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PLAYFULNESS AND ENVIRONMENTAL SUPPORTIVENESS IN HIV INFECTED CHILDREN AGED 4-5 YEARS IN TWO SETTINGS.

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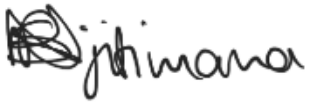
A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy.

10 September 2018

Declaration

I, Shailendra Njitimana hereby declare that this thesis is my own work. It is being submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, in fulfillment of the requirements for the degree of Master of Science in Occupational Therapy. It has not been submitted before for any degree or examination at this or any other university.

Signature 

10th day of September 2018

I dedicate this research to my family.

Thank you for standing by me throughout.

Abstract

Playfulness and environmental support improve children's participation in play; their major occupation. Play has been found to be limited in children with HIV.

This quantitative, descriptive cross-sectional study measured playfulness and environmental support in HIV infected children staying with their families and those staying in orphanages in Marondera.

A total of 30 children aged 4-5 years participated in the study. The Test of Playfulness and Test of Environmental Supportiveness were used to measure playfulness and environmental support respectively.

Results indicated that the children from the orphanages group were significantly more playful ($p=0.03$) than the children staying with their families. It was further found that the orphanages were more supportive of play than the families. It was recommended that this finding be further investigated and that occupational therapists in Marondera begin intervention to improve playfulness and environmental support of children with HIV living with their families.

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Operational definitions

Play - “A transaction between an individual and the environment that is: relatively intrinsically motivated, relatively internally controlled and free of some of the constraints of objective reality” (1).

Playfulness - The child’s “disposition to play” and “the way a child approaches play” (2)

Environment - “The particular physical and social, cultural, economic and political features of one’s contexts that impact upon the organization, motivation and performance of occupation” (3).

Families - One or more people staying together that have the responsibility of taking care of children by virtue of their biological or social relationship.

Orphanages - A residential child care facility that provides overnight accommodation for children under the age of 18.

Occupations - “Activities that people engage in throughout their daily lives to fulfill their time and give life meaning. Occupations involve mental abilities and skills and may or may not have an observable physical dimension” (4).

Children - Persons aged between 0 and 18 years of age.

List of Abbreviations

HIV	Human Immunodeficiency Virus
AIDS	Acquired Immunodeficiency Syndrome
HAART	Highly Active Antiretroviral Therapy
ARVs	Antiretroviral Drugs
ToP	Test of Playfulness
TOES	Test of Environmental Supportiveness
CPS	Child Playfulness Scale

CHAPTER 1: INTRODUCTION

1.1 Introduction

Play is described as children's most important occupation as it is a modality through which children develop physically, cognitively, and emotionally (5,6). Furthermore, through play children acquire skills that they need for them to successfully participate in other occupations for example, a hand skill such as dexterity that can develop during play and be later used in self-care and school tasks (5).

Play as an occupation cannot be considered in isolation, but as part of a transaction involving the player and the environment where the physical and social aspects of the environment can either facilitate or impede the player's ability to play (6,7). The player's contribution during the play transaction includes his attitude and approach to play, known as playfulness (2) as well as his physical, emotional and cognitive abilities which are depended on the developmental milestones that the child has reached (5,8). In an environment that promotes play, a child is more likely to express his or her playfulness. As a result, the child plays more and consequently enjoys the benefits of play, which include development (2). It is therefore important for a child's environment to support playfulness; more so, if the child has a chronic illness such as HIV/AIDS which is associated with neurodevelopmental delay.

Although the prevalence of HIV in sub-Saharan countries is on the decline, HIV still remains a major challenge in this region, with an estimated adult prevalence of 15% and 150 000 children infected (9). Due to increased awareness of HIV/AIDS and increased availability of Highly Active Antiretroviral Therapy (HAART) Zimbabwe has been reported

to be one of the countries with a rapid decline in HIV infections amongst infants in the region (9). However, 50% of children in Zimbabwe between the ages of 0 and 14 years, eligible to receive HAART, still have no access to the treatment and are at risk of the detrimental effects of the virus or even mortality (9).

Prolific research has established that HIV causes central nervous system impairments that result in motor, cognitive and speech developmental delays (10–14). It has been suggested that institutionalisation has a compounding effect on developmental delay in HIV infected children (13). Poverty has also been found to play a role in amplifying these developmental delays (15). Developmental delay and impoverished/disadvantaged environmental circumstances, in particular may reduce the child's ability and opportunities to engage in play (16). Therefore HIV infected children in institutions or living in impoverished circumstances may be at risk of being deprived from engaging in play which is a meaningful occupation to them (occupational deprivation) (17).

There are no statistics pertaining to the number of HIV infected orphaned children in Zimbabwe, but a total number of children orphaned due to HIV was reported to be about 570 000 which is approximately 30% of the HIV infected people in Zimbabwe between 2011 and 2014 (9). Many of these children have had to go under the care of extended family, foster care and orphanages or remain in vulnerable situations like child-headed families. While extended families sometimes lack the capacity to provide a conducive environment for these children due to cultural dynamics and sometimes poverty, orphanages are also not an absolute solution for orphan care as they may not be sustainable due to a lack of adequate funding in the long run (18). Moreover, institutions such as orphanages have been found to lack in resources to allow optimal and timely

child development as compared to family homes. Visual motor integration, sensory integration and social skills have been found to be poorly developed amongst institutionalized children (19–22).

The combined effect of HIV and institutionalisation on child development may limit a child's participation in his or her daily occupations. Play may be particularly affected (16,23) as it is the major occupation of children (5,7,24,25).

1.2 Statement of the problem

Research has suggested that HIV infected children may not be as playful as children without HIV due to limitations related to motor, cognitive and speech developmental delay (16,17,23,26). Environmental factors such as caregiver support and availability of resources have been also found to influence a child's expression of playfulness and ultimately the quality of his/her play (16,17,27–30).

The Zimbabwean Ministry of Labour and Social Services recommends that children who require alternative accommodation for whatever reason, are to be placed within families and that children should only be placed in orphanages as a last resort (31). Considering the environmental challenges that families often face, it is not obvious that by living within families, these children have a supportive environment.

Play is the major occupation of children and it is both dependent on, and a determinant of child development. There is a lack of research on what the most supportive environment for HIV infected children's playfulness is.

1.3 Purpose of study

To establish the playfulness of HIV infected children staying with their families and those staying in the orphanages, as well as the extent to which both environments support play.

1.4 Research question

What are the differences in the playfulness and environmental support of play of HIV infected children aged 4-5 years staying with their families and those staying in orphanages?

1.5 Aims

To determine whether there are differences in the playfulness of HIV infected children staying in orphanages and those staying with their families.

To determine whether there are differences in the environmental support of play between HIV infected children staying in orphanages and those staying with their families.

1.6 Objectives

1. To measure the level of playfulness in HIV-infected children staying in orphanages.
2. To measure the level of playfulness in HIV-infected children staying with their families.
3. To compare playfulness between HIV infected children in the two different settings.
4. To measure the environmental supportiveness of play in orphanages.
5. To measure the environmental supportiveness of play in the family home setting.
6. To compare the environmental supportiveness of play in the two settings.

1.7 Justification of the study

Within paediatric occupational therapy practice, occupational therapists play a major role in enhancing and enabling children's participation in occupations within different settings such as homes, schools, and the community (32). Since play is the main occupation of children, occupational therapists focus on enhancing children's participation in play within their natural environments; more importantly, for children whose development may be affected by conditions such as HIV. By carrying out a study that investigates the playfulness of HIV infected children, the knowledge base within occupational therapy, regarding these children is expanded, and opportunities for intervention are explored.

Since occupational therapists can therapeutically improve one's environment for enhanced participation in occupations, this study highlights limitations in the two types of home settings at which therapeutic intervention can be targeted.

Research on the effect of the environment on specific occupations is still limited (33). Neither playfulness nor the extent to which the environment supports playfulness, has been studied in Zimbabwe. So, this study can pave the way for future research in this area and improve paediatric occupational therapy practice within communities. Occupational therapists in Marondera, the town in which this study was conducted, engage in several Community Based Rehabilitation (CBR) programmes. Thus, the findings of this study will be valuable in informing the role of the occupational therapist in these CBR programmes particularly for HIV infected children.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter will review literature on the key concepts of this study: the effect of HIV on play, play and playfulness, and environmental support to play. Literature on these concepts was obtained from searches in PubMed, CINHAL, Google Scholar search engine and a manual search in the Witwatersrand Health Science Library.

Since HIV is a confounding variable in this study, its effect on child development, play and playfulness will be discussed. The literature on play will be narrowed down to the confines of the scope of occupational therapy. The focus will be on the nature of playfulness, how playfulness is measured and on various findings on playfulness in studies previously conducted. The effect of the environment on play and playfulness and how this is measured will then be discussed. A summary of the literature review will conclude the chapter with a consolidation of the major concepts and findings from previous studies.

2.2 Human Immunodeficiency virus/Acquired Immune Deficiency Syndrome

This study's focus is on playfulness and on the extent to which different environments support play. It is however imperative to understand the confounding effect of HIV and HAART on child development in infected children aged 4-5 years.

2.2.1 Human Immunodeficiency virus and child development

HIV largely affects child development by infecting the child's developing central nervous system, causing encephalopathy which may significantly affect the child's motor,

cognitive and language development (12,34). In the first four years of life, the brain develops most rapidly, therefore children infected during this period are highly likely to present with neurodevelopmental delays (10,12,35,36). This study focuses on HIV infected children aged 4-5 years of age, an age group in which neurodevelopmental delay can be anticipated.

Though HIV affects all aspects of child development (37), the most documented developmental delay is in motor, language and cognitive development (12).This delay in development puts HIV infected children at risk of learning disabilities and also contributes to them being considered as vulnerable (18,23). Studies in Zimbabwe and South Africa found significant motor and cognitive developmental delay in HIV infected children. The study in Zimbabwe found that 64.29% of HIV infected children studied, had cognitive delay, 60.71% had language delay and 53.57% had motor delay (14). In a South African study amongst HIV infected children aged 18-30 months, it was found that 70% had cognitive delay, 82.5% had language delay, 85% had gross motor delay and 12.5% had fine motor delay (11). Furthermore, HIV has been found to cause stunted growth, hence the delay in motor development which can be evident from as early as 6 months (13,38).

These findings are of concern to occupational therapists particularly for their effect on play as both motor and cognitive components are required during play (5). At 4-5 years of age children engage in rough and tumble play which requires strength. Caregivers of children with HIV reported that due to their small stature, their children were discriminated against during play and possibly bullied (23).

Children at this age also start to develop abstract thinking which is important for imagination and creativity during play (5,8). Fine motor skills are important as children are expected to incorporate fine hand use during play to do activities like beading and grasping crayons for colouring in.

The effect of HIV on the brain can be reduced by HAART. HAART is a combination of therapies that works by slowing down the replication of the virus hence preventing damage to the immune system of infected persons (39).

Early commencement and strict adherence to HAART can keep the HIV viral load low, thus preventing HIV encephalopathy (40). The World Health Organisation (WHO) recommends that HIV infected people start HAART as soon as they are diagnosed (9). However, HAART is still inaccessible to some children with a confirmed diagnosis of HIV and such children may still present with developmental delay (9). Moreover, even when HAART is commenced early, children may still present with residual neurodevelopmental delay (41).

2.2.2 The effect of Highly Active Antiretroviral Therapy on play

Owing to the use of HAART, HIV-infected children on HAART are now living longer than before, but they still face many challenges due to residual cognitive problems (34). Cognitive problems may affect children's play development. For a 4-5-year-old, if cognitive development is delayed, this may limit fantasy play which depends greatly on cognitive developmental milestones.

In addition to residual cognitive problems faced by children on HAART, these children also face challenges resulting from the side effects of the treatment (42). In a study in Malawi, people taking Antiretroviral drugs (ARVs) reported to be facing more stigma than those not taking ARVs (43) possibly due to the visible side effects of ARVs which have been termed “stigma symbols” (44). One such stigma symbol is the deformation of one’s face due to lipodystrophy (the uneven redistribution of body fat) on the face (45). Lipodystrophy is common in children who have been on stavudine based ARVs for at least 2 years (46). In Zimbabwe stavudine based drugs are still being dispensed to HIV infected children thereby putting these children at risk of developing lipodystrophy. The stigma related to the lipodystrophy may affect a child’s interaction with his/her peers, which will affect play.

In addition to the facial changes, lipodystrophy also predisposes affected children to metabolic complications which may, in the long run, cause cardiovascular complications (46). Cardiovascular problems may reduce children’s physical endurance during play.

Lactic acidosis is another adverse effect of HAART and may cause shortness of breath and fatigue (47). Children aged 4-5 years enjoy active play, so fatigue and shortness of breath will interfere with these children’s play.

Another side effect of HAART is central nervous system (CNS) toxicity which may cause psychosis, confusion and depression. At 4-5 years of age, abstract reasoning is expected to start developing, leading to the emergence of fantasy and imagination play (5). HAART-induced CNS toxicity may interfere with the cognitive functions required for such play.

2.2.3 Play in Human Immunodeficiency Virus-infected children

Children enjoy play and are more likely to learn and master new things during play. This is because play is believed to rid all activities of the potential to cause anxiety thus allowing children to learn within anxiety-free circumstances (48). Research has demonstrated how play improves learning in HIV infected children (17,26,49). Children with HIV have been found to be at risk of developing learning disabilities (50). This makes play particularly important for children with HIV to engage in play, thereby enhancing their learning.

However, previous studies indicate that HIV infected children may be deprived of opportunities to engage in play and consequently lose out on the benefits of play. In one study, it was found that parents of HIV infected children rarely let the children out to play with others as a way to protect them from illness (16). In the home, these children did not engage in much play either as their parents may be too sick to engage in play with them. It is also suggested that HIV infected children may end up caring for their sick parents thus neglecting their play (18).

2.3 Play and playfulness in children

The concept of play has been of interest to theorists from social and biological sciences over the centuries. This has resulted in a variety of play theories originating from a variety of fields. In social sciences, educational psychologists focus on the effect of play on learning, developmental psychologists focus on the developmental aspects of play and anthropologists focus on cultural aspects of play. Within biological sciences, neuroscientists focus on the effects of play on the brain, whilst evolutionary scientists look at the ontogeny of play in all animals (48).

With both social and biological scientists being interested in play, it has been difficult to come up with a universal definition of play (6,24). It is therefore important to define play based on occupational therapy literature to guide this study.

2.3.1 Defining play

Many scholars agree that identifying play intuitively is easier than defining it (48). For this reason occupational therapists, use observable traits exhibited by a child in any activity to distinguish play from no play (6). Thus, any activity that a child engages in can be rated as ‘play’ or ‘no play’ depending on the presence or absence of a set of attributes denoting play (51). The determinants of play have been proposed to be perception of control, source of motivation, and suspension of reality (1). Scholars, however, acknowledge that it is rare for a child to fully exhibit all three attributes, so these attributes should be considered on a continuum that has play on one end and non-play on the other end.

Since multiple characteristics determine play, a good definition of play must include multiple characteristics (52). A multidimensional definition of play has been adopted for this study in which play is defined as “a transaction between an individual and the environment that is: Relatively intrinsically motivated, relatively internally controlled and free of some of the constraints of objective reality” (1).

Apart from viewing play from the presence of observable characteristics, it has also been viewed in three paradigms which are play as observable behaviour, play as context, and play as disposition (53). Firstly, play as behaviour describes play by stratifying it into different types such as fantasy play and sensorimotor play. Secondly, play as context defines play according to the environment in which a child plays. Finally, play as

disposition refers to the child's approach to an activity. This involves individual differences in the way a child approaches play to play, a concept known as playfulness (53).

This study focuses on play as context and play as disposition. However, play as behavior cannot be excluded from this study as it is important to understand the type of play that children aged 4-5 engage in.

2.3.2 Play as behaviour

Play as behaviour describes the different types of play children engage in, and provides information about the child's development and how much they have mastered their interactions with the environment (3,5,6,17). A sequential development of play has been described and associated with the domination of different types of play at any given age. Children aged 0-2 years mainly engage in sensory play; at 2-4 years children engage in symbolic and simple constructive play; and at 4-7 years children engage in dramatic, complex constructive and pregame play (5,7,24,53).

This study focuses on the play of 4-5-year-old children, an age at which play is expected to include dramatic play, pregame play and the beginning of complex constructive play. At 4-5 years of age children's fine motor skills develop greatly and they can string small beads, use a pair of scissors well to cut out curves and straight lines, use a dynamic tripod grip and draw stick figures. These skills may be incorporated in complex constructive play and may also be used during dramatic play. Pre-writing skills can be used in drawing imaginary and fantasy figures like super-heroes and fairies, whilst manipulation skills may also be used to construct more complex objects used during play (5,27).

Children aged 4-5 years are expected to demonstrate increased activity levels (8). As part of pregame play, these children engage in rough and tumble play as they enjoy sensory input that is associated with the movement involved in this type of play (5). Some children with HIV have been described as having low energy and unable to engage in activities, particularly due to sickness (23). This may limit their capability to engage in play activities that require a lot of energy like the rough and tumble play.

Dramatic play often involves social play. Social play is a major feature of the 4-5 year age group's play as children at that age are able to play cooperatively with 2-3 other children (5). During cooperative dramatic play children learn the social aspects of group play such as being able to join a group that is already playing, turn taking, negotiating for their needs to be met during play and contributing towards goal oriented play (6). Furthermore, at 4-5 years of age children start to enact and modify real life roles during dramatic play (5). This facilitates the development of language and communication skills as children communicate with others both in their real roles, as children, as well as in their enacted roles. As they enact roles, children experience and learn to manage different emotions that come with these roles during play thus developing emotionally (48,54). While imitating life roles, children also learn important cognitive skills like problem solving, decision making, judgment and adaptability (5).

Imitating life roles is linked to the ability to suspend reality during play, as skill that is augmented between the ages of 4 and 7 years (5). Though children aged 4-5 years may struggle to differentiate reality from fantasy, they use their acquired knowledge to construct novel situations during pretend play. As pretend play starts to become more abstract, children develop their cognitive skills (8). For example, they may include

imaginary scenarios and used objects like sticks or leaves in their play to represent people. As previously mentioned, children with HIV may have difficulty using imagination during play. In a pilot study on the development of play in HIV infected children, children aged between 4 and 5 years only showed some aspects of developmentally appropriate play, lacking particularly in dramatic play, for which a definite need for play intervention and enrichment was indicated (23).

Occupational therapists acknowledge that a child's contribution to the play transaction includes his or her developmental abilities, play skills, personal preferences, playfulness, as well as the physical and social environment which can encourage or limit play activities (55). Thus, during play intervention and enrichment, occupational therapists facilitate the child's development and play skills, whilst at the same time, modifying the child's environment to make it more supportive of a child's play (5,24).

2.3.3 Play as context

Children's play is influenced by their environment. The environment can be defined as "the particular physical, social, cultural, economic and political features of one's contexts that impact upon the organisation, motivation and performance of occupation", (64, p.86). The environment can support or restrict the extent and quality of individuals' participation in daily occupations, including play (3,26,32). The environment in which children play comprises of physical aspects (physical environment) and social aspects (social environment) (3).

2.3.3.1 The physical environment

The physical environment consists of the space in which one acts, and the objects encountered (3). Both the amount and configuration of play areas are important features of a good play area (2). Fabricated playground equipment such as jungle gyms and natural playgrounds which have grasslands, sand and trees provide opportunities for children to develop and consolidate gross-motor skills during play (26,56). As already mentioned, children aged 4-5 years enjoy active play which includes gross motor skills such as running, hopping and climbing (5,8). It is therefore important for home environments to promote such play activities (56).

Children residing in the low-income suburbs of Marondera, Zimbabwe generally play in cul-de-sacs or in their small backyards during outdoor play. Though family homes do not usually have playground equipment, it is common to see trees in the backyards of homes as well as fences around homes which children can climb during play. Space for indoor play is usually limited due to the living circumstances as two to three families may share one house. Thus, children tend to play more when outdoors than when indoors. On the other hand, institutions like orphanages have to have a secure area designated for children's play both indoors and outdoors as required by the Zimbabwean Department of Labour and Social Services, which regulates all child care facilities (31). Thus, registered orphanages have dedicated play areas for the children outdoors and space available for play indoors. Outdoor play spaces may be equipped with swings and slides or jungle gyms.

In addition to space for play, play objects are part of the physical environment that promotes children's play. Play objects need to be age appropriate and have to stimulate

the development of age appropriate milestones (5). When available, play objects must be accessible for children to use during play. Previous research found that in some child care facilities such as day care centres, toys and other play objects are neatly packed away in cupboards and not available for the children's use during play (27).

When toys are limited, children can make their own play objects. In Marondera, children usually make toys from scrap material like wire used to make toy cars, bottle tops used as game pieces or plastic bags and paper used to make balls. They also use natural objects like sticks, leaves and stones to make toys. In addition to these, children in orphanages may also have store bought toys donated to them by well-wishers or in some cases bought by the orphanages. Making toys available for children may elicit children's playfulness and thus improve their play (27). One study demonstrated the importance of play equipment in eliciting children's playfulness. In that study, post-test improvement in playfulness was noted after play equipment was put in children's play areas at school for 11 weeks (29). However, children aged 4-5 years of age do not necessarily depend on pre-fabricated play objects and equipment, and can use objects not typically meant for play as play objects, as they start to think abstractly (5,8). Children would for example use objects to represent people, as mentioned earlier. Therefore, the unavailability of toys should not be a big limitation of playfulness especially when children have access to the outside environment. To support this, a previous study made mention of how a child exhibited his playfulness as he walked on a pavement by himself, without any play equipment (16). It can thus be suggested that playfulness may be enhanced by play equipment but may also be exhibited on the absence of this equipment.

Safety is another important feature of an environment that supports playfulness. Though a good environment should provide a degree of risk for children for it to be exciting and challenging, a certain degree of safety is important for the child to feel safe, as well as for the parents to let their children play outside (2,56). Children's natural home environments usually provide the balance between safety and risk, especially outdoors (56). For example, in a fenced yard with trees, children can climb these trees and still be within a safe environment, with clear boundaries.

Accessibility to play areas has been found to be a major challenge for children with physical disabilities due to mobility challenges while children without physical disabilities access play areas with more ease (57). Children in Marondera can play outside in nature and the play areas are accessible. Indoor play areas may however be less accessible depending on the amount of furniture and the amount of space available in different households.

Sensory stimulation within the play environment is important (2,56). Nature usually provides sensory stimulation such as tactile, from the soil and stones, auditory from the sounds of bugs or birds, or visual from the various shapes and colours of plants (56). On the inside, more effort has to be made to ensure the environment is stimulating enough, not too cluttered nor too bare (2).

2.3.3.2 The social environment

The social environment of the child refers to the people around the child, cultural aspects, traditions and the child's experience of care which all influence the child's play (3,48,55).

Regarding play, findings from previous studies highlight that the most significant part of the social environment during play are the people around the child (16,28,30,33). Thus, this study focuses particularly on the caregivers and playmates of the HIV infected children.

