Tufikirie Hisia: An exploratory study of emotion understanding in Zanzibari preschoolers

Hannah Simmons

MSc. Education (Education and Child Development)

Abstract

Emotion understanding is an important competency for children entering school. It facilitates positive relationships with peers and teachers, and is associated with a number of academic outcomes. In this exploratory study, we created a novel, culturally sensitive assessment of emotion understanding, the Fikiria Hisia test (FHT), to investigate emotion understanding among preschoolers in Zanzibar, Tanzania. Participants were 43 typically developing children in their second year at a state-run preschool (25 girls, 28 boys). A within-subject design was adopted to examine the relationship between participants' performance on the FHT and performance on the social-emotional domain of the International Development and Early Learning Assessment (IDELA), developed by Save the Children (2011). We also investigated how participants' understanding of four basic emotions (happy, sad, angry and scared) varied across different components of emotion understanding: emotion facial expression matching, knowledge of emotion labels, and understanding of which type of situations elicit which emotions. Regression models were used to examine the relationship between performance on the two assessments. Results indicated non-verbal performance in the FHT accounted for 11% of variance in performance on IDELA social-emotional items, despite all IDELA social-emotional items requiring verbal responses. Combined performance on FHT verbal and non-verbal tasks accounted for 7.9% of variance ($p < .05$) on IDELA social-emotional items, even after controlling for expressive language. Median scores for performance relating to each basic emotion across the different emotion understanding components were examined. These scores showed for each emotion, performance was highest on a different emotion understanding component. Floor effects were also found for the expressive knowledge of emotion labels task. A chi-square test investigated error types on this task and revealed the proportion of answers citing an appropriate behavioural manifestation of sadness was significantly higher than the proportion of answers citing an appropriate emotion label for sadness ($p < .05$). Finally, we examined the frequency of each facial expression being chosen in relation to 12 emotion-eliciting situations. Findings suggested images of laughing and crying faces were consistently associated with happy and sad situations respectively. Situations eliciting anger and fear triggered a variety of responses from participants. The results of this study imply non-verbal items make a valuable contribution to assessments of emotion understanding. At the same time, they suggest researchers approach these assessments with caution, as young children's responses may

reveal a real but nuanced understanding of emotions which existing tools are simply not sensitive enough to measure.

Contents

List of Abbreviations

AKT *Affective Knowledge Test (Denham, 1986)*

BET *Basic Emotion Theory (Ekman, 1972)*

CASEL *Collaborative for Academic Social and Emotional Learning*

CUREC *Central University Research Ethics Committee*

DES *Differential Emotions Scale (Izard, 1972)*

DET *Differential Emotions Theory (Izard, 1977)*

EMT *Emotion Matching Task (Izard, Haskins, Schultz, Trentacosta & King, 2003)*

FHT *Fikiria Hisia Test*

IDELA *International Development and Early Learning Assessment (Save the Children, 2011)*

MELQO *Measuring Early Learning Quality and Outcomes assessment (Anderson & Sayre, 2016)*

MoEVTZ *Ministry of Education and Vocational Training, Zanzibar*

TEC *Test of Emotion Comprehension (Pons & Harris, 2000)*

SDGs *Sustainable Development Goals (United Nations, 2015)*

ZEPD II *Zanzibar Education Development Plan II*

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1. Introduction

1.1 Overview

Emotion understanding is an essential social competency. Pons, Harris and de Rosnay (2004) present emotion understanding in children as comprising of recognition of discrete and complex emotions and their causes, regulation of emotions, and the ability to interpret others' emotions based on individual goals and beliefs. Elsewhere, emotion understanding is described as a mastering a 'script' of emotion labels, causes and behavioural consequences (Widen & Russell, 2008). Much research involving young children operationalises emotion understanding as the ability to: label emotions or recognise emotion labels; accurately interpret emotion facial expressions; and understand which types of situations elicit which types of emotions (e.g., Costa, Osorio, Verissimo & Martins, 2016; Ornaghi, Grazzani, Cherubin, Conte & Piralli, 2015.).

Underpinning the competency of emotion understanding is the principle that some emotions are discrete. This notion has been discussed extensively by Ekman (1972; Ekman & Friesen, 1971) and Izard (1977; 1972; 2010). They theorise certain emotions served an adaptive purpose in human evolution, and therefore possess universal, discrete qualities in terms of physical expression, phenomenological experience, and neurological response. These are frequently referred to as 'basic emotions'. While basic emotions have provided a foundation for much empirical research concerning emotion understanding, their relevance has been questioned: evidence about which emotions qualify as 'basic' is conflicting; and how these emotions are conceived of may vary between cultures.

Recently, interest in the development and fostering of emotion understanding in young children has increased. A body of research (discussed in 2.4.3 below) has highlighted the relationship between emotion understanding and academic and social outcomes deemed essential for adapting to, and thriving in, school. Emotion understanding is thus an important school readiness competency. The ratification of the Sustainable Development Goals has amplified the importance of school readiness: "By 2030 ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education," (Target 4.2, United Nations, 2015). As a region, sub-Saharan Africa has faced particular pressure to equip children with school readiness skills: 44% of 3- and 4-year old children in the region demonstrate low cognitive and socioemotional development (McCoy et al., 2016). The effective support and measurement of essential competencies, such as emotion understanding, in sub-Saharan African preschoolers

is therefore critical to inform policies and practices which will drive educational success in the region.

1.2 Rationale for the study

Existing tools for measuring emotion understanding have been developed for research in predominantly Western contexts. Given basic emotions may vary in their linguistic and expressive representation across cultures, employing Western-centric tools to evaluate emotion understanding among children in a sub-Saharan African context may fail to capture their true ability by overlooking cultural nuances. Consequently, there is an acute need for culturally sensitive instruments to accurately measure emotion understanding in such environments.

1.3 Aim of the study

The aim of this study was to investigate emotion understanding among preschoolers attending a state-run preschool in Zanzibar, Tanzania. The study sought to compare performance on two assessments: a novel test of emotion understanding designed to reflect Zanzibari culture; and the International Development and Early Learning Assessment (Save the Children, 2011) – an internationally validated tool for measuring emotion understanding as part of a holistic assessment of cognitive and social-emotional development. Zanzibari preschoolers' knowledge regarding four basic emotions was also investigated by examining trends in their responses concerning different components of emotion understanding.

1.4 Structure of the dissertation

The second chapter presents the literature review, outlining the theoretical framework of this study. It will discuss prominent theories of emotions and emotion understanding, and summarise empirical evidence for the importance of emotion understanding for young children's academic and social competence. It will also critically review existing tools for assessing emotion understanding in this age group.

The third chapter describes the methodology used for this study, including descriptions of the location, sample, recruitment and data collection processes.

The fourth chapter presents the results for each research question. The analytic strategies are outlined, together with assumptions for statistical tests and results.

The final chapter discusses the results of the study. Findings are evaluated in the context of the wider discussion around demand for culturally sensitive assessments, and the debate

pertaining to the notion of ‘universal’ basic emotions. The limitations of the present study will be stated, in addition to how the study may inform future research. Finally, this chapter highlights ways in which the present study may inform theory and practice around emotion understanding, particularly in low- and middle-income countries.

2. Literature Review

2.1 Theories and definition of emotions

2.1.1 Basic Emotion Theory.

Basic Emotion Theory (BET; Ekman, 1972) holds that some emotions have evolved biologically and thus manifest as discrete, universal facial expressions. Underlying each facial expression is a 'script-like pattern' of physiological and neural responses (Hutto, Robertson & Kirchhoff, 2018, p.1).

Though credited as a founder of BET, Ekman, himself, does not define 'emotion'. Instead, he concurs with Izard (1969) that the term is 'one of the most confused and ill-defined in psychology,' (cited from Ekman, 1972, p.11). It is possible to infer from the assumptions of BET that the theory conceives of emotion as a combination of physiological, neural, behavioural and expressive reactions.

2.1.2 Support for Basic Emotion Theory.

The notion of discrete emotions is rooted in the theory of evolution (Darwin, 1872). Continuity in the expression of particular emotions has been found between higher primates and humans (Bolwig, 1964; Darwin, 1872). The production, expression and recognition of emotions is also believed to serve an adaptive purpose (Tomkins, 1962; Izard, 1977). Positive emotions encourage approach toward, and engagement with, other people and objects (Izard, 1977). In contrast, negative emotions instigate avoidance due to their 'intolerable' nature (Izard, 1977). Basic emotions therefore serve unique, adaptive purposes, and are deemed critical for survival and wellbeing (Izard et al., 2011).

Initial support for BET came from Ekman and Friesen's (1971) study of American and New Guinean interpretations of facial expressions. New Guineans 'visually isolated' from Western culture were asked to demonstrate expressions of six basic emotions: happy, angry, disgust/contempt, sad, surprise and fear (Ekman, 1972, p.161). Thirty-four American college students then interpreted the expressions. The authors claimed all emotions were accurately judged, except for surprise and fear. They infer this is because New Guineans expressing the emotions had difficulty in distinguishing between the two. Ekman (1972) therefore proposed the existence of at least 5 distinct emotions, with surprise and fear integrating as one. Importantly, Ekman's list of basic emotions is not intended to be exhaustive. Other researchers maintain there are six basic emotions, with fear and surprise having their own unique 'scripts' (Hutto, Robertson & Kirchhoff, 2018). However, critics state categorising

certain emotions as pan-cultural inadvertently assumes other emotions are ‘entirely culture-bound and lacking distinctive response profiles,’ (Colombetti, 2014, p.36).

2.1.3 Differential Emotions Theory.

Differential Emotions Theory (DET; Izard, 1977) closely resembles BET. Both present emotions as multifaceted processes, and declare a number of innate, evolutionally advantageous emotions. However, DET elaborates on the experiential aspect of emotion, and offers a definitive list of basic emotions.

2.1.4 Differential Emotions Theory: definition of emotion.

Izard describes emotions as ‘experiential/motivational phenomena that have adaptive functions independent of tissue needs,’ (1977, p.45). Emotions are produced by the emotions system, consisting of biological functions which generate and maintain emotion phenomena, such as hormones and neurohumors (Izard, 1977). As maintained by BET, emotions consist of complex processes with multiple levels. At the neurophysiological level they are characterised by patterns of electrochemical activity, most prominently in the nervous system. At the neuromuscular level, emotions consist of patterns of facial activity, often accompanied by bodily reactions such as vocal responses. At the phenomenological level, emotions are motivating experiences: “the experience of an emotion can constitute a process in consciousness completely independent of cognition,” (Izard, 1977, p.49). BET and DET therefore share the assumption that discrete emotions consist of unique scripts which generate universal facial expressions, with DET proposing an additional experiential component within these emotion scripts. DET is thus an extension of BET rather than an alternative theoretical framework.

2.1.5 Differential Emotions Theory: basic emotions.

DET further elaborates on BET by expanding the list of basic emotions to include 10 fundamental emotions. These emotions are believed to discretely differ in two respects: each maintains different motivational properties; and each invokes unique inner experiences which produce different behavioural consequences.

The claim that there exist 10 basic emotions is based on a body of empirical research, summarised in Table 1.

Table 1

Percentage of Subjects Who Agreed on the Emotion Category of Photographs Selected to Represent Fundamental Emotions

	Cultural Group											
Emotion	American[a]	English[a]	German[a]	Swedish[a]	French[a]	Swiss[a]	Greek[a]	Japanese[a]	Mexican[b]	Brazilian[c]	Chilean[c]	Argentinian[c]
N =	89	62	158	41	67	36	50	60	616	82	90	168
Interest-excitement	84.5	79.2	82	83	77.5	77.2	66	71.2				
Enjoyment-joy	96.8	96.2	98.2	96.5	94.5	97	93.5	93.8	97	97	90	94
Surprise-startle	90.5	81	85.5	81	84.2	85.5	80.2	79.2	54	82	88	93
Distress-anguish	74	74.5	67.2	71.5	70.5	70	54.5	66.8	61	83	90	85
Disgust-contempt	83.2	84.5	73	88	78.5	78.2	87.5	55.8	61	86	85	79
Anger-rage	89.2	81.5	83.2	82.2	91.5	91.8	80	56.8	86	82	76	72
Shame-humiliation	73.2	59.5	71.8	76.2	77.2	70	71	41.2				
Fear-terror	76	67	84	88.8	83.5	67.5	67.8	58.2	71	77	78	68

[a]*From Izard, (1971)*

[b]*From Fickey & Knower (1941)*

[c]*From Ekman & Friesen (1972)*

(Adapted from Izard, 1977, p.7)

Izard (1977) describes the fundamental emotions as: interest-excitement, enjoyment-joy, surprise-startle, distress-anguish, anger-rage, disgust-revulsion, contempt-scorn, fear-terror, shyness-humiliation, and guilt. Note, guilt is absent from Table 1, while disgust and contempt are grouped together. Though discrete, Izard (1977) presents the emotions as dyads to reflect the combination of motivation and neural stimulation present. For example, interest-excitement denotes the motivation for learning (interest), and the neural stimulation generated by a novel experience (excitement). Unlike BET, DET presents this as an exhaustive list of basic emotions. However, it is not exhaustive of all possible emotions; 'higher-order' emotions may be generated by interactions between basic emotions (Fuenzalida, Emde, Pannabecker & Stenberg, 1981). The situations which incite each basic emotion are also not fixed, but will inevitably vary according to the subjective interpretation of the individual. That is, what is discrete is the physiological reaction of each emotion and not the cause or inciting event.

2.1.6 Contemporary definitions of emotion.

In 2010, Izard surveyed the prescriptive definitions of emotion offered by 35 scientists using a 10-point scale of agreement (0 indicates disagreement and 10 complete agreement).

For the structure of emotion, agreement was highest concerning involvement of neural systems (8.92), response systems (8.61) and feeling states (7.84). For the function of emotion, agreement was high for recruiting response system (8.87), motivating cognition and action (8.23), organizing, ordering and coordinating responses (7.78), and monitoring the significance of events (7.77). Notions of assessing significance of events and generating and ordering responses are echoed in definitions offered by Ekman (1992), Frijda and Mesquita (1994) and Campos, Walle, Dahl and Main (2011). Widen and Russell (2010) argue Izard's assessment overlooks everyday ideas of emotion used by adults and children as it does not offer a descriptive definition. A primary concern of Widen and Russell (2010) is that folk definitions of emotion may play a causal role in emotional experiences. Indeed, Izard concluded no 'generally accepted' definition of emotion exists within scientific literature (2010). As such, 'emotion' remains a somewhat ambiguous term in research.

2.1.7 Operationalising basic emotions.

Definitions offered by BET and DET suggest emotions are complex processes consisting of neurophysiological reactions, neuromuscular responses and experiential states. Basic emotions will henceforth be operationalised as those whose process is believed to be unique, in that they consist of physiological and experiential processes distinct to all other basic emotions, and universal, insofar as they are consistent across cultures. The term will not be used to denote a definitive list of discrete emotions, as empirical evidence implies some emotions may be more discrete than others.

2.2 Evidence for basic emotions

A body of empirical evidence supports the existence of basic emotions.

Fuenzalida, Emde, Pannabecker and Stenberg (1981) used the Differential Emotions Scale (DES; Izard, 1972) with a sample of 613 mothers. Factor analysis revealed of the 30 emotion terms, 25 items loaded onto nine factors of anger, surprise, contempt, fear, guilt, shyness and joy-distress. The first 8 factors are consistent with Izard and colleagues' validation of the DES (1974). The authors suggest the final factor of joy-distress may represent an emotional domain, aligned with dimensional approaches to the study of emotion. Such approaches regard emotions as representing unique positions on two axes of valence (the positive or negative aspect of emotion) and arousal (intensity) (Ekman, 1972).

In addition, Ekman and colleagues (Ekman et al., 1987) tested the hypothesis that there would be agreement across cultures about which emotion is expressed in a photo when

participants are limited to producing one emotion term. The basic emotions presented were: happiness, surprise, sadness, fear, disgust and anger. Across 10 cultures and six emotions included, all kappa coefficients were significant ($p < .01$). The authors concluded this to be a 'consistent and robust' finding indicating agreement across cultures for basic emotions. Importantly, these results challenged earlier studies which had found two of the cultures (Japan and Sumatra) to differ substantially from Western cultures in their attitudes towards emotion expression (Ekman, 1972; Heider, 1984). However, it is notable that all 10 countries represented are exclusively Western or Asian cultures. For basic emotions to be truly universal, sufficient evidence would need to show similar results in all continents and across a wider range of cultures.

Compelling evidence also comes from Widen (2013). Aggregated data from 11 studies with children aged 2- to 9-years-old conducted by Widen and Russell (2002, 2003, Study 2, Study 3, 2008b, 2008c, 2010a, Study 1, Study 2, 2010b, 2010c, 2012b, 2012c, cited in Widen, 2013) ($N = 1065$) were used to investigate children's ability to freely name the basic emotions of happy, angry, sad, surprised, scared and disgust. By age 3 years, over 60% of children were able to accurately label expressions of happy, angry and sad. By age 4 years, this included correct labelling of surprised, with approximately 50% of children accurately labelling scared. Across the sample, accuracy in labelling disgust did not exceed 50%.

Critics of basic emotion theories reject the notion that basic emotions are 'primitive'. Oatley and Johnson-Laird (1987) state when an emotion is directed at an object, it becomes a complex, not a primitive, event. Russell (2003) further argues emotions necessarily have an intentional object: fear is always fear of something, even fear of the unknown. As a result, there is some ambiguity around the extent to which basic emotions are 'primitive', even if they did serve an evolutionary purpose.

Alternative interpretations of evidence in support of basic emotions must also be considered. Widen (2013) posits unfamiliarity with some basic emotions may be indicative of unfamiliarity with the emotion term rather than the discrete phenomenological state. It is possible to partially understand a basic emotion without knowing its entire 'script'.

Despite empirical evidence supporting the existence of basic emotions, there is clearly a lack of consensus on which emotions are 'basic'. This likely explains why the concept of basic emotions has supported the design of many studies regarding children's social-emotional development, yet very few studies expound on their definition of 'basic emotion' (e.g., Ornaghi et al., 2015; DeKlerk, Dada & Alant, 2014).

2.3 Emotion understanding

The concept of emotion understanding (or 'emotion knowledge') offered by DET is 'an accurate understanding of the expressions, feelings and functions of discrete emotions,' (Izard et al., 2011, p.44). Hall, Geher and Brackett's (2004) definition similarly emphasises the ability to identify others' emotions from facial expressions, but adds understanding of which emotions are likely to be prompted by typical social situations. Though these definitions indicate emotion understanding is comprised of several aspects, there remains some opaqueness around which skills constitute each respective aspect.

2.3.1 A developmental model of emotion understanding.

Pons, Harris and de Rosnay (2004) provide a developmental model of emotion understanding for children aged 3-12 years. They present emotion understanding as consisting of nine components: Recognition, External cause, Desire, Belief, Reminder, Regulation, Hiding, Mixed and Morality. Component I (Recognition) is the ability to accurately recognise and name emotions based on expressive cues. Component II (External cause) is an awareness of how external causes affect others' emotions. Component III (Desire) describes an appreciation of others' feelings given their individual goals or desires. Component IV (Belief) is the ability to understand that a person's beliefs, irrespective of their correctness, will govern his or her emotional response. Component V (Reminder) is an awareness of the capacity for memories to elicit emotions, as well as the potential for emotion intensity to lessen over time. Component VI (Regulation) refers to strategies for controlling emotional responses, which vary with age. Component VII (Hiding) represents the recognition that an outward expression may not by consistent with the emotion felt. Component VIII (Mixed) is the understanding that a person can feel more than one emotion at any given time, and that these emotions may even contradict one another (e.g., feeling excited and scared at once). Finally, Component IX (Morality) describes the negative feelings prompted by a morally reprehensible act, such as lying. The first three components emerge approximately aged 3-4 years. Subsequent components emerge with age, with some children mastering all components by age 8 years. Analysis of the relationships between components confirmed the nine components can be organised into three groups, each of which contains three highly correlated components. The first group consists of Recognition, External cause and Reminder. The second consists of Belief, Desire and Hiding. The third group consists of Morality, Regulation and Mixed. The hierarchical relationship between components was

established using a scalogram analysis. The aim of such analysis is to establish a one-dimensional continuum between items, meaning we can assume a child who has mastered, for example, Belief, will also have mastered all preceding components. Results indicated components were scalable and the scale was valid (Pons et al., 2004).

2.3.2 Operationalising of emotion understanding.

Many recent studies of preschoolers' emotion understanding have operationalised the competence as a categorical script for each emotion (e.g., Costa et al., 2016). An emotion script contains at least one appropriate emotion label (e.g., sad), the prototypical bodily or behavioural expressions which accompany it (e.g., crying), and situations which ordinarily elicit that emotion (e.g., losing a favourite toy) (Costa et al., 2016). The notion is thus that each basic emotion is associated with a discrete script comprising of these elements. In mastering this script, the child has mastered understanding of that particular emotion. Preschool emotion understanding, then, primarily refers to Components I (Recognition) and II (External cause) of Pons et al.'s (2004) model. Measurements of emotion understanding therefore regularly require production or identification of an accurate emotion label in response to a picture or photograph of an emotion facial expression, and a vignette or narrative of an emotion-provoking situation. For the purposes of this study, and in what follows, emotion understanding will subsequently be operationalised as the ability to generate and comprehend emotion labels, appropriately interpret facial expressions of emotions, and identify which situations evoke which emotion.

2.4 Associations between emotion understanding and developmental outcomes

Good emotion understanding among preschoolers is associated with a range of positive outcomes.

2.4.1 Social adjustment.

Aged 2-5 years, many children progress into some form of education, necessitating relationships with agemates and adults (Denham et al., 2003). Emotional competence is essential to social integration at this stage (Saarni, 1990). Emotion understanding has been consistently found to relate to measures of social adjustment, such as empathy and cooperativeness (Denham, 1997; Cutting & Dunn, 1999). Children able to identify emotions in others and comprehend common causes of emotions are more likely to respond prosocially to emotion expression in peers (Denham et al., 2003). In turn, this supports further prosocial

behaviour. Affective perspective-taking, for example, is associated with prosocial behaviours such as conflict reconciliation (de Wied, Branje & Meeus, 2007; Liao, Li & Su, 2013). Understanding emotions has also been found to elicit prosocial acts from others, reflected in teacher and peer ratings of likeability (Cassidy, Werner, Rourke, Zubernis & Balaraman, 2003; Denham, McKinley, Couchoud & Holt, 1990). Denham and colleagues (2003) examined the contributions of components of emotional competence to peer- and teacher-rated social competence in preschoolers (N = 143). Using latent variable modelling, they found emotional competence, consisting of emotional expressiveness, emotion understanding and emotion regulation, contributed to both concurrent and kindergarten social competence. The authors state this reflects 'the ever-present nature of emotion at the core of social interaction and well-being' (p.253). Poor emotion understanding can consequently act as a 'road-block' to social adjustment, causing children to be aggressive or victimised and putting them at risk of a 'cascade of problems' including school difficulties (Denham et al., 2003).

2.4.2 Academic performance.

There is a strong argument that emotion understanding makes a critical contribution to academic success. Through its contribution to social competence, emotion understanding has been associated with indices of academic performance. In a study of kindergarten pupils (N = 206), Birch and Ladd (1997) found teacher-child closeness was positively related to the child's academic performance on the Metropolitan Readiness Test (Harcourt Brace Jovanovich, 1986). Earlier, Ladd (1990) had reported making friends at school was associated with academic gains on the same test. The specific contribution of emotion understanding (termed 'emotion knowledge') to academic performance was investigated by Izard, Fine and Schultz (2001). They assessed an index of emotion knowledge as a long-term predictor of academic competence among children from economically disadvantaged families. Path analysis indicated emotion knowledge mediated the effect of language on academic competence. Emotion knowledge was also an independent predictor of academic ability. More recently, Curby, Brown, Bassett and Denham's (2015) assessment of preschoolers' social-emotional and preliteracy skills revealed emotion understanding predicted preliteracy skills above and beyond age, gender, maternal education, classroom emotional support and attentional abilities. Garner and Waajid (2008) also found emotion understanding directly related to preschool children's performance on the Developmental Indicators for the Assessment of Learning-R (Mardell-Czudnowski & Goldenberg, 1990), which included measures of concept knowledge and language competence, both of which are

important for predicting academic success. These studies support the notion that children who are more socially competent are better able to engage in classroom activities, which facilitates learning of academic subjects (Curby et al., 2015; Denham, 2006a).

2.4.3 School readiness.

In recent years, emotion understanding has been identified as a specific school readiness competency. Wolf et al. (2017) describe school readiness as "an outcome of the early years that covers multiple dimensions of development, including early academic and behavioural skills, Social-Emotional development, and aspects of physical health including Motor development," (p.22). The domain of Social-Emotional development is comprised of various skills, including skills integral to emotion understanding, namely recognising and regulating emotions (CASEL, 2019). The ratification of the SDGs (United Nations, 2015) has demonstrated a global commitment to increasing access to, and quality of, preschool education. Many governments seeking to improve preschool education have also become acutely aware of the importance of the abilities that children bring at the start of school. School readiness has therefore become an area of concern and investment for many nations. As a result, preschoolers' emotion understanding has gained global interest as essential to school adjustment and performance.

2.5 Language and emotion understanding

Research employing a social interactionist framework indicates the influence of language on development of emotion understanding in children (Taumoepeau & Ruffman, 2006). This notion is rooted in the work of Vygotsky (1978), insofar as social experiences facilitate 'the acquisition of higher order mental functioning' (Taumoepeau & Ruffman, 2006, p.465). Through conversation with adults, children internalize ways of thinking (Symons, 2004). Adults provide a 'linguistic scaffold' that helps the child to interpret internal and external experiences and systematically arrange them into a 'coherent whole' (Fivush & Nelson, 2004, p.574). Parents' and caregivers' use of emotion language consequently structures the child's internal emotional experience, as well as their perception of others' experiences (Keltner, Oatley & Jenkins, 2014). Through language socialisation, the child is equipped with linguistic tools necessary to demonstrate emotion understanding. These include emotion labels (e.g., happy) and behavioural descriptors associated with emotions (e.g., laughing).

