERF-FIT and children's age group 1 (6-10 years) perceived motor performance (N=277)

	Run #	Step#	Side Jump	Long Jump	Overhand Throw	Bounce	Throw	Static Balance	Dynamic Balance	Jump	Hop Right	Hop Left
Kicking												
Bouncing					-.187**							-.146*
Aiming		.132*	-.166**		-.130*							
Catching		.135*	-.202**	-.163**	-.142*							
Writing			-.162**	-.155**	-.188**	-.155**			-.119*		-.137*	-.123*
Hitting		.145*	-.202**		-.210**	-.147**	-.123*	-.150*				-.150*
Throwing		.119*	-.181**	-.148*	-.181**							
Running												
Hopping			-.138*		-.125*						-.138*	
Riding												
Climbing												
Team Sport			-.243**	-.121*	-.167**			-.153*			-.160**	-.159**
Dancing	128*			-.160**	-.267**	-.219**	-.210**					
Chores			-.147*								-.132*	
Self-Care												

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Lower scores represent better performance, which means correlation are expected to be negative

Table 8b. Correlation co-efficient values for the relationship between PERF-FIT and children's age group 2 (11-12years) perceived motor performance (N=129).

	Run#	Step#	Side Jump	Long Jump	Overhand Throw	Bounce	Throw	Static Balance	Dynamic Balance	Jump	Hop Right	Hop Left
Kicking	-.323**	-.314**	.242**	.311*	.312**	.490**	.481**			.196*	.280**	.256**
Bouncing		-.175*			.201*	.192*	.202*					
Aiming				.290**	.174*	.183*	.219*					.204*
Catching		-.179*		.270**	.185*	.249**	.205*					
Writing								-.222				
Hitting	-.204*	-.231**		.320**	.278**	.288**	.275**					
Throwing		-.225*			.260**	.186*	.238**					
Running			.176*	.295**								
Hopping				.186*								
Riding	-.175*	-.284**			.375**	.456**	.402**					.208*
Climbing	-.176*	-.227**		.279**	.291**	.199*	.206*	.176*				
Team Sport			.174*	.368**	.305**	.337*	.262**			.256**		
Dancing												
Chores											-.236**	-.263**
Self-Care												

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Lower scores represent better performance which means correlation are expected to be negative.

4.10 Relation between Caregivers' Perceived Motor Performance and Actual Motor Performance

To determine the relationship between the caregivers' perception on their children's motor performance and actual motor performance, we correlated values from MCQ-caregivers to the items on the PERF-FIT. The values presented in Table 9a and 9b show weak correlations between the caregivers' perceived motor performance (MCQ items) and the children's actual motor performance (PERF-FIT items). "Bouncing", "aiming", "writing" and "hitting" had no significant correlation with any item on the PERF-FIT for children age group 1(6-10 years) as seen in table 9a. Also, when looking at caregivers' perceived motor performance for this age group, "household chores" "dancing" and "self-care" correlated negatively with items on the PERF-FIT indicating that if parent rated the children to be better at "household chores" "dancing" and "self-care" they scored poorer on some of the agility (running, stepping) and ball skill items (throwing, catching).

A weak significant correlation was found on two items of the PERF-FIT; "running" and "stepping" as shown in table 9b. "Catching", "hitting" and "chores" had no correlation with any item on the PERF-FIT for children age group 2(11-12 years). Overall, correlation was found to be significantly weak between caregivers' perceived motor performance and the children's actual motor performance in age group 2 (11-12 years), and all in the expected direction.

Table 9a. Correlation co-efficient values for the relationship between PERF-FIT and caregivers' perception on motor performance of children age group 1 (6-10 years) (N=277)

	Run#	Step#	Side Jump	Long Jump	Overhand Throw	Bounce	Throw	Static Balance	Dynamic Balance	Jump	Hop Right	Hop Left
Kicking	-.138*				.122*	.225**	.236**		.121*		.151*	
Bouncing												
Aiming												
Catching	-.176**		.178**	.173**		.172*	.160**		.125*			
Writing												
Hitting												
Throwing						.151*						
Running							.125*					
Hopping						.126*						
Riding				.166**	.187*	.282**	.290**		.225**		.184**	.159**
Climbing					.124*	.199**	.163**					
Team Sport						.168**	.152*					
Dancing	.119*											
Chores					-.120*	-.134*	-.122*	.121*				
Self-Care		.155**										

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

lower scores represent better performance which means correlation are expected to be negative

Table 9b. Correlation co-efficient values for the relationship between PERF-FIT and caregivers' perception on motor performance of children age group 2 (11-12 years) (N=129)

	Run#	Step#	Side Jump	Long Jump	Overhand Throw	Bounce	Throw	Static Balance	Dynamic Balance	Jump	Hop Right	Hop Left
Kicking	-.203*	-.264**		.304**	.300**	.359**	.338*					.175*
Bouncing		-.271**										
Aiming		-.189*			.202*							
Catching												
Writing			.215*									
Hitting												
Throwing	-.175*					.236**	.193*					
Running			.233**	.243**					.178*			
Hopping			.199*	.326**					.189*			
Riding				.210*	.197*	.253**			.241**			
Climbing					.224*	.207*	.234**					
Team Sport	-.188*	-.216*	.182*	.293**	.263**	.247**	.288**					
Dancing			.223*									
Chores												
Self-Care			.202*									

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

lower scores represent better performance which means correlation are expected to be negative

4.12 Conclusion

In conclusion, the 406 children (51% females, 49% males) were well distributed among age and grades.

Both caregivers and children perceived that the children had good to very good motor performance during active play and regarded active play as very important. Out of the total 24 additional games perceived as important by caregivers and children, four games with the highest frequency were two active games and two non-active games.

Weak and moderate positive correlation was found between children and caregivers' perception on motor performance during active play. However, correlation was lower between perception for younger children and their parents (mean correlation over all items 0.19) when compared to older children and their parents (mean correlation over all items 0.40).

Weak correlations, in the opposite direction, were found between the perceived motor performance among young children and their actual motor performance, measured with the PERF-FIT. In the older age group, weak and moderate correlations in the expected direction were found between the perceived performance in active play and their actual motor performance measured with the PERF-FIT. Mostly, weak correlations were found between the perceived performance in active play among caregivers and the actual motor performance of the children as measured with the PERF-FIT.

CHAPTER 5: DISCUSSION

5.1 Introduction

This study investigated the nature of active play in children aged 6-12 years in Ghana. The study also examined the perceptions of children and their caregivers on motor performance during active play and the importance of active play using the MCQ. Additional active play/games perceived to be important were identified. The PERF- FIT was used to determine the actual motor performance of the children during active play. In addition, this study examined the relationship between the perceived (children and caregivers) and actual motor performance (child) during active play.

Children and caregivers perceived active play to be important for the children. Interestingly, high perceptions of importance were found for 'handwriting', 'household chores', and 'self-care'; which are not active play items but related on certain motor skills. The study revealed additional forms of active play including 'Ampe', 'Skipping' and a non-active play; 'Ludu' among several others, that were of importance to Ghanaian children and caregivers.

Children and caregivers perceived good motor performance of the children during active play. Interestingly weak positive, weak negative and a few moderate correlations were found between perceived and actual motor performance during active play.

5.2 Demographic Characteristics of Children

The current study recruited 406 children aged 6-12 years and their caregivers from three primary schools in Ghana. The sample size for the current study was large enough when compared to the few studies that have investigated similar parameters (Barnett et al., 2015; Jones et al., 2010). These studies recruited 102 children from three primary schools (Barnett et al., 2015) and 1414 children from 20 primary schools (Jones et al., 2010). The age range (6-12 years) and grade (K-2 to Grade 6), used for this current study was broader than other studies investigating similar constructs within this population (Barnett et al., 2015; LeGear et al., 2012; Robinson, 2011). These studies used 4-8-year-old children in full-time primary school, 5 years (mean age) children in Kindergarten and 4 years (mean age) children in preschool respectively. We found another study that was conducted among 9 year old and 11 year old boys and their parents from 20 primary schools in Australia (Jones et al., 2010). The current study was well distributed among gender (51% of the children were females and 49% were males), and aligns

with a previous study done in this population conducted among 52% boys and 48% females (LeGear et al., 2012).

5.3 Children's Perceptions on Their Motor Performance

Most children perceived themselves to be good at all activities on the MCQ. Interestingly, the majority of the children perceived themselves to be super good at "running", "hopping", writing neatly", "household chores" and "self-care". Self-care, which involves taking care of one's own body (AOTA, 2014), had the highest proportion of children perceiving themselves to be super good/ good at. These relatively high perceptions of motor performance are consistent with studies in younger children (Barnett et al., 2015; Harter & Pike, 1984; LeGear et al., 2012). It is important to take note that these perceptions may/may not reflect the actual motor performance of the children as younger children are known to have difficulty in differentiating between their perceptions and their own reality (Barnett et al., 2015; Harter & Pike, 1984). This current study used children aged 6-12 years. Children in this age group (middle and late childhood) have accurate perceptions about their motor performance, however, they may also tend to overestimate their performance since the accuracy of their perceptions are based on the development of cognitive capabilities (De Meester et al., 2016). This was evident in the current study which grouped the children in two groups (6-10 years) and (11-12 years) and found more overestimated perceptions in the younger children than the older children. This result supported evidence of the development of cognitive capabilities in the children as they mature in age (De Meester et al., 2016). The current study used pictorial scales to measure the perceptions in the children to aid in the accuracy of results within this age group, as suggested by literature (LeGear et al., 2012).