Good social support systems are important, not only to maintain HIV infected children's health (11) but also to provide opportunities for a child to engage fully in his/her occupations; play included. HIV infected children may lose their parents to HIV thus ending up in the care of extended families. For example, grandmothers were the most common primary caregivers of HIV infected children in a prevous study conducted on playfulness of HIV infected children. These grandmothers understood the importance of play while biological mothers often lacked knowledge on the importance of play (16,28,33).

It has been found that caregivers of HIV infected children may deprive their children of play opportunities (16,23). In a study on the development of play in HIV infected children, caregivers reported that their children were smaller in stature and were therefore vulnerable to abuse by other children which can affect their play. As a result caregivers did not let their children go out to play with other children (23). In the same study, parents also refused to let their children visit relatives for fear of inadequate care thus depriving them of more potential play opportunities (23). This means that these children did not get exposed to playmates other than those from their home environment and possibly from school.

Research has found that caregivers of HIV infected children are not always available to play with their children due to sickness or low motivation on the part of the caregiver (16,18). In fact, when caregivers are HIV infected themselves, they may not be involved in their children's play and may need their children to care for them (18). Research also found that parental stresses of HIV infected children results in poor caregiver-child relationships (58). These poor relationships may also affect caregiver-child play.

Children aged 4-5 years can usually entertain themselves for up to one hour (8). However, social play is a significant feature of their play at this age. The availability of playmates during play is not only important for social play but also increases children's motivation to engage in play (27). Furthermore, more experienced players to play with, enhance children's play experiences (16). Orphanages usually have more children from more age groups than most families do. While community play exposes children staying with their families to more playmates of different ages, limited opportunity for these children to engage in community play may mean that they may have potentially less playmates than the children in orphanages.

When playmates are not available for play, it becomes even more important for caregivers to know how to play with their children (16). For example, at 4-5 years of age, children learn to be in control of their play by attempting to control their peers and caregivers when they try to stretch boundaries during play (5,8). Therefore, children may choose to include mischief and teasing in their play which are both regarded as an expression of playfulness. It is thus important for caregivers to be able to separate playful mischief from delinquent behaviour so as not to suppress the child's playfulness by reprimanding playful mischief (2). Caregivers must therefore allow the children a degree of control during play

by letting them use some objects not necessarily meant for play or by allowing them teasing.

2.3.4 Playfulness (play as disposition).

Relative to play, playfulness is a newer concept defined as a child's approach to play or a child's disposition to play (2). A theory of playfulness by Bundy (1997) proposes that playfulness is determined by the source of motivation, the source of control, the ability to suspend reality, and the ability to frame play. Again, viewed on a continuum, a child can be more playful or less playful depending on whether the child's source of motivation and control is external or internal, and whether the child can suspend reality and frame their play (communicate their feelings and needs) or not. The characteristics of a playful child are intrinsic motivation, internal control, freedom to suspend reality and framing (1,6). Intrinsic motivation is the child's motivation to play independent of external influences such as expecting to win a prize or to be admired by others. When children are intrinsically motivated to engage in activities it's usually because the activities bring pleasure to them, provide a medium for social interaction, or the activity is a source of sensory stimulation. When children are intrinsically motivated to engage in an activity they become totally involved, they ignore other unrelated stimulus and can focus on the task at hand, and they are persistent at the task despite obstacles. They may also modify the task to keep it interesting and to overcome obstacles (1,6).

Internal control is expressed when a child determines who and what to play with and how they want to play. When children are in control of play, they can change the rules of

games, or transform objects into things they are not. They may include twigs or leaves or even household furniture in their play (2,33)

When children are in control they are free to share ideas or negotiate for their needs to be met. This is termed shared control, and is also an important aspect of internal control. (2)

Freedom to suspend reality means that children include fantasy during play without the risks and consequences that may be associated with an activity outside play (6). For example, while swinging on a tree, a child can pretend to be a monkey in the jungle. This includes fantasy while at the same time rids the activity of the risks associated with life the jungle.

Framing is the ability to give and read social cues (6,59). This is particularly important in children aged 4-5 years as they start to engage in social play. When children can read and give cues clearly, they find it easier to engage in social play.

Most studies on playfulness in occupational therapy, are based on Bundy's Theory of Playfulness and so is this study. Bundy's Theory of Playfulness proposes that the interaction between the environment and the child during an activity elicits the child's playfulness (1,2). The relevance of this theory to the current study lies in its belief in the role of the environment in a child's ability to express his/her playfulness, therefore, it's concepts were applied.

Some aspects of playfulness have been found to be more difficult than others. The ability to suspend reality has been found to be more difficult than the other elements of play. Teasing and mischief, two of the items which measure the ability to suspend reality have

been rated as the most difficult (2). This has been related to the development of cognitive skills such as abstract reasoning when applied to come up with unconventional ways of playing and teasing. It has also been suggested that the ability to include mischief and teasing is not entirely dependent on the player but is also linked to the extent to which caregivers and playmates tolerate or allow children to express these skills (60–62).

Age appropriate motor skills development has also been related to playfulness. It was noted that when children's motor skills are well developed or are improved with occupational therapy, children's play skills and playfulness also improve (16,17). This finding Is particularly important in relation to HIV infected children whose motor skills may be delayed (63).

A child's overall health is important, not only for a child to be able to engage in play but also for the full expression of his/her playfulness fully. Poor health reduces the child's playfulness particularly when a child has a chronic illness or a disability (62). HIV is one such chronic illness that has been found to affect a child's playfulness (16,17). In addition to improving a child's engagement in play, playfulness increases adaptability which is a desired outcome of occupational therapy intervention in children with developmental deficits (64) such as those caused by HIV. Since playfulness can be broken down into elements and items, it can be an easier focus of intervention. For example, an occupational therapist can target one element or item of either motivation, framing, suspension of reality or perception of control during therapy to enhance playfulness.

2.4 The occupation of play

In occupational therapy, humans are regarded as occupational beings that require occupation to grow and thrive. Occupations refer to the everyday activities that people do as individuals, in families and with communities to occupy time and bring meaning and purpose to life. These activities include things people need to, want to and are expected to do (65).

As already discussed, play is considered the main occupation for children as it is the means through which children learn and develop across domains (5). Positive experiences during play have been found to improve a child's sense of self-efficacy and competency and mastery of the world (1).

Within the occupational therapy profession is a belief in occupational justice. Wilcock and Townsend (2009) defined occupational justice as "the right of every child to be able to meet basic needs and to have equal opportunities and life chances to reach her or his potential, specific to the individual's engagement in diverse and meaningful occupation" (54 p.193). It is thus important to ensure that HIV infected children, just like their uninfected counterparts, are given opportunities to engage in play and to express their playfulness without minimal barriers from the environment.

One of the outcomes of occupational therapy is client participation. Participation in play means that children engage in play in a way that satisfies them and is congruent to the cultural expectations (32). Occupational deprivation comes about over time when children are deprived from engaging in play which is a meaningful occupation to them due to the lack of resources and opportunities (66). HIV infected children's participation in play has

been found to be limited by an unsupportive social and physical environment as well as by the possible developmental delay due to their illness (16,23). Thus it has been suggested that HIV infected children may be at risk of occupational deprivation (17). Further, the impoverished circumstances in some orphanages and homes may also predispose these children to occupational deprivation.

In a Cambodian study amongst pediatric HAART patients, 18.6% of the participants experienced perceived stigma when they felt they were not invited to social activities, while 14.2% felt they were excluded from games (42). This study demonstrated occupational deprivation within the occupations of social participation and play in this population.

In HIV infected children occupational therapists have considered playfulness as a means (17) as well as an outcome of therapy (16,23). When using it as a means, occupational therapists structure environments in a way that elicit playfulness in children as they learn skills. For example, to improve perceptual skills, occupational therapist may provide puzzles which children can enjoy and at the same time improve their visual perceptual skills.

When the goal of therapy is to improve playfulness, occupational therapists present an environment that motivates the child to engage, allows suspension of reality, and allows the child to be in control of their engagement (1). Occupational therapists also educate caregivers on the importance of play. Involving the caregiver in play during therapy sessions has been found to be one way to ensure caregivers know how to engage with their children during play (17). In the two interventions mentioned above, occupational

therapists aim to ensure occupational justice for these patients by reducing barriers to participation in play.

2.4 Measuring play and playfulness

2.4.1 Tests of Play and Playfulness

Occupational therapists assess play and also use it as a context for both treatment and assessment (1,17,24). There are several published tests that focus on different aspects of play (60) for example, the Revised Knox Preschool Play Scale (PPS) (67) focuses on play skills and the Play History (68) focuses on play experiences.

The PPS, which was initially developed by Susan Knox 1974 and later revised by Bledsoe and Sherpherd (1982) analyses four dimensions of play i.e. space management, material management, imitation and participation (7). It measures the skills that a child needs to play, but does not measure the manner in which a child approaches the activities (60), hence according to the working definition of playfulness; the PPS could not be used for this study.

The Play History developed by Takata (1977) gathers information about the child's play history and play competencies, thereby coming up with the child's play development and diagnosing play dysfunction (23). Despite its potential to give valuable information about

a child's play, the Play History does not measure playfulness thus it was not used for this study. The Play History also lacks firmly established validity and reliability (23).

Published tests of playfulness are less common. Currently, only two tests measuring playfulness, with proven psychometrics, have been published (60). These are the Barnet's Child Playfulness Scale (CPS) and Bundy's Test of Playfulness (ToP).

Both the ToP and the CPS measure playfulness as an internal disposition (2,69). They identify and measure the constituent elements of playfulness. The elements in the CPS are based on Lieberman's (1977) five factor model of playfulness (cognitive, social and physical spontaneity, sense of humor and manifest joy) (70) while the ToP is based on the four elements of playfulness by Bundy (1997) (motivation, internal control, freedom to suspend reality and framing (6). Both tests have gone through rigorous adjustments from when they were first developed.

The first version of the CPS had poor content and construct validity (69). It comprised ten core questions on playfulness and two additional questions; one on intelligence and the other on physical attractiveness. The questions on intelligence and physical attractiveness measured other attributes that are not related to playfulness. Further, the scoring was different for each of the questions in the instrument, making it unpopular with raters. This instrument was then revised to improve its published flaws. The ensuing tool had 23 items which are all rated on a 5-point Likert Scale and has well established construct validity (69).

The CPS was not used for this study for two reasons. Firstly, because it is not the preferred tool for use by occupational therapists as it is mainly used by educators and

secondly, because it would have had a higher cost which was not within the budget of this study.

The ToP was developed by Bundy (1999) and is currently on its 4th version (2). It was designed for use in children aged 6 months to 18 years (6). The ToP, started off with 60 items to measure playfulness which were eventually reduced to 29 as some items were removed while other items were added to improve the tool's sensitivity (64). It's scoring has also been changed with the newer versions. The scoring in the initial version of the ToP was based only on a measure of the proportion of time a behaviour could be observed (extent). This measure was sometimes inapplicable for all behaviours and failed to capture "how" the child approached play. Hence two other scales were added which were "intensity" and "skillfulness". Intensity measures the intensity with which a child engaged in the behaviour while skillfulness measures the ease with which the child is able to complete a task. In the resultant tool, some descriptors have more than one scale. For example, where the item Engage, which measures whether a child is engaging in an activity, is measured on a scale of both extent (proportion of time they engage) and skill (the ease with which the child participates) but not on intensity as it was found to be irrelevant.

To obtain a measure score of playfulness, the ToP Keyform is scored by transferring item scores awarded during observation from each child's ToP score sheet to his/her corresponding scores on the ToP Keyform. From each child's Keyform, a Raw Score and a measure score are obtained. The measure score is an interval level score of playfulness that is then used for statistical analysis as recommended by the developers of the test (2).

In summary the ToP measures the following items: Intrinsic Motivation (whether the child is intrinsically or extrinsically motivated to play), Internal Control (the child's perception of being in control of a play activity) , Shared Control (a child's ability to work in a team during play), Freedom to Suspend Reality (a child's ability to play, disregarding the constraints of reality) and Framing (the way a child gives and reads social cues during play) thereby measuring play according to the working definition. Fundamentally, the ToP considers the individuality of play, as the perception of whether an activity is playful or not, differs from one child to the other. Thus the 29 items of the ToP focus on the characteristics that a child portrays while engaging in an activity rather than the activity itself (71).

The ToP has been used by occupational therapists to investigate playfulness in a variety of populations including HIV infected children (16,17), children with ADHD (59,72), children with physical disabilities (28,57,73) and in normally developing children (28,64,33,27,29). The test has mainly been used in children's home environments but it has also been used to test playfulness at schools (61,29) and in childcare centres (27). This test is thus appropriate to use for the population targeted by this study, as well as in the two settings as it has been successfully used in family homes and child care centres.

A significant amount of work has been done on the ToP and its reliability and validity have been proved (28). Further, its construct validity was tested and the items of the test being reduced (2). However, on its own, the ToP still does not take the effects of the environment into account. It has already been established that just like other occupations, play may not be considered separate from the environment. Further, playfulness can be highly influenced by the environment.

2.5 Measuring Environmental Supportiveness of play

2.5.1 Test of Environmental Supportiveness (TOES)

As already discussed, the environment has a significant effect on playfulness. The Test of Environmental Supportiveness (TOES) (2,28) was specifically designed to be used in conjunction with the ToP to assess the association between the environmental opportunities or challenges and the child's playfulness (28). It is also the only test that assesses the environment in relation to play. Other tests measure how the child uses the environment rather than how much the environment supports a child's play.

The TOES is a 17 item criterion referenced test that measures environmental elements (human and non-human) which influence play (33). Human factors are related to caregivers and younger playmates, peers and older playmates; while non-human factors are related to objects and space, sensory features and safety and accessibility of the child's play environment.

Caregivers and playmates are scored based on their contribution towards play opportunities for the participants. Objects are scored on the existing amount, ability to support play, and the degree to which they allow a player to modify them during play. For space, the rating is related to the amount, configuration, safety, and accessibility of the play areas. The extent to which colors, sounds, and temperature promoted play were rated under the sensory environment (24).

Several studies have found that the TOES is a valid and reliable measure for environmental supportiveness for use in children with and without disabilities (28,73). The

ToP and TOES have been used together in several published studies (27,28,61,73,74). One of these studies found a statistically significant positive correlation between the two tests (28).

The TOES was improved to increase its ability to measure the child-environment fit rather than general environmental supportiveness for children's play. This was following research findings suggesting that while the environment may influence playfulness, the individual's abilities and personality also influence playful behaviour (28). Thus, to improve the TOES' sensitivity to the child-environment fit, raters have to identify the major source of motivation of the child's play before scoring. Children's motivation to engage in play may include play objects, social engagement, physical activity, sensory stimulation or achievement (27). When the child's motivation to play is identified, the TOES can give a valuable measure of how much the elements of the environment support the child's apparent motivation to play and consequently, the effect of these environmental elements on the child's playfulness (2).

For this study, several factors influenced the decision to use this test to measure how much environments support play. Firstly because its correlation, when used in conjunction with the ToP, has been proved (28) it follows that it was the best tool to use together with the ToP. Secondly, since the TOES was designed for use with children aged 15 months to 12 years, it was appropriate for the age group of the study population of this study. Thirdly, it is easily accessible as it can be obtained from the book 'Play in Occupational Therapy for Children' at no additional cost (2). Finally, this test was designed for use in the child's usual environment to give an indication of how much the child's usual environment supports play without any need to take them outside their usual environment.

Overall, the play transaction described by Bundy illustrates the complex relationship between the elements of playfulness, elements of the environment and the child's motivation to play (1).

2.6 Summary of literature review

The literature review delved into the complexity of play which can be affected by a chronic illness such as HIV. Though much controversy surrounds the definition, nature and purpose of play in children, play literature within occupational therapy is almost conclusive. Occupational therapists agree that play is a major occupation for children which can be used as either a means or an end in paediatric practice (6,16,5,24).

Play was discussed in three paradigms of behaviour, disposition and context. Play as behaviour took note of the development of play and what is expected of a 4-5-year-old during play. Play as disposition focused on playfulness and play as context focused on the environment and its importance in play.

Play as behaviour may be affected in HIV infected children due to neurodevelopmental deficits and previous research has proved that HIV infected children may be less playful than their uninfected peers (16,17,23). The concept of playfulness has been of interest amongst occupational therapists and is arguably the most important part of play as it exhibits in any activity (16,64). Therefore, promoting playfulness in children is fundamental to enable them to participate fully in play.

This literature review also acknowledged the complexity of the play transaction thereby highlighting the vital role of the environment in play. While literature proposes that a supportive environment catalyses the expression of a child's inherent playfulness, it also

recognises the importance of an individualised child-environment fit for an optimum play experience regardless of the child's home situation (28). The need to ensure the best child-environment fit for every child makes it even more difficult to determine what a supportive environment really entails. However, by identifying the child's major source of motivation to play and assessing the extent to which the environment supports that identified motivation, a child-environment fit for play may be established. Using the ToP to assess a child's playfulness, and the TOES to assess the environmental supportiveness, the trends in playfulness and environmental support in HIV infected children staying in the two settings can be established.

CHAPTER 3: METHODOLOGY

3.1 Study design

This was a quantitative study that used an observational, descriptive, cross sectional design in which participants were observed as they played in their natural environments. The researcher did not interact with participants while observing them and observation was once off as this was a cross sectional study.

The selected study design was the best to provide a description of the existing trends in playfulness of the children and the environmental support of the two settings.

3.2 Study population and study sample

The population is defined as the entire set of people that conform to the common characteristics defined by the sampling criteria (75). In this study, the study population comprised of all HIV infected children aged 4-5 either staying with their families or staying in orphanages within the Marondera District of Zimbabwe.

The study sample comprised of two groups of 15 children each. One group consisted of children staying with their families and the other group consisted of children staying in orphanages.

3.3 Study location

This study was done in the Marondera is a small town in Mashonaland East Province of Zimbabwe. It is located about 72 km east of the capital city, Harare. Marondera is well known for farming seasonal crops as well as perennial vegetables. Unemployment in Zimbabwe at the time of the study was at about 84% (76). The employed population of

Marondera worked in surrounding farms, the informal sector or in government organisations.

Participants in the group of children staying with their families were recruited from Marondera Provincial Hospital's Opportunistic Infections Clinic as this was accessible to the researcher. Marondera Provincial Hospital is the only government hospital in Marondera and is under the management of the Ministry of Health and Child Care of Zimbabwe. There are also two municipality-run city clinics and one private hospital in the town. The Opportunistic Infections Clinic at Marondera Provincial Hospital is a department where HIV positive people within the district collect their free supply of antiretroviral drugs monthly. In addition to drug supply, this department also provides HIV testing and counseling facilities as well as continuous psychosocial support in the form of support groups.

At the time of this study Marondera Provincial Hospital had three occupational therapists and six rehabilitation technicians. The private hospital had one occupational therapist and the clinic had no occupational therapists. Most patients coming to Marondera Hospital were from farming areas and low-income suburbs in Marondera.

The occupational therapists and rehabilitation technicians at Marondera Provincial Hospital ran a child clinic once a week which was focused on children with developmental delay. They also carried out community-based rehabilitation programs in the farming areas and low-income suburbs of Marondera.

3.3.1 Homes of children staying with their families

Children staying with their families, stayed in Rusike, Yellow City and Dombotombo which are high density, low income suburbs in Marondera

The low-income suburbs of Marondera have free standing brick houses built on stands of areas not exceeding 300 m^2 and have rooms ranging from four to eight. Most houses are shared by two to three families with each family using two or three rooms of the house. Of the two or three rooms, one or two are used as the bedroom/s and the other is parted into a living room and a kitchen area. Rooms are usually crowded with furniture thus space for indoor play is limited. When families share a house they also share the toilet and bathroom within the house. Families typically have four to six people each thus each house may have at least 8 people. Children tend to play more outside than inside due to limited space indoors.

3.3.2 Children staying in orphanages: Marondera Child Care Society

The observations of playfulness and environmental support for the group of children staying in orphanages were done at Marondera Child Care Society's two orphanages in the Marondera.

Marondera Child Care Society is privately funded and has two orphanages that are in Marondera District. The orphanages take care of homeless and abandoned children brought to them by the members of the community, social services, the police or the hospital. The orphanages are in Dombotombo and Yellow City, high density suburbs. At the time of the study the orphanages had 86 children in total.

Each of the two orphanages had 5 houses each with an average of 8 children per house. Houses had a living room area, 3 bedrooms and a bathroom. Each living room had couches, a TV and a table. Boys shared one bedroom and girls shared another bedroom, the third one was for the caregiver and babies or children who needed more attention because of their health. Bedrooms had bunk beds and built in cupboards that contained the children's clothing and toys. Each house was headed by a female caregiver referred to as the house mother. The orphanages had children with ages ranging from six months to 18 years, so the participants in the orphanages group had both older and younger playmates. Houses obtained water from the boreholes within their premises.

3.4 Research sample

3.4.1 Sample size

A power calculation set the sample size at 16 participants per group having a 90% power to detect a mean 0.77-point difference between the groups. This was based on a research by Rigby and Gaik (2007) (61), which used the ToP when testing at 0.05 level of significance. This difference was based on a standard deviation of 0.67 reported by the researchers for ToP (61). However, because only 15 children from the two orphanages that consented to participating in the study met the inclusion criteria, this study had 15 children per group with a total sample size of 30 children.

3.4.2 Sample selection

Non-probability sampling methods were used. Convenience sampling was used to select the participants for the children staying with their families. The researcher recruited the first 15 children meeting the inclusion criteria for this group and who agreed to participate from the outpatients waiting area.

Purposive sampling was used to recruit participants staying in the orphanages. The researcher obtained a list of all the children aged 4-5 years and included all children who met the inclusion criteria from each of the orphanages. Total population sampling was used due to the small number of children meeting the inclusion criteria in the available sites for the study. Thus, all 15 children who met the selection criteria were recruited.

3.4.3 Inclusion criteria

1. HIV-infected children aged 4-5years
2. Children whose HIV status was confirmed by clinical tests.
3. Children staying with their families or in orphanages for the respective groups.

3.4.4 Exclusion criteria

1. Children who acquired HIV in ways other than perinatally
2. Children with physical disabilities or co-morbid conditions like Down's Syndrome, as these conditions may also impede the development of playfulness.
3. Children whose biological parents were known but could not be contacted for consent (only related to children staying with their families).

3.5 Data collection tools

When using an observational descriptive study design, questionnaires and observation checklists are usually used (75). This study used observation-based standardized tests; the ToP (Appendix A) and the TOES (Appendix B) to collect data for playfulness and environmental support respectively. A Demographic Data Collection Tool (Appendix C) designed by the researcher, with guidance from relevant literature from was used to collect demographic data.

The ToP has been used by occupational therapists to assess playfulness in HIV infected children (16,17), thus it was selected for use in this study. The TOES assesses the extent to which both social and physical aspects of the environment support a child's play and it was designed for use within the child's natural environment (2). This makes it the best test to use to measure environmental support for this study as participants were observed in their home environments.