The socialization of children's emotion language is said to begin as early as 18 months of age (Keltner, Oatley & Jenkins, 2014). Much research has focused on maternal mental-state

talk, which includes desire-terms and think-terms as well as emotion labels. A study by Taumoepeau and Ruffman (2006) investigated the relationship between maternal mental-state talk and children's performance on emotion tasks. Maternal talk about the child's desires at 15 months old was found to uniquely predict the child's performance on an emotion situation task, whereby the child was required to choose an appropriate facial expression for a character in an emotion-eliciting situation. Dunn, Brown, Slomkowski, Tesla and Youngblade (1991) also reported mother-child conversations at age 33 months concerning emotions and their causes predicted children's emotion understanding 7 months later.

2.5.1 Acquisition of emotion labels.

Widen and Russell (2003) propose children acquire unique emotion labels at the same time as acquiring the unique emotion concept. That is, while the emotion label may exist in the child's lexicon, it will not be used to freely label a facial expression until the child is familiar with the emotion concept.

This developmental model of the acquisition of emotion concepts was first hinted at by Russell and Bullock (1986). Children were asked to label a facial expression by choosing from a selection of emotion terms. The forced-labelling data indicated an initial two-category interpretation of emotions emerging at approximately 3 years old; children employ two emotion labels based on opposite valences (typically happy, and sad or angry) (Widen & Russell, 2003). Widen and Russell (2003) used a free-labelling task to further investigate the relationship between emotion label and concept. They intended to examine errors in free-labelling to reveal how errors deviated from the target label in terms of valence and arousal. Again, an initial two-category interpretation of emotions emerged, believed to reflect the salient dimensions of pleasure-displeasure experienced by young children. Following this, the negative category appeared to divide into two narrower categories – sad and angry. These categories are speculated to reflect dimensions of arousal (angry characterises high arousal; sad characterises low arousal). Only after another 6 months (age approximately 3.5 years) did children freely employ the terms 'scared', 'surprised' and 'disgusted' in interpreting facial expressions. The authors hypothesise that over time, emotion categories 'narrow in a systematic manner until the adult system is achieved' (p.115).

These findings have two important implications for measuring emotion understanding. First, measuring performance in a facial expression interpretation task by whether the child generated or chose a specific emotion label may not accurately reflect the child's true understanding. Development through phases indicates even young children have a way of

interpreting facial expressions which 'serves reasonably well' (Widen & Russell, 2003, p.127). In this sense, the label produced is as accurate as the child needs it to be. It is therefore more appropriate to use data from labelling tasks to gauge how a child perceives unique emotions, rather than if they perceive them at all (Widen & Russell, 2003). Secondly, young children may have sufficient ways of interpreting emotions different to those of adults, such as the rudimentary, two-category interpretation discussed above. Forced-label tasks can consequently yield misleading results: the selection of labels available may not reflect those the child would produce spontaneously (Russell, 1994). If forced-label tasks are used to determine understanding of discrete emotions, findings may be an inaccurate representation of the child's ability to make sense of, and respond to, emotion expressions.

According to this theory, an important function of exposure to mental-state talk is to support children in distinguishing emotions at both the linguistic and conceptual level. Cultures which deemphasise specific emotion concepts may consequently delay children's acquisition of them (Widen & Russell, 2003).

2.5.2 Language-based interventions to improve emotion understanding.

Given the significant influence of language on emotion understanding, it is unsurprising that emotion language-based interventions have proved effective in enhancing emotion understanding in young children. This is evidenced by Ornaghi and colleagues (2015), who provided 4- to 5-year-old children with a 6-week intervention consisting of researcher-led discussion around a target emotion. Using the standardized Italian version of the Test of Emotion Comprehension (Pons & Harris, 2000; Albanese & Molina, 2008), the authors found participants assigned to the experimental group outperformed the control group in emotion understanding even after gains in verbal ability were controlled for. Results were replicated in a similar study using participants in second-grade (Grazzani, Ornaghi & Crugnola, 2015).

2.6 Emotion understanding and cultural variation

Pursuing the notion that emotion understanding is cultivated through a process of socialization, we must consider the environment in which socialization takes place. Super & Harkness warn, children's environments are not "a random agglomeration of unrelated social customs, esthetic values, interpersonal interactions, physical situations, and beliefs about the world," (2002, p.271). Failing to acknowledge the dynamic nature of cultures poses a theoretical pitfall which undermines much research in cultural developmental psychology (Greenfield, 2009; Super & Harkness, 2002).

Cultural processes are multifaceted and relational, and culture, itself, continuously evolving (Rogoff, 2001). To subject cultural processes to scientific enquiry, researchers often dissect the 'whole' culture and transform it into categorical variables (Super & Harkness, 2002). To counter this, Super and Harkness propose culture be viewed as 'providing the organization of the developmental environment' (2002, p.271). Through interacting with their environment, children 'detect, abstract and internalize' culturally-informed systems of meaning and performance (Super & Harkness, 2002, p.272). Children's internalization of meaning is similarly subject to parental ethnotheories: culture-specific theories of child development (Greenfield, 2009). The impact of parental ethnotheories is demonstrated in the variable effects of child-rearing practices: outcomes of parental discipline styles are mediated by local meaning systems and relationship structures (e.g., Lansford et al., 2005). The value ascribed to emotion understanding, and the way in which it is shaped, likely reflects different parental ethnotheories.

Mastering emotion understanding depends on grasping culturally appropriate meanings and representations of emotions. In turn, these meanings influence the way in which emotion understanding will manifest. This is supported by a body of research concerning cultural nuances in attitudes towards emotions, expressions of emotions and emotional competence.

2.6.1 Attitudes.

Affect Valuation Theory asserts that cultures vary in the goal of their emotion socialization (Tsai, Miao, Seppala, Fung & Yeung, 2007). Western cultures seek to influence others to meet personal needs, while Eastern cultures seek to adjust to others to meet their needs (Tsai et al., 2007). As a result, Western cultures are more accepting of displays of high arousal positive affect (e.g., excitement) than East Asian cultures, due to the potential of high arousal emotions to disturb collective peace (Tsai, Louie, Chen & Uchida, 2007).

Specific emotions have also been found to elicit contrasting attitudes from different cultures. In Western literature, shyness in children is associated with internalizing behaviour, and, later in life, with lower income and more loneliness (Schmidt et al., 2017). It has also been linked to deficits in the classification of emotional facial expressions (Battaglia et al., 2004). In contrast, shy-inhibited children in China were found to be more accepted by peers and regarded as most competent by teachers (Chen, Rubin & Li, 1995). This divergence from Western norms is supported by Wang's (2001) comparative study of Chinese and American mother-child conversations. Chinese mothers employed an 'emotion-criticizing style' which emphasised appropriate emotional responses, while their American counterparts elaborated

on the causes of emotions (Wang, 2001). Such findings are concurrent with the notion that Western parental ethnotheories may be culturally inadequate for analysing the Chinese context (Liu et al., 2000).

Societies in Africa have also been found to deviate from Western cultures in the value ascribed to certain social and emotional competencies. African agricultural communities are typically based on collectivist cultures which emphasise competencies such as shyness and empathy (Jukes et al., 2018; Serpell & Jere-Folotiya, 2008). Social responsibility is also highly rated. It forms an integral part of the Chewa concept of '*nzelu*', often equated with the Western concept of intelligence (Serpell & Jere-Folotiya, 2008). Jukes and colleagues' (2018) similarly found members of an agricultural community in Tanzania placed greater value on social responsibility than individual competencies like self-belief. Significantly, both studies note discrepancies between how national education systems and community cultures value certain traits.

2.6.2 Emotion expression.

There is some debate around the extent to which facial expressions of basic emotions are universal. Universalists such as Ekman (1972) and Tomkins and McCarter (1964) posit a system of 'one-to-one' mapping between the feeling of basic emotions and the corresponding facial expression. Yet, in a meta-analysis of emotion-expression judging across cultures, Elfenbein and Ambady (2003) found an in-group advantage. Data sets for this study featured cultures from various parts of Europe and East Asia, together with Indonesia, Turkey, USA, Mexico, Singapore, New Zealand, Australia and New Guinea. Interestingly, no low-income countries were included (according to the Department for International Development, UK's definitive list, 2017). Nevertheless, participants were more accurate in interpreting emotion facial expressions from members of their own culture than those of a different cultural group. Cultural variation also emerged in a comparative study of Afrikaans-speaking and Sepedi-speaking children in South Africa (DeKlerk, Dada & Alant, 2014). DeKlerk, Dada and Alant (2014) presented both groups of children with a selection of facial expressions to represent the basic emotions of happy, sad, afraid and angry. Results indicated significant variation between the two groups, with sad receiving the lowest rate of agreement. The authors interpret this in light of Widen & Russell's (2003) differentiation model; children may be delayed in acquiring the concept of sadness. However, they also note the selection of 'sad' faces available may have limited performance by not accurately representing participants' experiences of sadness. From a universalist perspective, both studies do not offer evidence of

innate cultural differences in emotion expression, but in the cultural code used to interpret expressions (Ekman, 1972): cultural attitudes towards certain emotions lead communities to manipulate their own instinctive expression, often by supressing features, and to read others' expressions in a culturally appropriate manner. Irrespective of whether or not variation is innate or a product of cultural socialisation, cross-cultural differences in emotion expression have been speculated to impact non-verbal communication in multi-cultural environments (Teague, 2014): members of one culture may interpret the emotion expressions of another culture using their own cultural code.

2.6.3 Emotional competence.

Empirical research offers evidence for differences in children's emotional competence across cultures. Children from Western literate cultures have been found to develop the Belief component of emotion comprehension earlier than those from non-Western cultures (Vinden, 1999). On the other hand, children from non-Western cultures have outperformed Western peers on multiple inhibitory control tasks. Children in sub-Saharan Africa have consistently outperformed Western counterparts on delayed gratification tasks, associated with the social-emotional competency of self-regulation (Zuilkowski, McCoy, Serpell, Matafwali & Fink, 2016). Chinese preschoolers have likewise outperformed American preschoolers in behavioural tasks measuring inhibitory control, linked to emotion regulation (Sabbagh, Moses & Shiverick, 2006). It is possible some differences in task-based performance pertain to measures being poorly adapted to diverse cultural contexts (Zuilkowski et al., 2016).

2.7 Measuring emotion understanding

Over the past three decades a number of instruments have been developed to measure emotion understanding. Although they have expanded research into the development of emotion understanding in preschoolers, the development and use of these tools has predominantly targeted children from Europe and North America.

2.7.1 Affective Knowledge Test (AKT; Denham, 1986).

The Affective Knowledge Test was developed to assess young children's ability to accurately interpret and label emotions. It consists of verbal (expressive) and nonverbal (receptive) tasks using felt-fabric faces. Each face depicts one of four basic emotions: happy, sad, angry and scared. For verbal items, the child must verbally identify the emotion from the felt-fabric stimuli. For nonverbal items, the experimenter provides an emotion label and the

child must point to the corresponding face. As this test was designed for preschoolers, the scoring system takes into account the gradual development of emotion categories (Widen & Russell, 2003): children are awarded 2 points for a correct label, 1 point for a label of the correct valence, and 0 for an incorrect answer. Expressive and receptive scores are then combined for an aggregate score. The applicability of this test in non-Western cultures, particularly in low-income countries may be limited. The discrete representation of the four emotions may not reflect the prototypical facial expressions of another culture (as discussed in 2.6.2). Zuilkowski and colleagues (2016) have also highlighted issues of instrument and dimensionality bias. Instrument bias can manifest as unfamiliarity with the tool used for testing (Zuilkowski et al., 2016). In this instance, the use of felt-fabric faces could be distracting for children from low-income countries where felt is uncommon, particularly as a play material. Dimensionality bias refers to a specific type of instrument bias where the dimensions of the tool render the task unfamiliar (Zuilkowski et al., 2016). For example, children in resource-limited contexts may have limited encounters with two-dimensional facial expressions, and therefore fail to recognise the emotion depicted in on a felt-fabric face.

2.7.2 Test of Emotion Comprehension (TEC; Pons & Harris, 2000).

The Test of Emotion Comprehension, devised by Pons and Harris (2000), is based on the nine components described in the developmental model of emotion comprehension (see 2.3.1 above). A succession of studies have found it to be valid and reliable (e.g., Fidalgo, Tenenbaum & Aznar, 2018), with children from different cultural backgrounds demonstrating a similar trajectory of development (Molina, Bulgarelli, Henning & Aschersleben, 2014; Tang et al., 2017; Rocha et al., 2015). The TEC has subsequently earned a reputation as ‘a global index of emotion comprehension in children 3 to 11 years of age,’ (Fidalgo et al., 2018, p.1066). The test is comprised of a booklet of illustrations with a story to accompany each one. Children are required to choose an emotional facial expression to match the story. Facial expressions depict the basic emotions of happy, sad, angry and afraid, with ‘ok’ as a fifth option. Widen and Russell (2003) note without the availability of a neutral expression, the child has no ‘baseline’ against which to compare expressions of greater or lesser valence or arousal. The use of nonverbal responses was intended to facilitate use of the test in diverse cultural settings (Rocha et al., 2015). Yet, the illustrations for some items may invoke instrument bias. A scenario representing the Belief component depicts a rabbit who cannot see a fox behind a bush. Children unfamiliar with either animal may correctly or incorrectly

identify the rabbit's emotion, based solely on an unfamiliarity with the classic, predator-prey relationship between the two animals. Similarly, some cultures do not socialise children to empathise with animals. In fact, it may be actively discouraged (e.g., the utilitarian attitude towards dogs in sub-Saharan Africa) (Knobel, Laurenson, Kazwala & Cleaveland, 2008). Such children may consequently struggle to comprehend the emotion complexity of an animal as presented in some TEC items. Alternatively, they may be confused by the absurdity of a question applying theory of mind to animals.

2.7.3 Emotion Matching Task (EMT; Izard, Haskins, Schultz, Trentacosta & King, 2003).

The Emotion Matching Task is intended as a 'comprehensive measure of emotion knowledge' (Morgan, Izard & King, 2010, p.52). 'Emotion knowledge' is operationalised as the ability to 'recognise expressions of emotions, label expressions of emotions and understand the causes and consequences of emotions,' (Morgan et al., 2010, p.53), rendering it equivalent to emotion understanding.

The EMT consists of four parts, each measuring one of three components of emotion understanding (expressive, receptive and situational). Tests of validity and reliability have indicated strong correlations between the EMT and the Kusche Emotional Inventory (Kusche, 1984) and AKT, with the EMT proving a more robust predictor of effortful control and emotion regulation (Morgan et al., 2010). In contrast to other tests of emotion understanding which feature nonverbal tasks to measure receptive comprehension of emotion labels, the EMT includes a nonverbal emotion-matching task: children must match two facial expressions of the same emotion. This advances the theory that children acquire receptive emotion understanding before expressive emotion understanding (Morgan et al., 2010). Further, it hypothesises that young children may lack emotion vocabulary for expressive or receptive labelling tasks but be able to recognise two expressions of the same valence or arousal (Morgan et al., 2010).

A central claim of the EMT is that it is sensitive to the experiences of young and economically disadvantaged children. This is justified by its use of ethnically diverse images, 'highly attractive' to ethnic minority children (Morgan et al., 2010, p.55). Despite using ethnically diverse samples, most studies employing the tool have taken place in the USA (e.g., Morgan et al., 2010) or Western Europe (e.g., Alonso-Alberca, Vergara, Fernández-Berrocal, Johnson & Izard, 2012). In these regions, ethnic minority children are typically part of a larger, ethnically diverse community. Arguably, then, the validity and reliability of the

EMT within different isolated cultural communities has not been tested. Keeping in mind the in-group advantage in emotion recognition from Elfenbein & Ambady's (2003) cross-cultural meta-analysis, it is plausible that ethnically diverse images are not sufficient for a tool to be culturally adaptable, unless ethnic diversity is a familiar characteristic of the given society.

2.7.4 Decontextualized items.

Many test items described above present emotion understanding from a decontextualized perspective. Snow, Cancino, de Temple and Schley (1991) define decontextualized language as "language used in ways that eschew reliance on shared social and physical contexts in favour of reliance on a context created through the language itself," (p.90). Their definition can be extended to emotion understanding; emotion labels presented in a written form or spoken by the experimenter are detached from any other verbal, physical, social or environmental cue. As Super and Harkness stated, the contribution of culture to development is in 'how the pieces fit together' (2002, p.271). Providing an emotion term in isolation, even in a local language, is therefore extracting a single piece of culture from the dynamic interplay of cultural artefacts which give the term its meaning. This is also true of the use of emotion facial expressions in a two-dimensional, context-free form. In interpreting these expressions, children are unable to exploit situational cues as they would when faced with a real emotional situation.

2.7.5 Call for culturally diverse tools.

Whilst the development of measures of emotion understanding is essential to acquire a deeper awareness of children's emotional competence and evaluate social-emotional interventions, the measures outlined above have all been rooted in Western-centric ideas of emotion expression and emotion labels. Just as with early childhood development programs, assessment tools face the challenge of disentangling 'the implicit cultural agenda of an imported intervention from its more general developmental goals,' (Harkness, Super, Mavridis, Barry & Zeitlin, 2013, p.153). Increased interest in enhancing school readiness in low-income countries has seen social and emotional competencies appear on the agenda of numerous sub-Saharan African nations. Various programmes targeting school readiness from a holistic perspective have been introduced, along with changes to preschool curricula (e.g., USAID's Tusome Pamoja programme). As a result, there exists an acute need for tools to effectively measure emotion understanding in low-resource settings in sub-Saharan Africa.

Due to investment from international stakeholders, several tools have been designed to

assess children's development holistically. These assessments provide a general picture of child development by collecting data across multiple domains, including social-emotional development. Though this is advantageous to gauge effectiveness of school readiness interventions, the need to condense broad domains into few items means some competencies may not be thoroughly tested. Indeed, these tools may be insufficient for providing an accurate measure of children's emotion understanding.

2.7.6 International Development and Early Learning Assessment (IDELA; Save the Children, 2011).

One prominent tool for assessing school readiness in low- and middle-income countries is the International Development and Early Learning Assessment (Save the Children, 2011). The IDELA was developed by Save the Children as a rigorous and adaptable tool to evaluate and monitor their early childhood learning and development programmes globally. The tool covers four domains: emergent mathematics and numeracy, emergent literacy and language, motor development, and social-emotional development. Validation for the IDELA comes from the implementation and adaptation of the tool across 11 countries from Asia and Africa (Pisani, Borisova & Dowd, 2015). Exerted efforts by Save the Children to make the instrument adaptable for multiple linguistic and cultural environments (at present it is available in 50 languages) have also meant there is a wealth of data publicly available to compare performance between countries.

Emotion understanding is addressed directly and indirectly within the IDELA domain of social-emotional development. The Emotional Awareness item addresses receptive knowledge of emotion labels and expressive knowledge of emotion causes: children provide examples of what makes them feel sad and happy. Expressive knowledge of emotion labels, and interpretation of emotion facial expressions are addressed in the Empathy item: children must interpret the facial expression of a girl crying and produce an appropriate description of how she feels. In terms of basic emotions, the IDELA is subsequently restricted to measuring emotions from the two-category perspective. Rather than investigating comprehension of a range of discrete positive or negative emotions, the IDELA is limited to just 'happy' and 'sad'. It thus positions itself to assess the valence dimension of pleasure-displeasure. In other languages, the tool is even less precise: the Swahili version of the tool (Save the Children, 2016) translates 'sad' as 'not happy' (*kukosa furaha*). This restricts measurement of receptive knowledge of emotion labels to exclusively measure knowledge of the term 'happy'.

Interpretation of emotion-eliciting situations is indirectly assessed in both the Empathy

and Conflict Resolution items. The Empathy item requires the child to generate two ways of helping the crying girl feel better. Similarly, the Conflict Resolution item presents a scenario in which the child and an imagined friend both want to play with the same tool. The child is asked to suggest two ways of resolving the situation. In both tasks, the child must accurately interpret the emotion of the other character to produce an appropriate response.

The IDELA deviates from other measures of emotion understanding by not assessing receptive or expressive knowledge of a range of basic emotions. As outlined above, basic emotions are believed to exist within all cultures, though facial expressions and emotion terms may differ according to cultural norms. Moreover, empirical studies have indicated by age 5 years most children are able to discriminate between happy, sad, angry and surprise (Widen, 2013). Given the target age-range of the IDELA, it would make sense to investigate children's knowledge of discrete emotions using culturally appropriate materials to establish a more detailed picture of their emotion understanding.

Furthermore, all IDELA items tapping emotion understanding require verbal responses. The social-emotional domain itself shares 82% of variance with the early literacy domain (Wolf et al., 2017). Although the influence of language on emotion comprehension is widely acknowledged, non-verbal cognitive abilities have also proven predictors of more complex stages of emotion understanding (such as morality and regulation) (Albanese, de Stasio, Chiacchio, Fiorilli & Pons, 2010). By not including non-verbal responses, the IDELA's ability to measure emotion understanding will favour children with higher language abilities (Lewis & Osborne, 1990). Equally, in cultures which value traits such as shyness, children may be reluctant to provide verbal responses, even if they are able to comprehend the task (Zuilkowski et al., 2016).

The IDELA is hence limited in its ability to effectively assess emotion understanding in three significant ways. First, the components of emotion understanding are not fully examined: receptive knowledge of emotion labels does not go beyond happy and sad; expressive knowledge of emotion labels is limited to a single expression of negative valence; and emotion situation knowledge is only explored indirectly through the child's response to a conflict scenario. Second, the two categories of emotion used in the IDELA do not allow children to demonstrate distinction between valence and arousal. Third, by not using an array of basic emotions, IDELA data is limited in its contribution to the debate around the universality of these emotions.

2.8 The current study

The current study investigated emotion understanding in children attending a state-run preschool in Zanzibar, Tanzania. The goal of this study was twofold: First, it aimed to examine how performance on a novel, culturally sensitive assessment of emotion understanding compared with performance on IDELA social-emotional items. Second, it sought to provide a more detailed picture of understanding of basic emotions among Zanzibari preschoolers.

The IDELA was deemed an appropriate tool for investigating emotion understanding in this context as it had already been standardised and adapted for use in Tanzania, including translation of all materials to Swahili. The novel test, named 'Fikiria Hisia', was developed for the purposes of this study, with the name 'Fikiria Hisia' translating as 'think about feelings' in Swahili. The Fikiria Hisia test (FHT) drew inspiration from the EMT (Izard et al., 2003), TEC (Pons & Harris, 2000) and AKT (Denham, 1986), and is comprised of six tasks exploring three components: interpretation of emotion facial expressions, receptive and expressive emotion-term knowledge, and knowledge of emotion-eliciting situations. To shed light on children's ability to differentiate emotions based on valence and arousal, four basic emotions were featured in the test: happy, sad, angry and scared. The study did not assume these emotions would necessarily reflect the emotion categories of the children. It was anticipated there may be culturally-informed variation in the way the emotions are interpreted and articulated. The second goal of the study was therefore not to investigate if knowledge of these emotions exists or not (Widen & Russell, 2003), but what knowledge exists about these emotions.

The study addressed the following research questions:

1. What is the relationship between the Fikiria Hisia test and the IDELA socio-emotional items?
    i) What is the relationship between performance on the FHT non-verbal tasks and performance on the IDELA socio-emotional items?
    ii) What is the relationship between a composite score combining FHT verbal and non-verbal tasks and performance on the IDELA social-emotional items when controlling for age, years in school and expressive language?
2. What do Zanzibari preschoolers know about four basic emotions?
    i) How does understanding of four basic emotions vary across four FHT emotion understanding tasks?

ii) Which emotion facial expressions do children associate with twelve different emotion-eliciting situations?

Scores were generated using a descriptive scoring code which allowed for analysis of error types. Age and years in school were operationalised as teacher-reported age and years in school. Expressive language was operationalised as scores on the IDELA Expressive Language item.

The aim of this study was to initiate exploration into the emotion understanding of children in an under-researched, low-resource setting that differs from Western societies both linguistically and culturally. Due to the complex nature of emotions and variation across cultures, it was not assumed this study would provide a full picture of emotion understanding in the given context. Instead, the present study intended to shed light on how this critical skill is developing among a sample of Zanzibari preschoolers.

3. Methodology

3. 1 Introduction

This chapter presents the design and procedures of the study. The aims of the study, its research questions and design will be outlined. Descriptions of the location, sample and recruitment procedure will be provided, followed by descriptions of measurements and apparatus used. Coding and scoring systems for each measure will also be explained, alongside issues of validity and reliability. A summary of the pilot study will be provided. Finally, ethical considerations are discussed.

3. 2 Aims

The aim of the current study was to explore emotion understanding in children attending a state-run preschool in Zanzibar. Specifically, it investigated the relationship between a novel assessment of emotion understanding, the Fikiria Hisia test (FHT), and performance on IDELA social-emotional items, and examined how children's knowledge of four basic emotions varied across different emotion understanding components. In doing so, this study addresses reports of a 'universal trend' in the development of emotion understanding (Albenese et al., 2010; Pons, et al., 2004). That is, while research has found preschool-aged children can recognise and label basic emotions (Cutting & Dunn, 1999; Izard et al., 2001), and comprehend the situational causes of emotions (Pons et al., 2004; Dunn, Brown & Maguire, 1995), few studies have addressed emotion understanding in low-income countries like Tanzania (Jukes et al., 2018). Moreover, in developing the FHT, this study explores the potential for the development of culturally sensitive assessments of social-emotional competencies, appropriate for use in a non-Western context.