Ghanaian children showing high perceptions about their motor performance will be more motivated to engage in active play (Estevan et al., 2018). This could be a great step in advocating for the creation of more active play opportunities to increase their physical activity levels (Barnett et al., 2015; LeGear et al., 2012; Nobre, Bandeira, & Valentini, 2016) since perception of motor performance is critical for promotion of active play and motor performance in children (Niemistö et al., 2019). If we provide more active play opportunities for Ghanaian children, they will tend to engage more often thus, there will be an increase in their physical activity levels and their chances on building their motor performance in active play. Children with high perceived competence are known to exhibit higher self-esteem, exert greater efforts, attempt challenging tasks and demonstrate persistence; which influences motivation to learn

and participate in motor activities (Robinson, 2011; Stodden et al., 2008). It is worth to mention that, handwriting, self-care and household chores although highly rated in terms of importance and performance, are not active play items but related to certain motor skills of importance that directly influence academic and life skills (Fisher et al., 2008). Since these activities are valued than active games with regard to academic and life skills, this current study calls the need for active play and games to be given the same attention and value when it comes to child development.

5.4 Caregiver's Perceptions on Children's Motor Performance

Generally, caregivers perceived the children to be good at all the items on the MCQ. When compared to the perceptions of the children, the caregivers' perceptions on their children's motor performance were moderately high. This finding is valuable as perceptions of caregivers are integral in cultivating children's actual and perceived motor competence (Estevan et al., 2018). Caregiver perception on motor performance is critical in the promotion of active play. Caregivers are major stakeholders in the creation of more active play opportunities as well as the involvement of children in active play (Alexander et al., 2014; Tandon et al., 2015; Truelove et al., 2017). These moderately high perceptions of caregivers will be a good source of motivation for the children to engage in more active play and thus increase their motor performance and physical activity levels.

It is expected that caregivers have the cognitive ability to accurately grade their children's motor performance (Lalor et al., 2016). A study by (Estevan et al., 2018) in children aged 6-11 years and their caregivers shows that caregivers are more accurate in their perceptions than children. However, caregivers may not be actively involved in the day to day active play engagement of the children, and their perceptions on the children's motor performance may be wrongly estimated (Niemistö et al., 2019). Also, their perceptions may be influenced by *social desirability bias* (Fisher & Katz, 2000), where parents may overestimate the motor performance of their children with the mindset that reporting poor motor skills could reflect an incompetence in their parenting (Estevan et al., 2018).

Due to heightened concerns about safety, there has been an increase in screen time (watching television, computer games and mobile phones) in children and this may have influenced the perceptions of the caregivers on the children's motor performance since they don't get to watch their children engage in active play (Kottyan et al., 2014). In this current study, video games

were rated 5th in additional games perceived as important by Ghanaian children and their caregivers. However, screen time results in sedentary play behaviors among children and calls for research in ways to improve energy expenditure (making it more active) during engagement in such games (Brockman, Fox, et al., 2011). Additionally, it is interesting to note that among caregivers, 'handwriting', 'self-care' and 'household chores' also had high perceptions in both good performance and importance. These activities are not active play items but they are related to certain motor skills of importance. Research shows that in recent years, caregivers place a lot of value on the structured educational activities children engage in. An appropriate explanation for these high perceptions could be that handwriting is a pre-requisite for academic performance whereas self-care and household chores are necessary skills for emerging independent living. These activities are structured, goal-oriented, do not expend a good amount of energy and may not be child-oriented, unlike active play, and most caregivers are aware of their direct impact in education be it academic or life skills (Alexander et al., 2014; Fisher et al., 2008).

5.5 Children's Perceptions on the Importance of Active Play

The current study results show that children place a lot of importance on active play and perceive a high number of items on the MCQ (11 out of 15) to be very important to be good at. Out of these 11 items, 3 items; 'self-care', 'household chores' and 'handwriting' are not active play but are known for their direct influence of academic performance and living skills and as such, it is not surprising that they are highly perceived as important for the children (Alexander et al., 2014; Fisher et al., 2008). The high perceptions on the active play items is not surprising since children enjoy play and are mostly occupied by it. Active play is known to be a very productive form of play allowing children to expend lots of energy whilst drawing fun and pleasure from it (Alexander et al., 2014). Active play has emerged a critical means for children to increase their physical activity levels thereby promoting health (Brockman, Jago, & Fox, 2010). The perspectives of children on play is a critical step in establishing strategies around improving active play (Brockman, Fox, et al., 2011). A study in 10-11 year old children showed that apart from deriving pleasure from active play, children are well aware of the many health benefits associated with active play (Brockman, Jago, et al., 2011). Thus, children perceiving good performance in active play as very important, is a great motivation for their participation since humans tend to occupy themselves with activities that are meaningful to them (AOTA, 2014). Since research shows a decline in play opportunities especially in low resourced communities (Kotlyan et al., 2014), this study's results call for the creation of more active play

opportunities for Ghanaian children in order to build on their actual motor performance, and enjoy the benefits of engagement in active play.

5.6 Caregivers' Perceptions on the Importance of Active Play

Results from the current study show that caregivers place importance on active play. However, they perceive a lesser number of active play items on the MCQ to be very important for the children to be good at as compared to the findings from children. Notably, the highest perceptions among these items were 'self-care', 'household chores' and 'handwriting'. This finding is not surprising as although most caregivers may or may not be aware of the benefits of active play; several factors such as safety of play environments, competitive and standardized educational environments, increase in structured leisure activities and financial constraints associated with active play may have resulted in caregivers perceiving good performance in active play as less important as compared to the children (Brockman, Fox, et al., 2011; Kottyan et al., 2014; Veitch et al., 2006). In recent years, caregivers tend to place more importance on structured leisure activities and indoor games that tend to have a more educational focus due to competitive educational environments (Fisher et al., 2008). Alexander et al. (2014) calls for a change in standardized educational environments to integrate several forms of active play into the daily life of children to enhance its many physical, social, cognitive and hence academic benefits in the children. A study by Fisher et al. (2008) done among child professionals and mothers revealed that mothers placed high academic value on structured forms of play, whereas professionals placed high value on the benefits of unstructured play. The current study's results call for Ghanaian caregivers to be educated on the relevance of active play as a major physical activity in children among several social and cognitive benefits including academic skills (Brockman, Fox, et al., 2011; Brockman, Jago, et al., 2011). Since caregivers are responsible for providing play opportunities and establishing rules for playing in children (Alexander et al., 2014; Brockman, Jago, et al., 2011), this will further cause the creation of more active play opportunities for children, thus increasing the health of the children. Caregivers who have knowledge about the importance of active play on the development of their children are known to provide more active play opportunities for the children than parents who lack knowledge on the importance of active play (Fisher et al., 2008; Veitch et al., 2006).

5.7 Additional Active Games Described as Important by Participants

It is interesting to note that the first two additional games, Ampe and Skipping, with the highest frequency are active games considered to be important by both children and caregivers. The third and fourth game, 'ludu' and 'oware' are non-active games that are structured board games. They are fun and demand concentration, mathematical and fine motor skills. According to research, children engage more in active forms of play because they are fun, unstructured and self-oriented, thus the order of importance in the games recorded (Alexander et al., 2014; Brockman, Jago, et al., 2011). Children had the highest frequency in reporting these additional games (Ampe, Skipping, Oware and Ludu) as important as compared to caregivers. Throughout literature, it is evident that caregivers prioritize play less in children since they perceive play to have a lesser educational focus. This demands that caregivers in Ghana are educated on active play as critical for physical activity in children (Brockman, Jago, et al., 2011) in order to enhance their perception on its importance and also to motivate the creation of more opportunities for the children to engage in active play.

5.8 Correlation between Caregivers and their Children's Perceived Motor Performance

This current study found positive weak to moderate correlations between children and caregivers' perception on the children's motor performance. We decided to group the children into two age groups per the data. We found more significant and higher correlations among the older children and caregivers (11-12 years) when compared to the younger group (6-10 years). As children develop their cognitive abilities to make accurate judgments about their capabilities improves, and this, could be a reason for the better correlations between the older children and caregivers. It is worthwhile to mention that this current study found high perceptions among the children which were mostly not correlated with their actual performance, especially among the younger children. Among caregivers, moderate perceptions were found to be closer to scores on the PERF-FIT. This variance is understandable, as children tend to overestimate their abilities, leading to inflated perceptions. Research shows that children often positively report on their physical abilities when compared to their parents. Notwithstanding, caregivers' perceptions also stand to be influenced by other variables since they may not be actively involved in the daily active games engaged by children (Niemistö et al., 2019). Our results are consistent with other studies finding discrepancies in the perspective of children and parents on children's physical abilities (Kennedy, Brown, & Chien, 2012). The perceptions of caregivers on their children's motor performance serves as a motivation for the children to engage in active games

as they use such information to assess their motor skills (Estevan et al., 2018; Nobre et al., 2016). Finding significant correlations between the children and the caregivers could prove that children's perception on their motor performance is influenced by their caregiver's perception on their motor performance and thus both perspectives are valuable in establishing strategies and policies around active play of children (Bardid et al., 2019; Kennedy et al., 2012; Veitch et al., 2006). In addition to using standardized motor performance tests, Occupational Therapists and other health professionals should assess both the perspectives of children and caregivers on motor performance to gain a more holistic view to inform interventions.