These two tests were also easily accessible to the researcher from the book, Play in occupational therapy for children (24). The researcher obtained permission to use both the ToP and TOES for research purposes from the developer of the test (Appendix D). The TOES is the only published test that measures environmental supportiveness to play and its correlation for use with the ToP has been proved (28). Both the ToP and TOES have proved validity and reliability (28,64)

3.5.1 Demographic sheet

This was designed by the researcher for this research with guidance from literature related to this study. The following information was collected;

Age and gender: Differences in play preferences have been found between boys and girls. The types of play a child engages in also depends on his or her age. (5).

Length of stay in the home: The length of stay in the home was included as previous studies have reported a link between the duration of a child's stay in an institution and childhood behaviours (18,20).

Type of caregiver: One study on the playfulness of HIV infected children noted the importance of caregiver involvement and also that different types of caregivers placed different value on play (16).

Medication and hospitalization: It was important to collect information on the medication that the child was taking. Previous research on playfulness in HIV infected children was done prior to the HAART era (16,23) and one of the findings of this study was related to poor motivation to engage children in play because of the imminent death that these children face. Since this study was done during a period when HAART was available, knowing whether the participants had access to medication was necessary.

3.5.2 Test of Playfulness

The ToP (49) was used to measure playfulness. The test score sheet and manual were obtained from the book entitled Play in Occupational Therapy for Children(2) in which it has been published. This test consists of 29 items scored on a 4-point Likert scale with respect to three dimensions: Extent which is the proportion of time a child spends exhibiting the specified item(0 = rarely, 1= some of the time, 2 = much of the time and never, 3 = almost always), Intensity: degree of performance (0 = not, 1=mildly, 2=

moderately and 3 = highly), and Skillfulness: ease of performance (0 = unskilled, 1= slightly skilled, 2= moderately skilled and 3 = highly skilled). This scale is found on the ToP score sheet for ease of reference by the rater. Scores of 0 and 1 indicate relative difficulty while 2 and 3 indicate relative ease.

The 29 items of the ToP are allocated to the five elements of Bundy's model of playfulness i.e. motivation, suspension of reality, internal control, shared control and framing(2). For ease of reference the items measured within each element are presented in Table 3.1 below:

Table 3.1: Test of Playfulness items per element of playfulness.

Motivation	Suspension of Reality	Internal Control	Shared Control	Framing
Engaged (extent)	Mischief (extent)	Decides (extent)	Negotiates (skill)	Gives cues (extent)
Engaged (intensity)	Mischief (skill)	Safe (extent)	Social play (extent)	Gives cues (skill)
Process (extent)	Pretends (skill)	Modifies (skill)	Social play (intensity)	Reads cues (skill)
Persists (intensity)	Clowns and jokes (extent)	Interacts with objects (intensity)	Social play (skill)	Engaged (skill)
Affect (intensity)	Unconventional (extent)	Interacts with objects (skill)	Supports (skill)	
	Unconventional (skill)	Transitions (skill)	Enters group (skill)	
			Initiates play (skill)	
			Shares (skill)	

Each ToP item is described in detail and presented in Appendix E.

The ToP was designed to be scored during play sessions of 15 minutes each. Play can be observed outdoors, indoors or in both settings depending on where the child usually plays. Items are scored on the ToP score sheet (a score of 0-3 per item) and these scores are then transferred to a ToP Keyform (Appendix F) for each participant to get a measure score(2).

The ToP validity and reliability for use amongst children of different age groups; with and without disabilities has been confirmed (62,64). Raw data from the ToP has been subjected to the Rasch analysis which has confirmed that items of the ToP define a single unidimensional construct of playfulness; with 96% of items meeting the assumptions of the Rasch model consistently (2). Further, 93% of participants and 95% of raters consistently met the assumptions of the Rasch model (2).

3.5.3 Test of Environmental Supportiveness

The TOES was also obtained from the book entitled Play in Occupational Therapy for Children (2) where it has been published. It was used to measure the children's environmental support of play.

The first step when using the TOES is to identify and record the children's apparent motivation to play. During the 30 minutes' observation period of children's free play, both indoors and outdoors, the elements of the environment are scored according to the extent to which they support individuals' motivation to play. For example, if the child's biggest motivation is social play, every aspect of the environment is scored according to the way

it supports a child's social play. Scores of -2 and -1 are given for an environment that is unsupportive of the child's motivation to play while 1 and 2 are given for an environment that supports the child's motivation to play; where -2= strongly unsupportive, -1= slightly unsupportive, 1= slightly supportive and 2= strongly supportive.

The test consists of human elements and non-human elements. The human elements of the environment, according to the TOES are related to the support from caregivers, peers, younger players and older players. Each element is divided into specific items that are scored. The three items are caregivers support of play opportunities, caregivers' ability to set reasonable rules and caregivers ability to adhere to consistent rules and boundaries. Caregivers' support of play opportunities is scored as supportive if the caregivers according to the extent to which the caregiver gives ideas, prompts or objects to play with, facilitates interaction with peers, responds to the player's cues, respects players and is unobtrusive. The caregivers' rules must be flexible and should not change erratically. Boundaries that support play would be boundaries that ensure the player is safe and comfortable in the play areas. This means that the caregiver must give permission, explicit or tacit, to use certain objects, engage in specific play activities e.g. climbing trees and play in specific locations.

Playmates' supportiveness is divided into three elements i.e. younger playmates, older playmates and peers (similar aged playmates). Each element is further divided into items which are, the playmates' response to the player's cues, the clarity of cues given by playmates and the ability of playmates to participate as equals with the player. Supportive traits include playmates' ability to maintain the flow of play by getting involved in play,

giving clear messages about how they would like the interaction to go, giving logical ideas, possessing the skills to engage in play, not being bossy or manipulative etc.

The five non-human elements of the environment measured by the TOES are objects, space, sensory environment, safety and accessibility. The objects that are observed include both natural and fabricated objects and are observed for whether they allow for modification for the player's ability to engage in play, sufficient number and variety as well as whether they are attractive for sufficient engagement. Space that allows for modifications and has clear boundaries is supportive of play. The sensory environment's supportiveness is determined by the level and type of noise for example, laughing and chatting is supportive while crying will be unsupportive. A play environment that is not cluttered is more supportive of play than a cluttered one. Safety is determined by the extent to which the environment is physically safe for the children to play. A safe environment does not have any objects or surfaces that pose an imminent threat to the players' safety. Accessibility depends on the ease with which the players can get to the play areas and move around in the play area as well as the accessibility of play objects (2).

A full description of what is measured under each item of the TOES is provided in Appendix G.

Findings from the TOES are either reported using the most common score to determine whether an environment or an item of the environment is supportive or not supportive of play or environmental supportiveness is reported descriptively. When the most common score is used to report findings, environments are reported as being mostly supportive,

or mostly unsupportive. Environments that are mostly supportive are those in which most scores were either 1 or 2 and the mostly unsupportive environments are those whose main scores were either -1 or -2.

When using descriptive results, descriptive findings are used to determine whether an item on the TOES supports or does not support a child's playfulness. For example, when caregivers are supportive, they give players access to possibilities if needed for example ideas, prompts, or things to play with.

The validity and reliability of the TOES has been confirmed for typically developing children as well as children with disabilities (28). Data for 94% of the TOES items, and for 95% of environments tested conformed to the Rasch model (28). Interrater reliability has been confirmed by data from 100% of raters that conformed to the Rasch model with all estimated item model error of less than 0.27 for all items (28).

3.6 Ethical considerations

Prior to the commencement of data collection, ethical clearance was obtained from the University of the Witwatersrand Human Research Ethics Committee (Clearance certificate M120950) (Appendix H) and from the Zimbabwe Medical Research Council (REF: MRCZ/B/673) (Appendix I). Letters were written seeking permission from Marondera Provincial Hospital (Appendix J) and from Marondera Child Care Society (Appendix K). Written permission was obtained from Marondera Provincial Hospital (Appendix L) and from Marondera Child Care Society's orphanages management (Appendix M).

Using the Information Sheet (Appendix N), the study was explained to caregivers of all participants and the administrator who the legal guardian of the participants in the orphanages was. Written informed consent (Appendix O) was obtained from caregivers of participants and verbal assent (Appendix P) was obtained from the participants.

The researcher was cognisant of the fact that the study sample was from a vulnerable population. Thus, the researcher ensured confidentiality. Each child's ToP and TOES score sheets; ToP Keyform and demographics sheet were coded with the same code and stapled together. No names were included on the forms to ensure anonymity and confidentiality of the participants' data. A list with the name of each child and their corresponding code was kept by the researcher, separate from the coded data collection sheets. All data collection sheets were kept by the researcher for data analysis and participants were identified only by a number. Only the researcher, supervisor and statistician had access to the data.

Both the participants and caregivers were free to decline participation in the study and could withdraw at any time. This was communicated to all caregivers and children throughout the process of data collection.

The data collected will be stored in a locked archive at the researcher's home for six years, thereafter it will be destroyed.

3.7 Research procedure

3.7.1 Children staying with their families

Caregivers of HIV infected children and their children would gather at the clinic before the opening time of the Marondera Hospital Opportunistic Infections Clinic where they would sing, pray and sometimes be given health education. The researcher worked with the nurse who was Head of the Clinic and was given this platform to explain the purpose of the study to caregivers attending the clinic as per the Information Sheet. Parents of children who met the inclusion criteria were invited to participate in the study. Arrangements for a suitable date and time to observe the children playing in their homes were made with the caregivers who agreed for their children to participate in the study.

On the date and time agreed on, the researcher visited each family's home. Written informed consent was obtained from the caregivers of all participants and verbal assent was obtained from the children. Each caregiver and participant were clearly informed that they were free to withdraw from the study at any point if they wished. The researcher asked the caregiver questions from the Demographic Data Sheet and recorded their responses.

The researcher then asked the caregiver of the participant to let their child play in the way he/she always did. The researcher allowed five to ten minutes of warm up before starting the timer for the 15-minute scored indoor play session. Each participant was left to play for 15 minutes playing indoors while the researcher observed and scored the participant's playfulness. The researcher then asked the caregiver to cue their child to go and play outside. The participant was then observed for 15 minutes playing outdoors by the

researcher during which playfulness was scored again. Environmental support was scored on one TOES score sheet for both indoor and outdoor play. After the observations, the researcher thanked the participants and left. The researcher spent about one hour per home.

3.7.2 Children staying at orphanages

After the researcher was granted permission to carry out the research at the orphanages, the researcher set a date to select participants from the orphanages. The researcher got the list of names of children aged 4-5 who were HIV infected. The researcher requested to see the children and included 15 children that fit the selection criteria. The researcher then obtained consent to include these children from the legal guardian who was the orphanages administrator. Any clarification required by the administrator was provided by the researcher. Of the 15 children who were included, none of them had guardians known to the orphanages hence consent was given by the administrator.

After receiving consent, the researcher was introduced to the house mothers for the selected participants and made an appointment with them for the most suitable time for observations to be made. Eight houses in total were included in the study. Verbal assent was then sought from the children on the day of observation.

The participants were also informed that they could withdraw from the study at any point if they wished to. Observation of playfulness and environmental support were done in the same manner as for children staying with their families.

3.8 Statistical analyses

Data were coded and stored using Microsoft Excel. Data were analyzed using SPSS statistics software. Descriptive statistics were used to describe the participants' demographic data. Tables and graphs were used to present demographic data.

The Measure of Playfulness for each participant was determined using the scores obtained from the ToP Keyform. Frequencies of playfulness and non-playfulness for each of the groups were determined. The mean playfulness for the families group and the orphanages group were determined and descriptive statistics were used to present the data. To establish if there were significant differences in playfulness between the groups, the Mann Whitney U test was used. Non-parametric statistics were used to compare the groups in this study due to the small sample size as well as the ordinal nature of the scales on the ToP and TOES.

Scores for items belonging to each of the five elements of play were computed and the means and standard deviations were determined for each of the five elements for indoor and outdoor play. Significant differences between playfulness elements scores of the groups were determined using the Mann Whitney U test.

For indoor and outdoor play, all items of the ToP were analysed using frequencies. Items where at least 50% of the participants of each group scored low (0 or 1) for each of the groups, were presented in graphs. This gave an indication of limitations in playfulness for each of the groups for indoor and outdoor play.

The TOES scores cannot be summed or computed in anyway and can be analyzed using descriptive statistics (2). Some previous studies used the Rasch analysis to analyse

TOES scores (28,64), but such an analysis would have been too complicated for this study. Freeme et al. (2011) used descriptive statistics to analyze environmental support in a study that also used the TOES to measure environmental support (27). Similarly, for this study environmental supportiveness was determined using frequencies and percentages for the study sample. Frequencies were also used to determine the supportiveness of the human elements and non-human elements. Negative TOES scores (-2 and -1) were regarded as unsupportive and positive TOES scores (1 and 2) were regarded as supportive. To determine whether the environments supported each participant's play, the TOES mode score for each participant was determined. A negative mode indicated an unsupportive environment while a positive mode indicated a supportive environment.

In addition, descriptors of the most common occurrences that were observed during data collection were noted and presented.

A summary of environmental support of combined human and non-human elements for both groups are presented using frequencies and percentages.

CHAPTER 4: RESULTS

This chapter will present the results according to the objectives of this study. Firstly, the demographics as obtained from the Demographic Data Sheet will be discussed. Secondly, the summarized findings of playfulness from the ToP scores will be presented showing the number of playful and non-playful participants. The items that had particularly low scores for each of the groups as well as those items in which the group scores showed a significant difference will be presented. The mean scores for the elements of playfulness are then presented and compared. To summarise playfulness, a graph showing the playfulness of each of the participants from both groups is presented. The third part of this chapter will present and compare the environmental supportiveness of each of the groups descriptively.

4.1 Demographics

4.1.1 Age and gender of participants

The participants were matched for gender in each of the groups. Of the 15 participants in each of the groups, eight were male and seven were female. Overall there were more male participants (53.33%) than female participants (46.67%) in the study.

The ages of the participants ranged from four years one month to four years nine months. The average age was 52 months (four years, four months). There was no significant difference in the age or gender between the two groups (Table 4.1).

Table 4.1: Age and gender of participants (n=30)

		Orphanage n = 15n (%)	Family n = 15n (%)	p-value
Age in months	4.0 yrs. – 4.6 yrs.	10 (67%)	9 (60%)	0.46
	4.6 yrs. – 5.0 yrs.	5 (33%)	6 (40%)	
Gender	Male	8 (53%)	8 (53%)	0.77
	Female	7 (47%)	7 (47%)	

Significance p≤ 0.05*

Significance p≤ 0.01**

4.1.2 Type of family

Nine out of the 15 children, staying with their families, stayed with their biological families and the other 6 stayed with extended families. None of the participants stayed in foster families (Table 4.2).

Table 4.2: Types of family for the group of participants staying with their families (n=15)

Home group	**Biological family**	**Foster family**	**Extended family**
	Number of children n (%)	Number of children n (%)	Number of children n (%)
Families(n=15)	9 (60%)	0 (0%)	6 (40%)

4.1.3 Primary caregiver

In the group of children staying with their families, 9 children (60%) had their biological parent as their primary caregiver, 3 children (20%) had their grandparents as their primary

caregiver and 3 children (20 %) had either an aunt or an uncle as their primary caregiver. The primary caregiver for all children staying in orphanages was the orphanage caregiver (Table 4.3).

Table 4.3: The primary caregiver of the participants per setting (n=30).

	Families(n=15) n (%)	**Orphanages(n=15) n (%)**
Biological parent	9 (60%)	0
Grandparent	3 (20%)	0
Foster parent	0	0
Aunt/ uncle	3 (20%)	0
Orphanage caregiver "House mother"	N/A	15 (100%)

4.1.4 Duration of stay in current home

Ten (66.7%) of the children staying with their families had stayed in their current home for at least three years while 9 (60%) of children staying in the orphanages had stayed there for at least three years. There was no significant difference in duration of stay between the two groups (Table 4.4).

Table 4.4: Duration of stay in current homes per setting (n=30).

	Families(n=15)	**Orphanages (n=15)**	**p-value**
Below 1 year	1 (6.7%)	3 (20%)	0.56
1-2 years	2 (13.3%)	1(6.7%)	
2-3 years	2 (13.3%)	2(13.3%)	
3- 4 years	1 (6.7%)	8 (53.3%)	
Above 4 years	9 (60%)	1(6.7%)	

Significance p≤ 0.05*

Significance p≤ 0.01**

4.1.5 Medication

All (n=15) the children staying with their families were on chronic medication, with 14 on HAART and one on cotrimoxazole. Fourteen children in the group of children staying in the orphanages were on chronic medication, with 12 of them on HAART and 2 on cotrimoxazole. One child staying in the orphanage was not on any chronic medication (Table 4.5).

Table 4.5: Number of children on chronic medication, HAART and time they have been on HAART (n=30)

Variable		Families n=15n (%)	Orphanages n=15n (%)	p-value
Chronic medication	Number of children on chronic medication	15 (100%)	14(93.3%)	0.77
	Number of children not on chronic medication	0	1 (6.7%)	
HAART intake	Children on HAART	14 (93.3%)	12 (85.7%)	0.54
	Children not on HAART	1 (6.7%)	3 (20%)	
	Number of children on cotrimoxazole	0	3 (20%)	
Time on HAART	6-12 month	0	0	0.60
	12- 24 months	1 (6.7%)	0	
	24-36 months	2 (13.3%)	2 (13.3%)	
	36-48 months	11 (73.3%)	10 (66.7%)	
	48+ months	0	0	
	Not applicable	1 (6.7%)	3 (20%)	
Regime change	Number of children whose HAART regime was changed	0	0	

4.2 Playfulness

Findings from the ToP denoting playfulness and non-playfulness will be presented first then the playfulness of each of the groups will be presented separately, comparing indoor and outdoor play.

4.2.1 Playfulness of the study sample

4.2.1.1 Playfulness vs. non-playfulness

The total playfulness of the sample was analyzed for the family group, the orphanage group and for the total sample. A positive ToP score was regarded as playful and a negative ToP score was regarded as non-playful. More participants were found to be playful in the total sample, of the total sample, 18 (60%) of the participants were playful while 12 (40%) were not playful. Six (20%) of the playful participants were from the families group and 12 (40%) were from the orphanages group. Nine (30%) of the non-playful group were from the families and three (10%) were from the orphanages group (Table 4.6).

4.2.2 Playfulness of each of the groups.

The ToP item scores for both groups were determined for indoor and outdoor play. The items in which at least 50% of the participants scores 0-1 are presented (Tables 4.8 and 4.9). Items in which less than 50% of the participants scored 0-1 are not shown.

4.2.2.1: Playfulness of children staying with their families

During indoor play, four of the six items of Suspension of Reality, two of the six items of Internal Control, five of the eight items of Shared Control, three of the four items of Framing and one of the five items of Motivation had at least 50 %of the participants scoring 0-1(Table 4.7).

During outdoor play, three of the six items of Suspension of Reality, two of the six items of Internal Control, four of the eight items of Shared Control, three of the four items of

Framing and none of the five items of Motivation had at least 50 % of the participants scoring 0-1 (Table 4.7)

Table 4.7: Participants staying with their families with low ToP item scores (0-1) during both indoors and outdoors play.

Element	Item	Families indoor play N=15 n (%)	Families outdoors N=15 n (%)
Suspension of reality	Mischief (extent)	13 (86.67)	13 (86.67)
	Unconventional play (extent)	11 (73.33)	12 (80.00)
	Clowns (extent)	14 (93.33)	14 (93.33)
	Unconventional (skill)	10 (66.67)	
Internal Control	Decides		12 (80.00)
	Modifies (skill)	11 (73.33)	11 (73.33
	Interacts with objects (skill)	8 (53.33)	
Shared Control	Negotiates (skill)	10 (66.67)	9 (60.00)
	Supports (skill)	9 (60.00)	
	Enters (skill)	9 (60.00)	9 (60.00)
	Initiates (skill)	11 (73.33)	11 (73.33)
	Shares (skill)	11 (73.33)	10 (66.67)
Framing	Gives cues (extent)	10 (66.67)	11 (73.33)
	Gives cues (skill)	11 (73.33)	11 (73.33)
	Reads cues (skill)	9 (60.00)	11 (73.33)
Motivation	Persists (intensity)	8 (53.33)	

4.2.2.2: Playfulness of children staying in orphanages

During indoor play, five of the six items of Suspension of Reality, two of the six items of Internal Control, one of the eight items of Shared Control, one of the four items of Framing and one of the five items of Motivation had at least 50% of the participants scoring 0-1. During indoor play, two of the six items of Suspension of Reality, one of the six items of Internal Control, one of the eight items of Shared Control, none of the four items of Framing and none of the five items of Motivation had at least 50 % of the participants scoring 0-1(Table 4.8)

Table 4.8: Participants staying in orphanages with low ToP item scores (0-1) during both indoors and outdoors play.

Element	Item	Orphanages indoors N=15 n (%)	Orphanages outdoors N=15 n (%)
Suspension of reality	Clowns (extent)	8 (53.33)	
	Mischief (extent)	10 (66.67)	10 (66.67)
	Mischief (skill)	10 (66.67)	
	Pretends (skill)	11 (73.33)	10 (66.67)
	Unconventional (skill)	12 (80.00)	
Internal Control	Modifies (skill)	10 (66.67)	8 (53.33)
	Interacts with object (skill)	8 (53.33)	
Shared Control	Negotiates (skill)	8 (53.33)	
	Social (extent)		8 (53.33)
Framing	Engage (skill)	9 (60.00)	
Motivation	Persists (intensity)	9 (60.00)	

4.2.3 Comparison of playfulness for indoor and outdoor play between the groups.

In this section the mean ToP measure scores for the family and orphanage groups were firstly compared for their playfulness to determine the differences between the two groups. Secondly a comparison of the two groups' ToP scores for each of the 5 elements of play for indoor play as well as outdoor play is presented. Lastly, items of playfulness with significantly different ToP scores between the two groups for both indoor and outdoor play are presented.

4.2.3.1 Comparison of playfulness between groups

A negative ToP score shows non-playfulness and a positive ToP score shows playfulness. The mean score for the group of children staying with families shows that they are not playful (-0.21) in comparison to the mean score of the group of children staying in orphanages who are playful (0.5). A statistically significant difference was found between the mean ToP measures for each of the groups (p = 0.03) (Table 4.9).

Table 4.9: Mean playfulness of participants per setting.

Playfulness	Families Mean (SD)	Orphanages Mean (SD)	p-value
Measure of playfulness	-0.21 (0.77)	0.5 (0.97)	0.03*

*Significant p≤ 0.05

**Significant p≤ 0.01

4.2.3.2 Comparison of playfulness item scores per element of playfulness.

For children staying with their families, mean scores for the Motivation, Internal Control, and Suspension of Reality elements were lower for indoor play than for outdoor play. For the children staying in the orphanages, mean scores for all five elements were lower for indoor play than for outdoor play.