3.3 Research questions

The research questions for this study were:

1. What is the relationship between the Fikiria Hisia test and the IDELA socio-emotional items?
    i) What is the relationship between performance on the FHT non-verbal tasks and performance on the IDELA socio-emotional items?
    ii) What is the relationship between a composite score combining FHT verbal and non-verbal tasks and performance on the IDELA social-emotional items when controlling for age, years in school and expressive language?

2. What do Zanzibari preschoolers know about four basic emotions?
    i) How does understanding of four basic emotions vary across four FHT emotion understanding tasks?
    ii) Which emotion facial expressions do children associate with twelve different emotion-eliciting situations?

3.4 Research design

This study uses a mixed-methods design. Quantitative data was generated by assessment scores and explored for correlations, while verbal answers within the FHT were also examined thematically. This allowed for the triangulation of data to help interpret participants' perceptions of the materials used in the FHT. As participant scores on the FHT and IDELA are compared, the study is also a within-subject design. This offers the advantage of reducing the amount of performance error owing to natural variance between participants.

3.5 Location

Data collection took place in Unguja, the largest island of the Zanzibar archipelago. Zanzibar is a semi-autonomous region of Tanzania in sub-Saharan Africa, with a population of approximately 1.3 million. According to the World Bank (2017), Unguja has a basic needs poverty rate of 18.4 %. The location was chosen due to its linguistic homogeneity; Swahili is the mother-tongue of most Zanzibari people. The dialect of Unguja is also that of standard Swahili, meaning children's vocabulary is less likely to be influenced by other dialects.

3.6 Participants

Participants were pupils attending a state-run preschool in Urban-West Zanzibar. Children are expected to attend two years of preschool, enrolling at age 4 years (ZEPD-II, 2017). The first year is known as 'Nursery', and the second, as 'Junior'. It was therefore anticipated participants would be aged between 4- and 6-years-old and provide a representative sample of Nursery and Junior preschool classes.

Class lists were used to generate a random sample of participants from each class. During the first week of assessments with Nursery pupils, it became apparent children of this age group had difficulty engaging with both the IDELA and FHT. There are a number of possible reasons for this. The decontextualized thinking required of such assessments can prove challenging if a society emphasises contextualized thinking (Greenfield, 2016). Jukes and colleagues (2018) hypothesise this may manifest in children as shyness, obedience and a

desire to fit in, competencies which could conflict with assessments presenting unusual topics and tasks. In this instance, the social-emotional tasks of both assessments presented topics outside the Zanzibar preschool curriculum (Zanzibar Institute of Education, 2012), and required children to spend one-to-one time with a 'teacher', something not typical of their preschool routine. Similarly, the FHT may have experienced 'researcher effects'; it was administered by a foreign researcher, which could have been distracting and/or intimidating for younger children. Consequently, the Nursery classes were dropped from the study and only children from Junior classes participated.

A random sample of 16 pupils from all four Junior classes was recruited (N = 64). Participants were required to complete the test battery to be included in the study. During data collection, Zanzibar experienced heavy rains, which prevented many children from attending preschool. The holy month of Ramadhan also commenced one week into data collection, which meant the school day was reduced by 1.5 hours. A shorter school day combined with absences due to rain prevented some pupils from completing the test battery. As a result, the total number of participants who had completed each assessment was unequal: IDELA, N = 57; FHT, N = 43. Data from the IDELA were only to be used to examine the relationship between the FHT and the IDELA, meaning it was not possible to include data of children who had only completed the IDELA. All participants who had completed the FHT had also completed the IDELA. The final sample was therefore 43 pupils (25 girls, 28 boys). Teacher-reported age was 5- (N = 9) and 6-years-old (N = 34). The number of years in school for each participant was also reported by teachers (1 year, N = 6; 2 years, N = 37). Teachers were encouraged to inform researchers at their own discretion if any child invited to participate was unsuitable for assessment due to developmental delays, behavioural issues or for any other reason. This led to one child being dropped from the study.

3.7 Recruitment

The participating preschool was approached because it fit the criteria (a state-run preschool in Zanzibar). The researcher's network of local contacts was drawn upon to approach the headteacher, as the school did not have access to email. Informed consent was obtained from the headteacher. According to Zanzibar's Ministry of Education and Vocational Training (MoEVTZ), the headteacher is authorised to consent on behalf of the school and all pupils to participate in research, meaning parental consent for this study was not necessary.

3.8 Measures

3.8.1 International Development and Early Learning Assessment (IDELA).

The IDELA was developed by Save the Children (2011) as a holistic and rigorous tool to support its international early childhood care and development programmes. The present study used a select number of items from the Tanzanian Swahili adaptation of the IDELA (Save the Children, 2016). All items in the IDELA social-emotional domain were administered. Self-Awareness (Item 1) consists of questions about the child's name, age, caregiver and nation. Friends (Item 9) requires the child to list name their friends, with a maximum score of 10. Emotional Awareness (Item 11) asks the child to mention things which make them feel happy/unhappy, and cite two ways of making themselves feel better (Item 10). Empathy uses a culturally-appropriate image of a girl crying. The child is then asked to describe how the girl feels, and mention two ways of helping her feel better. Sharing/Conflict Resolution (Item 12) encourages the child to imagine they are playing with their preferred toy, but another child would also like to play with it. The child must describe two methods of appropriately resolving the situation. Oral Vocabulary (Item 15) was administered to control for expressive language in performance on IDELA social-emotional items and the FHT. This item requires the child to list as many items within two categories (food and animals) as possible, with a maximum score of 10 per category. Finally, Shape Identification was used to provide a measure of emergent mathematics skill (Item 4). It was hypothesised scores for Shape Identification would not be associated with scores on the IDELA social-emotional items, or the FHT. As encouraged by the IDELA adaptation guidelines, some language was altered to better suit the Zanzibar ccontext. The assessment took approximately 10 minutes to administer.

3.8.2 Fikiria Hisia test (FHT).

The FHT was developed for the purposes of this study. It consisted of six tasks targeting three components of emotion understanding: facial expression matching, knowledge of emotion labels (expressive and receptive), and comprehension of which situations elicit which emotions. Drawing on basic emotion theory (Ekman, 1972; Izard, 1977), the test focused on four basic emotions: happy, sad, angry and scared. The tasks were as follows:

- Facial Expression Matching (Task 1; non-verbal) – Children were presented with a series of 12 cards, each with a target facial expression and three other expressions

(one matching the target and two distractors). Children were required to point to the expression which matched the target expression.

- Expressive Knowledge of Emotion Labels (Task 2; verbal) – Children were asked to describe how the target face in Task 1 was feeling.
- Receptive Knowledge of Emotion Labels (Task 3; non-verbal) – Children were presented with a series of 12 cards, each featuring one character demonstrating three basic emotions. Children were required to point to the expression matching a researcher-provided emotion label.
- Expressive Understanding of Emotion Situations (Task 4; verbal) – Children were asked one of three questions pertaining to the cause of the emotion provided in Task 3: What makes you feel (X)? When do you feel (X)? Did you feel (X) today?
- Receptive Interpretation of Emotion-Eliciting Situations (Task 5; non-verbal) - The researcher narrated 12 emotion-invoking scenarios (e.g., Huruma's dad has given him a present). For each situation, children were asked to choose from three facial expressions that which best matched the character's feeling
- Expressive Interpretation of Emotion-Eliciting Situations (Task 6; verbal) - Children were asked one of three follow up questions regarding the 12 scenarios from Task 5. Questions concerned the valence of the character's emotion, the specific emotion term and their own experience of the target emotion (e.g., Does he feel good or bad here? What is the name of this feeling? Are there times when you feel angry, like this?).

The assessment took approximately 20 minutes to administer.

3.9 Apparatus

A Dictaphone was used to record participants' verbal answers during the FHT. Non-verbal answers (pointing) were recorded using a pen and paper score sheet (Appendix A). The IDELA was administered using a pen and paper score sheet.

Both assessments took place in different corners of the school's hall. This was the most consistently quiet area of the school and provided shelter from the rain.

3.10 Procedure

3.10.1 Data collection.

For consistency, a local research assistant trained in administering the IDELA by Save the Children, Zanzibar was recruited to administer all IDELA, while the FHT was administered

by the researcher.

Children recruited were invited to complete the IDELA or FHT. The researcher accompanied the child to the hall where the tests took place. Before beginning, assent was sought from the child. Any child who did not want to take part was returned to their class. The researcher would then introduce themselves and ask the child a few questions about their day to establish rapport. Administration of the IDELA does not require any practice items, therefore none were used. This did not prove problematic, given IDELA items used for this study primarily relied on verbal responses, without the use of varied materials. The conversation between the research assistant and child to establish rapport thus seemed sufficient to prepare participants for responding to questions.

The FHT included several practice items used to screen children's understanding of task demands. Specifically, practice items aimed to ensure children could respond to questions by pointing to the answer, and match two images based on a general likeness, e.g., matching two different coloured fish among a group of animals. Children who failed all three practice items were given a participation sticker and returned to class. If a child passed all practice items, the researcher would then introduce the Dictaphone. As this is a novel item for most Zanzibari preschoolers, the researcher would explain the purpose of the Dictaphone (to record our voices) before switching it on. To allow children to feel some ownership over the new device, they were invited to choose which side of their body they would like to place the Dictaphone (the right or left side). The pilot indicated the Dictaphone may not pick up quieter voices and would be unable to capture non-verbal responses such as physical expressions. The researcher therefore repeated aloud any answers which were softly spoken, or non-verbal, to ensure they would be included in analysis.

Throughout both assessments, children were free to take a break, or to return to class if they wished. All children who participated, including those who did not complete an assessment, were given a yellow smiley-face sticker as a reward. Stickers were chosen because they were uniform and not gendered. Before returning to the class, children were thanked verbally for their great work, and invited to ask any questions.

The order of assessments was counterbalanced, so those who completed the FHT on the first day would complete the IDELA on the following day, and vice versa. The time of testing was also counterbalanced, meaning if a child was the first to complete the FHT on day one, they would be the last to complete the IDELA on day two. However, due to unpredictable attendance prompted by the bad weather, completion of the second assessment was often delayed and counterbalancing of time of testing was not always possible.

3.10.2 Coding and scoring.

International Development and Early Learning Assessment. Data collected using the IDELA was coded according to IDELA guidelines: 1 = correct, 0 = incorrect, 999 = non-attempt. For analysis purposes, answers initially coded 999 were re-coded as 0, and scores for each item were calculated as a proportion. All IDELA were administered by the research assistant.

Fikiria Hisia test. Non-verbal responses were initially coded using the following scheme to allow for analysis of errors.

1	Correct (including self-corrected final answer)
0	Incorrect (including self-corrected final answer; if two faces chosen and both are incorrect)
4	Chose two faces, one face was correct
5	Stated no face matched target face/label
6	Chose all three faces
7	No response
8	Chose same option repeatedly (e.g., middle face)

All answers not originally coded as 1 were then re-coded as 0 for quantitative analysis.

Verbal answers were first transcribed from Swahili to English by the researcher. Respective scoring schemes were developed for the Expressive Knowledge of Emotion Labels and Expressive Understanding of Emotion Situations tasks. Answers were coded as 1 if acceptable, and 0 if unacceptable (see Appendix B for full coding scheme). To allow for examination of error-types, the codes aimed to highlight themes present in incorrect answers. A scoring scheme was not developed for Expressive Interpretation of Emotion-Eliciting Situations, as the nature of the task (interpreting a situation) is considered subjective and therefore unsuitable for scoring.

3.11 Validity and Reliability

The psychometric properties of validity and reliability are important in assessments and influence the accuracy and generalisability of findings. Validity refers to whether an instrument actually measures what it intends to measure (Field, 2009). Reliability concerns 'whether an instrument can be interpreted consistently across different situations,' (Field, 2009, p.11).

The validity and reliability of the IDELA were investigated by Pisani, Borisova and Dowd (2015), specifically, its internal consistency, inter-rater reliability and construct validity. Internal consistency 'measures correlation between items that propose to measure the same construct' (Pisani, et al., 2015, p.9) using Cronbach's alpha (α). Average α for the domains used in this study were 0.77 (Emergent Literacy and Language), 0.79 (Emergent Numeracy) and 0.75 (Socio-emotional Development). According to George and Mallery (2003), $\alpha > .7$ is considered acceptable. Construct validity concerns whether an instrument effectively measures an intended topic (Robson, 2011). Construct validity for the IDELA constructs used in this study was confirmed by examining whether differences in performance for these developmental outcomes remained when controlling for dimensions known to influence scores (such as age and socio-economic status) (Pisani et al., 2015). Inter-rater reliability considers how much variance in performance exists when two independent observers assess the same individual. This is particularly important when scoring requires the assessor to determine the appropriateness of an answer. Using Fleiss' benchmarks for interpretation, the IDELA was found to have excellent inter-rater reliability across all domains (ranging from .87 to .93). For the present study, inter-rater reliability was established by having two researchers simultaneously score 3 participants. Cohen's kappa was used to measure the degree of agreement between both assessors. The kappa value was 0.98, which is considered very good (Bryman, 2012).

Construct validity for the FHT was ensured by drawing on existing theory and measures of emotion comprehension in its design. In particular, the test combined and adapted tasks from the AKT (Denham, 1986), TEC (Pons & Harris, 2000) and EMT (Izard et al., 2003) (see 2.7 for descriptions of tests). Content validity was ensured through use of standardised images. Images used in the test materials used expressions developed by Ubongo, a leading creator of edu-tainment content in Africa. Images (Appendix C) were standardised by Ubongo using a sample of Tanzanian children. Permission was obtained from Ubongo for use of these images in the FHT (Appendix D). Using Tanzanian standardised images ensured the four basic emotions were expressed in discrete, independent ways, familiar to the sample for this study.

Two pilot studies also contributed to the content validity of the FHT. Pilots were conducted in state-run preschools in Dar es Salaam and Zanzibar to ensure emotion-evoking situations were relevant to the sample and associated with the target emotions. For example, it emerged that 'being given a balloon' evoked happiness for children in Dar es Salaam, but anger and sadness for children in Zanzibar. A Zanzibari preschool teacher suggested this is because children are discouraged from playing with balloons in Zanzibar as they are

considered a choking hazard. Appropriate changes were subsequently made. Changes to emotion labels, however, were not made, even if children struggled to understand particular labels. This is because one aim of the study was to investigate how familiar children were with emotion labels for four basic emotions. Inter-rater reliability was not necessary for non-verbal answers (pointing), due to the straight-forward nature of scoring (putting a mark next to the expression chosen by the participant and then coding as correct or incorrect accordingly). As verbal answers were audio-recorded, inter-rater reliability was established by having 10% of transcribed responses for the Expressive Knowledge of Emotion Labels and Expressive Understanding of Emotion Situations tasks scored by two researchers and comparing variance across scores. Kappa values were .808 (very good) and .743 (good) respectively (Bryman, 2012). A protocol (Appendix E) was followed for all assessments, which contributes to its reliability by enabling it to be replicated. Moreover, each FHT was administered by the same researcher, controlling for researcher effects.

Ecological validity, the extent to which findings are representative of participants' everyday lives (Cicourel, 1982), is uncertain in this study. This is because the assessment presented emotions in a decontextualized manner, while in everyday life children are able to draw on other contextual sources of information to make sense of an emotion (see 2.7.4).

3.12 Ethical Considerations

This study was granted approval by the Central University Research Ethics Committee (CUREC) (Appendix F). A research permit (Appendix G) was also obtained from the Second Vice President's Office, Zanzibar with approval from MoEVTZ. As cited in 3.7 above, consent was sought from the headteacher. Consent was opt-in because the study was exploratory, required a commitment of four consecutive weeks, and related only indirectly to the school's curriculum. Before obtaining consent from the headteacher, the consent form (Appendix H) was approved by the Second Vice President's Office. Verbal assent was sought from each child before they took part in the study. Each child was also informed that they would be recorded. In between each task, verbal assent was sought before continuing. As children completed the assessments during class-time, verbal consent was also sought from their teacher. Whilst the assessments aimed to be as engaging as possible for the children, assessments were paused during break-time to ensure children did not miss out on the opportunity to play or eat the snack provided by the school.

As the FHT prompted children to recall negative experiences, the researcher was mindful that harmful experiences may need to be brought to the attention of an authority. The

Zanzibar Children's Act of 2011 states any person legally responsible for a child (including teachers) 'may discipline their children in such a manner which shall not amount to injury to the child's physical and mental well-being,' (2011, p.12). A recent survey on violence against children in Zanzibar, reported physical violence as a form of punishment to be common at home and school (UNICEF, 2017). It was therefore considered child reports of physical violence (hitting or beating) at home or at school should not prompt further action from the researcher.

4. Analysis and Results

This study had two primary goals. The first was to investigate the relationship between a novel, culturally sensitive assessment of emotion understanding, the Fikiria Hisia test, and the IDELA social-emotional items. The second goal was to explore participants' level of emotion understanding in relation to four basic emotions from a perspective which embraces the notion that emotions and emotion understanding may be culturally relative.

This chapter presents descriptive statistics for the Fikiria Hisia test (FHT) and IDELA. Each research question will be addressed in turn, outlining the analytic strategy used and presenting the results.

4.1 Descriptive statistics

Table 2 presents descriptive statistics for scores on all IDELA items used in the present study, and four FHT tasks: Emotion Facial Expression Matching, Receptive Knowledge of Emotion Labels, Expressive Knowledge of Emotion Labels, and Expressive Understanding of Emotion Situations. Descriptive statistics are not presented for the final two FHT tasks as these required children to interpret emotion-eliciting situations and were therefore considered to offer subjective interpretations which would not be captured in a score.

Table 2

Descriptive Statistics of all IDELA items and four Fikiria Hisia Test tasks

Variable	Maximum Score	M	SD	SE
FHT Emotion Facial Expression Matching	12	6.6	2.761	0.421
FHT Receptive Knowledge of Emotion Labels	12	6.09	2.477	0.378
FHT Expressive Knowledge of Emotion Labels	12	2.23	2.959	0.451
FHT Expressive Understanding of Emotion Situations	12	7.37	3.645	0.556
IDELA Self-Awareness	6	4.547	0.905	0.138
IDELA Friends	10	4.86	2.199	0.335

IDELA Emotional Awareness	4	2.23	1.13	0.172
IDELA Empathy	3	2.26	1.002	0.153
IDELA Conflict Resolution	2	1.28	0.666	0.102
IDELA Expressive Language	20	10.58	4.727	0.721
IDELA Emergent Math	5	2.86	1.265	0.193

Notes: N = 43. Maximum Score indicates the highest possible score for each variable.

To address each research question appropriately, specific variables were used for each analysis. The first research question investigated the relationship between the FHT and IDELA social-emotional items using two analyses. The first analysis examined the relationship between FHT non-verbal scores and IDELA social-emotional scores. For this, FHT variables for tasks requiring non-verbal responses were selected, namely: Emotion Facial Expression Matching and Receptive Knowledge of Emotion Labels. All IDELA social-emotional variables were included: Self-Awareness, Friends, Emotional Awareness, Empathy, and Conflict Resolution. The second analysis used a composite score of all FHT variables (presented in Table 2) to investigate the relationship between combined scores on FHT verbal and non-verbal tasks and scores on IDELA social-emotional items when controlling for IDELA Expressive Language. It was not possible to run this analysis using only scores for FHT verbal tasks as these variables (Expressive Knowledge of Emotion Labels and Expressive Understanding of Emotion Situations) did not correlate significantly with performance on IDELA social-emotional items (Appendix J).

The second research question, exploring participants' knowledge of four basic emotions, was also addressed in two ways. First, we examined emotion-specific performance across the four FHT tasks presented in Table 2. Then, we observed the frequency of emotion facial expressions being chosen in relation to emotion-eliciting situations. Here, responses from a fifth FHT task (Receptive Interpretation of Emotion-Eliciting Situations) were used, whereby participants chose an emotion facial expression to represent the feeling of a character in a researcher-provided situation.

4.2 What is the relationship between performance on the Fikiria Hisia test non-verbal items and performance on the IDELA social-emotional items?

4.2.1 Analysis strategy.

This question was addressed in two stages. Total scores for FHT non-verbal items and IDELA social-emotional items were created respectively (explained in 4.2.2 and 4.2.3 below). The relationship between these scores was then examined using linear regression.

4.2.2 Internal consistency for IDELA social-emotional items.

Pisani, Borisova and Dowd (2015) reported internal consistency between all IDELA social-emotional items. Internal consistency measures the correlation between items that claim to measure the same construct (George & Mallery, 2003). According to George and Mallery's (2003) rules of thumb, internal consistency is considered good when $\alpha > 0.7$. For IDELA social-emotional items, $\alpha = 0.75$ (Pisani et al., 2015). It was therefore appropriate to use a composite score of all IDELA social-emotional items in this study. The test developers recommend combined performance on all IDELA social-emotional items be represented as an average proportion (IDELA, 2019). This is because, as denoted in Table 2, the maximum score for each item varies. Statistical analysis for this study has therefore used the average proportion for the variable, IDELA Social-Emotional Performance.

4.2.3 Pearson's Correlation Coefficients - assumptions

This stage of analysis investigated the correlation coefficients between the FHT variables of Emotion Facial Expression Matching and Receptive Knowledge of Emotion Labels, given both variables required non-verbal responses. Pearson's correlation coefficients test was used for this analysis. Both variables met the assumptions of this statistical test, namely: variables should be measured at the interval level, be normally distributed and have no significant outliers (Field, 2009). Both variables were measured at the interval level. Normality was assumed in the sample size ($N = 43$), which is possible when examining correlation coefficients with a sample greater than 30 (Field, 2018). Boxplots revealed a single outlier for FHT Emotion Facial Expression Matching where the score was 0 (Appendix J). However, this score was included in the analysis because it was less than 3 standard deviations from the mean ($SD = 2.3904$) (Field, 2009). This indicates that for one participant performance on this task was at floor: the task was too difficult for this participant. Floor effects threaten the validity of a measure if there is a concentration of participants scoring at the lower limit

(Hessling, Schmidt & Traxel, 2004). Given only one participant scored 0, this floor effect was not considered detrimental to analysis.

4.2.4 Pearson's correlation coefficients – results.

A significant positive association was found between scores on Emotion Facial Expression Matching and Receptive Knowledge of Emotion Labels ($r = .542$, $p < .001$). It was therefore considered appropriate to combine scores on these items to create composite score. The variable for this composite score was named FHT Non-Verbal Emotion Understanding.

Table 3 presents descriptive statistics for the variables using composite scores: FHT Non-Verbal Emotion Understanding and IDELA Social-Emotional Performance.

Table 3

Descriptive Statistics for IDELA Social-Emotional Performance and FHT Non-Verbal Emotion Understanding

Variable	Maximum Score	M	SD	SE
IDELA Social-Emotional Performance	1	0.639	0.128	0.196
FHT Non-Verbal Emotion Understanding	24	12.7	4.601	0.702

Notes: N = 43. Maximum Score indicates the highest possible statistic for each variable.

4.2.5 Linear regression – assumptions.

Linear regression was used to compare the relationship between FHT Non-Verbal Emotion Understanding and IDELA Social-Emotional Performance. All assumptions for linear regression including on predictor and one outcome variable were met. Linearity was confirmed by examining correlation coefficients for the two variables. A significant positive linear relationship was found ($r = .331$, $p < .05$). Homoscedasticity was checked using a scatterplot of predicted values versus standardised residual values (Appendix J), which shows residuals at each level of the predictor variable (FHT Non-Verbal Emotion Understanding) have the same variance (Field, 2018). A histogram shows the assumption of independent errors was met as the residuals are approximately normally distributed (Appendix J).

4.2.6 Linear regression – results.

A simple linear regression was calculated to predict IDELA Social-Emotional Performance based on FHT Non-Verbal Emotion Understanding. A significant regression

equation was found ($F(1, 41) = 5.043$, $p < .05$), with an R^2 of .110, indicating FHT Non-Verbal Emotion Understanding explained 11% of variance in IDELA Social-Emotional Performance. Participants' predicted score on IDELA Social-Emotional Performance is equal to 0.522 + 0.009 (FHT Non-Verbal Emotion Understanding). This shows IDELA Social-Emotional Performance increased by 0.009 for each additional point gained on FHT Non-Verbal Emotion Understanding.

4.3 What is the relationship between FHT verbal and non-verbal items and performance on the IDELA social-emotional items when expressive language is controlled for?

4.3.1 Analysis strategy.

This research question was also addressed in two stages: principle component analysis to extract a single, emotion understanding component from the variables within the Fikiria Hisia test; and hierarchical regression to investigate the relationship between the emotion understanding component and performance on IDELA social-emotional items.

4.3.2 Principle component analysis – assumptions.

The purpose of principle component analysis (PCA) is to reduce interrelated variables to fewer components without losing too much of the information of the original variable (Jolliffe, 2002).

PCA was conducted to determine if all FHT tasks with quantifiable measures of performance (Emotion Facial Expression Matching, Receptive Knowledge of Emotion Labels, Expressive Knowledge of Emotion Labels and Expressive Understanding of Emotion Situations) would load onto a single component. Descriptive statistics for each task are presented in Table 2 (see 4.1 above).