5.9 Relation between Children's Perceived Motor Performance and Actual Motor Performance

This current study found moderate and weak correlations between children's perceived motor performance and their actual motor performance. For children age group 1 (6-10 years), we noticed weak negative correlations. Regarding the variables measured with the PERF-FIT, two variables (running and stepping) moved opposite to the expected direction. This finding shows that the younger children (6-10 years) had no accurate perception in their motor performance as measured with the MCQ, looking at the direction of the correlation between their perceptions and their actual motor performance. Thus, the younger children performed less at the items on the PERF-FIT against the high perceptions they had about their motor performance.

Our results show that the older children started to have a better idea about their motor performance as measured with the PERF-FIT, although this was far from perfect. It should be taken into account that there is no one-on-one relation between the items of the MCQ and the PERF-FIT. So only moderate correlations are expected between activities that require similar skills for instance the ball skill items. In the older children, MCQ items; 'kicking', 'bouncing', 'aiming', 'catching', 'hitting', 'throwing', 'running' and 'hopping' were related to items on the PERF-FIT. Among these, ball skills; 'bouncing' and 'throwing' were expected to have had moderate correlations with 'throw' and 'bounce'; however, the results presented weak correlations. 'Running' and 'hopping' also had no correlation with 'jump' and 'hop' against what is expected (moderate correlations). Interestingly, the three non-active play items on the MCQ; 'writing', 'self-care' and 'household chores' had weak negative correlations showing how distant they are to items on the PERF-FIT.

A study in Australian kindergarten children found low significant correlations between perceived physical competence and actual motor proficiency (LeGear et al., 2012). The study used the Test of Gross Motor Development-2 (TGMD-2) to assess the actual motor proficiency and the Pictorial Scale of Perceived Competency and Social Acceptance for Young Children to assess perceptions in physical competence among the kindergarten children. Perceived motor competence was found to be relatively high in the current study and is consistent with other studies in Kindergarten children (Goodway & Rudisill, 1997; Valentini & Rudisill, 2004). Another study in pre-school children (mean age; 4 years) found moderate correlation between perceived physical competence and fundamental motor skills (Robinson, 2011). However, the study revealed low perceived competence in the preschoolers as opposed to what is found in literature (Rudisill, Mahar, & Meaney, 1993; Valentini & Rudisill, 2004). Six of the fundamental motor skill activities found in these two studies were used in this current study (run, jump, hop, throw, catch and bounce). The PERF-FIT items are similar to the daily real-life engagements in active play by children, thus physical activities. A study in children aged 4-8 years showed perceived object control competence was associated with actual object control competence (ball skills), yet neither was associated to physical activity (Barnett et al., 2015). This finding makes sense since most active play games (physical activities) engaged in by children are not only ball games (object control component) but several others demanding different motor skills. Another study did a comprehensive review of 108 studies; exploring the correlates of physical activity in children aged (3-12 years) and (13-18 years) and found an indeterminate relationship between perceived competence and physical activity (Sallis et al., 2000). A study by (Estevan et al., 2018) in children aged 6-11 years found no significant correlation between the children's perception and their actual fundamental motor skills which is similar to the current study's findings for younger children (6-10 years). The current study's results do not fully align with the few similar studies done. An explanation for this misalignment could be age. Most of the studies reported had different and a lower age range of participants as compared to this study. This current study used a broad range of children aged 6-12 years and further grouped children into age group 1 (6-10 years) and (11-12 years). It could also be that the current study used a variable – centered approach other than person centered approach and thus, findings are general for this age range other than for specific age, which could have yielded different results. One study, argued that person-centered approaches tend to provide more clarity about the associations between perceived and actual motor competence among other variables (De Meester et al., 2016). In addition, this current study's findings may be as a result of the fact that the younger children generally overestimate their perceptions on their motor performance due to

lack of cognitive ability and environmental influence (Estevan et al., 2018; Harter & Pike, 1984; Stodden et al., 2008). Also, caregivers may tend to encourage the child with poor motor skills more by making them feel they are super good at motor skill-related activities than the child who is really good. Thus, their lack of accurate judgment resulted in misalignment with their actual performance, thus the weak negative correlations. Several systematic reviews of physical activity correlates show that perceived competence is positively associated with adolescent physical activity (Biddle, Whitehead, O'Donovan, & Nevill, 2005; Sallis et al., 2000). In the older children (10-11years), we noticed weak to moderate positive correlation. This could be as a result of increased accuracy in perceptions since perceptions of children are directly influenced by the development of their cognitive capabilities (De Meester et al., 2016). Further, several studies show misalignment of assessment of perceived and actual motor competence (for example assessing hopping but asking perception of another task which influences results (Kennedy et al., 2012; LeGear et al., 2012). In the current study, most but not all the items on the perception questionnaire were in line with the actual assessments done and could have affected results. However, results from Table 8a and 8b show that similar items on the MCQ and PERF-FIT had no correlation and sometimes weak correlations. Another potential reason could be the contextual differences for the studies. For most developing countries like Ghana, there is no standard description of tasks involved in the completion of the various forms of active play for children to correctly grade their motor performance in these active games. There is no standardized comparison in Physical Education (P.E.) grades for organized competitions in order for trainers to know which child plays well or not. Thus, findings may have been influenced by culture/context (De Meester et al., 2020; Nobre et al., 2016) and may have resulted in inflated perceived competence (LeGear et al., 2012). On the positive side, the high perceptions yet low correlation between the perceptions and actual motor performance in this current study, could be a great window of opportunity for Ghanaian children to be imparted with motor skills as they stand a chance of having high motivation to engage in active play (LeGear et al., 2012; Robinson, 2011; Stodden et al., 2008). The current study's finding supports other studies in the need to obtain the perceptions of caregivers, as although not perfect, they contribute to a holistic understanding the motor performance of children (Estevan et al., 2018; Kennedy et al., 2012). Further, this finding shows that apart from the perceived motor performance of children and their caregivers, there is the need for health professionals to assess the actual motor performance of children (Barnett et al., 2015; De Meester et al., 2016); using contextually relevant tool like the PERF-FIT in order intervene appropriately (Bardid et al., 2019).

5.10 Relation between Caregiver's Perceived Motor Performance and Actual Motor Performance

The current study found weak correlation between caregivers' perceived motor performance and the actual motor performance of the children. For the older children (11-12 years), we noticed "running" and "stepping" had significant correlation with the some MCQ items like team sports, kicking, bouncing, aiming and throwing. This shows that caregivers had a fair idea on the performance of the older children although not accurate. However, findings for the younger children (6-10 years) showed mixed directions as compared to all other results with regards to "running" and "stepping" (Table 10a). A study by (Estevan et al., 2018), used children aged 6-11 years and found positive weak to moderate correlation between parent's perception and the actual motor competence in locomotion, object control and Fundamental Motor Skills(FMS). Studies deem caregivers' report on children's motor performance to be more accurate than the children themselves (Estevan et al., 2018; Lalor et al., 2016). Similar to the study by (Estevan et al., 2018), other studies done found moderate correlation between caregivers' perception and object control but not locomotion (Lalor et al., 2016). In the current study, the fall in accuracy of caregivers' perceptions could be as a result of the fact that they do not observe or partake in the play activities and may not have any idea on how to grade their children's performance since they don't have any standardized comparison to use against the performance of their children and peers. This current study may have yielded different results if there was a standard comparison of skills involved in the completion of the various forms of active play in Ghana. Caregivers may have wrongly estimated/graded the children's ability during active games based on mere comparison with other children or the fact that the children engage in those activities but not necessarily performing well. Another potential reason could be that parents and significant others of children with poor motor skills might hold a belief that the poor motor skills reflect their bad parenting/training and thus caregivers may have been tempted to report higher than what it is on the children's motor performance (Estevan et al., 2018; Fisher & Katz, 2000). Thus, the discrepancies in the results of this current study although parents are expected to have accurate perceptions. Several studies report that caregivers' perception on children's motor performance is affected by age, sex (Barnett et al., 2016; Estevan et al., 2018). The current study grouped the ages of the children into two groups (6-10years) and (11-12years) and findings may have been different if individual ages and gender were used as the parameters for analyzing.

CHAPTER 6: RECOMMENDATIONS AND CONCLUSION

6.1 RECOMMENDATIONS FOR POLICY, PRACTICE AND FUTURE RESEARCH

The generation of data about the perceptions from the children themselves and their caregivers, and the measure of actual motor performance of the children is a great strength of this study. The context in which the study occurred was child friendly for active play and thus, was most appropriate.