Further, mean scores for all elements were lower for children staying with their families than for children staying in orphanages, for indoor as well as outdoor play. Significant differences were found during outdoor play between the two groups in Internal Control (p=0.01), Shared Control (p=0.02), and Framing (p=0.003) (Table 4.10). No significant differences were found between the two groups during indoor play.

Table 4.10: Comparison of Test of Playfulness scores per element of playfulness for indoor and outdoor play for both settings.

Playfulness element	Indoor play		p value	Outdoor play		p value
	Families Mean (SD) n=15	Orphanages Mean (SD) n=15		Families Mean (SD) n=15	Orphanages Mean (SD) n=15	
Suspension of reality	0.99(0.54)	1.21 (0.77)	0.45	1.02 (0.60)	1.41 (0.60)	0.55
Internal control	1.41(0.46)	1.51 (0.57)	0.88	1.30 (0.57)	1.76 (0.57)	0.01**
Shared control	1.35 (0.58)	1.74 (0.54)	0.88	1.42 (0.58)	1.93 (0.66)	0.02*
Framing	1.35 (0.64)	1.66 (0.69)	0.22	1.13 (0.57)	1.85 (0.54)	0.003**
Motivation	1.64 (0.50)	1.81 (0.56)	0.33	1.73 (0.60)	2.04 (0.56)	0.13

Significance p≤ 0.05*

Significance p≤ 0.01**

4.2.3.3 Comparison of Test of Playfulness means per item of playfulness.

The ToP item scores for the individual items were compared between the groups for both indoors and outdoors play. Items that showed significant differences between the groups are presented in Table 4.11. Two items showed significant differences between the two groups during indoor play i.e. clowns (extent) and initiates (extent) while seven items showed significant differences during outdoor play. These seven items were decides *(extent),* interact with objects *(intensity),* social play*(extent),* enters*(skills)*, gives cues *(extent),* gives cues *(skill),* and reads cues *(skill).*

A total of 9 items showed significant differences and for these items, children staying with their families had a lower mean score than children staying in orphanages (Table 4.11).

Table 4.11: Comparison of significantly different Test of Playfulness items scores between the groups for both indoors play and outdoors play.

Element of playfulness	Indoors play			p value		Outdoors play		p value
	ToP item	Families Mean (SD) (n=15)	Orphanages Mean (SD)(n=15)		ToP item	Families Mean (SD) (n= 15)	Orphanages Mean (SD) (n=15)	
Suspension of reality	Clowns (extent)	0.46 (0.64)	1.49 (0.92)	0.005*				
Internal control					Decides (extent)	1.00 (0.65)	1.73 (0.80)	0.02*
					Interact with objects (intensity)	1.60 (0.51)	2.20 (0.77)	0.02*
Shared control	Initiates (skill)	1.00 (0.76)	1.79 (0.89)	0.031*				
					Social (extent)	1.67 (0.62)	2.27 (0.80)	0.05*
					Enters (skills)	1.27 (0.70)	1.87 (0.74)	0.04*
Framing					Gives cues (extent)	1.07 (0.70)	1.80 (0.77)	0.01**
					Gives cues (skill)	1.07 (0.70)	1.73 (0.80)	0.02*
					Reads cues (skill)	1.27 (0.46)	1.87 (0.35)	0.006**

Significance p≤ 0.05*

Significance p ≤ 0.01**

4.3 Individual participants' playfulness scores

4.3.1 Playfulness scores of individual participants staying in the two settings.

Negative ToP scores show non-playfulness and positive ToP score shows playfulness. ToP scores ranged from -1.8 to 0.9 for participants staying with their families and -1.5 to 1.8 for participants staying in the orphanages and are presented in descending order (Figure 4.1). Looking at Figures 4.1 and 4.2, children who stay in orphanages are generally more playful than children who stay with families.

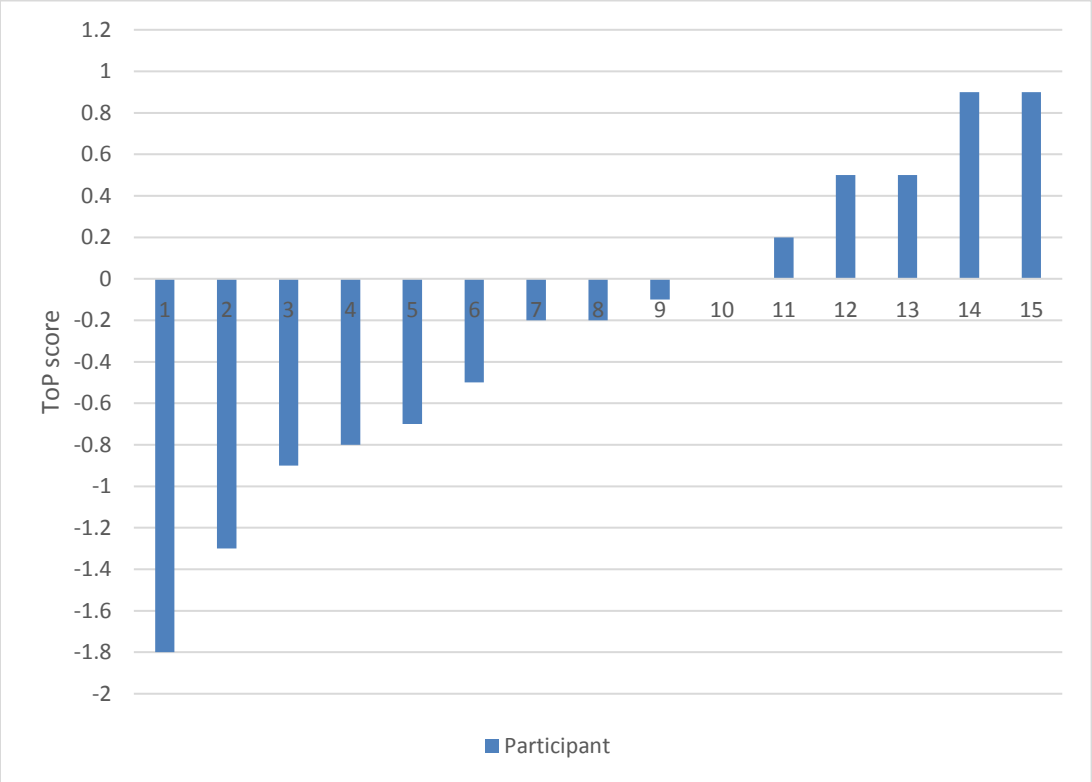

Figure 4.1: Test of Playfulness score for each of the participants staying with their families

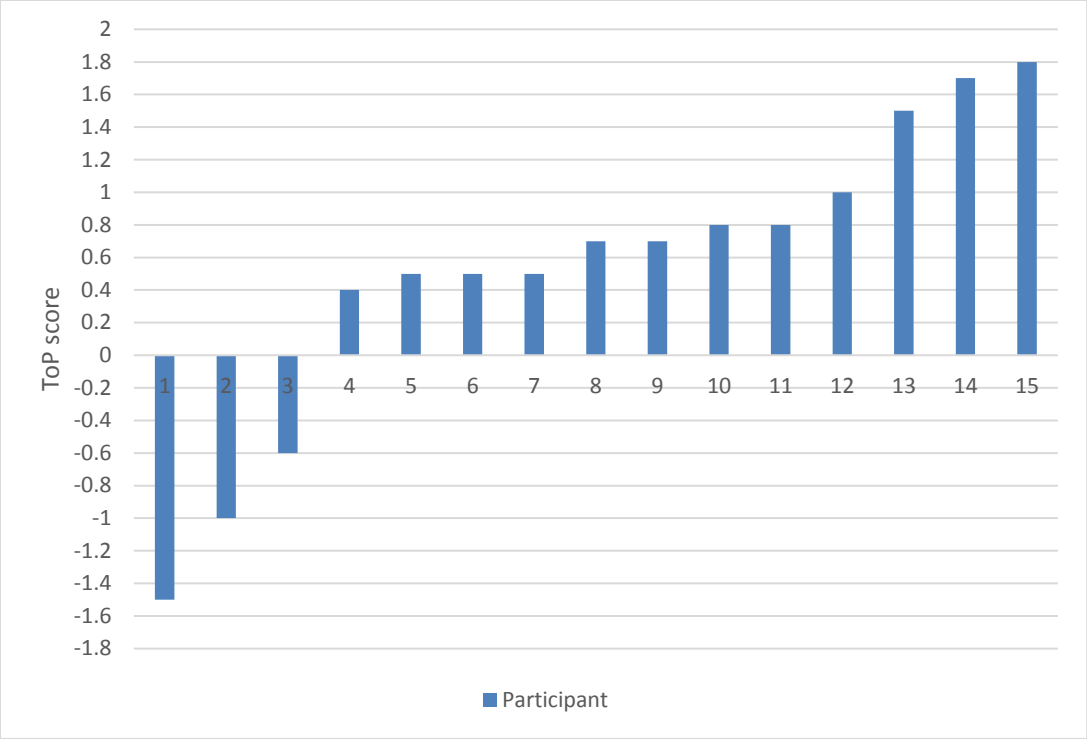

Figure 4.2: Test of Playfulness score for each of the participants staying in the orphanages

4.4 Test of Environmental Supportiveness findings

4.4.1 Source of motivation per setting

As is required with the use of TOES the apparent source of motivation for play for each of the participants was determined and is presented in Table 4.12. For both groups the most common source of motivation was social interaction with 40% for children staying with their families and 46.7% for children staying in the orphanages. Physical activity and objects were the next biggest sources of motivation where 20% of the participants staying with their families and 26.7% staying in orphanages were motivated by physical activity.

Objects were an apparent motivation for 26.7% of participants staying with their families and 13.3% of participants staying in orphanages.

Table 4.12: Identified sources of motivation for play per setting

Source of motivation	Families (n=15) n (%)	Orphanages (n=15) n (%)
Social interaction	6 (40%)	7 (46.7%)
Physical activity	3 (20%)	4 (26.7%)
Sensory stimulation	2 (13.3%)	1 (6.7%)
Objects	4 (26.7%)	2 (13.3%)
Achievement	0 (0%)	1 (6.7%)

4.4.2 Environmental supportiveness

The TOES are divided into human and non-human elements. The human elements are caregivers, younger playmates, peers and older playmates while the non-human elements are objects, safety, sensory input and accessibility.

4.4.2.1 Human elements:

The human elements that were observed were related to caregivers, younger playmates, peers (same age playmates) and older playmates. Caregivers were observed according to their ability to promote play activities, setting reasonable boundaries and adhering to consistent boundaries. Younger playmates, peers and older playmates were observed according to whether they respond to the participants' cues, their ability to give clear cues that promoted play and their ability to participate as equal playmates.

4.2.1.1 Caregiver-supportiveness of play in the two environments.

Table 4.13 below shows the observations made with regards to caregivers' supportiveness of the participants' play.

Table 4.13: Observations of caregivers' support of participants play

Element	Item	Families	Orphanages
Caregivers	Caregivers promote players' activities and opportunities	Caregivers could not provide opportunities for indoor play; due to space constraints. Caregivers were not present to play with the participants. Caregivers did not give suggestions and ideas during play. They seemed uninterested in the participants' play. Caregivers did not facilitate group play, with some not allowing children to go to their potential playmates' homes to play. Some players were stopped from playing immediately after the two 15-minute observations. Caregivers invited their children back indoors for unknown reasons.	Caregivers had a time table for the day that included a set time for participants to play outdoors.
	Caregivers adheres to consistent boundaries and rules.	Some caregivers were not available to set or reinforce rules.	Orphanages has a code of conduct for caregivers that guided their rule setting.

	Caregivers adheres to reasonable boundaries and rules.	Caregivers' rules were strict thus restricting play. For example, household objects were completely restricted from play.	Rules seemed consistent and most participants knew the rules. Participants possibly had enough toys and did not need to incorporate household objects in their play. When they included household objects, they generally did not move the around as there was enough space to play around them

Figures 4.3 and 4.4 show the caregivers' support of play in the families' and orphanages' environments; respectively as determined by the TOES. According to figure 4.3, in the families' environment 60% (n=9) of caregivers promoted the participants' play activities and opportunities while 30% (n=6) interfered with their play. Caregivers that set realistic boundaries and adhered to consistent boundaries were 86.6% (n=13).

According to Figure 4.4, 100% of caregivers in the orphanages supported the play of participants by promoting play activities and opportunities, setting realistic boundaries and adhering to consistent boundaries.

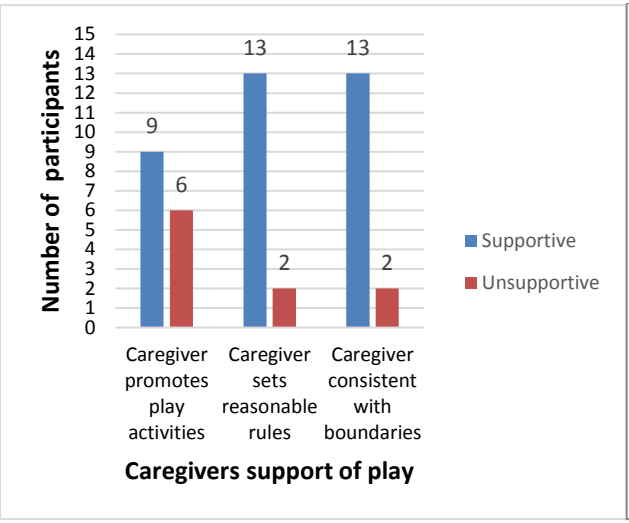

Figure 4.3: Caregivers' support of participants' play in families (n=15)

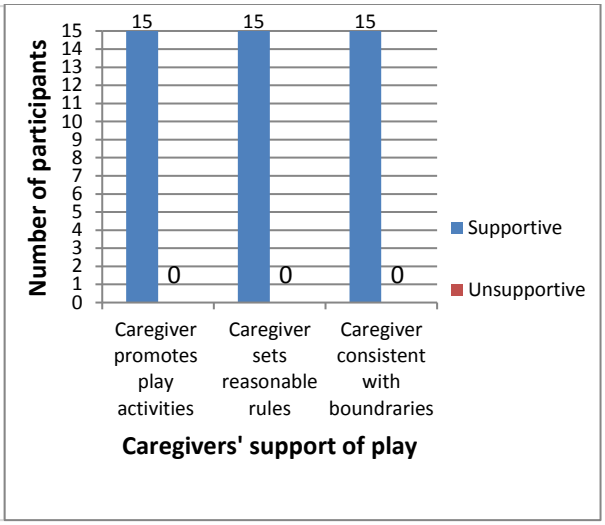

Figure 4.4: Caregivers' support of participants' play in orphanages (n=15)

4.2.1.2 Playmates' supportiveness of participants' play in the two environments

Table 4.14 below shows the observations made with regards to younger playmates', peers and older playmates' supportiveness of the participants' play

Table 4.14: Observations of younger playmates', peers' and older playmates' supportiveness of the participants' play

Element	Item	Families	Orphanages
Younger playmates	Younger playmates response to cues	Some participants did not have younger playmates. (This was taken into account by the tests and participants were not marked down for it). Where available, younger players were available they were siblings of the players and were clingy	When younger players were told not to interfere they generally stopped though in some cases they continued to demand attention
	Younger playmates ability to give clear cues	Younger playmates cried or were clingy to older playmates	Younger playmates gave clear cues though some cues interfered with play, such as crying for attention
	Younger playmates ability to play as equals	Younger playmates when siblings, would not let participants go out to play in some cases	Some younger playmates did not understand the play activities

			Some younger playmates required a lot of support thus reducing amount of time that players could engage in play
Peers	Peers' response to cues	Peers ignored participants' initiatives to play or their effort to engage in play with them Some peers refused to play with participants Some peers were not allowed by their caregivers to play at the particular time of the observation	Peers accepted both verbal and non-verbal invitation to play
	Peers' ability to give clear cues	Peers initially seemed keen to play but at the end acted uninterested in playing with participants giving mixed messages Some peers promised to join participants to play but did not turn up	Most peers communicated clearly
	Peers ability to play as equals	Peers did not teach participants games that were unfamiliar and chose to engage with other more experienced playmates Peers were condescending of some of the participants as they were not skilled Peers chose to group up with older playmates Peers sat with older playmates and did not engage in active play with the other playmates	Peers engaged in familiar play activities with participants
Older playmates	Older playmates' response to cues	Older playmates were sometimes stubborn and would not follow any cues given by participants	Participants understood and followed the older playmates' cues
	Older playmates' ability to give clear cues	Older playmates were overbearing Older playmates disregarded participants' ideas and suggestions to play.	Older playmates assumed the roles of the caregiver by enforcing boundaries and solving disputes amongst playmates.
	Older playmates' ability to play as equals	Older playmates bullied some participants Older playmates were sitting and chatting, did not engage in play activities that participants could also engage in	Older playmates were sometimes directive but mostly facilitated play by giving participants ideas on how to engage Older playmates sometimes favoured some participants over others and were unfair

		Older playmates were directive of play and were not cooperative	

Playmates' supportiveness of the participants' play is represented in figures 4.5 and 4.6 for the families and orphanages environments; respectively.

For the families' environment, Figure 4.5 shows that twenty percent (n=3) of the participants did not have younger players to play with thus were indicated as not applicable. Younger playmates responded clearly to 66.7% (n=10) of the participants' cues and gave clear cues while 13.3% (n=2) gave unclear cues. Younger playmates participated as equal players with 60% (n=9) of the participants, thus promoting play while for 20% (n=3) of the participants, younger players did not participate as equal players thus interfered with play.

All 15 participants had peers. For 60% (n=9) of the participants' peers responded clearly to cues, peers gave clear cues to 66.7% (n=10) of the participants and for 53.3% (n=8) of the participants, peers participated as equal playmates.

All 15 participants also had older playmates. For 60% (n=9) of the participants' older playmates responded well to the participants' cues and participated as equal playmates, thus supported play while 40% (n=6) did not respond well to cues and did not participate as equal playmates thus interfering with play. For 53.3% (n=8) of the participants' older playmates gave clear cues which supported play while for 46.7% (n=7) of the participants, older playmates did not give clear cues during play which interfered with play.

For the orphanages environment, Figure 4.6 below, thirteen of the younger playmate responded appropriately to the participants' cues, gave clear cues and participated as equal playmates with the participants during play; thus, supporting the participants play. Two of the participants interfered with play by not responding appropriately to cues, not giving clear cues and failing to participate as equal playmates the participants.

Thirteen peers responded appropriately to cues and participated equally during play while two peers failed to respond appropriately to play and did not participate as equals with the participants during play. Twelve peers gave clear cues that supported play while three peers gave unclear cues during play.

Twelve older players responded appropriately to cues and played as equals with the participants thus supporting play while three older players did not respond to cues and did not play as equals with the participants thus interfering with the play. Thirteen older players gave clear cues that supported play while two of them could not give clear cues.

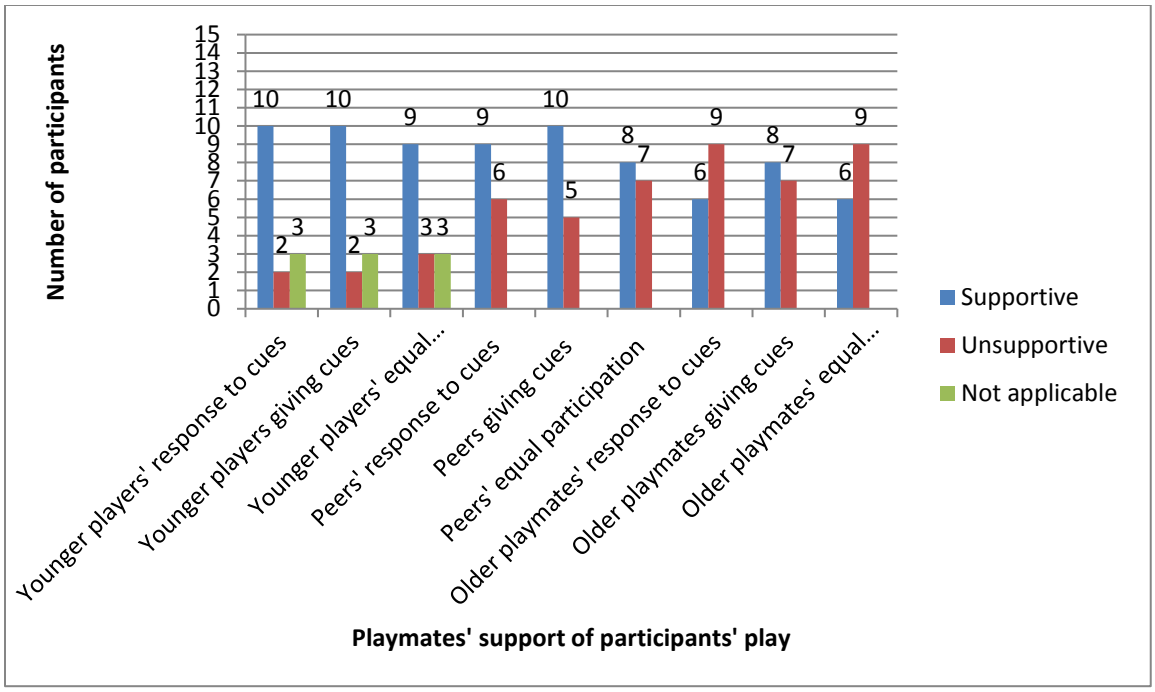

Figure 4.5: Playmates' support of play for participants staying with their families

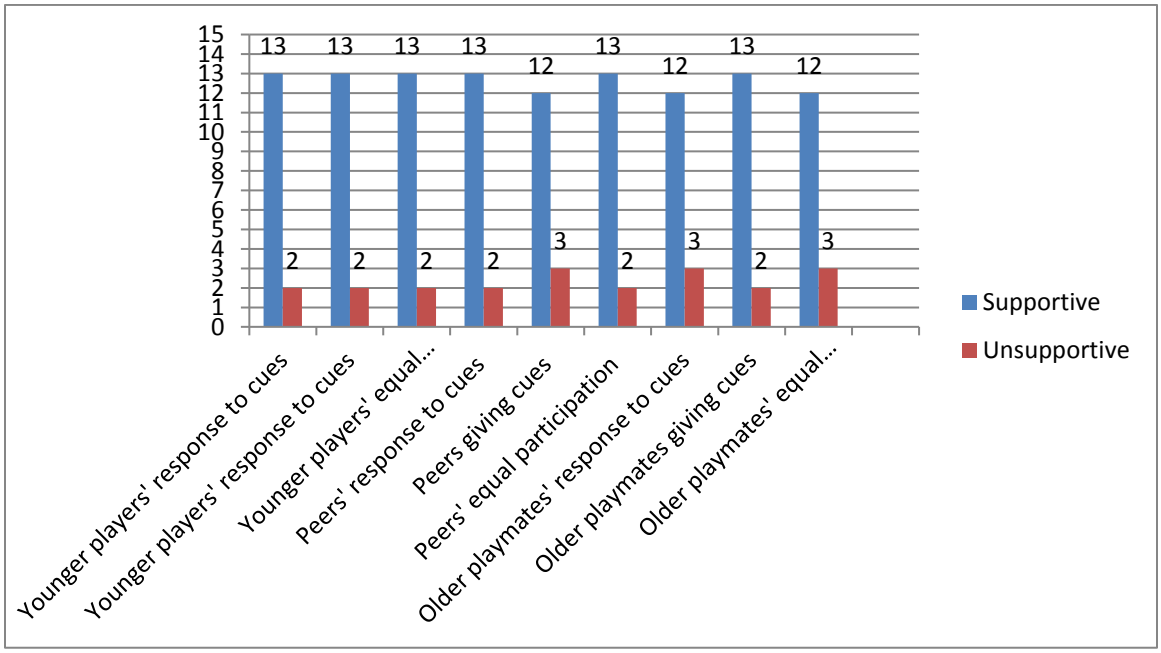

Figure 4.6: Playmates' supportiveness of the participants' play in the orphanages environment (n=15)

4.4.2.2: Non-human elements of the environment

The non-human elements of the environment that were observed according to the TOES were availability of both natural and fabricated objects that could be incorporated in play, the extent to which amount, and configuration of space supports play activities, the extent to which the sensory environment was inviting for play, physical safety of the environment and accessibility of the play space.