All assumptions for PCA were met. All variables included were continuous. Linearity was established using scatterplots which showed a linear relationship between all variables (Appendix J). Sampling adequacy was determined by the Kaiser-Meyer-Olkin (KMO) test: a value of 0.631 was found. According to Kaiser's (1974) rule of thumb, a value of .6 - .7 is acceptable. Suitability for reduction was determined using Bartlett's Test of Sphericity. This test investigates the null hypothesis that the correlation matrix has an identity matrix, meaning all correlations between variables would be zero (Field, 2018). Bartlett's Test of Sphericity found a statistically significant interrelationship between the four FHT variables ($p < .01$) which meant the null hypothesis could be rejected. Finally, boxplots were used to

check for outliers. As reported above, there was one mild outlier for Emotion Facial Expression Matching, and no outliers for Receptive Knowledge of Emotion Labels. Additional boxplots (Appendix J) showed no outliers for performance on Expressive Understanding of Emotion Situations, but several outliers for Expressive Knowledge of Emotion Labels. Field (2009) recommends any outlier three or more standard deviations from the mean be transformed or removed. The most extreme outlier in this instance had a score of 10 and was 2.625 standard deviations from the mean. It was thus possible to proceed without transforming or removing the outliers.

4.3.3 Principle component analysis – results.

A single component was extracted, based on the principle that only components with an eigenvalue greater than 1 should be retained (Ledesma & Pedro, 2007). This is evidenced in the scree plot (Appendix J). The single component explained almost half of the variance (49.499%), indicating that the four FHT variables were in some way held together by an underlying component. This suggested it was appropriate to combine performance on all four variables to create a composite score: FHT Emotion Understanding.

4.3.4 Hierarchical multiple regression – assumptions.

The second stage of analysis examined the relationship between FHT Emotion Understanding and IDELA Social-Emotional Performance when IDELA Expressive Language was controlled for. Before running the regression analysis, correlation coefficients between the three variables were examined. FHT Emotion Understanding showed a significant positive relationship with IDELA Social-Emotional Performance (r = .381, p <.05). IDELA Expressive Language also showed a significant positive relationship with IDELA Social-Emotional Performance (r = .460, p <.01). However, no significant association was found between FHT Emotion Understanding and IDELA Expressive Language (r = .236, p = .128). As multiple regression only requires linearity between each predictor variable and the outcome variable, this was not considered cause to reject the use of multiple regression.

All assumptions for performing hierarchical multiple regression were met. These are: adequate sample size for the number of predictor variables; linearity between each predictor variable and the outcome variable; no multicollinearity between predictor variables; multivariate normality; homoscedasticity, and normally distributed residuals. According to Stevens (1996), an adequate sample size for this type of statistical test contains at least 15

participants per predictor variable. The sample size of 43 for this study was deemed adequate given two predictor variables (FHT Emotion Understanding and IDELA Expressive Language) were to be included in the analysis. Linearity between predictors and the outcome variable was confirmed with scatterplots (Appendix J). Correlation coefficients for both predictor variables were examined for multicollinearity. A high correlation (r >.80) would imply multicollinearity. The correlation between IDELA Expressive Language and FHT Emotion Understanding (r = .236) indicated no multicollinearity. Multivariate normality and homoscedasticity were confirmed with a P-P plot and scatterplot (Appendix J). Finally, a histogram indicated residuals were normally distributed (Appendix J).

4.3.5 Hierarchical multiple regression – results.

The two predictor variables were entered in sequential steps. IDELA Expressive Language was entered as the first predictor. In light of empirical research highlighting the relationship between language and the construct of emotion understanding (e.g., de Rosnay & Harris, 2000; Taumoepeau & Ruffman, 2006), and the fact that all IDELA social-emotional items required verbal responses, it seemed plausible that IDELA Expressive Language may explain a considerable amount of variance in IDELA Social-Emotional Performance. FHT Emotion Understanding was added as the second predictor to investigate if emotion understanding, as measured by the FHT, was an independent predictor of IDELA Social-Emotional Performance, given emotion understanding has been found to contribute to social competence (e.g., Denham et al., 2003). Table 4 depicts the two regression models.

Table 4

IDELA Expressive Language and FHT Emotion Understanding as predictors of IDELA Social-Emotional Performance

	Model 1				Model 2			
	B	*SE*	*β*	*p*	*B*	*SE*	*β*	*p*
IDELA Expressive Language	0.013	0.004	0.46	**	0.011	0.004	0.392	**
FHT Emotion Understanding					0.004	0.002	0.289	*
ΔR^2					0.079	$F_{(1, 40)} = 4.450$		*
R^2	0.211	$F_{(1, 41)} = 10.989$		**	0.29	$F_{(2, 40)} = 8.182$		***

*Notes: All parameter estimates are from SPSS. * p <.05, ** p <.01, *** p <.001*

As shown in Table 4, IDELA Expressive Language explains a significant amount of variance (21.1%) in IDELA Social-Emotional Performance. FHT Emotion Understanding predicted an additional 7.9% of variance, which was also statistically significant. This indicates emotion understanding ability, as measured by FHT Emotion Understanding, uniquely contributes to performance on IDELA social-emotional items above and beyond the IDELA measure of expressive language.

4.4 How does understanding of four basic emotions (happy, sad, angry and scared) vary across the three components of emotion understanding in the Fikiria Hisia test?

4.4.1 Analysis strategy.

To answer this question, aggregate scores were created for each participant's performance on questions pertaining to each of the four emotions. This was done at the task level. Across the four tasks, three components of emotion understanding were measured: emotion facial expression matching, knowledge of emotion labels, and understanding of emotion-eliciting situations. Knowledge of emotion labels was addressed across two tasks as expressive and receptive knowledge respectively. Comparing performance on items for each emotion across the four tasks would therefore enable a more detailed picture of participants' understanding of these emotions to emerge. Table 2 shows mean scores for each task. Emotion-specific scores were calculated as a proportion because a design error in two tasks (facial expression matching and expressive knowledge of emotion labels) meant unequal distribution of items per emotions (3 happy, 3, sad, 2 angry and 4 scared).

4.4.2 Results.

Table 5 shows the median, skewness and kurtosis for each emotion across the four tasks. The median was chosen as the measure of central tendency due to significant skewness and kurtosis in score distribution for most tasks. A higher median score indicates a greater number of participants gave correct responses; a lower median score indicates fewer participants gave correct responses, suggesting participants found the task difficult.

Table 5

Median Knowledge of Basic Emotions Across Four Emotion Understanding Tasks

	Facial Expression Matching			Expressive Knowledge of Emotion Labels*		
Emotion	Mdn	Skewness	Kurtosis	Mdn	Skewness	Kurtosis
Happy	0.33	0.024	-1.266	0	1.108	-0.624
Sad	1	-1.996	3.635	0	1.647	1.433
Angry	0.5	0.46	-1.325	0	2.628	5.811
Scared	0.5	0.307	-0.355	0	1.572	0.99

*Notes: *performance on this task showed floor effects, so error analysis was conducted on children's answers (reported in Table 6)*

Table 5 Continued

	Receptive Knowledge of Emotion Labels			Expressive Understanding of Emotion Situations		
Emotion	Mdn	Skewness	Kurtosis	Mdn	Skewness	Kurtosis
Happy	0.67	-0.745	-0.833	0.67	-0.472	-1.298
Sad	0.33	0.494	-1.324	0.67	-0.253	-1.265
Angry	0.67	-0.655	-1.066	1	-0.849	-0.657
Scared	0.33	0.571	-0.378	0.67	-0.139	-1.354

Table 5 shows performance varied for each basic emotion term across the three components of emotion understanding. Examination of the median scores indicates median performance for 'sad' was highest for the emotion facial expression matching task, and lowest for expressive knowledge of emotion labels. Median performance for both 'scared' and 'angry' was highest for the expressive understanding of emotion situations task and lowest for the expressive knowledge of emotion labels task. For 'happy', the median was equally high for the expressive understanding of emotion situations and receptive knowledge of emotion labels tasks, and, like the other emotions, lowest for the expressive knowledge of emotion labels task. As floor effects were found for expressive knowledge of emotion labels (*Mdn* = 0 for all emotions), children's answers for how the character was feeling in this task were examined. Acceptable answers (the child's answer matches the expected answer) and three types of errors were coded: appropriate behavioural manifestation of target emotion; emotion term of opposite valence or arousal; and 'other', which comprised of responses of inappropriate behavioural manifestations, statements unrelated to internal state, and unknown or nonresponses.

4.4.3 Chi-square – assumptions.

A chi-square test was used to test the null hypothesis that the variables (basic emotion label and answer type) for expressive knowledge of emotion labels were independent: the frequency of each answer type would be equally distributed across each emotion.

The data met assumptions for this statistical test: independence of residuals and expected frequencies. Independence of residuals requires that 'one person, item or entity must contribute to only one cell of the contingency table,' (Field, 2018, p.849). The data met this assumption as responses for just one task were examined so no repeated measures were used. Field recommends that to satisfy the assumption of expected frequencies with tests of more than two variables, 'all expected counts should be greater than 1 and no more than 20% of expected counts should be less than 5,' (2018, p.849). The minimum expected count for this data set was 12.74 and no cells had an expected count less than 5.

4.4.4 Chi-square – results.

Table 6 presents the frequency of acceptable answers and different error types for the four emotions compared.

Table 6

Proportion of Expressive Knowledge of Emotion Label Answer Type by Emotion

Emotion	Acceptable	Appropriate Behavioural Manifestation	Opposite Valence/Arousal	Other
Happy	25.6%[a]	26.4%[a, b]	6.2%[c]	41.9%[b]
Sad	18.6%[a]	57.4%[b]	3.1%[c]	20.9%[c]
Angry	9.6%[a]	7.4%[a]	20.2%[b]	62.8%[b]
Scared	17.4%[a]	0%[b]	23.3%[c]	59.3%[a]
χ^2 (9) = 190.261, $p < .001$				

Notes: Percentage figures shown represent the distribution of answers within each emotion. Each subscript letter denotes a subset of Answer Type categories whose column proportions do not differ significantly from each other, p >.05

Table 6 indicates the null hypothesis was rejected: there was a statistically significant relationship between basic emotion and answer type ($p < .001$). Examining significant differences between answer types indicates that, for every emotion, the proportion of some error types differed significantly from the proportion of acceptable answers. For happy and angry, the proportion of incorrect answers citing a term of opposite valence or arousal, and 'other' incorrect answers differed significantly from the proportion of acceptable answers. For sad, all error-types differed significantly from the proportion of acceptable answers. For

scared, the proportions of incorrect answers citing appropriate behavioural manifestation and terms of opposite valence or arousal were significantly different to the proportion of acceptable answers. Notably, for sad, most participants responded with an appropriate behavioural manifestation of sadness (e.g., crying), while for all other emotions most participants responded with 'other' incorrect answers. This is interesting, given the median performance for sad was highest on facial expression matching (for which children matched an outward manifestation of sadness).

4.5 Which emotion facial expressions do children associate with emotion-eliciting situations?

The twelve situations were selected based on feedback from pilot studies and were thus anticipated to equally represent the four basic emotions (3 happy, 3 sad, 3 angry and 3 scared). For each situation, only three emotion facial expressions were available to choose from: two distractor expressions and one target expression. While the unique facial expressions for each emotion were consistent across all situations, the face on which the expression appeared varied between situations, in accordance with the gender of the character concerned.

4.5.1 Analysis strategy.

We examined the frequency of each emotion facial expression being chosen for each emotion-eliciting situation. Responses for one participant were excluded as they consistently chose the answer in the same place, implying an indiscriminate approach to the task which 'interferes with the goal of identifying the true ability,' (Lau, Lau, Hong & Usop, 2011, p.99). Similarly, any response where all three available expressions were chosen was excluded. Responses where two expressions were chosen were included to allow for the possibility that children are demonstrating knowledge of mixed emotions (Pons et al., 2004). Finally, it was decided to include responses where the participant stated none of the expressions available matched the situation provided, as this may indicate none of the expressions provided resonated with the individual child's interpretation of the situation.

4.5.2 Results.

Table 7 presents the twelve situations along with the anticipated emotion and frequency for each emotion facial expression.

Table 7

Frequency of Each Emotion Facial Expression by Emotion-Eliciting Situation

Situation	Anticipated Emotion					None
Huruma has been given a gift.	Happy	23	14	5		
Asma's dad bought her new clothes for (Eid).	Happy	23	9		9	
Pili is playing with her friends.	Happy	30		7	3	
Rajabu has lost his favourite ball.	Sad		19	12	11	
Baraka's friends left without saying goodbye.	Sad	5	32	6		
Neema's mum left her at home.	Sad	6	22	13		
Samira's peers are laughing at her.	Angry	16		11	17	
Feisal's little brother hit him.	Angry	6		11	24	1
Salim's classmate snatched his pencil.	Angry		21	15	5	
Aisha has come across a snake.	Scared	8	25		10	
Abu had a bad dream.	Scared		15	15	11	
Amina is home alone at night.	Scared	4		12	24	

The results indicate that for all situations there was variation in the emotion expressions they elicited. For all situations anticipated to elicit happiness, the smiling face was most frequently chosen. Similarly, for all situations anticipated to elicit sadness, the crying face was most

frequently chosen. For all situations anticipated to elicit anger, there was inconsistency across the facial expressions chosen. For two of these situations, expressions of a similar valence (sad and scared) proved most popular. However, for the situation 'Samira's peers are laughing at her', the smiling face and the 'scared' face were similarly favoured (N = 16, N = 17 respectively). For situations anticipated to elicit fear there was also some inconsistency, with the 'scared' expression the most frequently chosen for only one situation ('Amina is home alone at night').

5. Discussion

5.1 Interpretation of findings

The present study aimed to build on the body of research concerning emotion understanding in young children by exploring this ability among preschoolers in Zanzibar, a low-resource and under-researched location. Moreover, this study sought to address the need for culturally sensitive assessment tools in sub-Saharan Africa by developing a measure of emotion understanding informed by Zanzibari language and culture: the Fikiria Hisia test (FHT). Analyses focused on two areas of investigation. First, the relationship between the FHT and social-emotional skill as measured by the IDELA was examined. The latter was chosen owing to claims that it is a rigorous and highly adaptable instrument, suitable for use in low-income countries (Pisani et al., 2015). Second, participants' understanding of four basic emotions was explored by examining responses across FHT tasks.

5.2 Relationship between the Fikiria Hisia test and IDELA social-emotional items

5.2.1 Performance on FHT non-verbal tasks as a predictor of IDELA social-emotional performance.

Findings showed a significant positive relationship between scores on FHT non-verbal tasks and IDELA social-emotional items. Scores on FHT non-verbal tasks explained a significant amount of variance (11%) on IDELA social-emotional items. This supports the theory that children may acquire receptive skills in emotion understanding alongside expressive skills (Morgan et al., 2010). Moreover, it suggests reliance on verbal responses in the IDELA social-emotional items could mean children with receptive skills, but poor expressive abilities are overlooked. Non-verbal cognition (assessed by the Coloured Progressive Matrices; Raven, 1984) has previously been found to only predict more complex components of emotion understanding (Morality, Regulation and Mixed emotions) when age is controlled for (Albanese et al., 2010). Although, in the current study, age was controlled for by recruiting a narrow age band, data for participant age was teacher-reported and may have been skewed; the school did not appear to have any record of pupils' date of birth. It is possible, then, that the variance in IDELA social-emotional items explained by non-verbal emotion understanding is, itself, influenced by the underlying contribution of age.

5.2.2 An FHT composite score as a predictor of IDELA social-emotional performance.

The relationship between composite scores on the FHT (combining scores from verbal and non-verbal tasks) and performance on IDELA social-emotional items was also examined, controlling for expressive language. Results indicated that composite scores on the FHT uniquely predicted 7.9% of variance in performance on IDELA social-emotional items, and that this was significant. This is less than the amount of variance explained by FHT non-verbal task scores. Albeit responses to non-verbal tasks did not require expressive language, we can speculate that because comprehension of the task necessitated some language skill, language may have also contributed to the variance explained by performance on FHT non-verbal tasks. Given language has consistently been found to be strongly associated with emotion understanding, it is unsurprising that the regression model containing both FHT composite scores and expressive language explained 29% of variance in performance on IDELA social-emotional items.

5.3 Validity of the FHT

Another interesting finding emerged from the principle component analysis of FHT tasks. This was conducted to investigate the suitability of combining performance on FHT verbal and non-verbal tasks to create a composite score of emotion understanding. The four FHT tasks loaded onto a single component. This can be interpreted as a measure of construct validity: all four tasks are in some way held together by an underlying component. Considering the theoretical underpinnings of the FHT, we can infer that this component is one of emotion understanding. This is significant, given the acute need for valid and reliable assessment tools which accommodate the nuances of non-Western cultures (Harkness et al., 2013), and are suitable for use in low-resource settings (Wolf et al., 2017). Furthermore, the significant positive correlation between FHT composite scores and IDELA social-emotional performance suggests a degree of concurrent validity for the FHT. That is, because the IDELA measures components of emotion understanding (receptive and expressive knowledge of emotion labels, understanding of emotion situations) within its social-emotional domain, it is plausible the significant correlation is due to the fact that the FHT also measures these components. However, as discussed in 2.7.6 above, these IDELA items are limited in their ability to effectively measure components such as receptive knowledge of emotion labels, and facial expression recognition. As such, concurrent validity for the FHT would need to be further investigated by comparing it with more robust assessments of emotion understanding (e.g., Emotion Matching Task; Izard et al., 2003).

5.4 What do Zanzibari preschoolers know about four basic emotions?

The second research question examined participants' knowledge of four basic emotions (happy, sad, angry and scared) from an exploratory perspective.

5.4.1 Understanding of four basic emotions varies across four FHT emotion understanding tasks.

Examination of the median scores for each emotion by task showed that, for all emotions, performance varied across the tasks. Interestingly, performance on different tasks favoured different emotions. Median scores are taken in this study to capture the central tendency of performance on each task. For facial expression matching, median performance was highest when the target face was sad. In contrast, for expressive understanding of emotion situations, median performance was highest when participants provided a situation in which they felt angry. For receptive knowledge of emotion labels, median performance favoured the labels for happy (*furaha*) and angry (*hasira*) over those for sad (*huzuni*) and scared (*hofu*). These findings have implications for the developmental trajectory of emotion understanding in young children, as well as the importance of emotion labels. One interpretation is that results support the gradual acquisition of components of emotion understanding, as suggested by the developmental model of emotion understanding (Pons et al., 2004). Yet, while the developmental model supposes Recognition, External cause and Reminder emerge simultaneously around age 3-4 years, these findings imply the order in which components are acquired may depend on the emotion. This notion further challenges the theory of emotion-concept acquisition purported by Widen and Russell (2003). They propose emotion labels are mastered at the same time as emotion concepts, and that this facilitates the categorisation of emotion experiences in a more nuanced manner. For example, in acquiring the terms 'sad' and 'angry', a child can distinguish the feeling of displeasure according to the dimension of arousal (intensity). Results outlined here suggest Zanzibari preschoolers may acquire the concept of some basic emotions before their unique labels. Emphasis on specific emotion labels in assessments of emotion understanding may consequently limit our ability to measure young children's emotion understanding.

Equally, emotion labels used in this study may not have accurately reflected the language of participants' everyday lives. For example, the FHT used emotions in their noun form: *furaha* (happiness), *huzuni* (sadness), *hasira* (anger), *hofu* (fear). The same emotions can also be expressed as verbs: *kufurahi* (to be happy), *kusikitika* (to be sad), *kukasirika* (to be angry),

kuogopa (to be scared). Notably, emotions cannot be expressed as adjectives in Swahili (a happy person is translated as *mtu mwenye furaha* i.e., a person possessing happiness). Perhaps, in the location of this study, the use of verbs as a form of identifying emotion states is more common than nouns. This is certainly plausible. When acquiring a new word, children must find an appropriate referent in the situation to attach the word to (Imai, Haryu & Okada, 2005). For emotion terms, the referent is likely to be an outward expression, rather than an inward state: an adult is unlikely to point out others' emotions to a child unless these emotions are outwardly visible. From a linguistic perspective, the action denoted in a verb may resonate better with an outward emotion expression, while a noun better represents the internal state. Variance in answer types for the FHT expressive knowledge of emotion labels task supports this argument: for both happy and sad, the proportion of incorrect answers citing an appropriate behavioural manifestation of the target emotion (e.g., laughing) was greater than the proportion of answers stating an acceptable emotion label. Could it be that actions speak louder than words when it comes to emotions?

The same trend was not found in answers for scared and angry. For these emotions, 'other' types of incorrect answers made up the highest proportion of responses. This could be interpreted as evidence against the idea that active representations of emotions are more prominent than emotion state terms. Alternatively, it could be that the facial expression stimuli used to depict angry and scared in the FHT did not accurately represent the emotion in its dynamic form. That is, perhaps anger is better expressed through an act of violence than through a scowling face. This highlights a flaw in decontextualised assessments of emotion understanding: the emotion concept we are attempting to elicit from children may, at least for them, only exist in the dynamic interplay between a person and their environment. Indeed, the crux of Oatley and Johnson-Laird's (1987) critique of basic emotion theory was that many, if not all, basic emotions are directed at an object.

It is also possible responses were guided by aspects of the stimuli most salient to the child. For example, the 'scared' face elicited the highest proportion of answers citing a term of opposite valence or arousal. Observations of the raw data show that 'laughing' and 'surprised' were frequently mentioned in response to this face. It could be that the open mouth was the most salient facial feature and subsequently informed children's answers. This would suggest participants failed to interpret the face as a whole. Alternatively, children may acquire the emotion of surprise prior to scared, as signified in Widen's (2013) review of 11 studies in which children freely labelled facial expressions of basic emotions.

5.4.2 Facial expressions associated with different emotion-eliciting situations.

The frequencies of four facial expressions being chosen to represent the feelings of characters in different situations were analysed. The smiling face was most frequently chosen to depict the character's emotion in situations intended to elicit happiness. This suggests participants were able to detect the positive feeling evoked by these situations and match it to the positive valence depicted in the smiling face. However, frequency across the other facial expressions was somewhat messier. The crying face was the most frequently chosen expression for all situations intended to elicit sadness. Yet, it was also frequently chosen in relation to situations of anger and fear. In fact, on all occasions when the crying face was an available option for situations of anger or fear, it proved the most, or joint-most frequently chosen. One interpretation of this pertains to the two-category understanding of emotions (Bullock & Russell, 1986; Widen & Russell, 2003): perhaps participants only discriminated between facial expressions on the basis of valence. If this were the case, they consistently identified expressions of positive valence (smiling face) and negative valence (crying face) to match appropriate situations but were unable to comprehend the nuances of negative valence in situations invoking fear and anger, favouring a more familiar depiction of negative valence (crying face). A flaw of this interpretation is that it assumes these facial expressions are universal depictions of the four emotions. It may have been that participants did interpret the situation as intended but represented the emotion in a way which most resonates with their own reactions. For example, crying is a perfectly normal response in a child who feels scared. In fact, evolution theorists assert that crying, in children, is a vestige of screaming, which serves to elicit protection from caregivers (Keltner, Oatley & Jenkins, 2014). Moreover, we may be wrong to interpret responses on this task as indicative of the emotion the child deemed most immediately relevant to the situation. We must be mindful of 'how the pieces fit together' (Super & Harkness, 2002, p.271). In considering the situation, perhaps children don't limit their response to the immediate emotion experienced. Rather, they play out the reaction invoked by the situation as a complex succession of feelings, selecting the most striking as their answer. Certainly, in situations of fear and anger it is common that a child resorts to tears.

It may also be noted that for one situation intended to elicit anger ('Samira's peers are laughing at her') the smiling face had a far higher frequency than in all other negative situations. This may be owing to the linguistic demand of the situation when described in Swahili. In Swahili, the situation was described as follows: *Ndugu zake Samira wanamcheka.*

In this sentence, the object infix, 'm', in *wanamcheka* denotes the fact that Samira's friends are laughing at her, and not merely laughing. It is possible children failed to hear the object infix, and therefore interpreted it as 'Samira's peers are laughing', constituting a situation of positive valence.

5.5 Contributions to education research and psychology

A major contribution made by the present study lies in the development of the FHT: a novel assessment of emotion understanding which demonstrates sensitivity to a non-Western culture, and suitability for use in a low-resource setting. Demand for such instruments has been highlighted by educational researchers and stakeholders alike (e.g., Zuilkowski et al., 2016; USAID, 2016). In particular, they cite issues of item bias, whereby assessment items are 'distorted' when applied to other cultures, and over-reliance on materials standardized in Western cultures (Zuilkowski et al., 2016).

The FHT drew inspiration from existing assessments of emotion understanding validated in Western societies (e.g., EMT; Izard et al., 2003), but went further to accommodate the culture and conditions of the research location for this study. Materials used in the FHT were specifically designed to be engaging for young children, and reflect participants' own lives. They included images of girls wearing hijab, various styles of braided hair, and dark skin tones. This differs from other emotion understanding assessments which prioritise ethnic diversity as it appears in Western societies, rather than the types of diversity present in an individual society (e.g., varied tones of dark skin). The names of characters in the situation-based tasks also resonated with the children, with some remarking they had a sibling or friend of the same name. This is important when a task attempts to elicit empathy from a child.

Analysis of answer-types using the coding scheme developed also presents a method of investigating, at a deeper level, how emotions are conceived by young children in another culture. This coding scheme could be further utilised to better understand the significance of emotion-driven behaviour versus internal emotion state for young children across cultures.

The research study itself also makes a valuable contribution to research in education and psychology by investigating emotion understanding among an under-researcher population (Zanzibari preschoolers) and in an under-researched location. As discussed, the results of this study present implications for the way in which we believe emotion understanding develops, especially pertaining to theories of universal, basic emotions.

5.6 Limitations

There were a number of limitations to the present study, primarily concerning the reality of data collection in a low-resource setting.