Since active play is influenced by age, further studies measuring similar parameters should consider analyzing data in smaller age groups; 6-8 years, 9-10 years and 11-12 years or individual ages across genders to aid in clarity of results. **A limitation of this study was the lack of data on the caregivers of the children recruited for this study and thus, further studies should collect data on the caregivers as well.** Further studies could also be done in Ghanaian adolescents to find out the relationship between perceived and actual motor performance to provide more insight into active play and motor performance and its relation to cognition and development in Ghanaian children. This will further advise stakeholders in making policies around active play in Ghana. Again, studies should investigate the relationship between perceived and actual motor performance using the same motor activities for both parameters in order provide more accurate results.

A reliable assessment of motor performance like the PERF-FIT is needed to help provide a clear picture of abilities and skills that need mastering during daily play activities. The additional games provided by Ghanaian children and their caregivers need to be taken into consideration in future designs of play assessments and interventions for children with delayed motor development within this population. Caregivers need to be educated on the importance of good motor performance as well as the physical, academic benefits of active play to spike their interest in creating more active play opportunities for the children. **Most importantly, schools should be provided with active play resources and the school curriculum should give more room for active play participation. Also, education of teachers should include the critical impact of active play in childhood and the positive effect of teacher/caregiver engagement, in order to increase the rate at which children are allowed to play in school.** All stakeholders in Ghana involved in child development should address participation in active play as a public health priority and stimulate research, policies and actions in this area. Finally, researchers and policy makers in Ghana should consider developing a standard description of the types of active play and games as well as establish appropriate grading of children's motor performance during these active play and games.

6.2 CONCLUSION

The Ghanaian children taking part in this study had high perceptions about their motor performance during active play and valued the importance of good performance during active play. However, their actual performance was less than their perceptions of their performance, which may be a result of various factors, described above. The contrast between their high perceptions and actual motor performance calls for collaboration between caregivers, health professionals, policy makers, school authorities and the general public to put in efforts to create more opportunities for active play in children. Ghanaian children are motivated to play and the creation of these opportunities holds great potential to both increase their participation in, and their actual motor performance in active play. Further, stakeholders need to establish appropriate means of grading motor performance during active play in order to help in the identification of children who may have motor-skill related issues. Caregivers have direct impact on the perceived and actual motor performance of children. Caregivers in this study have moderate perceptions about the children's motor performance and moderately value the importance of good performance during active play. The study results show that we can't rely solely on perceptions to accurately assess motor performance of Ghanaian children during active play. This study shows that the relationship between perceived and actual motor performance among Ghanaian children is low. Thus, education on active play needs more attention in Ghana and further studies should be done on factors that influence the perceptions of caregivers and children on active play in Ghana. This step will contribute to helping Ghanaian caregivers and children to accurately perceive skill level during active play. A major positive side to this study's result is the high perceptions on active play performance among the younger children. This shows high self-esteem against minority complex which is a good motivation to engage them in active play and reap the benefits associated with it. Valid formal and contextually relevant assessments like the PERF-FIT should be used by health professionals in conjunction with other means to make conclusions about the motor performance of Ghana children.

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CHAPTER 8: APPENDICES

8.1 APPENDIX I: Letter of Ethical Approval



UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee



Room G50- Old Main Building
 Groote Schuur Hospital
 Observatory 7925
 Telephone (021) 406 6492
 Email: hrec-enquiries@uct.ac.za
 Website: www.health.uct.ac.za/fhs/research/humanethics/forms

09 June 2020

HREC REF: 112/2020

Dr P Gretschel
 Division of Occupational Therapy
 F-45 OMB
 Email: pam.gretschel@uct.ac.za
 Student: dsnros001@myuct.ac.za

Dear Dr Gretschel

PROJECT TITLE: ACTIVE PLAY: PERCEIVED AND ACTUAL MOTOR PERFORMANCE AMONG GHANAIAN CHILDREN MSc CANDIDATE -MS ROSEMARY DOE-ASINYO

Thank you for your response letter dated 26 May 2020, addressing the issues raised by the Faculty of Health Sciences Human Research Ethics Committee (HREC).

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

This approval is subject to strict adherence to the HREC recommendations regarding research involving human participants during COVID -19, dated 17 March 2020.

Approval is granted for one year until the 30 June 2021.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

The HREC acknowledge that the student: - Ms Rose Doe-Asinyo will also be involved in this study.

Please quote the HREC REF in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval, where necessary, before the research may occur.

Yours sincerely

Signature Removed

PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE

HREC 112/2020sa

Federal Wide Assurance Number: FWA00001637.
 Institutional Review Board (IRB) number: IRB00001938
 NHREC-registration number: REC-210208-007

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use: Good Clinical Practice (ICH GCP), South African Good Clinical Practice Guidelines (DoH 2006), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI), and Declaration of Helsinki (2013) guidelines. The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

8.2 APPENDIX II: Letters to Municipal Education Offices

Occupational Therapy Department
College of Health Sciences
University of Ghana
Korle Bu, Accra

The Municipal Director of Education
La Dadekotopon Municipal Education Office
Accra

Dear Sir/Madam,

PERMISSION TO WORK WITH SCHOOL CHILDREN IN TWO SCHOOLS WITHIN THE LA DADEKOTOPON MUNICIPALITY FOR A RESEARCH

I am Rosemary Xorlanyo Doe-Asinyo, an Occupational Therapist and Senior Research Assistant at the Department of Occupational Therapy, University of Ghana. I am currently pursuing a master's degree in Occupational Therapy at the University of Cape Town in South Africa. As a partial fulfilment for my degree, I will be carrying out a research in Ghana. The title of my project is "ACTIVE PLAY: PERCEIVED AND ACTUAL MOTOR PERFORMANCE AMONG GHANAIAAN CHILDREN". Children from two selected schools: Arakan Primary/JHS and La Anglican Basic School within the municipality will be assessed for motor performance using standard tools.

This study seeks to provide insight into daily active play, perceived and actual motor skills among children in Ghana. Findings from this study will provide information on active play occupations that are common and meaningful among Ghanaian children as well as their motor performance skills. This contextually relevant data will help draw specific programs to promote active play among children as well as contribute to existing guidelines for physical activity in Ghana. Children within the La Dadekotopon municipal may represent the various social-economic classes in Ghana hence they may be a perfect population for this study.

I hope my request will be favorably considered.

Thank you.
Yours faithfully,

.....
ROSEMARY XORLANYO DOE-ASINYO
(0209523307)

For further clarifications, questions and complaint you may contact the following persons:

- Ethical committee
- Prof Marc Blockman, Head of the University of Cape Town Human Research Ethics Committee
Telephone: +2721406338. Email: Marc.Blockman@uct.ac.za
- Hannah Frimpong, Administrator, Ghana Health Service Ethics Review Committee, Research Development Division, Ghana Health Service. Telephone: (0233) 507041223.

Supervisory team

- Prof Bouwien Smits-Engelsman (Supervisor). Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town. Telephone: 00310681273086. Email: bouwiensmits@hotmail.com
- Dr. Pam Gretschel (Supervisor). Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town. Telephone: +27214066739. Email: pam.gretschel@uct.ac.za

Occupational Therapy Department
 College of Health Sciences
 University of Ghana
 Korle Bu, Accra

The Chief Education Officer
Kwahu West Municipal District

Dear Sir/Madam,

PERMISSION TO RECRUIT SCHOOL CHILDREN IN ONE SCHOOL WITHIN THE KWAHU WEST MUNICIPALITY FOR A RESEARCH PROJECT

I am Rosemary Xorlanyo Doe-Asinyo, an Occupational Therapist and Senior Research Assistant at the Department of Occupational Therapy, University of Ghana. I am currently pursuing a master's degree in Occupational Therapy at the University of Cape Town in South Africa. As a partial fulfillment for my degree, I will be carrying out a research in Ghana. The title of my project is "ACTIVE PLAY: PERCEIVED AND ACTUAL MOTOR PERFORMANCE AMONG GHANAIAAN CHILDREN". Children from Pentecost Preparatory School within the municipality will be recruited and assessed for motor performance using standard tools.

This study seeks to provide insight into daily active play, perceived and actual motor skills among children in Ghana. Findings from this study will provide information on active play occupations that are common and meaningful among Ghanaian children as well as their motor performance skills. This contextually relevant data will help draw specific programs to promote active play among children as well as contribute to existing guidelines for physical activity in Ghana. Children within the Kwahu West Municipality may represent the various social-economic classes in Ghana hence they will be a perfect population for this study.

I hope my request will be favorably considered.

Thank you.

Yours faithfully,

.....

ROSEMARY XORLANYO DOE-ASINYO

(0209523307)

For further clarifications, questions and complaint you may contact the following persons:

Ethical committee

- Prof Marc Blockman, Head of the University of Cape Town Human Research Ethics Committee
 Telephone: +2721406338. Email: Marc.Blockman@uct.ac.za
- Hannah Frimpong, Administrator, Ghana Health Service Ethics Review Committee, Research Development Division, Ghana Health Service. Telephone: (0233) 507041223.