Table 4.15 shows observations made of how the non-human elements of the environment supported the participants' play.

Table 4.15: Observations of how the non-human elements of the environment supported the participants' play

Element	Item	Families	Orphanages
Objects	Natural objects	Play areas had trees, sand, grass	Play areas had trees, sand and grass
	Fabricated objects	Limited toys; mainly shakers and balls. However, enough natural and recyclable objects were available that players could have used to make their own play objects.	A variety of toys including balls, stuffed animals, age appropriate board games and puzzles. Natural and recyclable objects that players used to make their own toys.
Space	Amount of space	Small backyards. Closed-off streets.	Playgrounds were available
	Configuration of space	There were no distinct play areas. Play areas had no clear boundaries, however, closed streets were available as play areas.	Playgrounds had clear boundaries made by the distinct landscaping.
Sensory environment		Due to the small living spaces, rooms were cluttered. Outdoor environment had no playground equipment.	Rooms were not too cluttered. The sound of happy children playing, and laughing was not too noisy.

		Children make happy and playful noise outdoors. In some cases, children were told not to make noise by their parents. Colours indoors were neutral and did not hinder play. Temperature was supportive of both indoors and outdoors play.	Walls were painted in pastel colours which were calm Temperature was supportive of play both indoors and outdoors.
Accessibility	Accessibility of space	Indoor furniture made it difficult to maneuver in the space Outdoor play space and the closed streets were accessible	Proper paths to the play areas Indoor space was not too cluttered
	Accessibility of play objects	Access to water was limited. Participants had access to empty container that they could have incorporated in play. The play objects, though not stimulating enough, were available for use during play.	Orphanages had boreholes and tap water outside. Participants had access to empty containers of juice, milk, etc. that they incorporated in play. Toys were made available for play.

Figures 4.7 and 4.8 below show the number of participants whose play was supported and not supported by the different non-human elements of the environment

According to Figure 4.7, objects were available for play, the play environment was safe and accessible and supported play for all fifteen participants in the families' environment. Amount and configuration of play was supportive for nine of the participants and unsupportive for six of the participants. The environment had enough sensory stimulation for ten of the participants while the stimulation was not stimulating enough for five of the participants.

According to Figure 4.8 all non-human elements of the environment supported all participants' play in the orphanages environment.

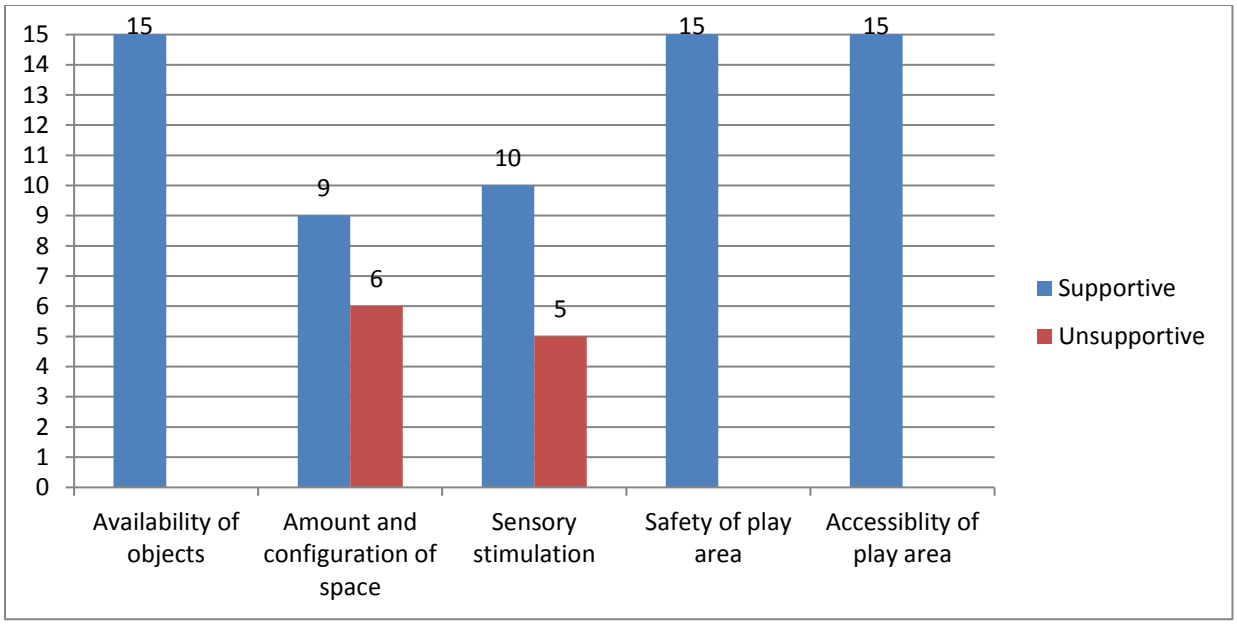

Figure 4.7: Non-human elements' supportiveness of the participants' play in the families' environment (n=15)

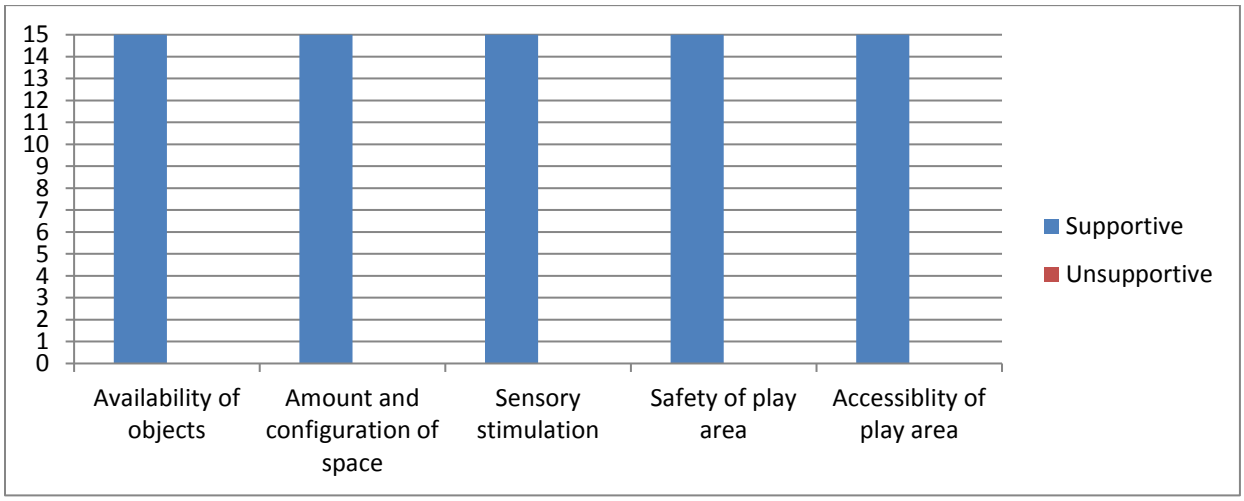

Figure 4.8: Non-human elements' supportiveness of the participants' play in the orphanages environment (n=15)

4.4.3 Comparison of general supportiveness of the two settings

Supportiveness of the environment was determined by the TOES scores where a participant's home environment is said to be supportive when most of the items were scored 1 or 2 or non-supportive when most items were scored -1 and -2.

Table 4.16 shows a summary of the environmental supportiveness of the two settings. It shows that 60% (n=9) of the participants' environment were not supportive of play while only 7% (n=1) of the environments of children staying in the orphanages did not support play.

Table 4.16: Environmental Supportiveness as determined by mode

	Environmental Supportiveness			
Most common TOES score	-2 (not supportive) n (%)	-1 (not supportive) n (%)	1 (supportive) n (%)	2 (supportive) n (%)
Family (n=15)	0	9 (60%)	6 (40%)	0
Orphanages (n=15)	0	1 (6%)	10 (67%)	4 (27%)

4.4.4 Summary of results

In summary, there was no significance difference in the participants' ages and gender between the groups; p-values 0.46 and 0.77 respectively. The biological parent and the orphanage caregiver were the most common caregivers for the families and orphanage groups respectively. Most children from both groups had stayed in their current homes for at least three years. Most children were on HAART with 93% of the children staying

with their families on HAART while 85 % of the children staying in the orphanages were on HAART.

Overall, more children in the orphanages group were playful as compared to the families group, with 40% of the families group being playful and 80% of the orphanages group being playful.

More participants in the families group had difficulty with suspension of reality, internal control, shared control as well as framing during play than those in the orphanages group (Tables 4.7 and 4.8). Further, more participants in the families group scored significantly lower on playfulness items during outdoor play than those in the orphanages group.

The orphanages were more supportive of participants' play than the family homes. For both groups, non-human elements were more supportive than human elements of the environment. In the families group, caregivers were the least supportive of play. They were mostly unavailable to engage in play, and when available, they interfered with play. In the orphanages group, caregivers supported play and did not interfere with play. Playmates in the families group hindered the participant's play as their communication was either unclear or inappropriate. The playmates in the orphanages group were more constructive and cooperative in their engagement. They mostly communicated clearly and appropriately.

Although non-human elements were different for the two groups, they were supportive of play for both groups. The main difference was in how the children interacted with objects in their environment; more so, during outdoor play when the interference of caregivers was less. A discussion of these results will be presented in the next chapter.

CHAPTER 5: DISCUSSION

5.1 Introduction

In this chapter, the results presented in Chapter Four will be discussed in line with the aim and objectives set out in Chapter One. The aims of this study were to investigate and compare the playfulness of HIV infected children in two different home settings and to investigate and compare the extent to which their home environments supported their playfulness. This study was greatly informed by the works of many scholars on the effect of HIV on neurodevelopmental delay (11,12) the possible limitations in play (23) and playfulness (16) as well as the work of Bundy et al.(1997- 2008) on playfulness and environmental supportiveness of play (33,57,59,64,72).

In this chapter, the group of participants staying with their families will be referred to as the families group and the group of participants staying in the orphanages will be referred to as the orphanages group.

5.2 Demographic set up

5.2.1 Study setting

This study was carried out in the high density, suburbs of Marondera, Zimbabwe within a medium to low socio-economic status society, similar to the settings of previous studies on playfulness (16,17,27). All participants' homes were located within about a 15-kilometer radius to Marondera Provincial Hospital with good access to public transport. Being HIV infected and living in impoverished circumstances, the participants were already predisposed to potential occupational deprivation.

5.2.2 Age and gender of participants

The mean age of the participants was 52 months (4 years 3 months). At this age children generally engage in social play (7). During social play, the influence of the playmates on playfulness, one of the 'human' elements of the environment measured by the TOES, is prominent hence could be easily observed. Further, during social play, the players' response to playmates which is a part of the Framing element of playfulness is exhibited and could also easily be observed. The two groups were thus comparable as there was no significant difference between them in age and gender (Table 4.1).

The participants in the two groups of the study were matched for gender because play has been found to differ with gender (7).

5.2.3 Type of family

For the families group, 60% of the participants, stayed with their biological families and had their parent as their primary caregiver while the other 40% had their grandparent, aunt or uncle as the primary caregiver. The primary caregivers for all the participants in the orphanages group were the house mothers. Some of these house mothers were referred to as "gogo"; meaning grandmother in vernacular language. The ages of the caregivers were not collected but from observation they appeared to be much older than the mothers in the families' group. In the families group, only 20% of the caregivers were grandmothers. In a previous study, the playfulness of HIV infected children has been associated with the type of primary caregiver. It was suggested that elderly caregivers seemed to understand the importance of play more than younger caregivers (16). Grandparents may understand the importance of play but their involvement in play may

be limited by their own poor health or decreased physical and mental functioning. In the orphanages group, caregivers generally did not engage in play with the participants but encouraged them to play by bringing out toys or sending them out to play. Participants in the orphanages mostly played with other children both younger and older than them and not caregivers.

The importance of caregiver involvement in play, particularly for HIV infected children has been researched and documented (17,30). In the families group, caregiver involvement during play was also minimal. Biological parents seemed more involved in play than grandparents, aunts and uncles during indoor play. During outdoor play, caregivers were generally not involved in play at all.

The participants in this study were infected via mother-to-child transmission of the virus hence their mothers were also HIV positive. Two of the mothers of the children in the families group looked particularly unwell on the day of observation. They looked frail and did not even talk much even though they tried to interact with their children. It is possible that these parents attempted to interact with their children because they were being observed. One mother excused herself and went to another room and left the participant to play with other children in her absence. It is understandable that mothers do not always have to be involved in their children's play, but this mother showed apathy towards her child's play.

It is possible that caregiver-child interaction was hindered due to the mothers' health status thereby negatively affecting the participants' play. In fact, it has been found that children tend to neglect their childhood roles, one of which is to be a player, so that they

can be their mothers' caregivers. Though a 4-5 year old child may not be capable of providing much care to his/her sick parent, such a child may still lose the opportunity to play with his or her parent which is important for play development (16). It has been found that HIV infected caregivers may fail to pay adequate attention to their child's health. A possible explanation is that they could be frail or that managing their children's health in addition to their own might be challenging for them (18). If parents struggle to manage their children's health properly, trying to get involved in their play may be less of a priority to them.

5.2.4 Duration of stay in current home

At least 60% of the children in each group had stayed in their current homes for at least three years (Table 4.4). The rest of the children had stayed in their current homes for less than three years as they had to change home after one or both of their parents were deceased. Children develop better in the context where lasting relationships with others are formed, particularly, a relationship with the caregiver. When a child stays in a loving and supportive family, they are more likely to have sustained social relationships, attachment to caregivers and a sense of belonging (77). Such an environment will most likely make the child feel safe. It is very important for a child to feel safe and emotionally secure during play (1). It can thus be postulated that the longer the child stays within an environment that makes them feel safe, the more likely they are to play freely within. In this study, though the duration of stay for most participants was at least three years, some of them were not playful.

The association between the duration of stay in the different environments and the supportiveness of the environment should/can be further investigated but this was not within the scope of this study.

5.2.5 Medication

Participants in this study had confirmed HIV diagnoses with 93% of the participants in the families group and 86% of the orphanages group being on HAART treatment. HAART has been found to combat viral replication thus reducing viral load (39). This should improve the children's overall functioning but it has been found that children who were infected in utero, often still present with cognitive problems (41).

However, some cognitive function problems have been found in children who were infected in utero. As part of the inclusion criteria, the participants of this study had to have been infected by their parent pre- or peri-natally. It is therefore possible that, although most of them are on HAART, they could still experience cognitive problems which possibly affected their play. A recommendation for future studies is to assess these children's cognition first before considering their play, playfulness and the environment.

5.3: Playfulness in Human Immunodeficiency Virus infected children staying with their families

According to the ToP, a total measure of playfulness shows on a continuum the inclination of a child's behaviour during an activity towards being playful or not being playful (1). In a study conducted on playfulness in institutionalised children, the researchers categorised the ToP scores as either being playful or not being playful (27) with negative ToP scores

indicating ‘non playfulness’ and positive scores indicating ‘playfulness’. Using the same criteria in this study, 60% of the participants in the families group were not playful and only 40% were playful (Table 4.6).

A lack of playfulness amongst HIV infected children living with their families was also reported in a previous study. The said study was done in the year 2000, when the only available drug was Azidothymidine (AZT), a drug which only delayed the, then inevitable, progression of HIV to AIDS (16). For this reason, it was proposed that caregivers’ lacked motivation and were reluctant to engage in play with their children because they believed that their children would not live long and found it pointless to interact much with them (16).

In this study however, 93% of the children staying with their families were on HAART which should have a positive effect on their playfulness but only 40% of these children were playful. Through the health education these caregivers received, they were aware that their children could live longer if on HAART. A possible reason for the lack of playfulness could be parents’ lack of knowledge on the necessity to engage in play with their children. Another reason could be that parents were too ill to constructively engage in play with their children, similar to what has been described in previous studies (16,18).

The routine HIV management and health education at Marondera Provincial Hospital did not include any input from the Occupational Therapy department at the time of this study. Previous studies have suggested that occupational therapists educate caregivers of HIV infected children on the importance of play and to help facilitate caregiver-child interaction

in a playful manner (16,17,30). When a child is playful, he or she will be able to reap most of the benefits of play (17); one of which is to facilitate development (5,24,54).

5.3.1 Elements of playfulness in HIV infected children staying with their families

Items of the ToP measure playfulness according to five elements namely: Motivation, Suspension of Reality, Internal Control, Shared Control and Framing (6). Though items of the ToP have been grouped under specific elements of play, as shown in Table 3.1, in practice, some elements may be related to more than one element of playfulness. For example items under Internal Control may be linked Motivation, and Freedom to Suspend Reality (1). Such links were also evident in the findings of this study.

The participants' performance varied across the elements of playfulness with some elements of playfulness proving to be more difficult than others.

5.3.1.1 Freedom to suspend reality

During both indoor and outdoor play, children staying with their families had the most difficulty with suspending reality as more than 50% of them scored low (0-1) in at least three of the six items related to this element of playfulness (Table 4.7). These three items were the extent of mischief, clowning during play and unconventional forms of play. In fact, considering the 'extent' scores which indicate the proportion of time children spent exhibiting the ToP items under freedom from constraints of reality, it was observed that less than 4 children staying with their families spent more than 50% of their play time engaged in unconventional play, mischief or clowning. This was to be expected as it was reported in a previous study that only children with ADHD tend to score high in mischief

and clowning which is possibly due to their impulsivity and hyperactivity (59,72) For most other children these items are generally more difficult to exhibit (2).

It was noted though that the low clowning and mischief scores in children staying with their families was not only due to the difficulty of these items per se but also because of environmental factors. The caregivers' influence during play mostly took the form of reproach against any action that could be related to mischief as caregivers seemed to perceive such action as non-compliance. For example, caregivers did not let their children make funny faces at them as they considered this to be disrespectful. Bundy (2007) clearly states that mischief during play can result in reprimanding if the player is caught (6). Nonetheless, Bundy highlights the need to differentiate between mischief and pure non-compliance where mischief is done for pure fun 'with a glint in the eye'. This is an important component of play while non-compliance is done to annoy others and hinders play (6). Caregivers of the children in this study did not seem to appreciate this distinction.

Mischief has further been related to stretching boundaries in order to remove barriers to play (59) and this can be a basis of unconventional play activities. Unconventional play is another item of the ToP that denotes ability to suspend reality during play. This involves incorporating objects during play in ways other than their intended purposes. When children tried to incorporate household items in play they were also reprimanded. Thus, caregiver influence during indoor play resulted in some of these children spending very little of their play time engaging in unconventional play (Table 4.7).

During outdoor play, a pure lack of creativity is implicated for the low scores as there were a lot of objects that the children could have used during play such as soil, bugs, leaves

and trees. Research on playfulness in HIV-infected children has shown that these children interact less with their environment (23).

It was also observed that there seemed to be a trend of making kites from sticks and plastic in the neighborhoods at the time of the study. Older children successfully made their kites and flew them while participants in this study seemed to spend a lot of time attempting to make kites which they failed at and did not manage to play with them at the end of the day. This way the children either did not use their creativity to attempt other unconventional play activities that they would have been more successful at or they lacked the creativity to do so. Creativity, a higher order function closely related to cognitive abilities (60), is key to unconventional play (28). The low scores in unconventional play may be a sign of a lack of creativity in this population; possibly because of the effect of HIV on their cognitive development.

5.3.1.2 Internal control

Removing barriers to play may also be done in an effort to modify a task either to keep it interesting or to maintain a level of novelty or challenge in it (2). Most participants (73.3%) found it difficult to modify activities during both indoor and outdoor play (Tables 4.7). This was measured under the item ‘Modifies’. The ability to modify tasks (an item that measures Internal Control) is closely related to the items unconventional play, mischief and teasing which is part of the Freedom to Suspend Reality element (1). To modify a play activity, one may need to think of unconventional ways of play or to incorporate mischief to ensure that the play activity would remain interesting and captivating. As already discussed, creativity is key to scoring high on items that indicate Freedom to

Suspend Reality. These children lacked creativity thus, found it difficult to modify play activities.

One way in which children can modify activities is to include objects in their play. One participant observed during the study, hid behind the curtain while playing with a younger playmate. Though this included mischief, object interaction and nonconventional play, it was not approved by the participant's caregiver thus the child faced reproach. During indoors play these children could have included objects such as paper or empty containers creatively during play. But their creative ways to use the objects in the house often resulted in reproach from caregivers.

During outdoor play, participants did not seem to be in control of their play. In addition to failing to modify play activities, children also had difficulty deciding on play activities (Table 4.7). When participants went outside most of them just went to join a group of other children already playing. It is possible that during outdoor play participants failed to modify activities because they did not actively decide on the play activities they wanted to do. When a child engages in a play activity that has been decided by others it might be difficult for them to modify it, particularly when they are playing in a group. An ability to control activities, or contribute towards planning them, is expected during play for children aged 4-5 years, as they start to understand simple games with rules (8). The participants in this study did not attempt to take control either because they did not know some of the games well, hence did not have anything to contribute or when they attempted to take control,

these attempts were futile because of the involvement and sometimes domineering tendencies of older playmates from the neighbourhoods during outside play.

5.3.1.3 Shared control

Participants in the families group found it difficult to share control and more than 50% of them had difficulty with 5 of the 8 items of the ToP that measure shared control.s. The children found it difficult to negotiate their needs during both indoor and outdoor play. During indoor play, it could have been due to the excessive control by the caregivers whilst during outside play, the children were probably not confident enough to contribute towards play. It was observed that some participants were not very familiar with the other playmates from the neighbourhood, possibly because they did not engage in community play very often. For this reason, perhaps, most of these children also scored low on initiating play with others and sharing ideas and objects (Table 4.7). Shared control mainly measures the skillfulness with which behaviours are exhibited. Participants' difficulty with these items may reflect a reduced exposure to social play hence they never learned the skills required to share control during play.