The sample size was limited due to the impact of rain. Frequent intense downpours meant many children did not attend school. As the study design required participants to complete both assessments, high rates of absenteeism meant some children's data had to be dropped as they had only completed one assessment. The sample size was further limited by the commencement of Ramadhan one week into data collection. This saw the school day reduced by 1.5 hours and resulted in fewer assessments administered each day. The school itself was also closed on several occasions unexpectedly. The small sample size (N = 43) subsequently limits the generalisability of the results to the wider population.

The reliability of data is also limited for several reasons. Both assessments were administered in the hall of the participating preschool, which had poor infrastructure and was sporadically used to give pupils their daily porridge. The resulting noise and sound from beating rain may have distracted participants and impeded their hearing of instructions. Likewise, although assessments were presented to the children as fun activities, the authoritarian practice of many teachers meant children were ordered to 'go with the teacher' (referring to researcher). This may have created the impression assessments were intended to scrutinize children and related to their classroom performance, potentially resulting in self-conscious responses. Responses may also have been influenced by social desirability: perhaps children gave responses they felt aligned with what was expected of them. Observations of the raw data suggest this may have been the case. When prompted to explain why she feels scared at home, one girl responded: 'If my brother cries, I should calm him down.' In response to the question, 'When do you feel happy?', another child responded: 'Children are fighting…I tell them you shouldn't fight.' Clearly, participants were aware of the expectations of themselves, and of others, in their community, which may have informed some responses coded as incorrect.

Moreover, though the researcher spoke fluent Swahili and dressed according to local customs, the researcher's 'foreignness' may have distracted participants. Ethnographic studies often cite the limitations of the 'outsider' researcher in obtaining valid and reliable data (e.g., Fleisher, 1998a). This matter may have been exacerbated by the unusual tasks entailed in the FHT. It must be acknowledged that whilst the tool aimed to be culturally sensitive insofar as the language, materials and situations used, the general topic of emotions could be considered strange for participants in this study. As one child put it: 'I don't know emotions.' Certainly, an important limitation of this study is the lack of robust tests of

reliability of the FHT as an instrument.

Finally, this study was unable to explore the development of emotion understanding with respect to age, due to floor effects found when administering the FHT to children from the Nursery classes. This further poses a limitation to the FHT itself, as it was unable to discriminate emotion understanding competencies of younger preschoolers.

5.7 Directions for Future Research

5.7.1 Validation of the FHT.

An interesting focus for future directions would be to thoroughly assess the validity and reliability of the FHT. Standardising visual test materials with a large sample of children would reduce the likelihood of item bias, and increase our certainty, as researchers, that the emotion facial expressions used are accurate representations of the target emotions. Similarly, emotion labels employed in the FHT should be standardised according to their frequency and accuracy in denoting target emotions in the local language. Concurrent validity could be further examined by comparing performance on the FHT with performance on other validated measures of emotion understanding (e.g., TEC; Pons & Harris, 2000). However, this may prove problematic given the argument that existing measures may 'systematically' undermine the abilities of children in non-Western societies (Zuilkowski et al., 2016). In addition, carrying out test-retest of the FHT would help to ascertain its reliability as an assessment tool. In evaluating the validity and reliability of the FHT, it would also be preferable to partner with local researchers to administer the assessment to reduce the potential 'outsider' effects described above.

5.7.2 Extension of the present study.

As the present study had a limited sample size, it would be valuable to extend this research to include children from different locations in Zanzibar. Given the tangible relationship between poverty and social-emotional development (Grantham-McGregor et al., 2007), comparing the emotion understanding of preschoolers in urban and rural Zanzibar (where poverty rates are higher; World Bank, 2017), and from state-run and private early learning centres, may reveal the effects of poverty on emotion understanding in young children. Acquiring more accurate data regarding participants' age would enable analyses to investigate the impact of age for this sample, which the present study was unable to do.

5.7.3 Analysis of a two-category interpretation of emotions.

The FHT could further be used to conduct specific analysis of the use of the two-category interpretation of emotions outlined by Widen and Russell (2003). The expressive knowledge of emotion labels task provides an opportunity to distinguish between acceptable answers employing a specific emotion term and those employing a general valence term. Furthermore, the expressive interpretation of emotion-eliciting situations task requires children to identify if a researcher-provided situation elicits a 'good' or 'bad' feeling in the character. This task did not feature in analyses for the present study as it was beyond the scope of this dissertation. However, exploring accuracy and answer-types on these tasks could reveal the extent to which children interpret emotions based primarily on the dimension of valence.

5.8 Implications

The significant contribution of non-verbal emotion understanding (measured by the FHT) to social-emotional skill (measured by the IDELA) found in this study supports the inclusion of non-verbal responses in assessments of emotion understanding. This aligns with the design of existing measures of emotion understanding (e.g., EMT; Izard et al., 2003). It also implies social-emotional assessments which overlook non-verbal responses may do a disservice to children who lack the expressive skills to articulate their experiences and perceptions. This includes the IDELA and other instruments seeking to measure child development in low- and middle-income countries holistically (e.g., Measuring Early Learning Quality and Outcomes assessment, MELQO; Anderson & Sayre, 2016). At present, there does not seem to be any measure of social-emotional competence adapted for use in sub-Saharan Africa which invites non-verbal responses. This seems unreasonable, given assessments like the IDELA and MELQO do accept non-verbal responses for other cognitive tasks (e.g., the IDELA Shape Identification item requires children to point to the target shape).

The above discussion concerning children's knowledge of four basic emotions also has implications for how we interpret results elicited from assessments of emotion understanding. Participants in this study demonstrated some knowledge of all four basic emotions featured. This could be considered evidence in support of basic emotion theory, insofar as young children were able to discriminate between these emotions, presumably due to their discrete, universal features. However, when we reflect on the results, it becomes apparent there may be trends in children's responses which do not indicate a lack of knowledge, but rather a knowledge different to that we had expected. This is particularly true of findings from the expressive knowledge of emotion labels task, and the task in which children matched a facial expression to an emotion-invoking situation. Responses from both these tasks highlighted the

need for careful interpretation on the part of the researcher. That is, interpretation which is sensitive not only to culture, but to the individual child and their subjective emotional experiences. While educational assessments are typically developed with the goal of gathering tangible data to monitor progress and inform practice, assessments of emotion understanding should be mindful of the fact that quantifying such a complex skill informed by deeply personal experiences is likely to always oversimplify what this ability really looks like.

5.9 Conclusion

This study aimed to explore emotion understanding in Zanzibari preschoolers using the Fikiria Hisia test, a novel assessment designed for the purposes of this research project. The research questions probed two aspects of emotion understanding. The influence of emotion understanding on social competence was examined by inspecting the relationship between the FHT and IDELA social-emotional items. Participants' understanding of four basic emotions in relation to different emotion understanding tasks was also investigated.

The development of the FHT represents a significant effort to respond to calls for culturally sensitive assessments, suitable for use in non-Western contexts with limited resources: "Where Western assessments do not perform well in non-Western samples, researchers must think creatively to develop assessments that are locally valid, reliable and feasible in the context," (Zuilkowski et al., 2016, p.351). Whilst there remains some way to go to validate the FHT, its development is evidence of the possibility and potential of such novel assessments, especially with regards to the domain of social-emotional competence which is heavily shaped by culture.

Analysis of results revealed a significant relationship between the FHT and performance on IDELA social-emotional items. Non-verbal emotion understanding measured by the FHT predicted a significant amount of variance in performance on IDELA social-emotional items. Similarly, emotion understanding captured by a FHT composite score made a unique contribution to performance on IDELA social-emotional items above and beyond expressive language.

Results also showed an interesting variance in children's understanding of four basic emotions across different components of emotion understanding. While sad elicited the strongest performance in facial expression matching, anger elicited the most correct answers for expressive understanding of emotion situations. Floor effects on the expressive knowledge of emotion labels task led to analysis of answer-types, which indicated

behavioural manifestations of emotions may be a popular way to categorise emotions among the sample for this study.

In a broader sense, this study raised a number of questions concerning the way in which we assess and interpret emotion understanding in young children. It highlighted the need to be mindful of the decontextualised nature of emotion understanding assessments, and the tendency of these tools to oversimplify very real and very powerful experiences. If we intend to enhance emotion understanding in preschoolers, we must endeavour to find effective ways of uncovering what they know. Even the child who claims ‘I don’t know feelings’ may very well know something.

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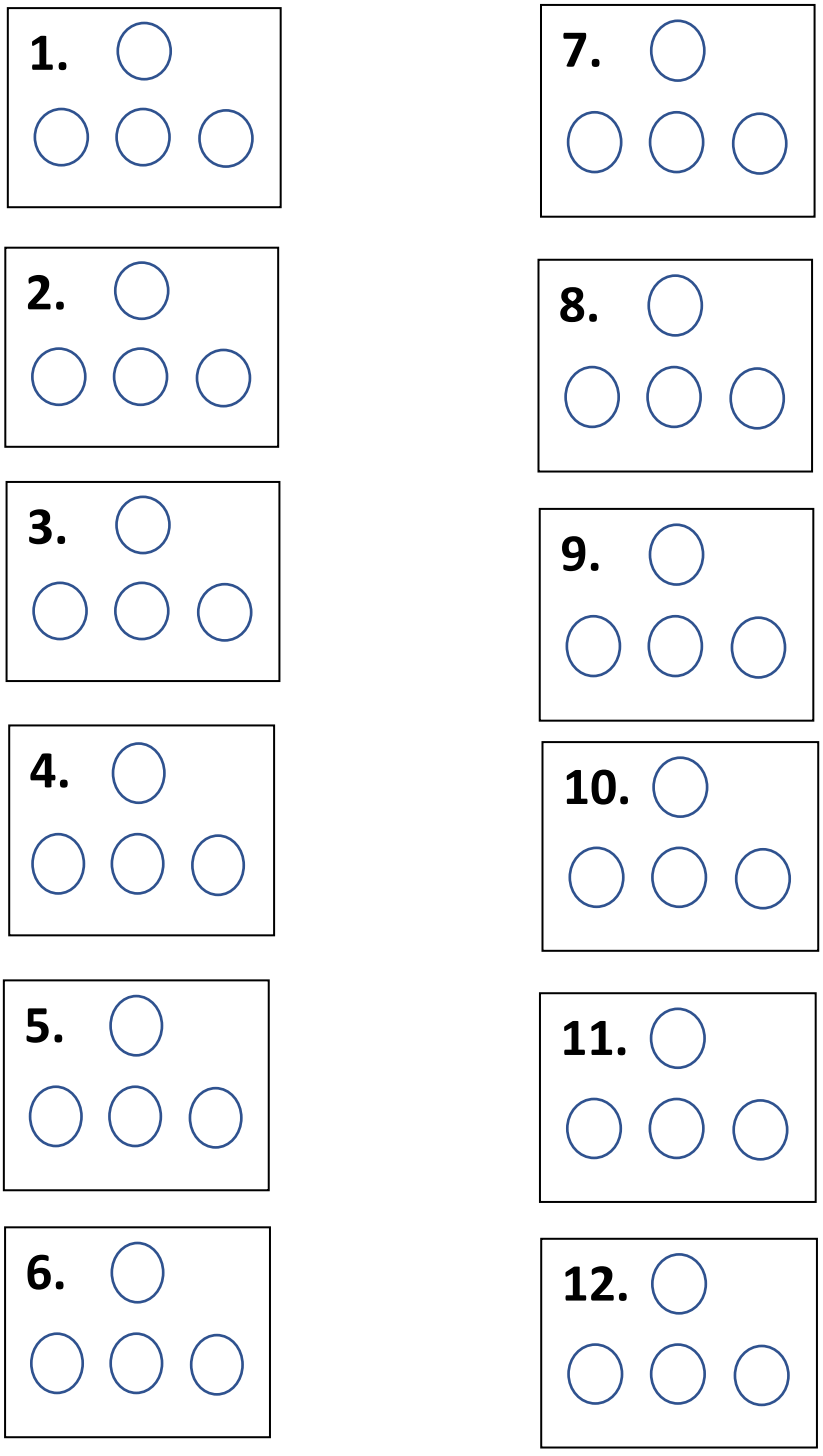
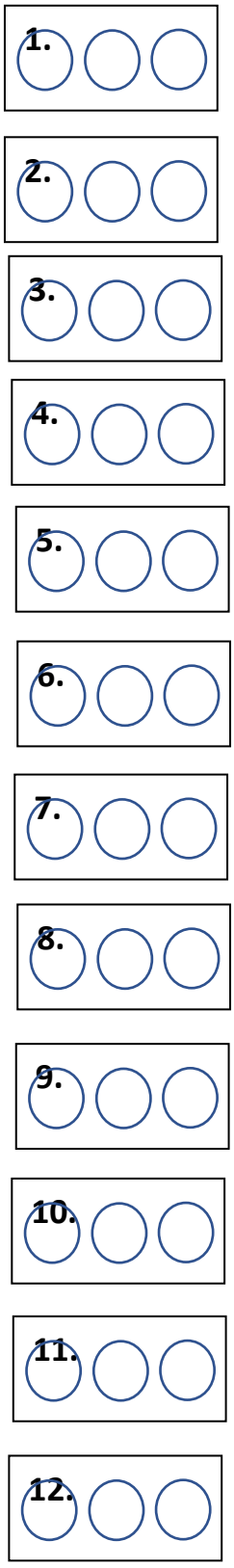
Appendix A –Score Sheet for Fikiria Hisia Test

Child ID	
Date	

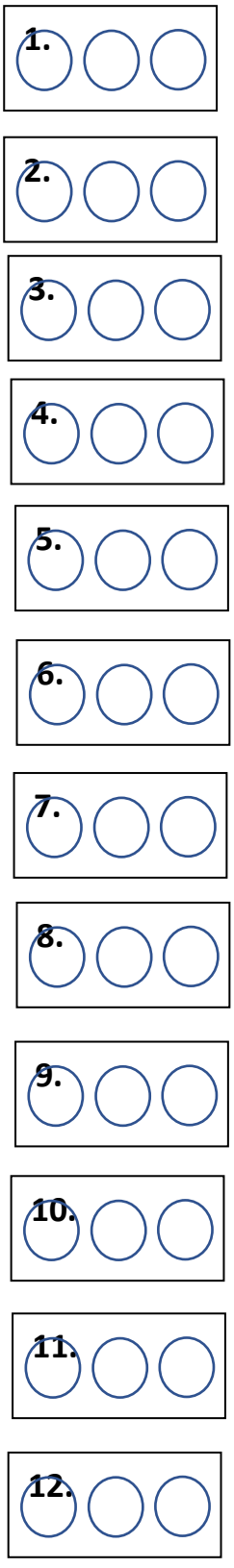
Facial Expression Matching & Expressive Knowledge of Emotion Labels



Receptive Knowledge of Emotion Labels & Expressive Understanding of Emotion Situations



Receptive & Expressive Interpretation of Emotion-Eliciting Situations



Appendix B – Scoring Code for Fikiria Hisia Test

Fikiria Hisia Test

Verbal-Questions Scoring Code

Based on IDELA scoring guide, and coding of 'appropriate' responses (IDELA was not detailed in describing what is appropriate).

'Acceptable' and 'Unacceptable' are sub-coded according to the nature of the response and will then be re-coded to for analysis. This allows for the different types of acceptable and unacceptable responses to be investigated.

Expressive Knowledge of Emotion Labels – Scoring Code

Question: How do you think he/she is feeling? (x 12)

1 = acceptable
acceptable answers include:
- an acceptable goal/situation (e.g. he wants his mum but she isn't there)

2= culturally appropriate
- e.g. for a negative valence emotion saying the contextually relevant experience of 'hungry' given it was Ramadan and children may have been fasting
- to be re-coded as 1

4 = emotions of similar valence
- sad = upset, unwell, in pain, scared, bad
- happy = good, fine
- angry = annoyed, sad, bad
- scared = surprised, amazed, shocked, bad
- to be re-coded as 1

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0 = unacceptable
unacceptable answers include:
- not crying/laughing
- not feeling good/bad
- irrelevant answers such as 'a lot'

7 = appropriate behavioural manifestations of emotion
- happy = laughing
- sad = crying
- angry = sulking
- scared = yawning
- to be re-coded as 0

8 = inappropriate behavioural manifestation of emotion
- e.g. if target emotion is happy, crying is an inappropriate behavioural manifestation of emotion
- to be re-coded as 0

9 = emotions of opposite arousal or valence
- e.g. if target answer is angry, responses like tired and sleepy would be unacceptable
- e.g. if target answer is a happy, negative valence answer like bad would be unacceptable
- to be re-coded as 0

10 = statement not related to the character's internal state (e.g. his mum is not there; his eyes are open)
- to be re-coded as 0

11 = don't know
- includes 'I've forgotten' and 'not sure'
- to be re-coded as 0

12 = no response
- to be re-coded as 0

13 = repeated answer
- does not include answer to 1.1 as the researcher's acceptance of initial response may have prompted the repeated use of this answer.
- repetition is defined as when the same answer is given to 5 questions in a row. This is because within every set of 5 answers there is always a combination of positive and negative valence emotions.
- to be re-coded as 0

Expressive Understanding of Emotion Situations – Scoring Code

Applicable to all:

Although questions are directed at child, any answer with an alternative subject can also be acceptable providing it satisfies the 'acceptable' criterion.

If the same answer is given for the opposite valence, it cancels out the 'acceptable' answer, both become 'unacceptable' (e.g. *What makes you feel happy?* When a car goes fast // *What makes you feel angry?* When a boat goes fast) – unless appropriate explanation provided.

10 = don't know
- to be re-coded as 0

11 = no response
- to be re-coded as 0

12 = repeated answer
- to be re-coded as 0

Question 1: What makes you feel angry?

1 = acceptable
acceptable answers include:
- situations associated with opposite valence and/or arousal IF appropriate explanation provided (e.g. sleeping. *Why does that make you feel angry?* Because you get possessed by evil spirits)

2 = culturally appropriate
- e.g. being sent on an errand, being possessed by evil spirits
- to be re-coded as 1

3 = physical expression/behavioural manifestation of anger
- e.g. hitting another, heavy breathing
- to be re-coded as 1

4 = emotion state term of same valence
- e.g. annoyed
- to be re-coded as 1

0 = unacceptable
unacceptable answers include:
- something which might evoke anger in another but is not itself an expression of anger (e.g. laughing at a friend)

8 = situations associated with opposite valence and/or arousal when appropriate explanation not provided
- e.g. playing, sleeping, singing
- to be re-coded as 0

9 = irrelevant
- a statement not related to subject's internal state (e.g. eyes are open)
- to be re-coded as 0

Question 2: What makes you feel sad?

1 = acceptable
acceptable answers include:
- situations associated with opposite valence and/or arousal IF appropriate explanation provided (e.g. birthday. *Why does that make you feel angry?* Because you didn't get invited).
- repetition of answer for another question of same valence (e.g. *What makes you feel sad?* Snakes // *When do you feel scared?* When I see a snake)
- physical states denoting wanting of something (e.g. cold, hungry)

2 = culturally appropriate
- e.g. being sent on an errand, not praying
- to be re-coded as 1

3 = physical expression/behavioural manifestation of sadness
- e.g. crying
- to be re-coded as 1

4 = emotion terms/states of same valence
- e.g. being angry, scared
- to be re-coded as 1

0 = unacceptable
unacceptable answers include:
- something which might evoke sadness in another but is not itself an expression of sadness (e.g. hitting someone)

8 = - situations associated with opposite valence and/or arousal when appropriate explanation not provided
- e.g. playing, sleeping, singing
- to be re-coded as 0

9 = irrelevant
- a statement not related to subject's internal state (e.g. eyes are open)
- to be re-coded as 0

Question 3: What makes you feel happy?

1 = acceptable
acceptable answers include:
- situations associated with opposite valence and/or arousal IF appropriate explanation provided (e.g. falling over. *Why does that make you feel happy?* When someone falls over you laugh).

2 = culturally appropriate
- e.g. Eid/'Sikukuu'
- to be re-coded as 1

3 = physical expression/behavioural manifestation of happy
- e.g. laughing
- to be re-coded as 1

4 = emotion terms/states of same valence
- e.g. excited
- to be re-coded as 1

0 = unacceptable
unacceptable answers include:

8 = - situations associated with opposite valence and/or arousal when appropriate explanation not provided
- e.g. fighting, sleeping
- to be re-coded as 0

9 = irrelevant
- a statement not related to subject's internal state (e.g. eyes are open)
- to be re-coded as 0

Question 4: When do you feel sad, like this?

1 = acceptable
acceptable answers include:
- situations associated with opposite valence and/or arousal IF appropriate explanation provided (e.g. birthday. *Why does that make you feel angry?* Because you didn't get invited).
- specific time IF appropriate explanation provided (e.g. afternoon *Why do you feel sad in the afternoon?* I have no-one to play with)
- repetition of answer for another question of same valence (e.g. *What makes you feel scared?* Snakes // *When do you feel sad?* When I see a snake)
- physical states denoting wanting of something (e.g. cold, hungry)

2 = culturally appropriate
- e.g. being sent on an errand, not praying
- to be re-coded as 1

3 = physical expression/behavioural manifestation of sadness
- e.g. crying
- to be re-coded as 1

4 = emotion terms/states of same valence
- e.g. being angry, scared
- to be re-coded as 1

0 = unacceptable
unacceptable answers include:
- specific time without appropriate explanation (e.g. morning, afternoon, 2 p.m.)
- something which might evoke sadness in another but is not itself an expression of sadness (e.g. hitting someone)

8 = situations associated with opposite valence and/or arousal when appropriate explanation not provided
- e.g. playing, sleeping, singing
- to be re-coded as 0

9 = irrelevant
- a statement not related to subject's internal state (e.g. eyes are open)
- to be re-coded as 0

Question 5: What makes you feel scared?

1 = acceptable
acceptable answers include:

- situations associated with opposite valence and/or arousal IF appropriate explanation provided (e.g. Eid. *Why does that make you feel scared?* Because there are too many people).
- repetition of answer for another question of same valence (e.g. *What makes you feel scared?* Snakes // *When do you feel sad?* When I see a snake)

2 = culturally appropriate
- being possessed by evil spirits
- to be re-coded as 1

3 = physical expression/behavioural manifestation of emotion
- e.g. gasp, crying
- to be re-coded as 1

4 = emotion term/states of same valence and arousal
- e.g. shock, surprise
- to be re-coded as 1

0 = unacceptable
unacceptable answers include:

8 = situations associated with opposite valence and/or arousal when appropriate explanation not provided
- e.g. playing, sleeping, singing
- to be re-coded as 0

9 = irrelevant
- a statement not related to subject's internal state (e.g. eyes are open)
- to be re-coded as 0

Question 6: When do you feel happy, like this?

1 = acceptable
acceptable answers include:
- situations associated with opposite valence and/or arousal IF appropriate explanation provided (e.g. falling over. *Why does that make you feel happy?* When someone falls over you laugh).
- specific time IF appropriate explanation provided (e.g. morning *Why do you feel happy in the morning?* I get to go to school).
- repetition of answer for another question of same valence (e.g. *What makes you feel happy?* Eid // *When do you feel happy?* Eid)

2 = culturally appropriate
- e.g. Eid/'Sikukuu'
- to be re-coded as 1

3 = physical expression/behavioural manifestation of happiness
- e.g. laughing, smiling
- to be re-coded as 1

4 = emotion term/state of same valence
- e.g. excited

- to be re-coded as 1

0 = unacceptable
unacceptable answers include:
- specific time without appropriate explanation (e.g. morning, afternoon, 2 p.m.)

8 = situations associated with opposite valence and/or arousal when appropriate explanation not provided
- to be re-coded as 0

9 = irrelevant
- a statement not related to subject's internal state (e.g. eyes are open)
- to be re-coded as 0

Question 7
(i): Did you feel like this [sad] today?

1 = acceptable
acceptable answers include:
- no
- if 'yes', 1 is ONLY awarded IF acceptable answer for part (ii)

0 = unacceptable
unacceptable answers include:
- don't remember
- no response
- don't know

(ii) Why did you feel sad today?

1 = acceptable
acceptable answers include:
- physical states denoting wanting of something (e.g. felt cold, hungry)
- situations associated with opposite valence and/or arousal IF appropriate explanation provided (e.g. school. *Why did that make you feel sad?* I got hit by the teacher).
- repetition of answer for another question of same valence (e.g. *What makes you feel scared?* I got hit // *Why did you feel sad today?* I got hit)

2 = culturally appropriate
- e.g. sent on an errand
- to be re-coded as 1

4 = emotion terms/states of same valence
- e.g. I was angry
- to be re-coded as 1

0 = unacceptable (therefore no point awarded for part (i))
unacceptable answers include:

- something which might evoke sadness in another but is not itself an expression of sadness (e.g. I hit someone)

7 = physical expression/behavioural manifestation of emotion
- e.g. crying
- to be re-coded as 0

8 = situations associated with opposite valence and/or arousal when appropriate explanation not provided
- e.g. playing, sleeping, singing
- to be re-coded as 0

9 = irrelevant
- a statement not related to subject's internal state (e.g. eyes are open)
- to be re-coded as 0

Question 8: When do you feel angry, like this?

1 = acceptable
acceptable answers include:
- situations associated with opposite valence and/or arousal IF appropriate explanation provided (e.g. sleeping. *Why does that make you feel angry?* Because you get possessed by evil spirits)
- specific time IF appropriate explanation provided (e.g. morning *Why do you feel angry in the morning?* My dad hit me)
- repetition of answer for another question of same valence (e.g. *What makes you feel scared?* Being hit // *When do you feel angry?* When I get hit)

2 = culturally appropriate
- e.g. sent on an errand
- to be re-coded as 1

3 = physical expression/behavioural manifestation of anger
- e.g. hitting another, heavy breathing
- to be re-coded as 1

4 = emotion term/state of same valence
- e.g. annoyed
- to be re-coded as 1

0 = unacceptable
unacceptable answers include:
- specific time without appropriate explanation (e.g. morning, afternoon, 2 p.m.)
- something which might evoke anger in another but is not itself an expression of sadness (e.g. laughing at someone)

8 = situations associated with opposite valence and/or arousal when appropriate explanation not provided

- e.g. playing, sleeping, singing
- to be re-coded as 0

9 = irrelevant
- a statement not related to subject's internal state (e.g. eyes are open)
- to be re-coded as 0

Question 9: When do you feel scared, like this?