Supervisory team

- Prof Bouwien Smits-Engelsman (Supervisor). Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town. Telephone: 00310681273086. Email: bouwien@smits@hotmail.com
- Dr. Pam Gretschel (Supervisor). Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town. Telephone: +27214066739. Email: pam.gretschel@uct.ac.za

8.3 APPENDIX III: Letters to Head Teachers

Occupational Therapy Department
College of Health Sciences
University of Ghana
Korle Bu, Accra

The Headmaster
Arakan Primary/JHS
Burma Camp

Dear Sir/Madam,

PERMISSION TO RECRUIT SCHOOL CHILDREN IN ARAKAN PRIMARY/JHS FOR A RESEARCH PROJECT

I am Rosemary Xorlanyo Doe-Asinyo, an Occupational Therapist and Senior Research Assistant at the Department of Occupational Therapy, University of Ghana. I am currently pursuing a master's degree in Occupational Therapy at the University of Cape Town in South Africa. As a partial fulfilment for my degree, I will be carrying out a research project in Ghana. The title of my project is "ACTIVE PLAY: PERCEIVED AND ACTUAL MOTOR PERFORMANCE AMONG GHANAIAIAN CHILDREN".

My research will involve administering motor performance assessments to children aged 6-12, attending selected schools within the La Dade-Kotopon Municipality of the Greater Accra Region and the Kwahu West Municipality of the Eastern Region of Ghana. Your school has been selected for this study within the La Dade-Kotopon Municipality. This study seeks to provide insight into daily active play, perceived and actual motor skills among children in Ghana. Findings from this study will provide information on active play occupations that are common and meaningful among Ghanaian children as well as their motor performance skills. This contextually relevant data will help draw specific programs to promote active play among children as well as contribute to existing guidelines for physical activity in Ghana. Children in Arakan School may represent the various social-economic classes in Ghana hence they will be a perfect population for this study.

In view of this, I ask for your permission to enable me to begin the project. I hope my request will be favorably considered. Thank you.

Yours faithfully,

.....
ROSEMARY XORLANYO DOE-ASINYO
(0209523307)

For further clarifications, questions and complaint you may contact the following persons:

- Ethical committee
- Prof Marc Blockman, Head of the University of Cape Town Human Research Ethics Committee
Telephone: +2721406338. Email: Marc.Blockman@uct.ac.za
 - Hannah Frimpong, Administrator, Ghana Health Service Ethics Review Committee, Research Development Division, Ghana Health Service. Telephone: (0233) 507041223.

Supervisory team

- Prof Bouwien Smits-Engelsman (Supervisor). Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town. Telephone: 00310681273086. Email: bouwiensmits@hotmail.com
- Dr. Pam Gretschel (Supervisor). Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town. Telephone: +27214066739. Email: pam.gretschel@uct.ac.za

Occupational Therapy Department
 College of Health Sciences
 University of Ghana
 Korle Bu, Accra

The Headmaster
La Anglican Basic School
 Burma Camp

Dear Sir/Madam,

PERMISSION TO RECRUIT SCHOOL CHILDREN IN LA ANGLICAN BASIC SCHOOL FOR A RESEARCH PROJECT

I am Rosemary Xorlanyo Doe-Asinyo, an Occupational Therapist and Senior Research Assistant at the Department of Occupational Therapy, University of Ghana. I am currently pursuing a master's degree in Occupational Therapy at the University of Cape Town in South Africa. As a partial fulfilment for my degree, I will be carrying out a research project in Ghana. The title of my project is "ACTIVE PLAY: PERCEIVED AND ACTUAL MOTOR PERFORMANCE AMONG GHANAIAI CHILDREN".

My research will involve administering motor performance assessments to children aged 6-12, attending selected schools within the La Dade-Kotopon Municipality of the Greater Accra Region and the Kwahu West Municipality of the Eastern Region of Ghana. Your school has been selected for this study within the La Dade-Kotopon Municipality. This study seeks to provide insight into daily active play, perceived and actual motor skills among children in Ghana. Findings from this study will provide information on active play occupations that are common and meaningful among Ghanaian children as well as their motor performance skills. This contextually relevant data will help draw specific programs to promote active play among children as well as contribute to existing guidelines for physical activity in Ghana. Children in La Anglican School may represent the various social-economic classes in Ghana hence they will be a perfect population for this study.

In view of this, I ask for your permission to enable me to begin the project. I hope my request will be favorably considered. Thank you.

Yours faithfully,

.....
 ROSEMARY XORLANYO DOE-ASINYO
 (0209523307)

For further clarifications, questions and complaint you may contact the following persons:

- Ethical committee
- Prof Marc Blockman, Head of the University of Cape Town Human Research Ethics Committee
 Telephone: +2721406338. Email: Marc.Blockman@uct.ac.za
 - Hannah Frimpong, Administrator, Ghana Health Service Ethics Review Committee, Research Development Division, Ghana Health Service. Telephone: (0233) 507041223.

Supervisory team

- Prof Bouwien Smits-Engelsman (Supervisor). Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town. Telephone: 00310681273086. Email: bouwien@smits@hotmail.com
- Dr. Pam Gretschel (Supervisor). Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town. Telephone: +27214066739. Email: pam.gretschel@uct.ac.za

Occupational Therapy Department
 College of Health Sciences
 University of Ghana
 Korle Bu, Accra

The Headmaster
Pentecost Preparatory School
 Nkawkaw

Dear Sir/Madam,

PERMISSION TO RECRUIT SCHOOL CHILDREN IN PENTECOST PREPARATORY SCHOOL FOR A RESEARCH PROJECT

I am Rosemary Xorlanyo Doe-Asinyo, an Occupational Therapist and Senior Research Assistant at the Department of Occupational Therapy, University of Ghana. I am currently pursuing a master's degree in Occupational Therapy at the University of Cape Town in South Africa. As a partial fulfilment for my degree, I will be carrying out a research project in Ghana. The title of my project is "ACTIVE PLAY: PERCEIVED AND ACTUAL MOTOR PERFORMANCE AMONG GHANAIAN CHILDREN".

My research will involve administering motor performance assessments to children aged 6-12, attending selected schools within the La Dade-Kotopon Municipality of the Greater Accra Region and the Kwahu West Municipality of the Eastern Region of Ghana. Your school has been selected for this study within the Kwahu West Municipality. This study seeks to provide insight into daily active play as well as the perceived and actual motor skills among children in Ghana. Results from this study will provide information on active play occupations that are common and meaningful among Ghanaian children as well as their motor performance skills. This contextually relevant data will help inform programs to promote active play among children as well as contribute to existing guidelines for physical activity in Ghana. Children in Pentecost Preparatory School may represent the various social-economic classes in Ghana, thus a perfect population for this study.

In view of this, I ask for your permission to enable me to begin the project. I hope my request will be favorably considered. Thank you.

Yours faithfully,

.....
 ROSEMARY XORLANYO DOE-ASINYO
 (0209523307)

For further clarifications, questions and complaint you may contact the following persons:

- Ethical committee
- Prof Marc Blockman, Head of the University of Cape Town Human Research Ethics Committee
 Telephone: +2721406338. Email: Marc.Blockman@uct.ac.za
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- Dr. Pam Gretschel (Supervisor). Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town. Telephone: +27214066739. Email: pam.gretschel@uct.ac.za

8.4 APPENDIX IV: RESPONSE FROM GHANA EDUCATION SERVICE FOR SCHOOLS

GHANA EDUCATION SERVICE

In case of reply the
number and date of this
letter should be quoted



La Dade-Kotopon Municipal
Education Office
La-Accra

My Ref: GES/LaDMEO/VOL 99
Your Ref:

10TH JULY, 2019

LETTER OF INTRODUCTION

I write to introduce **ROSEMARY XORLANYO DOE-ASINYO**, an Occupational Therapist and Senior Research Assistant at the Department of Occupational therapy, University of Cape Town in South Africa. She is carrying out a research in Ghana, the title of her project is "**ACTIVE PLAY AND PERCEIVED AND ACTUAL MOTOR PERFORMANCE AMONG GHANAIAAN CHILDREN**". Children form two selected schools: Arakan Primary/JHS and La Anglican Basic School in the municipality.

Please accord her the necessary support to carry out her task. You are also advised to monitor her activities so it would not interrupt academic work.

Attached are introductory letters from the University of Cape Town and Ghana Health Service Ethics Review Committee.

Thank you.

Signature Removed

BERNICE A. ADDAE (MRS)
DIRECTOR

Cc: The Circuit Supervisor – Manle Dada
The Circuit Supervisor – Arakan
The Headteacher – La Anglican Basic
The Headteacher – Arakan Prim/JHS

8.5 APPENDIX V: Information Sheet for Parents/Guardians

STUDY TITLE: ACTIVE PLAY: PERCEIVED AND ACTUAL MOTOR PERFORMANCE AMONG GHANAIA CHILDREN

Dear Parent/Guardian,

My name is Rosemary Doe-Asinyo. I am an Occupational Therapist registered for a Master's Degree at the University of Cape Town, South Africa. I work with a team of Occupational Therapists and Physiotherapists who work with children in Ghana. We are doing a research study on motor performance skills in children during active play and we would like your consent to include your child(ren) as participant(s) in the study.