5.3.1.4 Framing

It was observed that failure to negotiate needs, also took the form of failing to give cues or doing so unskillfully during both outside and inside play. Most of the children staying with their families gave cues for less than 50% of the observed play time (Table 4.7). The few who communicated resentment at the way they were treated withdrew from the play areas or resorted to parallel play. Though this withdrawal from the group could be viewed as non-verbal cue communicating contempt, it was regarded as unskillful because it hindered play as these children ultimately failed to make use of the play opportunities.

During indoor play when parents were involved it was observed that once the children failed to read cues the first time and the parent repeated an instruction verbally the children became anxious, sometimes causing them to isolate themselves or to act out in a tantrum. Failure to read social cues is common in children with learning disabilities and has been found to be poor in children with ADHD (59). Clinically stable HIV infected children on HAART have been reported to be prone to develop learning disabilities as well as ADHD related behavioural problems like impulsivity and hyperactivity (50). However, hyperactivity and impulsivity were not observed in this study. Participants in this study presented with some behaviours linked to inattentiveness and apathy. It is possible that these children had other diagnoses such as ADHD but this information was not obtained as part of the demographic information. It would be recommended for future studies to include other diagnoses as part of the demographic questionnaire.

5.3.1.5 Motivation

Children staying with their families scored highly in all items under motivation except for the intensity with which they persisted in play activities despite barriers. Persistence with an activity may greatly depend on the players' ability to modify tasks to maintain interest, the players' ability to decide what, who and how they would like to play as well as the ability to communicate this to their playmates. These factors are closely related to the internal and shared control that the players have during play (6). Thus, the difficulty with items under internal and shared control, could have affected the participants' ability to persist in activities during play.

In conclusion, all five elements of playfulness: Freedom to suspend reality, Internal control, Shared control, Framing and Motivation were affected; with Motivation being the least affected and Shared control and Framing being the most affected (Tables 4.7)

5.4 Playfulness of Human Immunodeficiency Virus infected children staying in orphanages.

Only 10% of the children staying in orphanages were not playful (Table 4.6). Similarly to a study conducted on children from child care centres in Johannesburg, South Africa, most participants were playful (83%) and only 17% were not (27). The children in the above-mentioned study, only went to the child care centres during the day and back to their families in the afternoon, so comparing the results with those from this study has been done cautiously. It is possible that the small proportion of children who were not playful in the above-mentioned study, were anxious of being observed. To reduce anxiety amongst the participants, enough warm-up time was given by the researcher in this study before starting to record observations. Non-playfulness that was observed can be an indication of the children's anxious personalities or simply deficits in playfulness.

The orphanages seemed to be more resourceful than the family homes. This aspect could have affected the children's playfulness, and this will be discussed in more detail under environmental support.

5.4.1 Elements of playfulness in Human Immunodeficiency Virus infected children staying with their families

5.4.2.1 Freedom to suspend reality

Children staying in orphanages also had difficulty suspending reality, more during indoor play than outdoor play (Table 4.7). It has been suggested that there is a link between the amount of play resources in an institution with the ability to suspend reality during play following findings that children who were in more advantaged settings had a tendency to engage in more fantasy play than those with less play resources (27). Although a link has been made between having a resourceful environment and the development of personality traits such as curiosity, imagination, and spontaneity, this was not evident in the group of children staying in the orphanages as they still lacked in freedom to suspend reality during indoors play despite having a resourceful environment. A possible reason for this could be that they were also reprimanded by older playmates. However, during outdoor play, play equipment seemed to promote imagination and spontaneity thus; participants seemed to engage in more fantasy play. This is evidenced by the better scores for the clowning, mischief and unconventional play items during outdoor play (Table 4.7).

Clowning has been linked to the need to attract positive attention from others (28). During outdoor play participants in the orphanages played with children from other houses within the orphanages. This could have probed the participants' need to attract the attention of their playmates from other houses hence clowning more during outdoor play than during indoor play.

Participants still scored low on the extent of mischief during both indoor and outdoor play (Table 4.7). During indoor play, it was because caregivers restricted the amount of mischief children could engage in by the boundaries they set. Although caregivers were not present during outdoor play the older children in the orphanages seemed to take the caregivers' roles, setting boundaries for the younger children. Thus, most attempts towards mischief were hindered by the older playmates' interference. However, the participants scored higher on skillfulness of mischief during outdoor play possibly because of more resources and ample space found outdoors. An example is the way children playfully sprayed water at each other using empty juice bottles with a hole on the lid (as a form of water guns). This same example is also a demonstration of one of the ways in which children incorporated objects, not normally used as toys, during play. Thus, their unconventional play was better outdoors than indoors. Indoor play mainly took the form of conventional play such as watching TV or playing "clapping and singing" games.

5.4.2.2 Internal control

Children staying in orphanages had difficulty with two of the items of internal control (Table 4.8). Firstly, modifying activities was difficult for most of them during both indoor and outdoor play. Interaction with caregivers has been found to promote self-reliance (77). Self-reliance may help to promote creativity which is needed during play especially when modifying activities. In the orphanages children appeared to lack creativity or creation of novel play activities. During play, participants would start off on the playground equipment and once this became unexciting or unchallenging for them they tended to change the activity rather than try to modify it. Modification could have taken the form of racing, playing counting games or singing while on playground equipment rides to make

them more exciting. This behaviour was however not noticed in the children from families and it is worth investing further if self-reliance was promoted in these orphanages.

Secondly, the skill of interacting with objects was poorer for indoor play. The children did not seem interested in the toys they had indoors, so they ignored them and preferred to engage in social play that did not include objects. Even though some of the toys were very good and most were age appropriated, the children ignored them. This finding is in line with the findings by Hamm (2006) who suggested that exposure to toys was not enough on its own. Children require guidance from adults to interact with toys (73). While the toys were age-appropriate for these children, neither older children nor caregivers gave the participants guidance on how they could use these toys. However, during outdoor play, these children seemed to copy the way older playmates incorporated objects during play. It is possible that these older children had also not been taught to use the toys indoors but had learned to use the equipment outdoors from others.

5.4.2.3 Shared control

Difficulties in sharing control were found in only two items (Table 4.8). Firstly, the skill of negotiating for their needs to be met during indoor play and secondly the extent of social play during outdoor play. Although participants tried to make sure that their needs were met during indoor play, most of them did so unskillfully. For example, in some of the houses, the participating children were the youngest and used tantrums to try and get their way, which was ineffective and, in some cases, punished by the caregivers.

The extent of social play was limited during outdoor play possibly because outside, participants had to interact with children from other houses within the orphanages. The

familiarity that children staying in one house had with each other probably made it easier for them to socially interact during indoor play. Further, during outdoor play, older children who were involved in indoor play with participants preferred to play with other older children from other houses or preferred to stay indoors to do homework or to help their caregivers with house work.

5.4.2.4 Framing

Children staying in the orphanages did not have difficulties with reading or giving cues (Table 4.8). However, the skill with which they engaged in play, which also falls under Framing, was difficult for them during indoor play. As mentioned earlier, the lack of input from caregivers or older children on how to play with toys indoors could have been the reason for their lack of skill to engage in play during indoor play.

5.4.2.5 Motivation

Participants staying in the orphanages did not have difficulties with ToP items related to motivation during indoor and outdoor play (Table 4.8). Although these children were highly motivated to play, they had difficulties with persisting with a play activity (persevering to overcome barriers to play) during indoor play (Table 4.8). It was overt during observation that these children preferred playing outside. Thus, they did not put much effort into persisting with indoor play activities. When they realised that they did not have enough space for play activities indoors, they preferred to take their activity outside and this was their way of overcoming the barrier of limited space. In fact, for some children ensuring that they spent the full 15 minutes engaging in indoor play, was not an easy task for the researcher. The participants had no problems with this aspect outdoors.

Considering their age, gross motor activities are preferred, which are easier to participate in outdoors.

It is possible that due to the HIV/AIDS illness, children may have had difficulty sustaining energy through activities. Further, the possible cognitive changes, resulting from HIV/AIDS, probably made it difficult for the participants to pay attention in activities, thus making it difficult for their motivation to persist through activities.

5.5 Describing the differences in playfulness between the two groups.

5.5.1 Comparison of playfulness between the two groups

The mean playfulness score for the two groups differed significantly (p=0.03) (Table 4.9). Playfulness of the orphanages group was higher than that of the families group. Several reasons could account for this significant difference between the two groups.

Firstly, the challenge associated with community play as opposed to home play can explain the difference in mean playfulness scores. The home is usually a place where children feel safe, comfortable and less challenged (57,61) unlike the community. Previous research confirmed that because the home environment is less challenging, observations of play in the home can result in inflated scores on the ToP (57). Although the children in the study by Harkness and Bundy (2001) had some physical disabilities and cognitive limitations which participants in this study did not have, challenges during community play were apparent for participants in the families group that were not necessarily present for children staying in the orphanages who played within their home environment. During both indoor and outdoor play, the participants in the orphanages

group were within the confines of the orphanages' premises where they also had playmates while some of the participants in the families group had to leave their homes to go and find playmates. In addition, children in the orphanages group had more playmates than children in the families group which could further explain the different result in comparison to the literature.

Secondly, while the children staying in the orphanages had a structured playground on which they played, those staying with their families either played in their small backyards or in a cul-de-sac in the high-density suburbs. This meant that children staying with their families did not have as many objects readily available and as much amount of space to support play as those staying in the orphanages. It has been suggested that playfulness does not necessarily require objects or toys and most of the elements of playfulness be observed in for example a child walking in a particular way (16). On the contrary, some studies on playfulness showed that more play equipment may improve playfulness (27,57). In a study conducted in Sydney, Australia, the playfulness scores of the children significantly improved after placing play equipment in the school playground for 11 weeks (57).

Furthermore, in a comparison of playfulness in typically developing children in advantaged and disadvantaged child care centres, in Johannesburg, South Africa the researchers categorised the centres according to the resources that they had (27). Differences, although not statistically significant, were found between the playfulness of the advantaged and disadvantaged groups. Using the same criterion, the orphanages can be categorised as being more advantaged than the families. The orphanages had equipped playgrounds and children had age appropriate toys to play with.

Thirdly, it was also observed that participants in the orphanage generally took less time to become accustomed to being observed before engaging in their usual play activities and in some cases, even tried to engage the researcher in play. Institutionalised children have been reported to be overly affectionate and friendly to strangers; a phenomenon known as indiscriminate friendliness (20). This probably made the participants staying in the orphanages engage in unhindered play while the children staying with their families were probably conscious of being observed hence the higher playfulness scores for the former group.

Fourthly, government policy through the Zimbabwe Child Care Society guide, serves to ensure that children in orphanages enjoy their rights as children. These include good nutrition and the right to adequate health care (31). When HIV infected children have these two things at their disposal, their health condition is more manageable and they may experience less developmental delay (78) and possibly their play will also be better than it would have been without proper nutrition and access to health. On the other hand, participants staying with their families may not be provided with these resources due to a lack of access or affordability of adequate nutrition and health care. Consequently, children staying with their families may be predisposed to poorer health and atypical development which may also affect their play. Adherence to HAART and good nutrition is indispensable for HIV infected children to reduce the virus' effect on their development (41,78,13,79).

5.5.2 Comparison of the elements of playfulness of the two groups

Mean scores of the elements of playfulness were also compared between the groups. Participants staying with their families scored lower in all the elements of playfulness in both indoor and outdoor play but significantly lower in the elements Internal Control, Shared Control and Framing for outdoor play (Table 4.11).

5.5.2.1 Internal control

Participants in the families group scored significantly lower in Internal Control. During outdoor play, these participants played in the community with some domineering behaviour of older playmates being observed. This could be because the older children in the community did not know the participants well, possibly because participants seldom played outdoor outside of this study. Poor internal control could have possibly stemmed from fear of self-expression, a learned response to deal with the overbearing older playmates.

5.5.2.2 Shared control

The participants in the families group also had difficulty with Shared Control. In comparison to populations in other studies, Shared Control has been found to be difficult for children with ADHD. This has been attributed to these children's communication difficulties and general inability to succeed in team work (59). For HIV infected participants in the families group, difficulty with Shared Control may have been caused by other reasons. Perhaps, limited exposure to playmates due to caregivers' over-protectiveness meant that these children had not had sufficient opportunities to relate with others during play. Hence, they had limited experience on how to share control with others during play. For example, it was also observed that when participants in the families group

approached groups of children already playing (an aspect of the ToP related to shared control), they did so timidly and found it difficult to initiate play activities.

The supposedly reduced opportunities to play can be viewed as occupational deprivation. To support this, it has been reported that caregivers of HIV infected children may be overly protective of their children since they assume that their children require more medical attention (23). In a similar study, caregivers of HIV infected children did not allow their children to go out to play for fear that they would fall sick (16). In contrast, given the ample opportunities to play that children staying in the orphanages had, these children probably learned and mastered how to share control during play by initiating play, skillfully joining a group that is already playing as well as engaging in social play with other children. Further, shared control was easier for these children because they were familiar with their playmates thus felt comfortable with them and engaged easily with them.

5.5.2.3 Framing

The participants staying with their families scored significantly lower (p-value = 0.003) on the element Framing (Table 4.12). Framing involves giving and receiving cues as well as the skillfulness exhibited when engaging in play. Bronson and Bundy (2000) suggested that giving and responding to cues may be difficult for young children. Both groups had young children hence difficulty in framing were anticipated. However, the group of participants staying in the orphanages had significantly higher Framing scores. Several reasons may account for this finding (28).

In a study focusing on the development of play in a group of HIV infected children, it was found that HIV infected children scored low under the Revised Play History's People Skills

category (23). Just like Framing, People Skills partly measures giving and reading cues (23). It was further found that HIV infected children staying with their families had fewer friends than their uninfected counterparts hence had poorer people skills. The children in the study referred to here were also not allowed to freely visit other homes as their parents feared for inadequate care for their children (23).

While children staying with their families may not have had consistent playmates, those staying in the orphanages had many consistent playmates to play with within their home; since at the time of study the orphanages had about 86 children. This may explain why Framing was more difficult for HIV infected children staying with their families and not those staying in the orphanages.

In addition, a link between caregiver interaction during play and development of the ability to give and respond to cues has been previously suggested (62). Although caregiver-child interaction was not optimal for both groups, the children staying in the orphanages had more interaction with much older playmates, some in their adolescence, who probably taught them to respond appropriately to cues.

5.5.3 Individual participants' playfulness of both groups

The individual participants' ToP scores were presented in Figures 4.1 and 4.2 for ease of comparison. The ToP has not been standardised; but the average playfulness scores for 2000 children have been documented. The average score for typically developing children was found to be about 0.3 while that of atypically developing children was found to be about -0.2 (2). In comparison with the findings of this study, the mean ToP score for the group of the families group was -0.2 and that for the orphanages group was 0.5 (Table

4.7). By and large, the playfulness of children staying with their families in this study can be likened to that of atypically developing children while that of the HIV infected children staying in the orphanages is above the average of typically developing children. This is partly due to the environment as it has been noted that, in the discussion on playfulness, objects, caregivers and playmates, were some of the reasons for the variations in playfulness. In view of that, it is noteworthy that when considering play, it is not easy to separate the environment from play. Thus, most of the differences in playfulness seemed to be more easily accounted for by environmental factors, in particular the social environment.

Discussing the TOES scores and the environmental supportiveness to play, will further explain the trends that were observed.

5.6 Environmental supportiveness to play

The effect of the environment on playfulness has been explored by a number of researchers, though most research on the environmental supportiveness has been on physically disabled children (57,61,62). As mentioned before, the environment includes both social and physical environments (3) which the TOES refers to as human and non-human, respectively. While most studies on playfulness acknowledged the effect of the environment, only a few objectively measured this phenomenon. One study done in South Africa on playfulness used the TOES to measure the supportiveness both human and non-human elements of the environment (27). Other studies qualitatively assessed the effect of caregivers' involvement (a non-human element) on child playfulness, with little

focus on the effect of non-human/physical elements of the environment and their effect on playfulness (16,17).

5.6.1 Source of motivation

As is required when using the TOES, each child's apparent motivation to play was identified. In this study, the major motivation for play was social interaction for both groups (Table 4.12). This was consistent with the type of play that children aged 4-5 years mainly engage in, that is, social play (5). It was observed that because children seemed to enjoy social play the most, some caregivers even used this as positive reinforcement for good behaviour for example the child would only be allowed to go and play with friends or playmates after finishing his/her food.

It is suggested that the resource that is most available in a child's environment is usually their chief source of motivation for play (27). This was true with regards to social interaction as peers were generally available within the orphanages and community. From the findings, objects were the second highest source of motivation for the families group and the third highest for the orphanage group (Table 4.12). Unlike the orphanage group, the families group did not have many objects to play with. Some of the participants in the group spent a lot of time trying to fabricate objects. Scarcity of toys, in fact, motivated children to play, as they tried to make their own objects for play. For example, the kites were a big motivation for play for these participants during outdoor play. The unavailability of toys therefore did not affect these children's play.

Physical activity was also seen as a major source of motivation for children in both settings: Second for the orphanage group and third for the families group (Table 4.12). At

the age of 4-5 years, participants were expected to demonstrate increased activity with a greater focus on achievement rather than mere physical activity (8). However, while engaging in physical activity, only one child staying in the orphanage was motivated by achievement. This lack of desire for achievement in the study sample could have been another sign of delayed play development.

The extent to which elements of the environment supported a child's play, considering their major sources of motivation, was measured and will be discussed below.

5.6.2 Environmental Supportiveness of play

In participants living with their families, non-human elements were more supportive of the children's play than the human elements. In participants staying in the orphanages, the environment was mostly supportive of play, whilst it was mostly unsupportive for the families group Table 4.16. Non-human elements were also more supportive than the human elements. A detailed comparison is presented below.

5.6.2.1 Human elements

The contribution of the caregivers towards a child's playfulness cannot be over emphasized. Several studies have documented a positive change in post–intervention playfulness scores compared to the pre-intervention ones when caregivers' received training on the importance of play (16,62).

In the families group, caregiver interference during play was one of the major drawbacks. Caregivers repeatedly cautioned their children during play, which hindered play. This was

reflected in the TOES where most participants' environments were scored as unsupportive with regards to the extent to which caregivers supported play activities (Figure 4.3). In terms of rules, caregivers in the orphanages were not very restricting in terms of what the children could play with. Caregivers in the orphanages also did not engage much in play, however, they did not interfere with their children's play (Figure 4.4). In fact, they promoted play activities by assigning time dedicated to the children's play daily in accordance with the policy of the orphanages. Furthermore, caregivers often instructed older children to engage with the younger children in play activities. Caregivers knew that they would not be available to play as they were busy with other responsibilities such as cleaning and cooking, as well as taking care of the babies in their houses. The time available for them to spend interacting with the participants during play was limited. On the contrary, the main reason why the caregivers in the families group did not engage in their children's play were linked to a lack of motivation to engage and the inability to engage due to ill-health. Although the caregivers' direct engagement during play could have been more ideal, in the case of the orphanages group, the presence of older children who were more experienced players was supportive of the participants' play. In the families group, participants were left to play alone or with other inexperienced children.

In a similar study to this one, caregivers' minimal involvement in their HIV infected children's play was attributed to low caregiver motivation because the caregivers anticipated their children's inevitable death (16). In addition, caregivers of HIV infected children felt burdened by the responsibility to manage their own health plus their children's health. As a result, play felt like an unmanageable burden, adding to their responsibilities (18).

Consistent with the literature, most caregivers in orphanages set realistic rules and seemed to be consistent with the rules though it was not easy to observe during the short, once off play sessions observed (27).

Regarding playmates, it is important to mention that participants in the families group did not always have older and younger playmates. Older playmates were found during outdoor play; where neighbours joined in during play. It was noted that these older children dominated, interfered and did not support the play of the young participants. Older playmates seemed to ignore the cues that were given by the participants and did not give clear cues. Older playmates communicated in a rude manner; sometimes including physical handling. In such cases, this way of communication by older playmates was considered as bullying and, necessary measures were taken to rectify this. This finding justifies why, in a previous study, caregivers of HIV infected children overly protected their children and were selective of whom they wanted their children to interact with in fear of their children being ill-treated due to their smaller stature (23).

Peer interaction at the ages 4-5 years is important for play; where both the player and playmates must contribute equally to the play interaction. However, some participants seemed to lack the skill to play and did not know the games that their peers wanted to play. More participants in the families group struggled with the skill to play in contrast to the participants in the orphanages groups who were skilled to engage in play. The importance of learning skills to engage and a lack thereof amongst HIV infected children due to reduced exposure to play has been highlighted in previous studies (16,17,30). As a result, some peers passed condescending remarks towards the participants or

displayed a lack of interest to engage with the participants. Overall, this resulted in a lack of support for the participants' play by their peers in the family group.

In the families group, younger peers were generally supportive as they cooperated during play. However, the play of 17% of the participants' play was not supported by younger playmates. This finding is in line with the literature which suggests that it is difficult for younger playmates to be supportive of others' play as they may lack the skill to do so (28).

In the orphanages group, peers and younger playmates were mostly supportive of play. Unlike most participants in the families group who had to leave their homes to find playmates, participants in the orphanages group had their playmates within the orphanages. This probably created strong social relationships between the children as they engaged with each other frequently. Further, it is possible that these children had a sense of oneness and equality thus, supporting each other during play, was easier for them.

Most of the older playmates in the orphanages group were supportive of the younger participants' play. In a few cases, older playmates were domineering, rather than rude and offensive as noted in the families group (Figure 4.3). Maclean (2003) found that previously institutionalised children had behaviour problems; one of which was difficulty with establishing healthy peer relations (20). The domineering behaviour of some older playmates during play could reflect the behaviour problems institutionalised children may develop while in the institution. Probably as their way of avoiding the undesirable

overbearing behaviour of the older playmates, participants spent less of their playtime engaging in social play, as reflected under the shared control score (Table 4.8).

5.6.2.2 Non-human elements

In the families group, three of the five elements of the non-human environment were supportive of play for all participants while two were not. The three supportive elements were: availability of objects, safety of play area and accessibility of the play area while amount and configuration of space and sensory stimulation were not supportive of all participants in the families group. Objects and space were relatively supportive of play for the families group. While the physical environments were accessible, they were not entirely safe. In addition, the configuration and amount of space as well as the sensory environments of the children did not support some of the participants' play (Figure 4.7).

In the orphanages group, all five elements were supportive of the participant's play.

According to the TOES, space is observed and measured according to its availability and configuration. Availability generally considers the area of space available while configuration considers the landscape, available equipment as well as clear boundaries of play space. Good play areas must allow modification of play activities to maintain challenge and interest (29,56). Participants staying with their families had more space to play outside compared to inside. During outdoor play, they mainly played on abandoned streets with other children within the community. While the amount of space for outdoor play was supportive of physical play, the configuration was not very supportive. It has been suggested that playground equipment (29), ensures engagement while gullies, trees

and other natural objects can allow for engagement and modification of the play activities. Though there were trees that children could climb or play around, the participants did not include these trees long enough for sufficient engagement in play. One brief moment of a participant chasing playmates around trees and around the house was observed. More participants could have included the trees and houses in such a manner or in other ways. There was no playground equipment in the children's play areas for the family group.