1 = acceptable
acceptable answers include:
- situations associated with opposite valence and/or arousal IF appropriate explanation provided (e.g. Eid. *Why does that make you feel scared?* Because there are too many people).
- specific time IF appropriate explanation provided (e.g. afternoon *Why do you feel scared in the afternoon?* My leaves me at home alone)
- repetition of answer for another question of same valence (e.g. *What makes you feel sad?* Being hit // *When do you feel scared?* Getting hit)

2 = culturally appropriate
- e.g. being possessed by evil spirits
- to be re-coded as 1

3 = physical expression/behavioural manifestation of emotion
- e.g. gasp, crying
- to be re-coded as 1

4 = emotion term/state of same valence and arousal
- e.g. shock, surprise
- to be re-coded as 1

0 = unacceptable
unacceptable answers include:
- specific time without appropriate explanation

8 = situations associated with opposite valence and/or arousal when appropriate explanation not provided
- e.g. playing, sleeping, singing
- to be re-coded as 0

9 = irrelevant
- a statement not related to subject's internal state (e.g. eyes are open)
- to be re-coded as 0

Question 10
(i): Did you feel like this [scared] today?

1 = acceptable
acceptable answers include:
- no
- if 'yes', 1 is ONLY awarded IF acceptable answer for part (ii)

0 = unacceptable
unacceptable answers include:
- don't remember
- no response
- don't know

(ii) Why did you feel scared today?

1 = acceptable
acceptable answers include:
- situations associated with opposite valence and/or arousal IF appropriate explanation provided (e.g. school. *Why did that make you feel scared?* I got hit by the teacher).
- repetition of answer for another question of same valence (e.g. *What makes you feel sad?* I got hit // *Why did you feel scared today?* I got hit)

2 = culturally appropriate
- e.g. possessed by evil spirits
- to be re-coded as 1

4 = emotion terms/states of same valence
- e.g. I was shocked
- to be re-coded as 1

0 = unacceptable (therefore no point awarded for part (i))
unacceptable answers include:

7 = physical expression/behavioural manifestation of emotion
- e.g. crying
- to be re-coded as 0

8 = situations associated with opposite valence and/or arousal when appropriate explanation not provided
- e.g. playing, sleeping, singing
- to be re-coded as 0

9 = irrelevant
- a statement not related to subject's internal state (e.g. eyes are open)
- to be re-coded as 0

Question 11
(i): Did you feel like this [angry] today?

1 = acceptable
acceptable answers include:

- no
- if 'yes', 1 is ONLY awarded IF acceptable answer for part (ii)

0 = unacceptable
unacceptable answers include:
- don't remember
- no response
- don't know

(ii) Why did you feel angry today?

1 = acceptable
acceptable answers include:
- situations associated with opposite valence and/or arousal IF appropriate explanation provided (e.g. school. *Why did that make you feel angry?* I got hit by the teacher).
- repetition of answer for another question of same valence (e.g. *What makes you feel scared?* I got hit // *Why did you feel angry today?* I got hit)

2 = culturally appropriate
- e.g. sent on an errand, hungry given the child may be fasting
- to be re-coded as 1

3 = behavioural manifestation of emotion
- e.g. hitting, fighting
- to be re-coded as 1

4 = emotion terms/states of same valence
- e.g. I was annoyed
- to be re-coded as 1

0 = unacceptable (therefore no point awarded for part (i))
unacceptable answers include:

7 = physical expression of anger
- e.g. crying, frowning
- to be re-coded as 0

8 = situations associated with opposite valence and/or arousal when appropriate explanation not provided
- e.g. playing, sleeping, singing
- to be re-coded as 0

9 = irrelevant
- a statement not related to subject's internal state (e.g. eyes are open)
- to be re-coded as 0

Question 12
(i): Did you feel like this [happy] today?

1 = acceptable
acceptable answers include:
- no
- if 'yes', 1 is ONLY awarded IF acceptable answer for part (ii)

0 = unacceptable
unacceptable answers include:
- don't remember
- no response
- don't know

(ii) Why did you feel happy today?

1 = acceptable
acceptable answers include:
- situations associated with opposite valence and/or arousal IF appropriate explanation provided (e.g. I was chased. *Why did that make you feel happy?* I was chased by my friends outside).
- repetition of answer for another question of same valence (e.g. *What makes you feel happy?* Cake// *Why did you feel happy today?* I got cake)

2 = culturally appropriate
- e.g. Eid/'Sikukuu'
- to be re-coded as 1

4 = emotion terms/states of same valence
- e.g. I was angry
- to be re-coded as 1

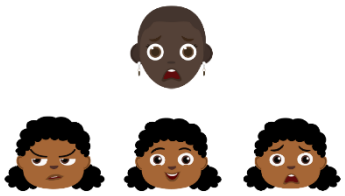
0 = unacceptable (therefore no point awarded for part (i))
unacceptable answers include:

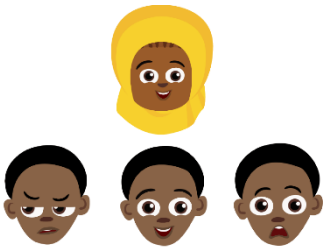
7 = physical expression/behavioural manifestation of emotion
- e.g. laughing, smiling
- to be re-coded as 0

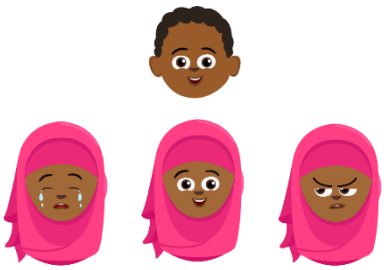
8 = situations associated with opposite valence and/or arousal when appropriate explanation not provided
- e.g. fighting, crying
- to be re-coded as 0

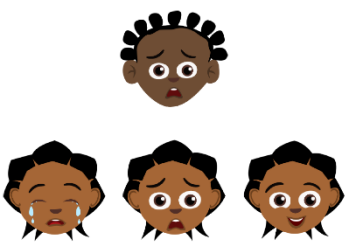
9 = irrelevant
- a statement not related to subject's internal state (e.g. mouth is open)
- to be re-coded as 0

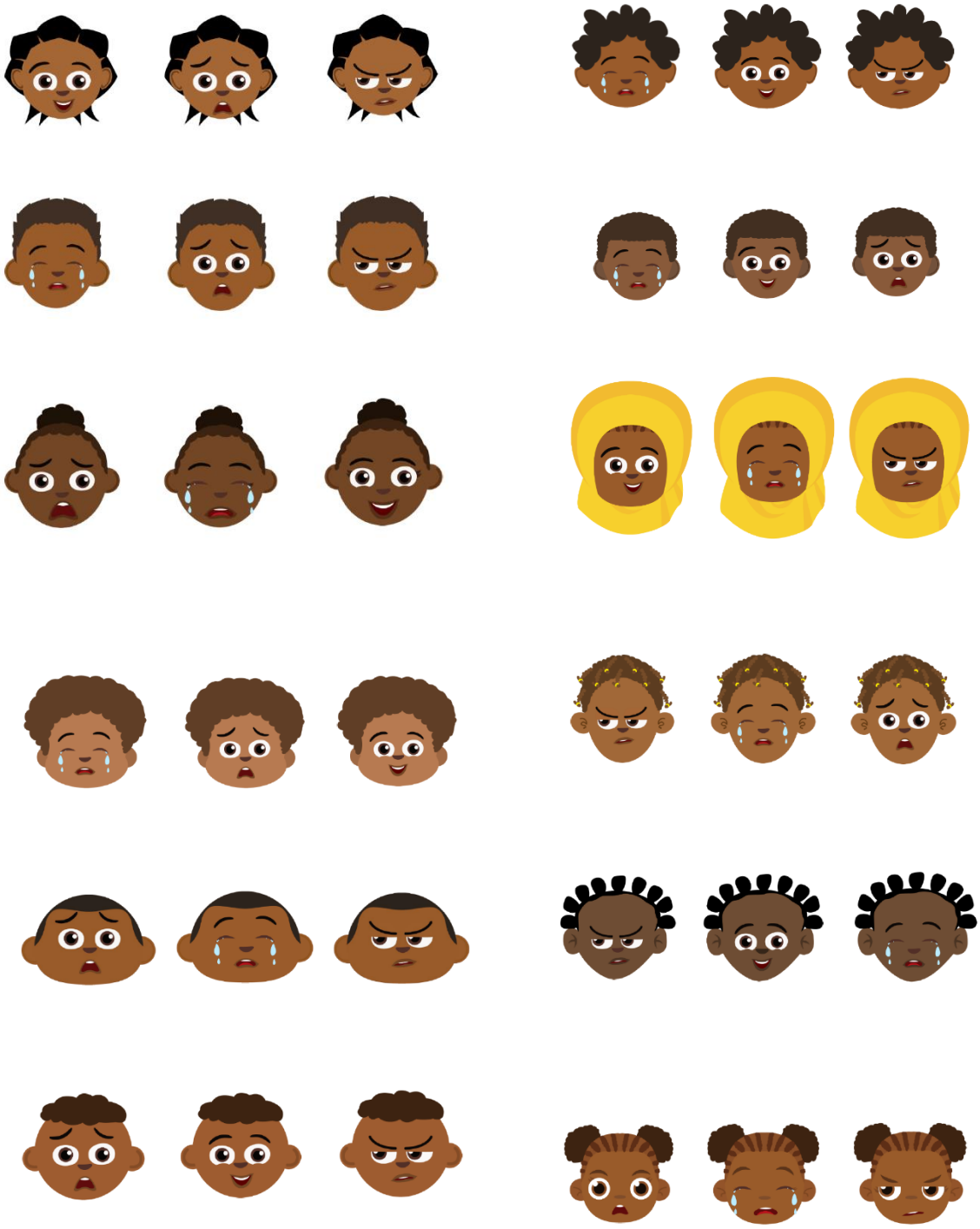
Appendix C – Materials for Fikiria Hisia Test

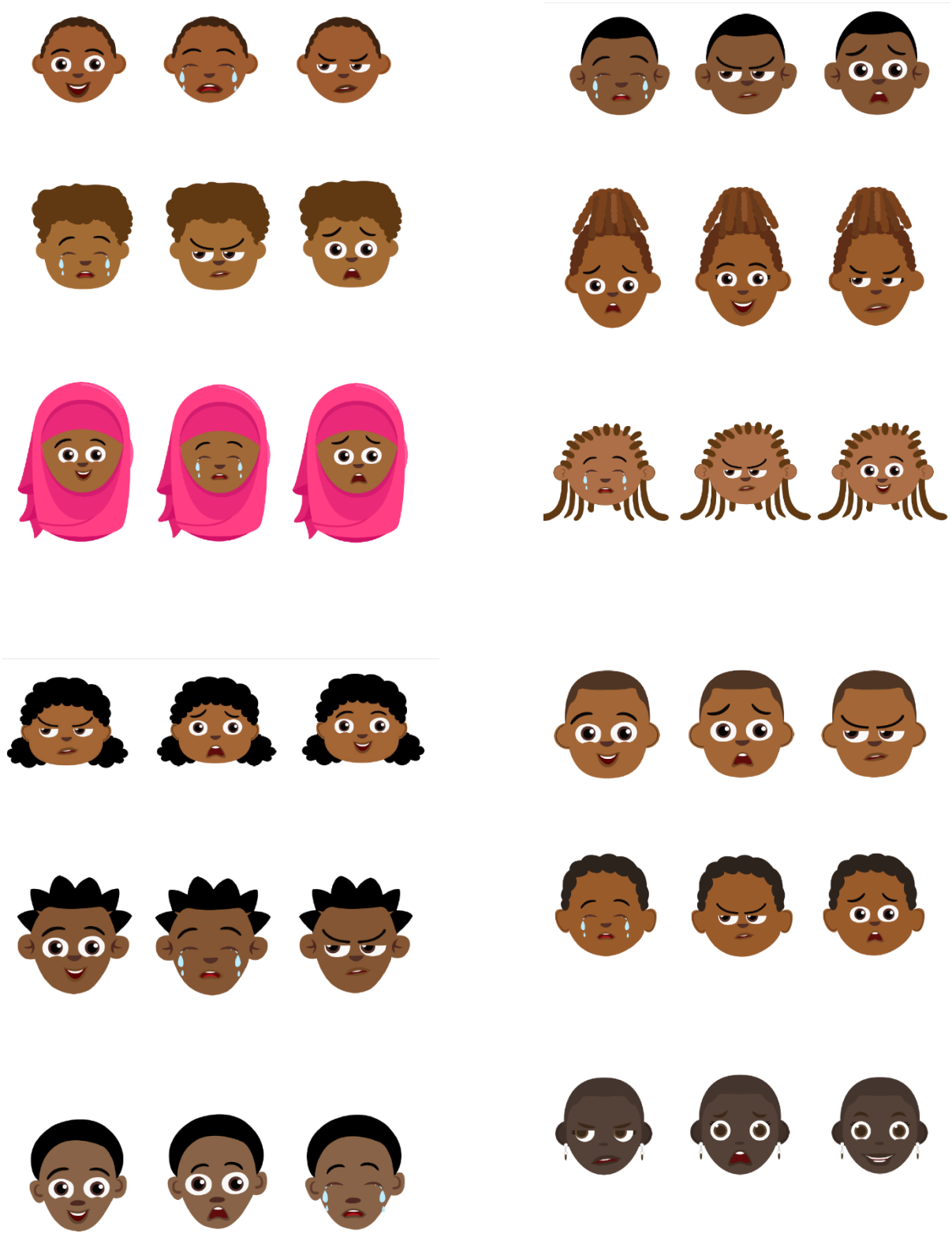












Appendix E – Letter of Permission from Ubongo for use of graphics

ubongo

P.O. Box 66647 · 1st Floor FSM House, 614 Kimweri Ave., Msasani, Dar es Salaam, Tanzania
+255 685 012897 · info@ubongo.org · www.ubongo.org

Dear Ms Hannah Simmons,

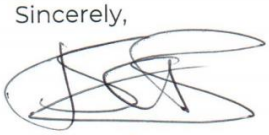
We have received your request for use of Akili and Me image(s) in your dissertation project as part of your MSc programme in Education and Child Development at the University of Oxford.

We agree that what you are researching - emotion understanding in preschoolers - is important and is in line with what we aim to do as a company.

Ubongo grants you permission to use our Akili and Me image(s) for any assessments related to this your project.

We wish you all the best in these assessments and would love to know your findings after your dissertation is done.

Sincerely,



Christina Bwana
Chief Product Officer
UBONGO.org
Creators of Ubongo Kids and Akili and Me

Appendix E – Data Collection Protocol for Fikiria Hisia Test

Introduction

Hi,

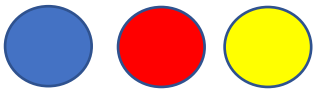
My name is _____. I've come to your school to play some games with children like you. The games are about feelings. Would you like to play these games with me?

[if yes] Great! [if no – take back to class]

Warm up – answer by pointing:

I'm going to show you some pictures.

[show pictures of different colours: red, blue, yellow]

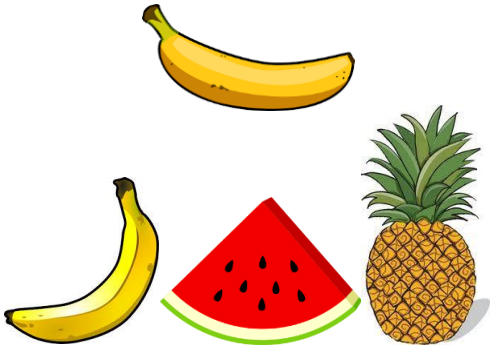


Point to your favourite colour.

[if points] That's a very nice colour!
[if no response – prompt] Which of these colours do you like best?
[if no response after prompt – move on to matching warm up]

Warm up – matching 1:

[Show warm up item: target = banana; distractors = watermelon, pineapple, banana]



Now I'm going to show you some pictures of fruits. Have a look at these fruits. [wait 5 seconds]

[point at target banana]. What fruit this?

[if correct] Very good.
[if incorrect] Banana.

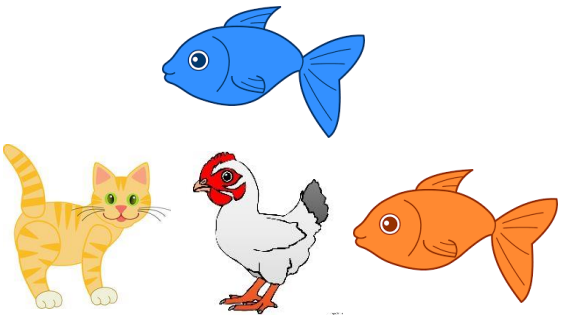
[if no response] Banana.

Point to the fruit [point to distractors] which is the same as this [point to target]?

[if correct] Very good.
[if incorrect – prompt] This is a banana [point to target banana] Which is the banana here? [point to distractors]
[if no response – prompt] This is a banana [point to target banana] Which is the banana here? [point to distractors]

Warm up – matching 2:

[Show warm up – matching 2 item: target = fish; distractors = cat, chicken, fish]



Now I'm going to show you some pictures of animals. Have a look at these animals. [wait 5 seconds]

[point at target banana]. What animal is this?

[if correct] Very good.
[if incorrect] Fish.
[if no response] Fish.

Point to the animal [point to distractors] which is the same as this [point to target]?

[if correct] Very good.
[if incorrect – prompt] This is a fish [point to target fish] Which is the fish here? [point to distractors]
[if no response – prompt] This is a fish [point to target banana] Which is the fish here? [point to distractors]

[if no response on both pointing and matching warm-ups – return child to class and say: Thank you for looking at the pictures with me.
If it is the child's first attempt, the child should get another go on another day]

Test

[begin audio recording]

Now I'm going to show you some pictures of faces with different feelings.

Facial Expression Matching & Expressive Knowledge of Emotion Labels

Practice 1

EM Practice 1. Have a look at these faces.

EM Practice 1.1 Point to the face [point to the distractors] which is feeling the same as this one [point to target face]

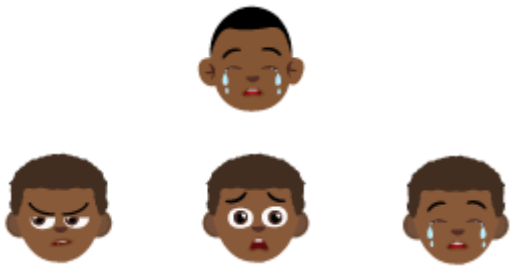
[if points] Very good.
[if responds verbally] OK, can you show me which one of these [point to distractors] faces is feeling like that?
[if no response – prompt once] Which of these faces [point to distractors] is feeling like this one [point to target]?

EM Practice 1.2 How do you think [she/he] feels?

[if responds correctly] Well done.
[is responds incorrectly] Well done.
[if no response – prompt once] How do you think this girl is feeling? [point to target face]

Practice 2

EM Practice 2. Have a look at these faces.



EM Practice 2.1 Point to the face [point to the distractors] which is feeling the same as this one [point to target face]

[if points] Very good.
[if responds verbally] OK, can you show me which one of these [point to distractors] faces is feeling like that?
[if no response – prompt once] Which of these faces [point to distractors] is feeling like this one [point to target]?

EM Practice 2.2 How do you think [she/he] feels?

[if responds correctly] Well done.
[is responds incorrectly] Well done.
[if no response – prompt once] How do you think this boy is feeling? [point to target face]

[Begin test]

EM Item 1. Have a look at these faces.

EM 1.1 Point to the face [point to distractors] which is feeling the same as this one [point to target]?

[if points] Very good.
[if responds verbally] OK, can you show me which one of these [point to distractors] faces is feeling like that?
[if no response – prompt once] Which of these faces [point to distractors] is feeling like this one [point to target]?

EM 1.2 How do you think [she/he] feels?

[if responds correctly] Well done.
[is responds incorrectly] Well done.
[if no response – prompt once] How do you think this girl/boy is feeling? [point to target face]

Repeat for each item in Emotion Matching – (12 Items)

[During test – if child asks questions, say: Good question, let's talk about that when we finish the game. Which of these children [*point to distractors*] is like this child [*point to target*]]

[During test – if child gets distracted e.g. gets up, begins to play with things, ask: do you want to keep playing this game?
If yes – give prompt. If no – take back to class.]

[Before continuing, ask] Would you like to play the next game?

[if yes – continue. If no – take back to class]

Receptive Knowledge of Emotion Labels & Expressive Knowledge of Emotion Situations

ETR Practice 1. Have a look at these faces.

ETR Practice 1.1 Point to the happy face.

[if points] Good job.
[if incorrect – continue]
[if no response – prompt once] Which of these faces is feeling happy?

[point to happy face] This face feels happy.

ETR Practice 1.2 What makes you feel happy?

[if response is unclear/incomprehensible – ask clarifying question] How does that make you feel happy?
[if no response – prompt] This face feels happy. Have a little think, what makes you feel like that?

ETR Practice 2. Have a look at these faces.

ETR Practice 2.1 Point to the sad face.

[if points] Good job.
[if incorrect – continue]
[if no response – prompt once] Which of these faces is feeling sad?

[point to sad face] This face feels sad.

ETR Practice 2.2 What makes you feel sad?

[if response is unclear/incomprehensible – ask clarifying question] How does that make you feel sad?
[if no response – prompt] This face feels sad. Have a little think, what makes you feel like that?

[begin test]

ETR Item 1. Have a look at these faces.

ETR 1.1 Point to the [emotion] face.

[if points] Good job.
[if incorrect – continue]
[if no response – prompt once] Which of these faces is feeling [emotion]?

[point to [*emotion*] face] This face feels [emotion].

ETR 1.2.1 What makes you feel [emotion]?

[if response is unclear/incomprehensible – ask clarifying question] How does that make you feel [emotion]?
[if no response – prompt] This face feels [emotion]. Have a little think, what makes you feel like that?

ETR 1.2.2 When do you feel [emotion], like this?

[if response is unclear/incomprehensible – ask clarifying question] When do you feel [emotion]?
[if no response – prompt] This face feels [emotion]. When do you feel [emotion]?

ETR 1.2.3 Did you feel like this today?

[if response is unclear/incomprehensible – ask clarifying question while pointing at [*emotion*] face] Did you feel like this today?
[if no response – prompt] Look at this child's face. Did you feel like this today?

Repeat for all Emotion Term Items. Each emotion occurs 3 times. The first occurrence ETR 1.2.1 is the follow up question, the second occurrence 1.2.2 is the follow up question, and the third occurrence 1.2.3 is the follow up question.

[During test – if child asks questions, say: Good question, let's talk about that when we finish the game. Then give prompt.]

[During test – if child gets distracted e.g. gets up, begins to play with things, ask: do you want to keep playing this game?
If yes – give prompt. If no – take back to class.]

[Before continuing, ask] I have one more game to play. Would you like to keep playing?

[if yes – continue. If no – take back to class]

Receptive Interpretation of Emotion-eliciting Situations & Expressive Interpretation of Emotion-eliciting Situations

Now I'm going to tell you about some of my friends. They are children, just like you.

Practice ECR 1. This is my friend Akili.

Akili's mother gave her an ice cream.

Practice ECR 1.1 Point to how Akili feels.

[if correct] Great job.
[if responds verbally] Good, can you show me which face feels like that?
[if no response – prompt] Akili's mother gave her a book today. Show me how Akili feels.

Practice ECR 1.2 Does she feel good or bad?

[if correct] Very good.
[if incorrect] Very good.
[if no response – prompt] [point to face child chose in 1.1] Does Akili feel good or bad here?
[if no response and child did not respond in 1.1 – prompt] [point to happy face] Does Akili feel good or bad here?

Practice ECR 2. This is my friend Mapendo.

Mapendo's brother broke his toy car.

Practice ECR 2.1 Point to how Mapendo feels.

[if correct] Great job.
[if responds verbally] Good, can you show me which face feels like that?
[if no response – prompt] Mapendo's brother snatched his toy car. Show me how Mapendo feels.

Practice ECR 2.2 Does he feel good or bad?

[if correct] Very good.
[if incorrect] Very good.
[if no response – prompt] [point to face child chose in 2.1] Does Mapendo feel good or bad here?
[if no response and child did not respond in 2.1 – prompt] [point to angry face] Does Mapendo feel good or bad here?

[Begin test]

ECR Item 1. This is my friend Asha.

Asha's father bought her a balloon.

ECR 1.1 Point to how Asha feels.

[if correct] Great job.
[if incorrect] Great job.
[if responds verbally] Good, can you show me which face feels like that?
[if no response – prompt] Asha's father bought her a balloon today. Show me how Asha feels.

ECR 1.2.1 Does she feel good or bad?

[if correct] Very good.
[if correct] Very good.
[if no response – prompt] When Asha is given a balloon does she feel good or bad?

ECR 1.2.2 What is the name of that feeling?

[if correct] Very good.
[if correct] Very good.
[is no response – prompt] Look at Asha's face here [point to child's answer for 1.1]. What is the name of that feeling?

ECR 1.2.2 Do you ever feel like that?

[if correct] Ok.
[if correct] Ok.
[is no response – prompt] Look at Asha's face here [point to child's answer for 1.1]. Do you ever feel like that?