What is the aim of this study?

This study will find out how good your children aged 6-12 years are during play activities like running, jumping, hopping, throwing and catching. It will also explore what types of active play are common and meaningful among Ghanaian children. This will help all professionals who work with children to design programs aiming to help Ghanaian children who have difficulties during the active play.

What are we asking you to do?

We are asking for your permission to test your child's motor performance skills in daily active play. You will be required to answer simple questions about yourself (like where you stay and work) and about your child (health status and how he/she is during certain activities). Only if you agree for your child to partake in the study, will he/she be approached to take part in the study. Your child will sign an assent form to confirm his/her participation. If you agree to us approaching your child to participate, we would like you to sign the informed consent declaration form. If you do not want your child to be involved in the study, please indicate your decision on the form. We will only approach your child if you give us permission to do so.

What does my child have to do?

Your child will perform a few activities that test their motor performance skills. There are ten tests in total. We will ask your child to:

1. Make a long jump
2. Throw a ball overhand
3. Run in a 4-meter agility ladder
4. Make stepping movements in a 4-meter agility ladder
5. Jump sideways in the agility ladder
6. Bounce and catch a ball
7. Throw and catch a ball
8. Balance on both legs
9. Jump on the agility ladder
10. Hop on the agility ladder

These tests will take place during the time given by the school. The test will take approximately 30-40 minutes. We are also asking for your permission to videotape some of the activities your child does for further analysis. Once the videotapes have been analyzed, the tapes will be destroyed. Your child will be asked some information about his/her motor skill in some daily activities.

Can my child refuse?

Your child also has the right to refuse to participate. If your child agrees to participate, we will ask him/her to sign an assent form that shows his/her agreement.

What are the risks involved?

Because the tests are all physical, your child may feel tired during or after the tests. To ensure your child's safety we will allow them to take breaks between each part of the test. A researcher will be present at all times to ensure the safety of your child. There will also be a first aid kit with a trained first aider available at all times to assist should the need arise.

Who will know the results of the tests?

Only you and the researchers will know the results of the tests. All the information we gather about you and your child will be kept locked in a safe location in the researcher's office. No personal information will be presented in papers written out of this study. The researcher will contact you in person if your child performs poorly and refer you to seek help for the child from the appropriate health professional.

What are the benefits of participating?

Findings from this study will be disseminated to health professionals involved with children and to the wider research group and the general public through peer-reviewed scientific journals, articles, conference presentations and media presentations to help use information from Ghana in improving the health and wellbeing of Ghanaian children.

Will you be paid for taking part?

We are not offering any money to the children or the parents for taking part in this research study. All children who take part in the study will receive healthy snacks at the end of the test and water will be made available at all times. Kindly let us know in the questionnaire if your child has a health condition that will demand an alternative to the healthy snack to be provided.

What happens if I do not want my child to take part?

Your consent to ensure your child's participation is voluntary. If you change your mind about your child's participation in the study, you may withdraw your consent at any time. There will be no consequences to withdrawal from the study. Refusal to take part in this study will not affect the quality of education or treatment that your child will receive in future.

For further clarifications, questions and complaint about participants rights and welfare you may contact the following:

Ethical committee

- Prof Marc Blockman, Head of the University of Cape Town Human Research Ethics Committee
Telephone: +2721406338. Email: Marc.Blockman@uct.ac.za
- Hannah Frimpong, Administrator, Ghana Health Service Ethics Review Committee, Research Development Division, Ghana Health Service. Telephone: (0233) 507041223.

Supervisory team

- Prof Bouwien Smits-Engelsman (Supervisor). Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town. Telephone: 00310681273086. Email: bouwiensmits@hotmail.com
- Dr. Pam Gretschel (Supervisor). Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town. Telephone: +27214066739. Email: pam.gretschel@uct.ac.za
- Dr. Emmanuel Bonney (Local Supervisor). School of Biomedical and Allied Health Sciences, Physiotherapy Department. Korle Bu. Telephone: +233243936728. Email: ebonney10@gmail.com

- Rosemary Xorlanyo Doe-Asinyo (Student Researcher). Telephone: +233 209523307. Email: itsrosedoe@gmail.com

**PLEASE KEEP THIS INFORMATION SHEET FOR YOUR RECORDS AND COMPLETE THE
DECLARATION ON THE NEXT PAGE**

Informed Consent: Parent/Legal Guardian Declaration

I (name and surname) am the parent/ legal guardian of(name and surname of your child) in class..... at..... (name of school)

I have read through the attached information letter and I understand what is required of my child and I. I don't feel that I am forced to have my child participate and I am doing so out of my own free will. I know that I can withdraw my child at any time that I so wish. I understand that withdrawal will have no ill consequences on my child.

PLEASE INDICATE YOUR CHOICE BY TICKING ONE BOX BELOW AND SIGNING NEXT TO THE BOX:

Make an x in the box to indicate your choice	Parent Name	Witness Name ¹
YES, I AGREE that my child takes part in this research study		
NO, I DO NOT AGREE that my child takes part in this research study		

If someone else has helped you read and complete this form: please write their name here:

REGARDING THE VIDEOTAPES:

Make an x in the box to indicate your choice	Parent Name	Witness Name ¹
YES, I AGREE that the researcher can videotape the assessments		
NO, I DO NOT AGREE that the researcher can videotape the assessment		

If someone else has helped you read and complete this form: please write their name here:

If you have any questions or concerns, please write them here:

--

Please complete this form and return it with your child.

**8.6 APPENDIX VI: Informed Assent and Child Declaration for Children
Informed Assent and Child Declaration for Children 6-8 Years****STUDY TITLE: ACTIVE PLAY: PERCEIVED AND ACTUAL MOTOR PERFORMANCE AMONG
GHANAIAN CHILDREN.**

My name is Rosemary Doe-Asinyo. I am studying at a University in South Africa. I want to find out how good you are during active play, the types of active play that you engage in and how important they are to you. You will be required to do simple play activities like running, jumping, hopping, throwing and catching.

DECLARATION

I agree to show the researchers how I do some activities. I may be tired after the tests. I understand that I do not have to do all the things, I can stop at any time and no one will be angry with me. I understand that the researcher will tell my parents how well I performed so that plans can be made to help me if necessary. If you understand and agree to show us how you do some of these activities please write your name in the box below. If you DO NOT want to show us how you do these activities, please DO NOT write your name in the box below.

Name:

Informed Assent for Children 9-12 Years

STUDY TITLE: ACTIVE PLAY: PERCEIVED AND ACTUAL MOTOR PERFORMANCE AMONG GHANAIA CHILDREN.

My name is Rosemary Doe-Asinyo. I work at the University of Ghana and currently studying at a University in South Africa. I am doing a research on the Active Play among Ghanaian Children.

What is the aim of this study?

This study will find out how good you are during play activities like running, jumping, hopping, throwing and catching. It will also find what types of active play are common and meaningful to you. It is very important to check how fit you are during active play so that if problems are identified, they can be solved early so that you become a happy and healthy adult. Also, this study will help all professionals who work with children to design programs in order help Ghanaian children who have difficulties during active play.

What do I have to do?

You will perform a few activities that test your skills during active play. You will be asked to:

1. Throw and catch a ball
2. Bounce and catch a ball
3. Throw a sand bag
4. Make stepping movements
5. Run
6. Jump
7. Balance on both legs

These tests will take place during the time given by your school. The test will take only 30-40 minutes.

What are the benefits of participating?

When you are good during play activities that you like, you will be able to play with other children. This helps your develop well. Information from you will help in improving the health and wellbeing of other Ghanaian children.

What are the challenges involved?

The tests are all physical so you may feel tired during or after the tests. We will allow you to take breaks between each part of the test. There will also be a first aid kit with a trained first aider available at all times to treat if you are hurt.

Can I refuse to take part in the study?

You have the right to refuse to take part in this study. If you change your mind about your participation in the study, you may withdraw your consent at any time. There will be no consequences if you withdraw from the study.

Will I be paid for taking part?

You will not be paid for taking part in this study. You will receive healthy snacks at the end of the test and water will be made available at all times.

CHILD DECLARATION FOR CHILDREN 9-12 YEARS OLD

My name is (name and surname of child), **in**
class.....at..... (name of school)

I agree to show the researchers how I do some activities. I may be tired after the tests. I understand that I do not have to do all the things, I can stop at any time and no one will be angry with me. I understand that the researcher will tell my parents how well I performed so that plans can be made to help me if necessary. If you understand and agree to show us how you do some of these activities please write your name in the box below. If you DO NOT want to show us how you do these activities, please DO NOT write your name in the box below.

Name:

--

8.7 APPENDIX VII: Questionnaire for Parents/Caregivers

Please try to answer all questions and **circle** the answer that is most applicable for the child. All information given in this questionnaire will be kept confidential.