Due to the lack of clear physical boundaries of the play areas, the families' environments were found to be unsupportive of play. A lack of a designated play area may limit children's play (56). Considering that physical activity was one of the major sources of motivation for play, not having a structured space for outdoor play and in some cases not having enough space for indoor play was considered a huge hindrance to play in the families group.

The orphanages environment had structured and designated play areas that were safe. Children could play in the playgrounds which were about the size of a netball court. The orphanages playgrounds were also equipped with slides and swings. Considering physical activity was one of the biggest motivations for play, the availability of a playground and the presence of playground equipment facilitated this kind of engagement.

Both indoor and outdoor play areas were accessible to all children in the orphanages. Indoors the participants played in their bedrooms or in the living room areas which had enough space for several players. The living areas basically had a TV and couches. This minimal furniture made the areas more accessible for play. For outdoor play, the

orphanages' yards were well manicured and there were distinct paths to the play areas as described previously. This made the play areas not only accessible but also safe to play in. All play areas were within the fenced and gated yards of the orphanages which ensured the safety of players. Broken playground equipment however, posed a health risk to the participants and this was of major concern not only to the 4-5 age group but also to the younger children in the orphanages; which is not However, children avoided playing on some of this broken equipment.

Children staying with their families generally did not have toys to play with. In cases where children had toys, the toys were not age-appropriate. Some participants had toys such as shakers which the children had when they were much younger which certainly did not stimulate the 4-5-year-old children anymore. Some participants had balls but were not allowed to play with the balls indoors. Thus, children generally played with indoor furniture. They would crawl under chairs or hiding behind curtains. These household objects either did not sufficiently sustain the child's engagement or were beyond the boundaries set by the caregiver for what was to be played with. In cases where participants tried to incorporate household furniture during play to maintain engagement and interest in a play activity, the caregiver would not allow them. Clearly, the interfering tendencies of the caregivers and the lack of age-appropriate toys made object play almost impossible during indoor play for the families group. Proprioceptive and tactile play are motivating for children whose source of motivation for play is sensory (2). Caregivers could have encouraged engagement that included vestibular and proprioceptive input by creating obstacle courses with some of the furniture and supervising their children through the obstacles.

During outdoor play, the availability of natural and recyclable objects was supportive of play for the family group. Children had sticks, empty plastic bottles and packets, stones, trees etc. which they could incorporate in play. These were available, but as noted before on the discussion on playfulness, the children in the families group barely used these objects to enhance their play.

Participants in the orphanages group had more age-appropriate toys, thus they played with their toys rather than with the furniture in the house. Further, they made use of natural materials like leaves and sticks and recyclable waste like paper and plastics to make play objects.

The sensory environment was supportive of play for 67% of the participants staying with their families and unsupportive for 33% of the participants (Figure 4.7). As explained in the TOES, the sensory environment must meet the needs of the player. It is important to note that only 13% of the players from the families group had their primary source of motivation as sensory stimulation (Table 4.12). These players were evidently tactile-seeking as they enjoyed playing with sand and crushing dried leaves with their hands. However, though 87% of the participants had other primary sources of motivation to play, it is still important for the play environment to have neutral colours, an amount of noise that is conducive for play as well as not be too cluttered. The indoor environments were generally cluttered as families had small living spaces. Though both the inside and outside environment were not particularly visually inviting to play and lacked vestibular-stimulating play equipment, the outside environment seemed to have adequate auditory, tactile and visual stimulation for play.

For the orphanage participants whose major source of motivation for play was sensory stimulation, the slide and swings available at the homes provided for the necessary stimulation. The manicured yards and the levelled playfield could have been utilised to provide more proprioceptive play had the children learnt how to for example do animal walks or play hop-scotch. Indoors, there were pastel coloured walls, but the windows were small which meant limited lighting and poor air circulation in the houses, but this did not seem to affect their play. Overall, the orphanages had the typical playful giggles and joyful noises which were supportive of play. Occasionally, children did cry but were quickly pacified and therefore did not hinder play in any way.

Safety was carefully considered in the families' environments due to a lack of clear boundaries around the play areas as children played on the streets. However, the participants played in neglected roads or in the backyards which were reasonably safe. The ground surface was mainly sandy, and the roads were made of gravel soil thus surfaces were also safe and, in fact, sensory stimulating for the kids, who mostly played barefoot.

Accessibility to play areas mainly looks at whether the area permits movement and whether play equipment is placed where children can readily access it (2,29). This is usually a concern with children with physical disabilities. For the participants in this study, accessibility was not a major concern as children could freely move within their play areas. During indoor play, however, due to clutter and heavily furnished small rooms in the families group, accessibility was limited. In the orphanages group, less cluttered indoors made the environment more accessible.

5.6.4 Summary of the Environmental Supportiveness of the two groups

For the participants in the families group, the environment was mostly unsupportive while for the participants in the orphanages group, the environment was mainly supportive (Table 4.16). The human factors that mainly accounted for this difference were caregiver interference, peer participation and older playmates response, cues and participation (Figures 4.3, 4.4, 4.5 and 4.6).

For the orphanages groups, caregivers did not interfere much with play, but they also did not participate much in play. Caregivers of the families group attempted to engage in play but ended up interfering rather than supporting the participants' play. With regards to playmates the older playmates in the orphanages group were like older siblings thus they cared for the participants. This was not the case for the families group as the older playmates were children from other families who had no attachment with the participants. This can explain why bullying tendencies, that were unfavorable for play, were found in the families group and not in the orphanages group.

For the non-human elements, the amount and configuration of space and the sensory environment accounted for the differences in environmental supportiveness. Participants in the orphanages group had ample space for outdoor play as well as some playground equipment. According to the Zimbabwe child care society guide, every child care centre must have a playground for children to play in (31). Such a policy does not necessarily apply to the homes of children staying with their families. In addition, the families group stayed in low income areas which generally do not have much space around houses.

Secondly, since houses were small, and rooms often had multiple purposes, participants in the families group did not have much room to play inside the houses. Indoor play space for the children in the orphanages group was generally bigger in terms of area and was also free of clutter as only minimal furniture was in the rooms.

In summary, the availability of more opportunities for play in the orphanages supported by playmates, objects and space were favorable for play. As a result, the orphanages environment was more supportive of play. This is however contrary to other studies that report limited stimulation in childcare centres (20). Families' homes were disadvantaged due to limited resources, in particular, shared houses by families which resulted in limited space for play. This contrasts with the donor funded orphanages which were better resourced.

5.7 Limitations of the study

Though this study produced important findings on the playfulness of HIV infected children, an area that had not been studied in Zimbabwe, it had some limitations.

Firstly, the Test of Environmental Supportiveness to play seemed inadequate to provide enough information on its own about the two different settings using a quantitative study design. It is recommended that for future studies on the supportiveness of environments, that researchers design a checklist which can be used in combination with the TOES to describe the physical environment. This checklist should include information on both the human and non-human elements. The human items on the checklist should include information such as the number of peers the child plays with, the ages of the peers and if the peers are known to the child. Non-human aspects on the checklist should include

comments on a designated play are, play equipment available and objects available in the specific environment. In this study it could have made the comparison between the two settings easier thus making it clear whether the environments were responsible for the difference in playfulness between the two groups.

Secondly, the small size of the study sample makes it difficult for the results to be generalised to the whole population. However, it provides a basis for similar and possibly bigger studies to be conducted in Zimbabwe.

Thirdly, more information could have been collected in the Demographic Data Collection Tool which could have been useful in analysing the results. Questions around size of families, presence or absence of siblings, socioeconomic status of families as well as ages and education level of caregivers could have helped explained some of the traits found in the group of children staying with their families.

Fourthly, some HIV infected children take longer to reach developmental milestones. To establish the effect of HIV on these children's development, obtaining the developmental profiles of the participants could have added valuable information to the study.

Lastly, for the purposes of this study, the researcher could have measured the body mass index (BMI) of participants, especially considering the findings that the families group was less playful. The possible link between the decreased playfulness in this group and malnutrition could have been explored. In a report on the impact of HIV/AIDS on children in Africa, it was found that poverty was quite common among HIV infected children, with some families struggling to meet the children's basic needs such as nutrition (18). In a

more recent study, it was found that despite HAART treatment, malnutrition is still a challenge amongst HIV infected children (78).

5.8 Recommendations

The following recommendations are made, in light with the findings of this study:

5.8.1 Recommendations for practice

The findings of this study can be used to inform occupational therapy practice as play is a very important area of practice.

Research has proved that caregiver training on the importance of play and caregiver involvement in play improves the playfulness of HIV infected children (16,17,30). Already, positive changes in playfulness have been recorded with occupational therapy intervention. Such interventions are not common to occupational therapy practice in Zimbabwe. Since intervention should be done within the children's homes and not occupational therapy clinic this can be a very good adjunct to occupational therapy practice in the district of Marondera. More importantly, such a treatment can be an appendage to the currently running CBR programs with a possibility to expand throughout the country.

A significant finding was that some caregivers were too ill to play with their children. However, with children whose caregivers are too ill to play, it is suggested that, as part of the CBR programs, support groups or community play groups facilitated by occupational therapist should be included. Support groups may be run at the hospital where both

caregivers and children may receive education and support from each other while the children engage in play at the hospital's equipped play area. Here these children will have access to age appropriate and stimulating toys with the right facilitation of play by the occupational therapist. Play groups may also be formed within the communities. However, it may be challenging for the sick caregivers to consistently bring these children to a central venue for play groups. The involvement of volunteers from the community may also help to overcome this challenge.

5.8.2 Recommendations for further study

Although nutrition status and developmental profiles could have helped to describe the findings, investigating the direct causes of the trends in playfulness was not within the scope of this study as this was a descriptive study. Taking into consideration the limitations stated above, the following recommendations are made:

A follow up in-depth study of the social and physical environments that the children staying with their families are playing in may be necessary. This can be done by using a qualitative study design to understand the different environments in more depth. This will also help to establish the environment-person fit for play for these children so that intervention may ensure that these children are as playful as they can be within their home environments.

A comparison of playfulness levels of same aged children who are not HIV infected as a control may be necessary to establish if the average playfulness levels obtained in this sample (HIV infected children) differs much from the average playfulness levels of

unaffected children at this age. Such a study may have several confounding variables but if these are controlled, a study of this nature can yield some variable information.

CHAPTER 6: CONCLUSION

The aims and objectives of this study were sufficiently met. Differences in playfulness and environmental support between children staying with their families and those staying in orphanages were determined. The mean level of playfulness of children staying with their families was -0.21 while that of children staying in orphanages was 0.5. A significant difference ($p=0.03$) in playfulness between the two groups was found with children staying with their families on the less playful end. Limitations in the playfulness of HIV infected children has been reported in a few studies (16,17,23,26,49); and studies have also reported less ideal conditions in many orphanages that predispose children to delayed development or failure to reach optimal development (20,19,22,21). Despite inferences in the literature towards less optimal development this study did not reflect a similar relationship between institutionalization and child playfulness in HIV infected children.

The environmental support was also determined and compared between groups with both human and non-human elements of the environment being more supportive in the orphanages group than in the families group.

Major differences in environmental supportiveness were the availability of age appropriate toys and objects, a structured playground, more playmates and more opportunities to play found in the orphanages group. In addition, caregivers in the orphanages were not necessarily HIV infected hence probably had less health problems to deal with. The

knowledgeable orphanages administration possibly also ensured best access to health care for these children.

There are no statistics on the number of HIV infected children stay with their families compared to those in the institutions, but it is an obvious fact that most HIV infected children in Zimbabwe stay with their families. The role of playfulness in child play has been clearly explained thus it is of essence to ensure higher playfulness levels in HIV infected children regardless of where they stay. More studies involving a variety of institutions and families may be necessary to investigate playfulness and environmental support for this population.

Ramugondo's (2004) work on playfulness in HIV infected children highlighted that like their uninfected counterparts, HIV infected children also need to play regardless of how long they will live (16). With the introduction of HAART, HIV infected children are now living longer (80) thus it is important to focus these children's occupational performance and in particular play which was somewhat neglected prior to the HAART era (16). Symonds (2010) reiterated this with an emphasis on the need to ensure occupational justice for the children with HIV in particular ensuring they get opportunities for play (17).

The need to ensure that HIV infected children participate in play has also been echoed in the findings of this study. Occupational therapists can play a role in ensuring that HIV infected children participate fully and freely in play within their natural home environments. This can be done through adapting the children's environments to support play better, educating and supporting caregivers to improve their involvement in their children's play and facilitating the expression of playfulness in children with HIV.

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Appendix A: Test of Playfulness

Test of Playfulness (Skard and Bundy, 2008)

Child (#): In Out Video Live (circle)	EXTENT 3= Almost always 2=Much of the time 1=Some of the time 0=Rarely or never NA= Not Applicable	INTENSITY 3=Highly 2= Moderately 1=Mildly 0=Not NA= Not Applicable	SKILLFULNESS 3=Highly skilled 2=Moderately skilled 1=Slightly skilled 0=Unskilled NA= Not Applicable

Item	EXT	INT	SKILL	COMMENTS
Is actively engaged				
Decides what to do				
Maintains level of safety sufficient to play				
Tries to overcome barriers or obstacles to persist with activity				
Modifies activity to maintain challenge or make it more fun				
Engages in playful mischief or teasing				

Engages in activity for sheer pleasure of it (process) rather than primarily for the end product				
Pretends (to be someone else, to do something else; that something else is happening)				
Incorporates objects or other people into play in unconventional or variable and creative ways				
Negotiates with others to have needs/desires met				
Engages in social play				
Supports play of others				
Enters a group already engaged in an activity				
Initiates play with others				
Clowns or jokes				
Shares (toys, equipment, friends, ideas)				
Gives readily understandable cues (facial, verbal, body) that say, “This				

is how you should act towards me.”				
Responds to others cues				
Demonstrates positive affect during play				
Interacts with objects				
Transition from one play activity to another with ease				

Appendix B: Test of Environmental Supportiveness

(Skard and Bundy 2008)

TEST OF ENVIRONMENTAL SUPPORTIVENESS (TOES)–7/03

Child's Name: _____ Apparent Source(s) of Motivation:

Date of Observation: _____

Child's Birth Date: _____ Location of Observation: _____

Age at Observation: _____ Examiner: _____

CONTINUA OF ITEMS 2 = strongly favors description on right 1 = slightly favors description on right −1 = slightly favors description on left −2 = strongly favors description on left NA = not applicable			Comments
Caregivers interfere with player's activities and opportunities	−2 −1 1 2 NA	Caregivers promote player's activities and opportunities	
Caregivers change the rules	−2 −1 1 2 NA	Caregivers adhere to consistent boundaries/rules	
Caregivers enforce unreasonably strict boundaries or fail to set boundaries	−2 −1 1 2 NA	Caregivers adhere to reasonable boundaries/rules	
Peer playmate's response to player's cues interferes with transaction	−2 −1 1 2 NA	Peer playmate's response to player's cues supports transaction	
Peer playmates do not give clear cues or give cues that interfere with the transaction	−2 −1 1 2 NA	Peer playmates give clear cues that support the transaction	
Peer playmates are dominated by player or dominate players	−2 −1 1 2 NA	Peer playmates participate as equals with player	
Older playmate's response to player's cues interferes with transaction	−2 −1 1 2 NA	Older playmate's response to player's cues supports transaction	
Older playmates fail to give clear cues or give cues that interfere with transaction	−2 −1 1 2 NA	Older playmates give clear cues that support the transaction	
Older playmates are dominated by or dominate player	−2 −1 1 2 NA	Older playmates participate as equals with player	
Younger playmate's response to player's cues interferes with transaction	−2 −1 1 2 NA	Younger playmate's response to player's cues supports transaction	
Younger playmates fail to give clear cues or give cues that interfere with transaction	−2 −1 1 2 NA	Younger playmates give clear cues that support the transaction	
Younger playmates are dominated by or dominate player	−2 −1 1 2 NA	Younger playmates participate as equals with player	
Natural/fabricated objects do not support activity of player	−2 −1 1 2 NA	Natural/fabricated objects support activity of player	
Amount and configuration of space do not support type of play	−2 −1 1 2 NA	Amount and configuration of space support activity of player	
Sensory environment does not offer adequate invitation to play	−2 −1 1 2 NA	Sensory environment offers adequate invitation to play	
Space is not physically safe	−2 −1 1 2 NA	Space is physically safe	
Space is not accessible	−2 −1 1 2 NA	Space is accessible	
Additional comments:			

Appendix C: Demographic Data Collection Tool

1. Child code number:

2. Child's date of birth (Age in months):

3. Sex of the child

☐ Male ☐ Female

4. Current home

☐ Biological family ☐ Foster family

☐ Extended family ☐ Orphanage

5. Duration of stay in current home

<1year ☐ 1year-2 years ☐ 2 years -3years

☐ 3years- 4years ☐ above 4years

6. Primary caregiver

☐ Biological Mother/ father ☐ Grandparent ☐ Foster parent

☐ Aunt/uncle ☐ Sibling ☐ Orphanage caregiver

7. Is your child taking any medication every day?

Yes☐ No☐

8. Is your child on Highly Active Antiretroviral Treatment (HAART)?

Yes No (If yes, continue to questions 9 and 10, if no, go to question 11)

9. For how long?

☐ Less than 3 months ☐ 3-6 months ☐ 6-12 months ☐ more than 12 months

10. Has there been any Highly Active Antiretroviral Treatment (HAART) regimen change?

☐ Yes ☐ No

11. Has your child been hospitalized in the past 3 months?

☐ Yes ☐ No

Appendix D: Permission to use the Test of Playfulness and Test of Environmental Supportiveness

shailendra rufaro Njitimana <snjitimana@gmail.com>
03/14/2016 10:14 AM

To George.Senzere@schneider-electric.com,
cc
bcc
Subject Fwd: Request for permission to use the ToP in research

Please may you print and scan this email from Professor Bundy
---------- Forwarded message ----------
From: **Anita Bundy** <anita.bundy@sydney.edu.au>
Date: Wed, Sep 4, 2013 at 9:50 PM
Subject: RE: Request for permission to use the ToP in research
To: shailendra rufaro njitimana <snjitimana@gmail.com>

Dear Shailendra,

This email seems to have been lost in my inbox! So sorry. I amhappy for you to use the ToP and TOLES if that is still your plan. Most of the instructions are published in the 2nd edition of Parham & Fazio's book, Play in Occupational Therapy for Children. Let me know if there is something I can help with. aB

Anita Bundy, ScD, OT, FAOTA

Professor & Chair of Occupational Therapy

Co-Convenor, Global Systems & Health Policies Faculty Research Group

Chief Investigator, Wobbly Hub & Double Spokes Partnership Project

http://sydney.edu.au/health-sciences/research/wobbly-hub

http://twitter.com/WobblyHub

Faculty of Health Sciences

University of Sydney

Phone: +61 2 9351 9857

Appendix E: Description of ToP items

Descriptors of ToP items(2). Reproduced with permission.

Table 4-1
Definitions of ToP Items

Item	*Description*
Is actively engaged.	Extent—Proportion of time player is involved in activities rather than aimless wandering or other nonfocused activity or temper tantrums. Intensity—Degree to which the child is concentrating on the activity or playmates. Skill—Players' ability to stay focused or carry a play theme from activity to activity.
Decides what to do and how to do it.	Extent—Proportion of time when players actively choose what they are doing. Players may decide to do what another is doing, but no one is forcing them or rewarding them for doing the activity.
Maintains level of safety sufficient to play.	Extent—Proportion of time when players feel safe enough to play. If necessary, players may alter the environment.
Tries to overcome barriers or obstacles to persist with an activity.	Intensity—Degree to which the child perseveres in order to overcome obstacles to continuing the activity.
Modifies activity to maintain challenge or make it more fun.	Skill—Ease with which the child actively changes the requirements or complexity of the task in order to vary the challenge or degree of novelty.
Engages in playful mischief or teasing.	Extent—Proportion of time when players are involved in playful teasing or minor infractions of the rules designed to make the play more fun. Skill—The ease, cleverness, or adeptness with which players create and carry out mischief or teasing.
Engages in activity for the sheer pleasure of it (process) rather than primarily for the end product.	Extent—Proportion of time when players seem to want to do the activity simply because they enjoy it rather than to attain a particular outcome or for some extrinsic reward.
Pretends (to be someone else; to do something else; that an object is something else; that something else is happening).	Extent—Proportion of time when there are overt indicators players are assuming different character roles, pretending to be doing something, pretending something is happening, or pretending an object or person is something else. Skill—The degree to which the "performance" convinces the examiner.

Continued

Table 4-1
Definitions of ToP Items—cont'd

Item	*Description*
Incorporates objects or other people into play in unconventional or variable ways.	Extent—Proportion of time when players (1) use objects commonly thought of as toys in ways other than those the manufacturer clearly intended, (2) incorporate objects not classically thought of as toys into the play (e.g., bugs, table legs), or (3) use one toy or object in a number of different ways. Creativity is a key. Skill—The ease or cleverness with which players incorporate objects or other people in creative ways.
Negotiates with others to have needs/desires met.	Skill—Ease and finesse with which players verbally or nonverbally ask for what they need.
Engages in social play.	Extent—Proportion of time during which player interacts with others involved in the same or similar activity. Intensity—The depth of the player's interactions with other people during play. Skill—The level of social play. Ranges from playing alone to being the leader.
Supports play of others.	Skill—Ease with which players support play of others (e.g., encouragement, ideas).
Enters a group already engaged in an activity.	Skill—Ease with which player does something to become part of a group (two or more) already engaged in an activity; the action is not disruptive to what is going on.
Initiates play with others.	Skill—Ease with which player initiates a new activity with another.
Clowns or jokes.	Extent—Proportion of time when players tell jokes or funny stories or engage in exaggerated, swaggering behavior, usually for the purpose of gaining others' attention. Skill—The ease or cleverness with which a player clowns or jokes. Ranges from not gaining others' attention to gaining positive reactions from others to being overtly funny.
Shares (toys, equipment, friends, ideas).	Skill—The ease with which players allow others to use toys, personal belongings, or equipment they are using or share playmates (friends) or ideas.
Gives readily understandable cues (facial, verbal, body) that say, "This is how you should act toward me."	Extent—Proportion of time during which players act in a way to give out clear messages about how others should interact with them.
Responds to others' cues.	Extent—Proportion of time during which the child acts in accord with others' play cues.
Demonstrates positive affect during play.	Intensity—Degree to which player's affect is positive; ranges from mild enjoyment to real exuberance.
Interacts with objects.	Intensity—The degree to which players get involved with objects. Skill—The ease with which players interact with objects.
Transitions from one play activity to another with ease.	Skill—The ease with which players move from activity to activity when one has ended or is not evolving and another is available.