Repeat for all Emotion Cause Items. Each emotion occurs 3 times. The first occurrence ECR 1.2.1 is the follow up question, the second occurrence 1.2.2 is the follow up question, and the third occurrence 1.2.3 is the follow up question.

[During test – if child asks questions, say: Good question, let's talk about that when we finish the game. Then give prompt.]

[During test – if child gets distracted e.g. gets up, begins to play with things, ask: do you want to keep playing this game?
If yes – give prompt. If no – take back to class.]

Closing

Wow, we've finished all the games! Thank you so much for playing with me.

[stop audio recording]

Data Collection Protocol for Fikiria Hisia Test – Swahili

Introduction

Habari,

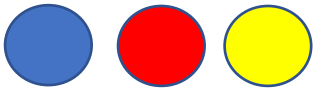
Jina langu ni _____. Nimekuja hapa skuleni kwako kucheza michezo na watoto kama wewe. Michezo hii inahusu hisia. Je, ungependa kucheza michezo hiyo na mimi?

[if yes] Safi sana! [if no – take back to class]

Warm up – answer by pointing:

Sasa nitakuonyesha picha.

[show pictures of different colours: red, blue, yellow]

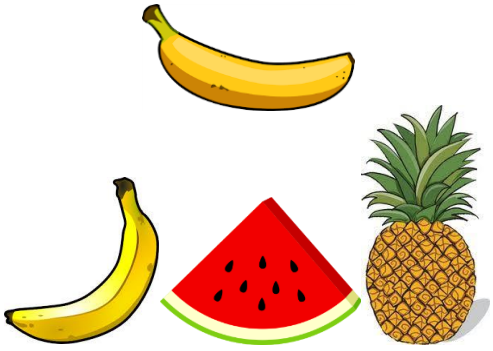


Nionyeshe rangi unayoipenda zaidi.

[if points] Rangi nzuri kweli!
[if no response – prompt] Rangi ipi unapenda zaidi?
[if no response after prompt – move on to matching warm up]

Warm up – matching 1:

[Show warm up item: target = banana; distractors = watermelon, pineapple, banana]



Sasa nitakuonyesha picha ya matunda. Angalia haya matunda. [wait 5 seconds]

[point at target banana]. Hili ni tunda gani?

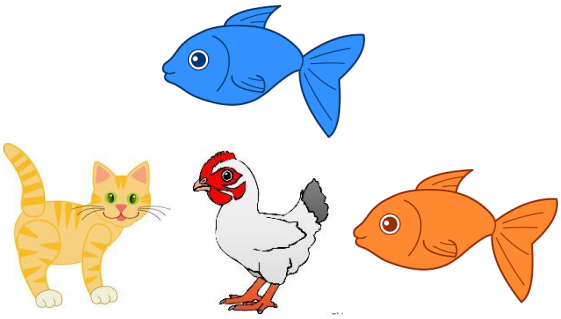
[if correct]Vizuri sana.
[if incorrect] Ndizi.
[if no response] Ndizi.

Nionyeshe kwa kidole tunda lipi [point to distractors] ni sawasawa na hili [point to target]?

[if correct] Vizuri sana.
[if incorrect – prompt] Hii ni ndizi [point to target banana] Ipi 104aucasi ndizi? [point to distractors]
[if no response – prompt] Hii ni ndizi [point to target banana] Ipi 104aucasi ndizi? [point to distractors]

Warm up – matching 2:

[Show warm up – matching 2 item: target = fish; distractors = cat, chicken, fish]



Sasa nitakuonyesha picha ya wanyama. Hebu angalia wanyama hawa. [wait 5 seconds]

[point at target fish]. Huyu ni mnyama gani?

[if correct] Vizuri sana.
[if incorrect] Samaki.
[if no response] Samaki.

Nionyeshe mnyama yupi [point to distractors] ni sawasawa na huyu [point to target]?

[if correct] Safi sana.
[if incorrect – prompt] Huyu ni samaki [point to target fish] Yupi 104aucasi samaki? [point to distractors]
[if no response – prompt] Huyu ni samaki [point to target fish] Yupi 104aucasi samaki? [point to distractors]

[if no response on both pointing and matching warm-ups – return child to class and say:

Haya asante sana kwa kuangalia hizi picha nami.
[If it is the child's first attempt, the child should get another go on another day]

[begin audio recording]

Test

Sasa nitakuonyesha picha za watoto wenye hisia mbalimbali.

Facial Expression Matching & Expressive Knowledge of Emotion Labels

Practice 1

EM Practice 1. Angalia hawa watoto.

EM Practice 1.1 Nionyeshe kwa kidole nani hapa [point to the distractors] anajisikia sawasawa na huyu [point to target face]

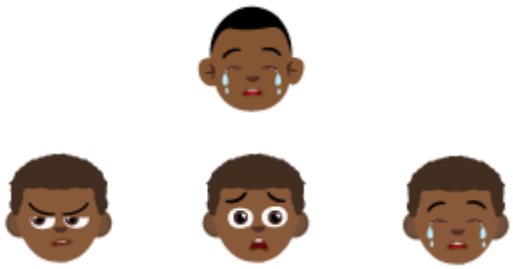
[if points] Vizuri sana.
[if responds verbally] Sawa, unaweza kunionyesha kwa kidole nani kati yao [point to distractors] anajisikia kama huyu?
[if no response – prompt once] Nani kati ya hawa [point to distractors] anajisikia sawasawa na huyu [point to target]?

EM Practice 1.2 Unafikiri anajisikiaje?

[if responds correctly] Safi sana.
[is responds incorrectly] Safi sana.
[if no response – prompt once] Unafikiri mtoto huyu anajisikiaje? [point to target face]

Practice 2

EM Practice 2. Angalia nyuso hizi.



EM Practice 2.1 Nionyeshe nani hapa [point to the distractors] anajisikia sawasawa na huyu [point to target face]

[if points] Nzuri sana.
[if responds verbally] Sawa, unaweza kunionyesha kwa kidole nani kati yao [point to distractors] anajisikia kama huyu?
[if no response – prompt once] Nani kati ya hawa [point to distractors] anajisikia sawasawa na huyu [point to target]?

EM Practice 2.2 Unafikiri anajisikiaje?

[if responds correctly] Safi sana.
[is responds incorrectly] Safi sana.
[if no response – prompt once] Unafikiri mtoto huyu anajisikiaje? [point to target face]

[Begin test]

EM Item 1. Angalia hawa watoto..

EM 1.1 Nionyeshe kwa kidole nani hapa [point to distractors] anajisikia sawasawa na huyu [point to target]?

[if points] Vizuri sana.
[if responds verbally] Sawa, unaweza kunionyesha kwa kidole nani kati yao [point to distractors] anajisikia kama huyu?
[if no response – prompt once] Nani kati ya hawa [point to distractors] anajisikia sawasawa na huyu [point to target]?

EM 1.2 Unafikiri anajisikiaje?

[if responds correctly] Safi sana.
[is responds incorrectly] Safi sana.
[if no response – prompt once] Unafikiri mtoto huyu anajisikiaje? [point to target face]

Repeat for each item in Emotion Matching – (12 Items)

[During test – if child asks questions, say: Hilo ni swali zuri, na tutalirudia tukimaliza na mchezo huu, sawa? Sasa, nani kati ya watoto hawa [*point to distractors*] anajisikia kama huyu [*point to target*]]

[During test – if child gets distracted e.g. gets up, begins to play with things, ask: unataka kuendelea kucheza?
If yes – give prompt. If no – take back to class.]

[Before continuing, ask] Je, ungependa kuendelea na mchezo mwingine?

[if yes – continue. If no – take back to class]

Receptive Knowledge of Emotion Labels & Expressive Understanding of Emotion Situations

ETR Practice 1. Angalia watoto hawa.

ETR Practice 1.1 Nionyeshe nani hapa ana furaha.

[if points] Kazi nzuri.
[if incorrect – continue]
[if no response – prompt once] Nani kati ya hawa ana furaha?

[point to happy face] Huyu ana furaha.

ETR Practice 1.2 Ni kitu gani kinachokufanya wewe uwe na furaha?

[if response is unclear/incomprehensible – ask clarifying question] Kivipi ____ kinakufanya uwe na furaha?
[if no response – prompt] Huyu ana furaha. Hebu fikiri kidogo, ni kitu gani kinachokufanya wewe ujisikie kama huyu?

ETR Practice 2. Angalia nyuso hizi.

ETR Practice 2.1 Nionyeshe nani hapa ana huzuni.

[if points] Kazi nzuri.
[if incorrect – continue]
[if no response – prompt once] Nani kati ya hawa ana huzuni?

[point to sad face] Huyu ana huzuni.

ETR Practice 2.2 Ni kitu gani kinachokufanya wewe uwe na huzuni?

[if response is unclear/incomprehensible – ask clarifying question] Kivipi ____ kinakufanya uwe na huzuni?
[if no response – prompt] Huyu ana huzuni. Hebu fikiri kidogo, ni kitu gani kinachokufanya wewe ujisikie kama huyu?

[begin test]

ETR Item 1. Angalia hawa watoto.

ETR 1.1 Nionyeshe nani hapa ana [emotion].

[if points] Vizuri sana.
[if incorrect – continue]
[if no response – prompt once] Nani kati ya hawa ana [emotion]?

[point to [*emotion*] face] Huyu ana [emotion].

ETR 1.2.1 Ni kitu gani kinachokufanya wewe uwe na [emotion]?

[if response is unclear/incomprehensible – ask clarifying question] Kivipi _____ kinakufanya uwe na [emotion]?
[if no response – prompt] Huyu ana [emotion]. Hebu fikiri kidogo, ni kitu gani kinachokufanya wewe ujisikie kama huyu?

ETR 1.2.2 Ni wakati gani una [emotion], kama huyu?

[if response is unclear/incomprehensible – ask clarifying question] Ni wakati gani unajisikia [emotion]?
[if no response – prompt] Huyu ana [emotion]. Ni wakati gani wewe una [emotion]?

ETR 1.2.3 Je, umejisikia hivi leo?

[if response is unclear/incomprehensible – ask clarifying question while pointing at [*emotion*] face] Ulijisikia kama huyu leo?
[if no response – prompt] Angalia mtoto huyu. Je, ulijisikia kama huyu leo?

Repeat for all Emotion Term Items. Each emotion occurs 3 times. The first occurrence ETR 1.2.1 is the follow up question, the second occurrence 1.2.2 is the follow up question, and the third occurrence 1.2.3 is the follow up question.

[During test – if child asks questions, say: Hilo ni swali zuri, na tutalirudia tukimaliza na mchezo huu, sawa? Then give prompt.]

[During test – if child gets distracted e.g. gets up, begins to play with things, ask: unataka kuendelea kucheza?
If yes – give prompt. If no – take back to class.]

[Before continuing, ask] Bado umebaki mchezo mmoja. Je, ungependa kuucheza?

[if yes – continue. If no – take back to class]

Receptive & Expressive Interpretation of Emotion-Eliciting Situations

Sasa nitakuambia kuhusu baadhi ya 109aucas zangu. Ni watoto kama wewe.

Practice ECR 1. Huyu ni 109aucas yangu, Akili.

Mama yake Akili amempa kitabu.

Practice ECR 1.1 Nionyeshe anavyojisikia Akili hapo anapopewa kitabu.

[if correct] Safi sana.
[if responds verbally] Safi, sasa nionyeshe nani hapa anajisikia [_____]?
[if no response – prompt] Mama yake Akili kampa kitabu leo. Nionyeshe anavyojisikia Akili akipewa kitabu.

Practice ECR 1.2 Je, itakuwa Akili anajisikia vizuri au vibaya?

[if correct] Vizuri sana.
[if incorrect] Vizuri sana.
[if no response – prompt] [point to face child chose in 1.1] Hapa Akili anajisikia vizuri au vibaya?
[if no response and child did not respond in 1.1 – prompt] Akili akipewa kitabu anajisikia vizuri au vibaya?

Practice ECR 2. Huyu ni 109aucas yangu, Mapendo.

Kaka yake Mapendo amemnyang'anya gari lake.

Practice ECR 2.1 Nionyeshe anavyojisikia Mapendo hapo anaponyang'anywa.

[if correct] Safi sana.
[if responds verbally] Safi, sasa nionyeshe nani hapa anajisikia [_____]?
[if no response – prompt] Kaka yake Mapendo kamnyang'anya garli lake. Nionyehse anavyojisikia Mapenda akinyang'anywa gari.

Practice ECR 2.2 Je, itakuwa Mapenda anajisikia vizur au vibaya?

[if correct] Vizuri sana.
[if incorrect] Vizuri sana.
[if no response – prompt] [point to face child chose in 2.1] Hapa Mapendo anajisikia vizuri au vibaya?
[if no response and child did not respond in 2.1 – prompt] Mapendo akinyang'anywa gari anajisikia vizuri au vibaya?

[Begin test]

ECR Item 1. Huyu ni 110aucas yangu Asha.

Baba yake Asha alimnunulia puto.

ECR 1.1 Nionyeshe anavyojisikia Asha.

[if correct] Safi sana.
[if incorrect] Safi sana.
[if responds verbally] Safi, sasa nionyeshe nani hapa anajisikia [_____]?
[if no response – prompt] Baba yake Asha kamnunulia puto. Nionyeshe anavyojisikia Asha akinunuliwa puto.

ECR 1.2.1 Je, itakuwa anajisikia vizuri au vibaya?

[if correct] Vizuri sana.
[if incorrect] Vizuri sana.
[if no response – prompt] Asha akinunuliwa puto anajisikia vizuri au vibaya?

ECR 1.2.2 Hisia hiyo inaitwaje?

[if correct] Vizuri sana.
[if incorrect] Vizuri sana.

[is no response – prompt] Angalia uso wake wa Asha hapa [point to child's answer for 1.1]. Hisia hii inaitwaje?

ECR 1.2.2 Je, kuna wakati unajisikia hivi?

[if correct] Sawa.
[if incorrect] Sawa.
[is no response – prompt] Angalia uso wa Asha hapa [point to child's answer for 1.1]. Kuna wakati na wewe unajisikia hivi?

Repeat for all Emotion Cause Items. Each emotion occurs 3 times. The first occurrence ECR 1.2.1 is the follow up question, the second occurrence 1.2.2 is the follow up question, and the third occurrence 1.2.3 is the follow up question.

[During test – if child asks questions, say: Hilo ni swali zuri, na tutalirudia tukimaliza na mchezo huu, sawa? Then give prompt.]

[During test – if child gets distracted e.g. gets up, begins to play with things, ask: unataka kuendelea kucheza?
If yes – give prompt. If no – take back to class.]

Closing

Waow, naona tumemaliza michezo yote! Asante sana kwa kucheza nami.

[stop audio recording]

Appendix F – CUREC Approval

Dear [Author's name]

Title: Tufikirie Hisia: An exploratory study of emotion understanding in Zanzibari pre-schoolers
Ref: ED-CIA-19-171

The above application has been considered on behalf of the Departmental Research Ethics Committee (DREC) in accordance with the procedures laid down by the University for ethical approval of all research involving human participants.

I am pleased to inform you that, on the basis of the information provided to DREC, the proposed research has been judged as meeting appropriate ethical standards, and accordingly, approval has been granted.

If your research involves participants whose ability to give free and informed consent is in question (this includes those under 18 and vulnerable adults), then it is advisable to read the following NSPCC professional reporting requirements for cases of suspected abuse http://www.nspcc.org.uk/Inform/research/questions/reporting_child_abuse_wda74908.html

Should there be any subsequent changes to the project which raise ethical issues not covered in the original application you should submit details to research.office@education.ox.ac.uk for consideration.

Good luck with your research study.

Yours sincerely,

Laura Molway
Member of DREC

CENTRAL UNIVERSITY RESEARCH ETHICS COMMITTEE (CUREC)

Form CUREC 1A Checklist for the Social Sciences and Humanities

The University of Oxford places a high value on the knowledge, expertise, and integrity of its members and their ability to conduct research to high standards of scholarship and ethics. The research ethics clearance procedures have been established to ensure that the University is meeting its obligations as a responsible institution.

They start from the presumption that all members of the University will take their responsibilities and obligations seriously and will ensure that their research involving human participants is conducted according to the established principles and good practice in their fields and in accordance, where appropriate, with legal requirements. Since the requirements of research ethics review will vary from field to field and from project to project, the University accepts that different guidelines and procedures will be appropriate.

- Please check **"Where and how to apply for ethical review"** and the **CUREC flowchart** first to see if you need ethics approval.
- Please complete this form using a word processor and email it, together with your supporting documents, to your **Departmental Research Ethics Committee (DREC)** (**if applicable**). If you don't have a DREC please email this form to **ethics@socsci.ox.ac.uk** using your official **ox.ac.uk email** address. **Only emailed applications will be accepted.**

WHAT THIS CHECKLIST IS DESIGNED FOR

This **CUREC 1A checklist** is designed largely for research that falls within the Divisions of Social Sciences and Humanities where ethical issues are relatively few and straightforward. Interviews, field work and oral history are also included in the CUREC process.

The **full CUREC 2 application** is only required where certain project characteristics (e.g. type of participants, or procedures) result in a more complex set of ethical issues. It is expected that only in a limited number of cases will it be necessary for researchers to complete a CUREC 2 application. The checklist below will direct you to a CUREC 2 application if needed.

WHAT THIS CHECKLIST WILL NOT ASSESS

This checklist does not cover research governance, satisfactory methodology, or compliance with the requirements of publishers when administering their tests or questionnaires. As **principal researcher (i.e. principal investigator)**, it is your responsibility to ensure that requirements in these areas are met.

CUREC does not review studies classed as **audit** (see Glossary and Decision Flowchart for CUREC on our website).

If your study involves **NHS patients, NHS staff / data / facilities, or human tissue**, please check the Decision Flowchart for NHS approval and contact the Clinical Trials and Research Governance (CTRG) team in the first instance.

Further information on the University's research ethics procedures is available from the CUREC website.

SECTION A: Filter for CUREC2 application This section determines whether your study raises more complex issues which require the completion of a full application for ethical review, known as the CUREC 2 application. **(Please mark 'X' in the Yes/No column as appropriate to indicate your response.)**		
i) Are research participants classed as **people whose ability to give free and rmed consent is in question**? (This may include those under 18 (though see npetent youths"), prisoners, or adults "at risk".) Your attention is drawn to the University's **eguarding Code of Practice** and its implications for researchers involving children or lts at risk, including the need for the work to be risk assessed and for researchers to ertake related training. (**Note**: If any of your participants are aged 16 or under, please answer 'Yes' here **and** also answer question 5 below.)	Yes X	No
2. By taking part in the research, will participants be at serious risk of criminal prosecution (e.g. by providing information on drug abuse or child abuse)?	Yes	No X
3. Does the research involve the **deception** of participants?	Yes	No X
4. Does your research raise issues relevant to the **Counter-Terrorism and Security Act (the Prevent duty)**, which seeks to prevent people from being drawn into terrorism? Please see advice on this on our **Best Practice Guidance web page**.	Yes	No X
If you have answered 'No' to all of the questions above please go to **Section B**. If you have answered 'Yes' to any question above continue to question 5 below.		
5. Is your project covered by a CUREC **approved procedure** (formerly known as "CUREC Protocols")?	Yes X	No
If yes, please give research procedure number(s): AP25		
If you answered '**Yes'** to **ANY** of questions **1-4**, **and** answered '**No'** to question **5**, **please stop completing this checklist and do not submit it for ethical review**. Instead, please complete the CUREC 2 application form from the CUREC website. Then submit the CUREC 2 form for ethical review. If you answered 'Yes' to ANY of questions 1-3, **and** answered 'Yes' to question 5, please go on to **Section B**.		
SECTION B: Contact details and project description (NB: must be typed not handwritten)		
Contact details:		
1. **Principal investigator /** supervisor (if student research (title and full name):	[redacted]	
2. Name of student (if student research):	[redacted]	
3. Degree programme, e.g. Dphil, BA, Mphil, BSc, MSc (if student research):	MSc Education (Education and Child Development)	
4. Department or Institute name:	Department of Education	
5. Address for correspondence (if different from above):		
6. University e-mail (**not** private email) and telephone:	Hannah.simmons@st[redacted]	
7. Name and status of others taking part in the project, e.g. third year undergraduate; postdoctoral research assistant:	[redacted] Research assistant This role is strictly limited to data collection: - using the International Development and Early Learning Assessment (IDELA) with child participants - Following IDELA protocols	

	- Using paper and pen to collect data according to IDELA protocols/scoring The research assistant has been trained as an IDELA enumerator in Tanzania and is a native speaker of Swahili. The research assistant is in no way linked to the conceptualisation or analysis for this study.

SECTION B continued	
Project description:	
8. Title of research project:	Tufikirie Hisia: An exploratory study of emotion understanding in Zanzibari pre-schoolers
9. List of location(s) where project will be conducted:	[redacted], Zanzibar Homes of participating caregivers, [redacted] Zanzibar
10. If your research involves overseas travel or fieldwork and your department requires a travel risk assessment, will you have completed and returned a risk assessment form beforehand? (This has to be approved by your department before you travel. If you are travelling overseas, you are strongly advised to take out University travel insurance.)	Yes X No Not required in this instance
11. Anticipated duration of research project overall:	4 months
12. Anticipated start and end dates of the research project involving human participants:	From: (23/04/19) To: (31/05/19) Please note that you will need ethics approval **before** you start your research. CUREC 1As may take up to 30 days to process.
13. External organisation funding the research (if applicable):	
14. Title and very brief and simple lay description of **research** (about 150 words), plus description (about 200 words) of the nature of participants.	
a) Title, brief description of research (150 words) in lay language. When describing the research, please include your methodology, how you are applying professional guidelines, and the use to which results/data will be put. **Please also declare any conflicts of interest here.**	

The title of this research project is:
Tufikirie Hisia: an exploratory study of emotion understanding in Zanzibari 116aucasian116ers

The project has two phases: an **in-school study** of emotion understanding with children, and an **at-home study** of caregiver emotion language with caregivers

1. **In-school study**

This component will explore what children in a government preschool in Zanzibar understand about emotions. It will use a novel emotion understanding tool developed by the researcher (Appendix H), and the International Development and Early Learning Assessment (IDELA) developed by Save the Children (Appendix I). The novel tool will ask children to answer multiple choice questions about emotions using cartoon images of different facial expressions. Seven items from the IDELA will be used: all socio-emotional items, a shape identification item, and an expressive language item. Assessments will take approximately 15 minutes. The child will complete the assessments over two consecutive days. The order of the tests will be counterbalanced.

Data – Two types of data will be collected on child participants: **personal data** and **test performance data**.

Personal data – The child's age, gender and years in school will be obtained from their teacher.
When children are selected, they will be assigned a unique number generated by the order, day and date they are seen by the researcher (e.g. the second child on the first day will be assigned number 020119).

Test performance data -
The test draws on non-verbal (pointing) and verbal responses. Test performance data will therefore be collected using **pen and paper** (to record non-verbal responses) and **audio recorded** data.

Data collected with pen and paper and identified with the child's unique ID number. Data will then be entered to Excel and stored in a password-protected file. The hard copy will be shredded, and the electronic copy will be uploaded to the university server as soon as all test performance data has been collected.

Audio-recorded data will be collected using a Dictaphone. The Dictaphone will be switched on before the researcher introduces the test to the participant. At the beginning of the audio-recording the researcher will state the child's unique ID number. The Dictaphone will be switched off as soon the test is complete. At the end of the day, all recordings will be uploaded to the University server. They will be named according to the child's unique ID number.

2. **At-home study**

This component examines the correlation between primary caregiver emotion understanding and child performance on the tests in component 1. The caregiver will be sat in a quiet area of their home. The researcher will show the caregiver an image of a scene with different characters showing different facial expressions suggesting different emotions. The image will have a dotted line which the caregiver can follow with their finger to guide them through the scene. The researcher will ask them to follow the line with their finger first to check they understand. The child will then be invited to join and the caregiver and child will be given a colouring task as a warm up. After the warm up, the caregiver will be given the image again and asked to trace the dotted line and discuss how each character is feeling along the dotted line. The tasks will be audio-recorded using a Dictaphone. It will take approximately 30 minutes and will follow an established protocol (Appendix J) The caregiver and/or child can opt out at any point by notifying the researcher (or if the child indicates to the caregiver they would no longer like to do the task).

Data – Two types of data will be collected on the caregiver: **personal data** and **emotion task data**

Personal data – Paper consent forms for the caregiver will contain the caregiver's name and will be scanned and uploaded to the university server for secure storage.

An electronic file will be created which will contain the caregiver's name and the caregiver's unique ID number (generated from the child's unique ID no. and adding _cg, e.g. 020119_cg). These data will be entered while the researcher is with the caregiver and child to ensure that the child's ID number is correct.

Data on the caregiver's age, gender, level of education and relationship with the index child will be sought from the caregiver. These data will be collected electronically using a password-protected file and will use the caregiver's unique ID number.

Electronic files will be backed up to the university server and deleted from the laptop when data collection is complete.

Emotion task data – during the emotion task the caregiver will be recorded using a Dictaphone. Audio files will be immediately uploaded to the university server and named using the caregiver's ID number, then deleted from the Dictaphone.

Outcomes

The main outcomes will be child performance on the novel emotion understanding tool, the IDELA items, and caregiver emotion understanding based on the emotion task. Child performance on the two tests will be compared using multiple regression. Data from the caregiver emotion task will then be used to examine the correlation between the child's performance and caregiver use of emotion language. Individual child performance on the tests will not be shared with the school or with the child's family. Caregiver performance will also not be shared with the school or family. A report on the findings of the study will be shared with the community through a community meeting in September 2019, with an opportunity for the community to ask questions. The same report will be made available to the MOEZ and the Zanzibar Institute of Education.

There are no conflicts of interest.