Section A:

Demographic information

Child's full name	
Child's date of birth	
Child's Grade	
Name of person (completing the form)	
Relationship to child	
Where do you live	
Telephone number	
E-mail address	

The Child's Development, Health and Well-being

1 Were there any complications during pregnancy or at the birth of your child? If yes, please explain:	Yes	No
2 Was your child born underweight or premature at birth (born early)?	Yes	No
3 Has your child ever been seriously ill or hospitalised? If yes, please explain:	Yes	No
4 Does your child suffer from any medical conditions or take any medication? If yes, please explain:	Yes	No
5 Does your child have any problems with eyesight/ vision, ears/ hearing? If yes, please explain:	Yes	No
6 Does your child struggle with motor activities at home? If yes, please explain:	Yes	No
7 Does your child easily get tired or out of breath? For instance when playing chasing and ball games?	Yes	No
8 Does your child participate in any sport outside school? If yes which sport activity and how often per week?	Yes	No
9 Did your child struggle to learn motor activities or /active games (e.g. how catch or kick a ball, skip rope or climb play structures)? If yes which activity was hard?	Yes	No
10 Does your child struggle to pay attention (easily distracted) at home?	Yes	No
11 Has your child ever failed a grade a school?	Yes	No
12 Do you think your child has a motor problem?	Yes	Maybe

Section B: Your Child's Coordination Skills

Answer the following questions by comparing the degree of coordination your child has with other children of the same age when answering the questions. Use the key below:

Not at all like your child	A bit like your child	Moderately like your child	Quite a bit like your child	Extremely like your child
1	2	3	4	6

1. Your child *throws a ball* in a controlled and accurate fashion.

1 2 3 4 5

2. Your child *catches a small ball* (e.g. tennis ball size) thrown from a distance of 6 to 8 feet (1.8 to 2.4 m)

1 2 3 4 5

3. Your child *hits an approaching ball or birdie* with a bat or racquet accurately.

1 2 3 4 5

4. Your child *jumps easily over obstacles* found in garden or play environment.

1 2 3 4 5

5. Your child *runs* as fast and in a *similar* way to other children of the same gender and age.

1 2 3 4 5

6. If your child has a *plan* to do a *motor activity*, he/she can organize his/her body to follow the plan and effectively complete the task (e.g., building a cardboard or cushion "fort," moving on playground equipment, building a house or a structure with blocks, or using craft materials).

1 2 3 4 5

7. Your child's printing or *writing* or drawing in class is *fast* enough to keep up with the rest of the children in the class.

1 2 3 4 5

8. Your child's printing or *writing* letters, numbers and words is *legible*, precise and accurate or, if your child is not yet printing, he or she *colors and draws* in a coordinated way and makes pictures that you can recognize.

1 2 3 4 5

9. Your child uses appropriate *effort* or tension when printing or writing or drawing (no excessive *pressure* or tightness of grasp on the pencil, writing is not too heavy or dark, or too light).

1 2 3 4 5

10. Your child *cuts* out pictures and *shapes* accurately and easily.

1 2 3 4 5

11. Your child is interested in and *likes* participating in *sports or active* games requiring good motor skills.

1 2 3 4 5

12. Your child learns *new motor tasks* (e.g., swimming, rollerblading) easily and does not require more practice or time than other children to achieve the same level of skill.

1 2 3 4 5

13. Your child is *quick and competent* in tidying up, putting on shoes, tying shoes, dressing, etc.

1 2 3 4 5

14. Your child would *never* be described as a "*bull in a china shop*" (that is, appears so clumsy that he or she might break fragile things in a small room).

1 2 3 4 5

15. Your child does *not fatigue easily* or appear to slouch and "fall out" of the chair if required to sit for long periods.
























1 2 3 4 5








8.8 APPENDIX VIII: Motor Coordination Questionnaire for Children
























Name of Child: _____ ID number: _____













Child's Date of Birth: _____ Date: _____

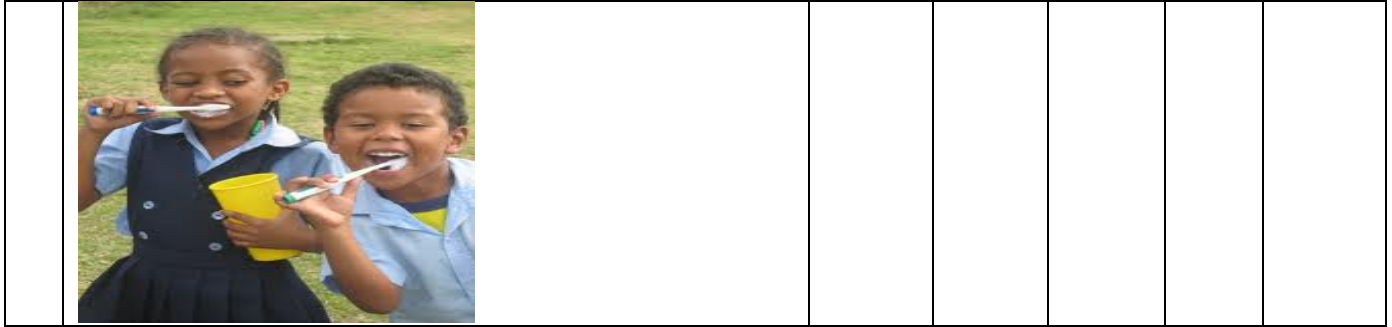
[A] How good are YOU in.....

		Not good at all	Not so good	A little good	Good	Super good
1	<p>Kicking a ball</p>  <p>(e.g. football, etc.)</p>					
2	<p>Bouncing a ball (e.g. tennis ball or a big ball)</p> 					
3	<p>Aiming at a target (e.g. throwing a ball into a basket or net)</p> 					
4	<p>Catching (e.g. a ball thrown by someone else)</p>					




































							
<p>5</p>	<p>Writing neatly/readable</p> 						
<p>6</p>	<p>Hitting a ball with a bat (e.g. tennis, etc.)</p> 						
<p>7</p>	<p>Throwing a ball (e.g. bowling, throwing a soccer ball, etc.)</p> 						
<p>8</p>	<p>Running (e.g. without falling, coordinated)</p> 						









































		Not good at all	Not so good	A little good	Good	Super good
9	Hopping (e.g. hopscotch, on one leg, on two legs) 					
10	Riding a Bicycle or other moving toy (e.g. skateboard, roller skates, scooter, etc) 					
11	Climbing (e.g. on playground equipment; jungle gym, wall, etc.) 					
12	Playing team sport (e.g. Soccer, netball, soft ball, etc.)					

						
<p>13</p>	<p>Dancing/moving to a musical beat (e.g. moving with rhythm and sequence, etc.)</p>  					
<p>14</p>	<p>Household chores (e.g. helping at home without dropping, spilling or breaking things...)</p> 					
<p>15</p>	<p>Self-care (e.g. dressing, washing self, combing or plaiting own hair, etc.)</p> 					



[B] How important do you think is it for YOU to be GOOD in

		Not at all important	Not so important	A little bit important	Important	Very important
1	Ball games involving kicking (e.g. football/soccer ball, etc.)					
2	Bouncing a ball (e.g. a tennis ball or a big ball)					
3	Aiming at a target (e.g. throwing a ball into a basket or net)					
4	Catching (e.g. a ball thrown by someone else)					
5	Writing neatly/readable					
6	Hitting a ball with a bat (e.g. playing tennis, etc.)					
7	Throwing a ball (e.g. bowling, throwing a soccer ball, etc.)					

		Not at all important	Not so important	A little bit important	Important	Very important
8	Running (e.g. without falling, coordinated)					
9	Hopping (e.g. hopscotch, on one leg, on two legs)					
10	Riding a Bicycle or other moving toy (e.g. skateboard, roller skates, scooter)					
11	Climbing (e.g. on playground equipment; jungle gym, wall, etc.)					
12	Playing team sport (e.g. Soccer, netball, softball, etc)					
13	Dancing/moving to a musical beat (e.g. moving with rhythm and sequence, etc.)					
14	Household chores (e.g. helping at home without dropping, spilling or breaking things...)					
15	Self-care (e.g. dressing, washing self, combing or plaiting own hair, etc.)					

Are there any other games you do? (Think about times when you are playing inside or outside the home, e.g. playing with a ball, skipping etc. and list them below)

Thank you for taking the time to complete the questionnaires!









































8.9 APPENDIX IX: Motor Coordination Questionnaire for Parents/Caregivers




































Name of Child: _____ Name of parent/guardian: _____

Child's date of Birth: _____ Date: _____




































We would like to know what you think about the motor skills of your child as compared to other children. We kindly ask you to complete the two questionnaires below. If you can think of any other activities, not listed below, that you think are important for your child please write them in the space provided.









































[A] How good is YOUR CHILD in.....