Appendix F: Test of Playfulness Keyform

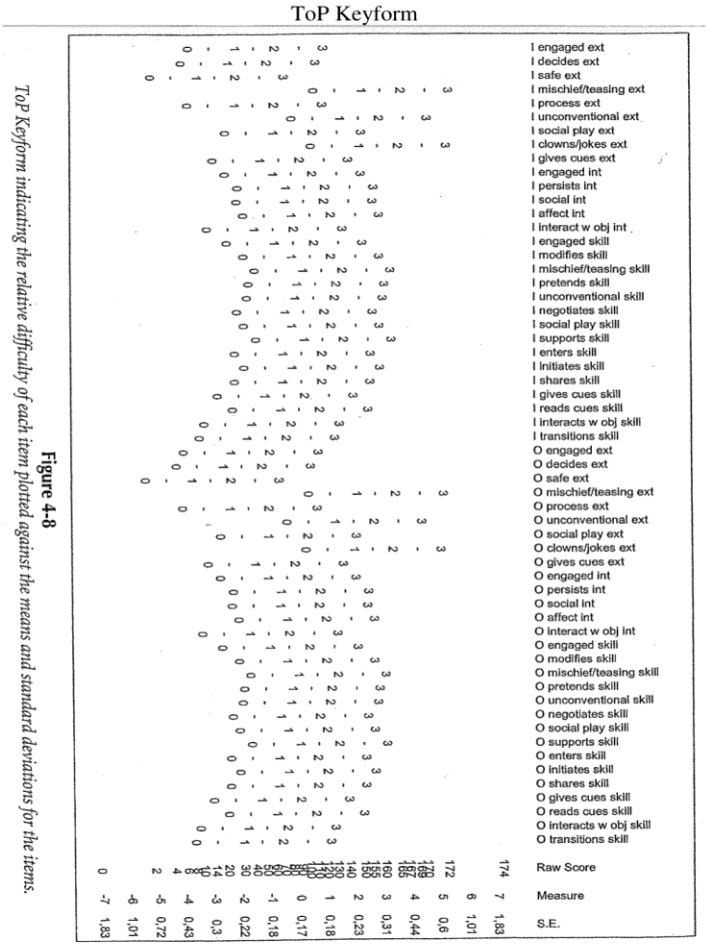


Figure 4-8

ToP Keyform indicating the relative difficulty of each item plotted against the means and standard deviations for the items.

Appendix G: Description of items of the Test of Environmental Supportiveness Obtained from the book Play in occupational therapy for children (2)

	Element	Item	Description
Human Elements	Caregivers	Caregiver promotes player's activities and opportunities.	Gives player access to possibilities if needed (e.g., ideas, prompts, or playthings). Facilitates interactions of entire group (including player). Acts in a way that says play and player's motivations are important (e.g., does not interrupt player or stop play unnecessarily). Responds to player's cues in a way that sanctions play. Available for help if needed. Shows respect for players. Is unobtrusive when appropriate. Gives only amount of direction necessary to facilitate play
		Caregiver adheres to consistent boundaries and rules	Rules can be flexible but do not change unexpectedly or irrationally
		Caregiver adheres to reasonable boundaries and rules	Enough to make player safe and comfortable. Not derived from power struggle. Not excessively strict; flexible when appropriate. Tacit or explicit permission to choose objects, activities, type of play, play locations
	Older playmates	Older playmate(s) response to player's cues supports transaction.	Behaves toward player in logical, supportive way. Waits for responses (timing). Contributes to maintaining the flow of the play.
		Older playmate(s) gives clear cues that support transaction.	Gives clear messages about how player should interact with him or her. Messages reflect a continuation of the frame or a logical change.
		Older playmate(s) participates as equal with player.	Gets involved in activity. Adapts activity so it is play for self and player. Contributes good ideas.

			Does not get suppressed by player. Have skills to engage in the play. Plays with (rather than directs) player. Not bossy, manipulative. Shares common interests. Seems happy with status and roles in the situation
	Peers	Peer(s) response to player's cues supports transaction.	Behaves toward player in logical, supportive way. Waits for responses (timing). Contributes to maintaining the flow of the play.
		Peer(s) gives clear cues that support transaction.	Gives clear messages about how player should interact with him or her. Messages reflect a continuation of the frame or a logical change.
		Peer(s) participates as equal with player.	Gets involved in activity. Adapts activity so it is play for self and player. Contributes good ideas. Does not get suppressed by player. Have skills to engage in the play. Plays with (rather than directs) player. Not bossy, manipulative. Shares common interests. Seems happy with status and roles in the situation
	Younger playmates	Younger playmate(s) response to player's cues supports transaction.	Behaves toward player in logical, supportive way. Waits for responses (timing). Contributes to maintaining the flow of the play.
		Younger playmate(s) gives clear cues that support transaction.	Gives clear messages about how player should interact with him or her. Messages reflect a continuation of the frame or a logical change.
		Younger playmate(s) participates as equal with player.	Gets involved in activity. Adapts activity so it is play for self and player. Contributes good ideas. Does not get suppressed by player. Have skills to engage in the play. Plays with (rather than directs) player. Not bossy, manipulative. Shares common interests. Seems happy with status and roles in the situation
Non-Human Elements	Objects	Natural and fabricated object(s) support activity and apparent motivations of player.	Support player in his or her efforts to fulfill motivations. Allow modification of challenges. Sufficient number exists to support play. Engender feeling to do something with them.

	Space	Amount and configuration of space support activity.	Allow modification of challenges. Boundaries of play space evident when necessary.
	Sensory Environment	Sensory environment offers adequate invitation to play.	Meets player's needs (this is the most important element). Colors—neither over-stimulating nor drab. Level and type of noise are conducive to play (anger, crying versus laughing, chatting). Neither sterile nor overly cluttered. Temperature well controlled
	Safety	Space is physically safe.	No objects or surfaces pose an imminent threat to player's safety.
	Accessibility	Space is accessible	Objects are placed where player can get them readily. Readily permits movement. Provides physical support as needed for player

Appendix H: Human Research Ethics Committee Approval

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Ms Shailendra Njitimana

CLEARANCE CERTIFICATE	**M1211107**
PROJECT	Playfullness and Enviromental Supportiveness in Huma Immunodeficiency Virus Infected Children Aged 4-5 Years in Two Different Settings (Resubmission M120950)
INVESTIGATORS	Ms Shailendra Njitimana.
DEPARTMENT	Department of Occupational Therapy
DATE CONSIDERED	30/11/2012
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 30/11/2012 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Mrs Lizelle Jacobs

DECLARATION OF INVESTIGATOR(S)
To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

Appendix I: Medical Research Council of Zimbabwe Approval

Telephone: 791792/791193
Telefax: (263) - 4 - 790715
E-mail: mrcz@mrcz.org.zw
Website: http://www.mrcz.org.zw

Medical Research Council of Zimbabwe
Josiah Tongogara / Mazoe Street
P. O. Box CY 573
Causeway
Harare

APPROVAL

REF: MRCZ/B/673 **18 July 2014**

Shailendra Rufaro Njitimana
University of Witwatersrand
Faculty of Health Sciences
7 York Street
Parktown

RE: Playfulness and environmental supportiveness of play in HIV infected children aged 4-5 years

Thank you for the application for review of Research Activity that you submitted to the Medical Research Council of Zimbabwe (MRCZ). Please be advised that the Medical Research Council of Zimbabwe has **reviewed** and **approved** your application to conduct the above titled study.

This approval is based on the review and approval of the following documents that were submitted to MRCZ for review:-

a) Study proposal
b) Parental Consent Form (English and Shona)

- **TYPE OF MEETING : Expedited**
- **EFFECTIVE APPROVAL DATE : 18 July 2014**
- **EXPIRATION DATE : 17 July 2015**

After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the MRCZ Offices should be submitted three months before the expiration date for continuing review.

•**SERIOUS ADVERSE EVENT REPORTING**: All serious problems having to do with subject safety must be reported to the Institutional Ethical Review Committee (IERC) as well as the MRCZ within 3 working days using standard forms obtainable from the MRCZ Offices or website.

•**MODIFICATIONS**: Prior MRCZ and IERC approval using standard forms obtainable from the MRCZ Offices is required before implementing any changes in the Protocol (including changes in the consent documents).

•**TERMINATION OF STUDY**: On termination of a study, a report has to be submitted to the MRCZ using standard forms obtainable from the MRCZ Offices or website.

•**QUESTIONS**: Please contact the MRCZ on Telephone No. (04) 791792, 791193 or by e-mail on mrcz@mrcz.org.zw

Other

- Please be reminded to send in copies of your research results for our records as well as for Health Research Database.
- You're also encouraged to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study.

Yours Faithfully

.....

MRCZ SECRETARIAT
FOR CHAIRPERSON
MEDICAL RESEARCH COUNCIL OF ZIMBABWE

MEDICAL RESEARCH COUNCIL OF ZIMBABWE
2014 -07- 18
APPROVED
P.O. BOX CY 573 CAUSEWAY, HARARE

PROMOTING THE ETHICAL CONDUCT OF HEALTH RESEARCH

Appendix J: Marondera Provincial Hospital Approval

All official communications should not be addressed to individuals

Telephone 0279-248768
Cell +077 8 761 827
Fax 0279-23082

ZIMBABWE

MINISTRY OF HEALTH AND CHILD CARE
Marondera Provincial Hospital
P.O. Box 20
Marondera
Zimbabwe

11 June 2014

Dear Ms S. Njiftmana

RE: RESEARCH STUDY PERMISSION FOR MS SHAILENDRA NJIFTIMANA

I am happy to inform you that we have granted you permission to carry out your research entitled Playfulness and environmental supportiveness in HIV infected children aged 4-5 years in two different settings in our HIV clinic.

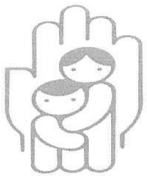
It will be our pleasure to assist you to the best of our capability you throughout your data collection.

Yours Faithfully

Dr. Dhege

Medical Superintendent

Appendix K: Permission letter from Marondera Child Care Society



MARONDERA CHILD CARE SOCIETY

Address: 7 Dombo Close, Nyamemi, Marondera, Zimbabwe Tel: 0279 24646
Email:maronderachildcaresociety@gmail.com, Registration Number W/027193

MARONDERA CHILD
CARE SOCIETY

12 February 2014

Ms Shailendra Njitimana

University of the Witwatersrand

Johannesburg

South Africa

Dear Ms Njitimana

Re: Permission to carry out study entitled Playfulness and environmental supportiveness in HIV-infected children aged 4-5 years.

It is my pleasure to inform you that permission has been granted to you to carry out your study at our homes. We will be happy to assist you where we can during your study.

We are looking forward to having you.

Sincerely,

Mrs Kaseke

(Administrator)

Appendix L: Letter to Medical Superintendent Marondera

Occupational Therapy

School of Therapeutic Sciences • Faculty of Health Sciences • 7 York Road, Parktown 2192, South Africa
Tel: +27 11 717-3701 • Fax: +27 11 717-3709 • E-mail: denise.franzsen@wits.ac.za

The Medical Superintendent

Marondera Provincial Hospital

Box 20 Marondera

Zimbabwe

Dear Dr. Dhege

RE: Application to carry out research.

I am writing to apply for permission to carry out research at Marondera Provincial Hospital. The details of the study are listed below.

Title: Playfulness and environmental supportiveness in HIV-infected children aged 4-5 years

Researcher: Shailendra R. Njitimana

Supervisor: Lizelle Jacobs

Description of the study

The study's focus is on establishing the level of playfulness of HIV-infected children staying in orphanages and those staying with their families, measuring the supportiveness to play of their environments and establishing the differences in playfulness between HIV-infected children in different contexts.

I would like to recruit participants from the Opportunistic Infections Clinic at Marondera Hospital. Participants will then be asked for their home addresses where I will go to collect the data. I would also like to request for permission to access medical records for treatment and medical history.

Risks and Benefits

There are no physical or potential risks involved in the research. The major advantage of participating in this research is that if a participant has low level of playfulness or an environment that does not support play, they will be identified quickly and the caregiver will be informed. The researcher does not guarantee that participants will receive benefits from their participation.

Confidentiality

Any personal information obtained will be kept strictly confidential and the participant will remain anonymous in the research report and any publications.

In the event of detection of problems, the researcher will inform the caregiver of these concerning problems and the possible treatment options.

Free withdrawal

Participants or caregivers are free to refuse to participate and this will not affect the children's treatment in any way. If they agree to participate, they may withdraw from the research at any given moment and the decision will not affect their care.

Results

The results of the research will be available to the caregiver. The researcher can be contacted on the number provided below.

Contact details:

Shailendra R. Njitimana +263772 845824

For any queries, you may contact the University of Witwatersrand Occupational Therapy department on +2711 717 3701

Appendix M: Letter to Marondera Childcare Society

Occupational Therapy

School of Therapeutic Sciences • Faculty of Health Sciences • 7 York Road, Parktown 2192, South Africa
Tel: +27 11 717-3701 • Fax: +27 11 717-3709 • E-mail: denise.franzsen@wits.ac.za

The Administrator

Marondera Childcare Society

Zimbabwe

Dear Mrs. Kaseke

RE: Application to carry out research.

I am writing to apply for permission to carry out research at Marondera Childcare Society. The details of the study are listed below.

Title: Playfulness and environmental supportiveness in HIV-infected children aged 4-5 years

Researcher: Shailendra R. Njitimana

Supervisor: Lizelle Jacobs

Description of the study

The study's focus is on establishing the level of playfulness of HIV-infected children staying in orphanages and those staying with their families, measuring the supportiveness

to play of their environments and establishing the differences in playfulness between HIV-infected children in different contexts.

Time required

The research will be done in one session consisting of two fifteen minute sessions per participant where children will be observed as they play within the orphanage. A further 10minute will be required for collection of demographic information.

Risks and Benefits

There are no physical or potential risks involved in the research. The major advantage of participating in this research is that if a participant has low level of playfulness or an environment that does not support play, they will be identified quickly and the caregiver will be informed. The researcher does not guarantee that participants will receive benefits from their participation.

Confidentiality

Any personal information obtained will be kept strictly confidential and the participant will remain anonymous in the research report and any publications.

In the event of detection of problems, the researcher will inform the caregiver of these concerning problems and the possible treatment options.

Free withdrawal

Participants or caregivers are free to refuse to participate and this will not affect the children's treatment in any way. If they agree to participate, they may withdraw from the research at any given moment and the decision will not affect their care.

Results

The results of the research will be available to the caregiver. The researcher can be contacted on the number provided below.

Contact details:

Shailendra R. Njitimana +263772 845824

For any queries, you may contact the University of Witwatersrand Occupational Therapy department on +2711 717 3701

For ethical clearance queries please contact Professor Cleaton-Jones, chairman of the Human Research Ethics Committee at the University of Witwatersrand on +2711 717 1234 or at anisa.keshav@wits.ac.za

Yours Faithfully

Shailendra Rufaro Njitimana

Appendix N: Information Sheet

This information sheet was meant for the parents/guardians of potential participants during the participant recruitment period.

Introduction

My name is Shailendra Njitimana and I am doing a research study on playfulness and environmental support in HIV-infected children. Research is just the process to learn the answer to a question. In this study, we want to learn about the playfulness of children infected with HIV and whether the children's environment supports their play. This study is only for research purposes and is not part of the routine care that your child receives from the hospital. It will, however, inform practice with regards to the possible needs of the HIV-infected children in the area of playfulness. This study is also being done as part of fulfilling my requirements for attaining a Master's degree in Occupational Therapy.

Invitation to participate

I am inviting you and your child to participate in this research study.

What is involved in the study

This study uses a descriptive observational design study design, which means that I will only be observing your child playing at home as they usually do and recording the findings. I am asking permission to observe your child playing at home. If you agree to take part in the study, I will first ask you (the child's caregiver) to answer 10 questions on basic information about the child which will take at most 10 minutes. We would also like to access your child's medical records to obtain his/her last known CD4 count for the

purposes of demographics. Your child will then be observed playing inside the house for 15 minutes and then outside for 15 minutes. That will be the duration of the period that your child will be in the study. I will be recording what I observe concerning your child's playfulness during those two 15 minute periods.

Risks

There are no risks of being involved in this study; neither to you nor to your child. Your child shall continue to receive any services that they are currently receiving and the study will not interfere with therapy.

Benefits

The benefit of the study lies in its potential to identify any problems early and you will be informed about the problems and where you can get help.

You will be given pertinent information on the study while involved in the project and after the results are available.

Participation is voluntary

You are free to refuse for you and your child to participate in the study and you may choose to withdraw your and their participation at any point during the study and there will be no consequence or loss of benefits to either of you.

Confidentiality

Efforts will be made to keep all personal information confidential. Absolute confidentiality cannot be guaranteed. Personal information may be disclosed if required by law. The researcher will keep all identifying information separate and in a secure location. Only codes will be used on the data forms.

Organizations that may inspect and/or copy your research records for quality assurance and data analysis include groups such as the Research Ethics Committee. Results will be available on request.

Contact details of researcher for further information

Shailendra R. Njitimana 071 6194 187

For any queries, you may contact the University of Witwatersrand Occupational Therapy department on +2711 717 3701.You may also contact the Human Research Ethics Committee Chair Professor P. Cleaton-Jones, Wits Research Office, 10th Floor Senate House, East Campus at +2711-717-1234 Fax: +2711-717-1265

Email anisa.keshav@wits.ac.zafor further clarifications**.**

Information Sheet (Shona)

Musoro wetsvakiridzo

Playfulness and environmental supportiveness in HIV-infected children aged 4-5years (Matambiroevana vane HIV vane makore 4 kusvika 5)

Makadini.

Nhanganyaya

Zita rangu ndinonzi Shailendra Njitimana ndirikuitawo tsvakiridzo yematambiro anoita vana vane hutachiwana hweHIV kana varikudzimbakwavo.Tsvakiridzoinongovanzirayekuwanamhinduroyemibvunzoinengeiripo.Mutsvakiridzoinotinodakuzivakutivana vane hutachiwana hweHIV vanotamba here uyevanowanakurudziroyakawandaseikutivatambekudzimba.Zvatirikudakuitazvakangonangananetsvakiridzo, hazvitadzisemwanawenyukuwanarubatsiropachipatarauyehazviwedzereparubatsirorwaanowana; zvisinei, zvichatibatsira neruzivo pamusoro pematambiro anoita vana vane hutachiwanahweHIV.NdirikuitatsvakiridzoiyikutiindibatsirewopadzidzoyepamberiyandirikuitanechikorocheWitwatersrand ye Occupational Therapy.

Kukokwa

Ndiri kukukokai kuti munditenderewo kushanda nemi uye ne mwana wenyu.

Zvichaitwa

Mutsvakiridzo iyi, ini ndichangotarisa mwana wenyu achitamba ndiri nechekure kwemaminitsi anokwana 15 mumba uye 15 panze. Ndichange ndichinyora pasi zvandinenge ndichiona.Ndokumbirawo mvumo yekuita izvi.

Zvingakuvadza

Hapana zvingakuvadze imi kana mwana wenyu mutsvakiridzo iyi.

Zvingabatsira

Kana mwana wenyu akawanikwa aine dambudziko tinokuzivisai kwaangaenda kunowana rubatsiro.

Ruzivo rwose rwamungade pamusoro petsvagiridzo iyi mukabvunza tichakupindurai.

Isarudzo yenyu kuva mutsvagiridzo kana kusavamo. Munotenderwa kuramba kana kurambira mwana wenyu kuti apinde mutsvakiridzo iyi uye kana mukafunga kurega tsvakiridzo yavapakati munotenderwa. Mukaramba hapana mhosva yamunopomerwa uye hamutadziswi kuwana rubatsiro rwamagara muchiwana pachipatara.

Kusashambadzirwa kwezviwanikwa

Tichazama napose patinogona kuti tichengetedze zvatinowana pasarudzo iyi kwatiri. Mazita enyu kana evana haanyorwi pamapepa tichangoshandisa manhamba chete. Kana muchidakuona zviwanikwa zvakananganа nemwana wenyu tinokuratidzai nemufaro.

Pamunokwanisa kundibata

Shailendra R. Njitimana

Nhare: 0772845824

Kana mune zvimwe zvamunoda kubvunzisisa munobata ava: University of Witwatersrand Occupational Therapy department on (+2711) 717 3701; kana ava: the Human Research Ethics Committee chair Professor P. Cleaton-Jones, Wits Research Office, 10th Floor Senate House, East Campus at +2711-717-1234 Fax: +2711-717-1265 Email anisa.keshav@wits.ac.za**.**

Appendix O: Informed Consent

Title: Playfulness and environmental supportiveness in HIV-infected children aged 4-5 years

Researcher: Shailendra R. Njitimana

Supervisor: Lizelle Jacobs

I ……certify that I have read the information sheet and understand its contents. By signing I confirm that I understand the information and freely give my consent for my child to participate in the research. I understand that my child will be observed playing at my house. Any questions I had, have been answered or will be answered by the researcher. The researcher can come and observe my child on the date discussed.

_____

Signature

_____

Date

Informed Consent (Shona)

MVUMO

Musorowetsvakiridzo: Playfulness and environmental supportiveness in HIV-infected children aged 4-5 years

Zita rearikuitatsvakiridzo: Shailendra R. Njitimana

Mudzidzisi: Lizelle Jacobs

Ini …….ndinobvuma kuti ndaverenga/ ndaverengerwa tsamba ine tsanangudzo yetsvakiridzo iyi uye ndainzwisisa. Nekusaina ndinoratidza kuti ndabvuma kuti mwana wangu ave mutsvakiridzo iyi. Ndanzwisisa zvakare kuti mwana wangu achange achiongororwa achitamba ari kumba kwangu. Mibvunzo yose yandaivanayo yapindurwa zvandigutsa. Ndinobvuma kuti vauye kumba kwangu kunoongorora matambiro emwana wangu.

_____

Signature

_____

Zuva

Appendix P: Verbal Assent Form

Hi. My name is Shailendra. I'm a student at Wits. Right now, I'm trying to learn about the way you play when you are at home. I would like to watch you play like you usually do inside and outside. Do you mind if I watch you play?

Child code number; _____

Parental Permission on File:☐ Yes ☐ No

(If "No," the researcher shall not proceed with research procedures. Only a definite "Yes" will be considered as assent.)

Child's Voluntary Response to Participation: ☐ Yes ☐ No

Signature of Researcher:_____

Date: _____

Verbal Assent (Shona)

Mvumo kubva kumwana

Mhoro ini ndinonzi Shailendra. Ndinodzidza kuSouth Africa. Ikozvino ndoda kungoona zvangu matambiro aunoita kana uri mumba uye kunze. Unoda here kuti ndione uchitamba?

Nhamba; _____

Mvumo yemubereki:☐Hongu ☐Kwete

(Kana zvikanzi kwete “Kwete” mwana iyeye haatariswe achitamba.)

Mvumo kubva kumwana: ☐Hongu☐Kwete

Signature yangu: _____

Zuva: _____