		Not good at all	Not so good	A little good	Good	Super good
1	Kicking a ball (e.g. football, etc.)					
2	Bouncing a ball (e.g. a tennis ball or a big ball)					
3	Aiming at a target (e.g. throwing a ball into a basket or net)					
4	Catching (e.g. a ball thrown by someone else)					
5	Writing neatly/readable					
6	Hitting a ball with a bat (e.g. tennis, etc.)					
7	Throwing a ball (e.g. bowling, throwing a soccer ball, etc.)					
8	Running (e.g. without falling, coordinated)					

		Not good at all	Not so good	A little good	Good	Super good
9	Hopping (e.g. hopscotch, on one leg, on two legs)					
10	Riding a Bicycle or other moving toy (e.g. skateboard, roller skates, scooter, etc)					
11	Climbing (e.g. on playground equipment; jungle gym, wall, etc.)					
12	Playing team sport (e.g. Soccer, netball, soft ball, etc.)					
13	Dancing/moving to a musical beat (e.g. moving with rhythm and sequence, etc.)					
14	Household chores (e.g. helping at home without dropping, spilling or breaking things...)					
15	Self-care (e.g. dressing, washing self, combing or plaiting own hair, etc.)					

[B] How important do you think is it for your child to be good in

		Not at all important	Not so important	A little bit important	Important	Very important
1	Ball games involving kicking (e.g. football/soccer ball, etc.)					
2	Bouncing a ball (e.g. a tennis ball or a big ball)					
3	Aiming at a target (e.g. throwing a ball into a basket or net)					
4	Catching (e.g. a ball thrown by someone else)					
5	Writing neatly/readable					
6	Hitting a ball with a bat (e.g. playing tennis, etc.)					
7	Throwing a ball (e.g. bowling, throwing a soccer ball, etc.)					

		Not at all important	Not so important	A little bit important	Important	Very important
8	Running (e.g. without falling, coordinated)					
9	Hopping (e.g. hopscotch, on one leg, on two legs)					
10	Riding a Bicycle or other moving toy (e.g. skateboard, roller skates, scooter)					
11	Climbing (e.g. on playground equipment; jungle gym, wall, etc.)					
12	Playing team sport (e.g. Soccer, netball, softball, etc)					
13	Dancing/moving to a musical beat (e.g. moving with rhythm and sequence, etc.)					
14	Household chores (e.g. helping at home without dropping, spilling or breaking things...)					
15	Self-care (e.g. dressing, washing self, combing or plaiting own hair, etc.)					

List any other physical active play (Think about times when your child is playing inside or outside the home, e.g. playing with a ball, skipping etc.)

Overall Motor Skill Ability: Which of the following best describe your child's overall motor skill ability (Tick only one color)

- | | |
|--|--------|
| a. Do you judge your child to be generally motor skilled? | Green |
| b. Do you judge your child to be less motor skilled compared to peers? | Orange |
| c. Do you judge your child to be generally uncoordinated? | Red |

Thank you for taking the time to complete the questionnaires!
Please return the questionnaires with the child.

8.10 APPENDIX X: PERF-FIT Score Forms

Score form Power and Agility PERF-FIT©					
Name:		ID:		Remarks	
Tester:		Test date:			
Agility ladder Running (0.01 s) <i>Always 2 trials</i>	Trial 1 Time (0.01 s)	#Mistakes	Rest 15s Trial 2 Time (0.01 s)	#Mistakes	Extra trial Running Needed? 3 mistakes or more
					Yes/No
Agility ladder Stepping (0.01 s) <i>Always 2 trials</i>	Trial 1 Time (0.01 s)	#Mistakes	Rest 15s Trial 2 Time (0.01 s)	#Mistakes	Extra Trial Needed? 3 mistakes or more
					Yes/No
Extra trial Running Only if needed	Time (0.01 s)	#Mistakes	Extra trial Stepping Only if needed	Time (0.01 s)	#Mistakes
Side Jump <i>Always 2 trials</i>	Trial 1 (# in 15 s)	Rest 15s Trial 2	Long jump Distance cm <i>Always 2 trials</i>	Trial 1 distance cm	Rest 15s Trial 2 cm
Throw sandbag 2Kg Kneeling <i>Always 2 trials</i>	Trial 1 Kneeling distance cm	Trial 2 Kneeling distance cm	Throw tennis ball if space available	Trial 1 distance cm	Trial 2 distance cm

Score form SIS Bouncing and Throwing PERF-FIT©					
Name:			ID:		
Tester:			Test date:		
Ball Skills Bounce and catch <i>Max score 10 catches per item</i> Preferred R/L	Item 1 # Bounce and catches with 2 hands <i>6 out of 10 continue</i>	Item2 # Bounce and catches with Preferred hand <i>6 out of 10 continue</i>	Item 3 # Bounce and catches with Non - preferred hand <i>6 out of 10 continue</i>	Item4 # Bounce and catches with Preferred hand with clap <i>6 out of 10 continue</i>	Item 5 # Bounce and catches with Non-preferred hand with clap <i>End of series</i>
SIS Bounce and Catch					
Ball Skills Throw and Catch <i>Max score 10 catches per item</i> Preferred R/L	Item 1 # Throw and Catches 2 hands <i>6 out of 10 continue</i>	Item2 # Throw and Catches Preferred <i>6 out of 10 continue</i>	Item 3 # Throw and catches Non preferred <i>6 out of 10 continue</i>	Item4 # Throw and catches with Preferred hand with clap <i>6 out of 10 continue</i>	Item 5 # Throw and catches with Non-preferred hand with clap <i>End of series</i>
SIS Throw and Catch					

Score form SIS Balance PERF-FIT©					
Name		Tester		Remarks	
ID		Date		Shoes Y/N	
Protocol 1 2					
Knee Stance Static R <i>If 15s no second trial</i>	Item R Leg Trial 1 Max 15 s	Item R Trial 2 Max 15 s	Knee Stance Static L <i>If 15s no second trial</i>	Item L Trial 1 Max 15 s	Item L Trial 2 Max 15 s
Knee Stance Dynamic <i>If 8 steps no second trial</i>	Item Knee Stance Walk Trial 1 Max 8 steps		Knee Stance Dynamic <i>If 8 steps no second trial</i>	Item Knee Stance Walk Trial 2 Max 8 steps	
Grasp Foot Static Right <i>If 15s no second trial</i>	Item R Trial 1 Max 15 s	Item R Trial 2 Max 15 s	Grasp Foot Static Left <i>If 15s no second trial</i>	Item L leg Trial 1 Max 15 s	Item L leg Trial 2 Max 15 s
Grasp Foot Dynamic <i>If 8 steps no second trial</i>	Item Grasp Foot Walk Trial 1 Max 8		Grasp Foot Dynamic <i>If 8 steps no second trial</i>	Item Grasp Foot Walk Trial 2 Max 8	
Pick up 4 cans Right Stance # of right performed cans	Item R Stance Leg Close to far Max 4	Item R Stance Leg Far to close Max 4	Pick up 4 cans Left Stance # of right performed cans	Item L Stance Leg Close to far Max 4	Item L Stance Leg Far to close Max 4

Score form SIS Jumps Hops PERF-FIT©			
Name:		ID:	
Jump in each square Item 1 Trial 1 <i>Max score 8 (no 2nd trial)</i>	Rest 15s Item 1 Trial 2 <i>Stop if not 5 points</i>	Jump in every other square Item2 Trial 1 <i>Max score 4 (no 2nd trial)</i>	Rest 15s Item 2 Trial 2 <i>Stop if not 3 points</i>
Jump in every other square 5cm Item 3 Trial 1 <i>Max score 4 (no 2nd trial)</i>	Rest 15s Item 3 Trial 2 <i>Stop if not 3 points</i>	Jump in every other square 10cm Item 4 Trial 1 <i>Max score 4 (no 2nd trial)</i>	Rest 15s Item 4 Trial 2 End of series
Hop in each square Item 1 Right Trial 1 <i>Max score 8 (no 2nd trial)</i>	Rest 15s Item 1 Right Trial 2 <i>Stop if not 5 points</i>	Hop in every other square Item2 Right Trial 1 <i>Max score (no 2nd trial)</i>	Rest 15s Item 2 Right Trial 2 <i>Stop if not 3 points</i>
Hop Every other square 5cm Item 3 Right Trial 1 <i>Max score 4 (no 2nd trial)</i>	Rest 15s Item 3 Right Trial 2. <i>Stop if not 3 points</i>	Hop every other square 10cm Item 4 Right Trial 1 <i>Max score 4 (no 2nd trial)</i>	Rest 15s Item 4 Right Trial 3 End of series
Hop in each square Item 1 Left Trial 1 <i>Max score 8 (no 2nd trial)</i>	Rest 15s Item 1 Left Trial 2 <i>Stop if not 5 points</i>	Hop in every other square Item2 Left Trial 1 <i>Max score 4 (no 2nd trial)</i>	Rest 15s Item 2 Left Trial 2 <i>Stop if not 3 points</i>

Hop every other square over 5cm Item 3 Left Trial 1 <i>Max score 4 (no 2nd trial)</i>	Rest 15s Item 3 Left Trial 2 <i>Stop if not 3 points</i>	Hop every other square over 10cm Item 4 Left Trial 1 <i>Max score 4 (no 2nd trial)</i>	Rest 15s Item 4 Left Trial 2 End of series