SECTION B continued

b) Description of participants and **obtaining informed consent** (200 words). When describing participants, please include

- criteria for inclusion/exclusion
- method of recruitment
- processes for consent to participate

Please ensure you attach as separate documents (if applicable, in English translation):

- your recruitment and advertisement material e.g. a poster or brief invitation letter/ email
- information for participants to read (or hear) before they agree to take part e.g. written information sheets or (only if applicable) oral information scripts.
- a document to record informed consent. Templates for written consent forms and/or oral information scripts (in case of an oral consent process) are available from the CUREC website
- a guide to interview questions (this may be a list of questions to be asked, or a preliminary scope of questions), or a sample of other instruments (such as a sample questionnaire)
- (if relevant) debriefing document after participants have taken part

School

Saateni preschool is the second-largest government preshcool in the Zanzibar Urban area, providing a representative sample of children attending government preschool in Zanzibar.

Consent to conduct the research within the school will be sought by applying for a research permit from the Zanzibar Ministry of Education, and by seeking opt-in consent from the headteacher in accordance with Zanzibar's protocols. Children will be given the option to opt-out at any stage by notifying the researcher or their teacher
The research proposal (Appendix A) will be presented to the MOEZ, along with a letter of introduction. The researcher will present these documents to the MOEZ in person, allowing for any questions or queries from the MOEZ to be addressed.

The information sheet (Appendix B) will be provided to the headteacher. The attached letter (Appendix C) will be presented to the headteacher, and a consent form (Appendix D) will be signed to obtain consent. The researcher will meet with the headteacher and headteacher will have a chance to ask questions before consenting to participate.

According to the MOEZ, a valid research permit and permission from the headteacher must be obtained, however consent from parents/guardians of children is not required.

Children

15 children aged between 4 and 5 years from each class (8 classes in total) will be randomly selected. This will be done by generating 15 random numbers and then selecting the children who correspond with those numbers from the class list. If the class list is rank-ordered, the children will be listed by alphabetisising surnames before being selected.

Verbal consent will be sought from the children selected before they participate. All children will have the right to opt-out. If the child opts not to participate, they will be returned to the class and their data will not be used. The child will be asked if they would like to continue the task at several times during the session according to protocols. Should the child opt not to continue, they will be returned to the class but their data may still be used.

If the teacher is concerned with the child's ability to participate (for example, due to being identified as having special educational needs (SEN) or a disability which might impede their ability to participate (such as being blind or deaf) the teacher can opt to withdraw that child. In this instance, another child will be randomly selected.

Caregivers

A sample of approximately 20 caregivers of participating children will be selected based on convenience sampling (who is available and consents to participate). Caregivers will be identified by asking those present at the child's home who does the majority of the following for the child:
- Gets child ready for school
- Feeds child/ensures child eats
- Bathes child/ensures child bathes
- Plays with/reads to child
- Tends to child if they are hurt/upset
- Disciplines child at home

Informed consent to participate in the study and to be audio-recorded will be sought by presenting the attached information sheet (Appendix E). Consenting caregiver participants will sign the attached written consent form (Appendix F). Should the caregiver be illiterate, the information will be read to them and oral consent will be sought using the attatched oral consent form (Appendix G). For any caregiver under the age of 18 consent will be sought from their mother or father. The caregiver themselves will still have the option to opt-out by notifying the researcher.

The caregiver, and any other consenting party (e.g. caregiver mother or father) will have the option to ask questions before consenting to participate.

15. What are the ethical issues connected with your research and what steps have you taken to address them? Please do not answer 'none'. The committee needs to see evidence that you have identified potential ethical issues with respect to your research and have taken steps to address them. These issues could relate to:

- your own physical and psychological safety as a researcher (please see the University's and Social Science Division's Safety in Fieldwork guidance
- participant burdens and/or risks, and
- data protection/ confidentiality (please also see section 18).

For more guidance on ethical issues, please see
http://researchsupport.admin.ox.ac.uk/governance/ethics/resources

Informed Consent

The headteacher will receive an information letter and an opt-in consent form. Caregivers will be given an information sheet and either written or oral opt-in consent will be sought. The headteacher, teachers and caregivers will have the opportunity to ask questions about the study and will receive answers before agreeing to participate. All information and consent materials will be made available in Swahili. The translation of these materials will be subject to back-translation to ensure it is accurate and comprehensible for teachers and caregivers.

Data protection/Confidentiality

There is no significant risk or harm posed to the children, teachers or caregivers participating in this study.

As outlined in question 14 (a), the respective documents linking child name with unique ID number, and caregiver name with unique ID number will not be stored on the laptop at the same time. This reduces any chance of identifying the link between child and caregiver.

- **Headteacher consent**

The headteacher's consent form for the school to opt-in to the study will be scanned and uploaded to the university server. The hard copy will then be shredded.

- **Caregiver data**

Paper consent forms obtained from caregivers will be scanned and uploaded to the university server at the end of the day. As soon as the scanned copy is uploaded, the hard copy will be shredded.

The caregiver will be assigned a unique ID number which corresponds to the ID number of the index child. An Excel sheet will be created which will contain the caregiver's name and unique ID number. These data will be entered while the researcher is with the caregiver and child to ensure the child's ID number is correct. The file will be password-protected, and will be on the researcher's laptop which will be stored in a locked cupboard. It will be the only file linking the caregiver to the child. As the child's data collection will finish before caregiver data collection begins, the file containing the child name and ID number will have already be uploaded to the university server and will not be on the laptop at the same time as the caregiver linking file. This means it will be very difficult to link the child and caregiver. When all caregiver data has been collected this file will be uploaded to the university server when all caregiver data has been collected, at which point the electronic file will be deleted from the laptop by using the Microsoft 'Sdelete' tool.

Caregiver data collected using audio recording will be uploaded to the university server, named using the caregiver's unique ID number. The recording will be immediately uploaded to the university server where it will be given a file name corresponding to the caregiver's ID number (e.g. 020119_cg). If there are more than audio file for the same caregiver, the extension _02 will be used, e.g. 020119_cg_02. Once the audio file has been uploaded to the server it will be deleted from the Dictaphone.

Personal data will be collected on a password-protected electronic document and will only be identifiable by the caregiver's unique ID number. When data collection is complete this will be uploaded to the university server and the original will be deleted from the laptop using the Microsoft 'Sdelete' tool.

- **Child data**

Paper copies of child test scores will be scanned and uploaded to the university server at the end of each day. The file will be named using the child's unique ID number. As soon as a scanned copy is uploaded, the hard copy will be shredded. When the file has been uploaded to the server, the file will be deleted from the laptop using the Microsoft 'Sdelete' tool. This data will then be entered to Excel and stored in a password-protected file.

Audio-recordings will have the child's unique ID number stated at the beginning. The Dictaphone will be switched on at the start of the test and switched off as soon as the test is over. If the child takes a break, the Dictaphone will be switched off during the break and recording will recommence when the child indicates they are ready to resume (by responding verbally or gesturing when the researchers asks if they are ready to continue). At the end of the day all audio files recorded that day will be uploaded to the university server, and named with the child's unique ID number. The files will then be deleted from the Dictaphone.

Personal data will be collected on a password-protected electronic document and will only be identifiable by the child's unique ID number. A single electronic document will exist which contains the link between the child's name and their unique ID number. This document will be password protected, on a password-protected computer which will be kept in a locked safe at the researcher's hotel. The linking document will be kept until the end of the study in September 2019. It will then be destroyed using the Microsoft 'Sdelete' tool.

In the event that internet access is unreliable/unavailable, any scanned items will be stored in password-protected files on the researcher's laptop and uploaded at the earliest available opportunity. When they have been uploaded the scanned copies will be deleted from the laptop using the Microsoft 'Sdelete' tool. The hard

copies will be stored in a locked safe in the researcher's hotel and will be shredded as soon as the scanned copies are uploaded to the university server.
Similarly, the audio files will be stored in a separate password-protected file and uploaded at the earliest opportunity. During this time the laptop will be kept in a locked cupboard in the researcher's hotel room and the researcher will carry the key with them at all times. The files will be deleted from the Dictaphone. As soon as files have been uploaded they will be deleted from the laptop using the Microsoft 'Sdelete' tool.

Due to time constraints it is not possible to allow all children in the school to participate in the study. However, to compensate for any envy that may arise among children, at the end of the study the researcher will present teachers with activities including feeling-drawing worksheets and an inclusive game which can be used to involve all children in emotion-understanding-based activities.

Safeguarding

The researcher will adhere to all the safeguarding policies and procedures of the school. As the research involves the discussion of negative emotions, and situations which may invoke these emotions, it is possible a child may disclose sensitive information. In this instance, the school's policies on disclosure will be followed.

Researcher safety

For any research carried out in a non-public place (caregiver homes), the supervisor and local contacts will be notified in advance and location and time will be specified.

The researcher will adhere to local Zanzibari customs by dressing according to Islamic values and communicating with all participants in Swahili.

Travel insurance will be sought through the University of Oxford and the risk assessment will be completed.

Section B continued		
16. Will you obtain informed consent according to CUREC guidelines and good practice in your discipline before participation?	Yes X	No
If you have marked '**No**', please give a brief explanation and justification for this decision here:		
17. Will your research involve discussing sensitive issues? This could be information relating to race or ethnic origin, political opinions, religious beliefs, physical/mental health, trade union membership, sexual life or criminal activities.	Yes X	No
If you have marked '**Yes**', please make sure that you have included some **supporting information** (as directed in question 14 of this section) showing the range of questions covering these issues. There is potential for the test items to evoke emotional memories. Certain questions ask the child to identify a time when they felt happy, angry, sad or scared. These can be seen in the attached test items for the novel tool and for the IDELA. If negative emotions have been evoked in the child, the researcher will consult the supervisor for advice on next steps. This may include informing the headteacher and the headteacher's judgement of who else to inform.		

18. **Management and handling of personal and other research data**

Your management and handling of personal data and special category data of human participants, either directly or via a third party, will need to comply with the requirements of the General Data Protection Regulation (GDPR) and the new Data Protection Act, as set out in the University's Guidance on Data Protection and Research. In answering the questions below, please also consider the points raised in the Data Protection Checklist. For advice on research data management and security, please consult with the University's Research Data Team (**researchdata@ox.ac.uk)** and/or your local IT department and the University's web pages on research data management.

i) Will your research involve the collection of **records of consent** (e.g. written forms, io-recorded, or other recorded consent)? **If 'Yes', these will be classed as fully identifiable personal data (directly linked to an individual).**	Yes X	No
b) Will your research involve the collection of **other personal data?** **If 'Yes**', specify in what form(s) this will be stored:	Yes X	No
• Fully identifiable (directly linked to an individual)	Yes	No X
• Pseudonymised (potentially identifiable as data may be attributed to an individual if linkage information can be accessed elsewhere by researchers)	Yes X	No
• Fully anonymised (i.e. cannot be linked to an individual)	Yes	No X
c) Will any of the personal data you collect classify as **special category** data? **If 'Yes',** in what form(s) will this be stored:	Yes	No X
• Fully identifiable (directly linked to an individual)	Yes	No
• Pseudonymised (potentially identifiable as data may be attributed to an individual if linkage information can be accessed elsewhere by researchers)	Yes	No
• Fully anonymised (i.e. cannot be linked to an individual)	Yes	No
d) How will any personally identifiable data be collected, transferred and backed up? Please describe the arrangements for any physical transfer of personal data (including paper records and data captured electronically via portable media) from where it is collected to local storage.		

As outlined, data will be collected separately for the **child** and the **caregiver**.

Personally identifiable child data:
Personally identifiable data for children will be (a) **their audio recordings**, as it will feature their voices, and (b) the **linking file connecting their unique ID number with their name**.
This number will be generated as soon as the child participates in the first test. This is because the unique ID number is generated by their order in sitting the test, the day and the date (e.g. the second child on day 1 in 2019 will be assigned the number: 020119).

Child audio recorded data
This will be collected using a Dictaphone. The researcher will state the child's unique ID number at the beginning of the recording. Their name will not be used at any point during the recording. At the end of the day, all audio files collected that day will be uploaded to the university server and named according to the child's unique ID number. Files will then be deleted from the Dictaphone. If it is not possible to access the internet to upload the files, the files will be backed up to a password-protected file on a laptop and stored in a locked cupboard in the researcher's hotel, and deleted from the Dictaphone. As soon as the files have been successfully uploaded to the server, they will be erased from the laptop using the Microsoft 'Sdelete' tool.

Linking data (unique ID number and name)

The only way to identify the child will be by accessing the file which contains the link between the names and the unique ID numbers. This file will be created when the testing begins, as the unique ID number will only be generated when the child participates in a test. The names will be obtained from the teacher's class list. The file will be password-protected on the researcher's laptop. An updated version will be uploaded to the university server daily (or as regularly as possible if internet access is not reliable). As soon as all child data have been collected and final upload is complete, the file will be deleted from the researcher's laptop using the Microsoft 'Sdelete' tool.

Non-linking data (child unique ID number only)

Personal data – data on the child's gender, age and years in school will be collected electronically and uploaded to the university server daily (or as soon as possible). As soon as the data has been successfully uploaded to the serve, it will be deleted from the researcher's laptop using the Microsoft 'Sdelete' tool.

Child test performance data collected with pen and paper – These will be scanned and uploaded to the university server. As soon scanned copies have been uploaded, the hard copy will be shredded. If internet access is unreliable, the scanned copies will be saved in a password-protected file on the researcher's laptop and uploaded as soon as possible. During this time the paper copies will be stored in a locked safe in the researcher's hotel. The key will be kept with the researcher at all times. As soon as the scanned copies have been successfully uploaded to the server, the paper copies will be shredded.

Personally identifiable caregiver data:

Participating caregivers will be anonymised by assigning a unique ID number which links them to the corresponding child. This will be generated by adding _cg to the child's unique ID number e.g. 020119_cg. The following precautions will be taken to prevent any caregiver data using the unique ID number from being linked to their name or their child's name.

Linking data (caregiver name and unique ID number)

There will be two ways to identify the caregiver:
i) through the **caregiver consent form** - the paper consent form will be scanned and uploaded to the university server as soon as possible after consent is obtained. If internet is unreliable, the scanned copy will be saved on

the researcher's laptop until it is possible to upload it. When it is uploaded, the scanned copy will be deleted from the laptop using Microsoft 'Sdelete'. The paper copy will be shredded as soon as the corresponding scanned copy has been uploaded. If there is any delay in uploading the scanned copy, the paper copy will be stored in a locked safe in the researcher's hotel room until the scanned copy is uploaded, at which point the paper copy will be shredded.

r) through the **linking file containing the caregiver name and unique ID number**. This file will be created en caregiver consent is obtained. The file will be password-protected, on the researcher's laptop. An updated sion will be backed-up by uploading it to the university server at the end of each day, or as soon as possible if the rnet is unreliable. As soon as all caregiver data has been collected and the most up-to-date version has been oaded to the university server, the file will be deleted from the researcher's laptop using the Microsoft 'Sdelete' .

Non-linking data (unique ID number only)

Personal data – data on the caregiver's gender, age, relationship to child (e.g. mother, grandmother, brother) and highest level of education will be recorded electronically. They will only be identifiable by the caregiver's unique ID number. The electronic file will be a password-protected file on the researcher's laptop. As soon as the data is collected it will be uploaded to the university server, and the original file will be deleted from the laptop using the Microsoft 'Sdelete' tool.

Emotion task data – data on the caregiver's performance on the emotion task will be collected using a Dictaphone. It will be identified by the researcher first stating the unique ID number of the caregiver on the recording. After completing the task, the audio file will be uploaded to the university server and named using the caregiver's unique ID number. If there is any delay in uploading to the server, the audio file will be saved on the researcher's laptop in a password-protected file, and uploaded at the first available opportunity, at which point the file will be deleted form the laptop using Microsoft 'Sdelete'.

Linking the child with the caregiver

To minimise the possibility of linking the child with the caregiver the following precautions will be taken:

- Files linking the child name and unique ID, and the caregiver name and unique ID will be separate, password-protected files requiring different passwords. The data will not be combined to one file.
- The respective files will only be **both** be on the laptop at the same time while the researcher obtains consent from caregivers. This is because the researcher will require the caregiver to identify themselves in relation to the child's name, as the caregiver will not know the child's ID number. When caregiver consent is obtained, their caregiver unique ID will be generated as it corresponds to the unique ID number of the child. Therefore, as soon as consent is obtained from all caregivers, the file linking the child name and unique ID can be deleted from the laptop. This will be done using Microsoft 'Sdelete'.

e) Where, and for how long, will participants' personally identifiable data be stored during and after the study? (Please outline the procedures for ensuring confidentiality, eg security arrangements, anonymisation or pseudonymisation of such data. Please distinguish between records of consent and other forms of personally identifiable data stored)

Personally identifiable data will be:

i) **File containing child's name and unique ID number**
ii) **Child audio recordings**
iii) **Caregiver consent form**
iv) **File containing caregiver name and unique ID number**
v) **Caregiver audio recordings**

File containing child's name and unique ID number
During the child data collection phase this will be stored in an electronic, password protected file on the researcher's laptop. It will be regularly backed up to the university server. This file will be required to obtain caregiver consent, as the caregiver will need to identify themselves in relation to the child by the child's name. As soon as all caregiver consent has been obtained, and the caregiver names have been recorded with their unique ID number, the electronic file will be permanently deleted from the laptop using the Microsoft 'Sdelete' tool. On the server, the file will only be accessible by the researcher and the supervisor. When the research project is complete, the file containing the data will be permanently deleted from the university server.

Child audio recordings
During data collection, the recordings will be stored on the University server in files only accessible by the researcher and supervisor. When data collection is complete, the audio recordings will be coded and may be transcribed using only the child's unique ID number to identify them. Once the recordings have been coded/transcribed, the audio files will be permanently deleted from the University server.

Caregiver consent form
When paper consent forms are obtained, they will be immediately scanned and uploaded to the university server. Paper copies will then be shredded. If there is any delay in scanning/uploading the scanned copies, the following will occur: scanned copies will be stored in a password-protected file on the researcher's laptop and uploaded at the first available opportunity, at which point the file will be erased from the researcher's laptop using Microsoft 'Sdelete'; paper copies will be stored in a locked safe in the researcher's hotel and shredded as soon as scanned copies have been successfully uploaded. Scanned copies on the server will only be accessibly by the researcher and the supervisor. When the research project is complete, the file containing the scanned copies will be permanently deleted from the university server.

File containing caregiver name and unique ID number
This file will only be created once caregiver consent has been obtained. It will not exist during the school data collection phase.
During the caregiver data collection, this file will be password protected on the researcher's laptop. It will be regularly uploaded to the university server to ensure the most up-to-date version is backed-up. During the caregiver data collection, it will be used to ensure that the audio recordings are accurately named using the caregiver's unique ID number.
As soon as all caregiver data has been collected, and the most up-to-date version has been uploaded to the university server, the file will be permanently deleted from the researcher's laptop using Microsoft 'Sdelete'.
The file on the server will only be accessible by the researcher and the supervisor.
When the research project is complete, the file will be permanently deleted from the university server.

Caregiver audio recordings
During data collection, the recordings will be stored on the University server in files only accessible by the researcher and supervisor. When data collection is complete, the audio recordings will be transcribed and coded using the caregiver's unique ID number to identify them. Once the recordings have been coded/transcribed, the audio files will be permanently deleted from the University server.

f) If storing pseudonymised data, please confirm that identifiers will be held separately from the research data and linked through a unique study number. Specify how and at what point the pseudonymisation will occur, how the linkage information will be stored and state whether or not (and when) the linkage will be destroyed.
There are two types of pseudonymised data in this study: **child data** and **caregiver data** **Child data** will be pseudonymised by assigning a unique ID number. This will be generated when the child begins their first test. The number will be generated according to the order, the day and the date (year). For example, the second child on the first day in 2019 will be allocated the number 020119. The data using this pseudonym will be the child's age, gender and years in school, and their test scores for both tests. A document containing the child participants' names and unique ID numbers will be kept separately from all data gathered using the unique ID numbers. This linking file will be stored electronically on the researcher's laptop in a password protected file, and backed-up to the university server. It will be deleted from the laptop as soon as caregiver consent has been obtained for the second phase of the study, as the child's name and ID number will be necessary to identify the caregiver and assign the caregiver ID number. It will be deleted from the laptop using Microsoft 'Sdelete'. It will then be deleted from the university server when the research project is complete (in August 2019). **Caregiver data** will be pseudonymised by assigning a unique ID number when caregiver consent is obtained. The number will be generated from the corresponding child's unique ID number, by adding _cg to the end. For example, the caregiver of child no. 020119 will be pseudonymised as 020119_cg. The data using this pseudonym will be the caregiver's age, gender and level of education, and the audio-recording of their performance on the emotion task. A document linking caregiver name with their unique ID number will be stored electronically in a password-protected file on the researcher's laptop. It will be regularly backed-up to the university server. As soon as all caregiver data collection is complete, the file will be deleted from the laptop using Microsoft 'Sdelete'. It will then be deleted from the university server when the research project is complete (in August 2019). This linking document will always be separate from both the child name and ID number linking document, and all other caregiver data.
g) Who will have access to the personally identifiable data? If personally identifiable data is to be shared with another organisation, how will it be transferred/disclosed securely?
Only the researcher and the supervisor will have access to personally identifiable data, Only the researcher will have the password to the files containing the data while they are on the researcher's laptop. As soon as they have been uploaded to the university server, only the researcher and the supervisor will have access to them.
h) When and how will personally identifiable data be destroyed? (NB. Personally identifiable data should be destroyed when no longer required.)

Personally identifiable data is:

i) **File containing child name and unique ID number**
ii) **Child audio recordings**
iii) **File containing caregiver name and unique ID number**
iv) **Caregiver consent forms**
v) **Caregiver audio recordings**

File containing child name and unique ID number
This will be stored on the university server as soon as caregiver consent forms have been obtained. At this point it will be permanently deleted from the researcher's laptop using Microsoft 'Sdelete'.
It will then be deleted from the university server when the research project is complete at the end of September 2019.

Child audio recordings
These will be stored on the university server throughout the data collection. During the analysis the recordings will be coded and may be transcribed. After the coding/transcription is complete, the audio files will be deleted from the server.

File containing caregiver name and unique ID number
This will be stored on the university server as soon as all caregiver data has been collected. At this point it will be permanently deleted from the researcher's laptop using Microsoft 'Sdelete'.
It will then be deleted from the university server when the research project is complete at the end of September 2019.

Caregiver consent forms
Scanned copies will be stored on the university server, at which point paper copies will be shredded immediately after uploading. Scanned copies will then be deleted from the university server when the research project is complete at the end of September 2019.

Caregiver audio recordings
These will be stored on the university server throughout the data collection. During the analysis the recordings will be coded and transcribed. After the coding/transcription is complete, the audio files will be deleted from the server.

i) How, where and for how long will other research data be stored after the study has finished? For more information about University and research funder retention policies, please see the University's web pages on research data management.

Other research data will be:

i) **Child personal data** (gender, age, years in school)
ii) **Child test scores**
iii) **Transcriptions of child audio recordings** (generated from audio recordings)
iv) **Caregiver personal data** (gender, age, level of education)
v) **Transcriptions of caregiver audio recordings** (generated from audio recordings)

Child personal data

The file containing the personal data (age, gender, years in school) will be stored on the university server. It will be retained for 3 years from August 2019. It will then be permanently deleted from the server.

Child test scores

These will be stored on the university server and named as the child's unique ID number. They will be retained for 3 years from August 2019. They will then be permanently deleted from the server.

Transcriptions of child audio recordings

These will be stored on the university server and named as the child's unique ID number. They will be retained for 3 years from August 2019. They will then be permanently deleted from the server.

Caregiver personal data

The file containing the personal data (age, gender, highest level of education, relationship to child) will be stored on the university server. It will be retained for 3 years from August 2019. It will then be permanently deleted from the server.

Transcriptions of caregiver audio recordings

These will be stored on the university server and named as the child's unique ID number. They will be retained for 3 years from August 2019. They will then be permanently deleted from the server.

SECTION C: Methods and procedures to be used	
Method used: Please ensure you have addressed any potential ethical issues related to these methods in Section 14 and in your Participant Information Sheet	**Please mark 'X'**
1. Analysis of existing records	
2. Snowball sampling (recruiting through contacts of existing participants)	
3. Use of casual or local workers e.g. interpreters	
4. Participant observation	
5. Covert observation	
6. Observation of specific organisational practices	
7. Participant completes questionnaire in hard copy	
8. Participant completes online questionnaire or other online task	
9. Using social media	
10. Participant performs paper and pencil task	
11. Participant performs verbal or aural task (e.g. for linguistic study)	
12. Focus group	
13. Interview	
14. Audio recording of participant (you will generally need specific consent from participants for this)	X
15. Video recording of participant (you will generally need specific consent from participants for this)	
16. Photography of participant (you will generally need specific consent from participants for this)	
17. Others (please specify):	

SECTION D: Professional guidelines and training		
In this section, please mark 'X' against at least one of the following professional guidelines you aim to adhere to. You should use the principles listed in your chosen guideline(s) in conducting your own research. **Note**: this is not an exhaustive list.		**Please mark 'X'**
Research specialism/ methodology	**Association and guidance document**	
Anthropology	Association of Social Anthropologists of the UK and Commonwealth	
Criminology	http://www.britsoccrim.org/ethics/	
Education	British Educational Research Association Ethical Guidelines for Educational Research	X
Geography	Association of American Geographers Statement on Professional Ethics	
History	Oral History Society of the UK Ethical Guidelines	
Internet-based Research	British Psychological Society: Conducting Research on the Internet Association of Internet Researchers Ethics Guide Also see our Best Practice Guidance on internet-based research	
Law (Socio-Legal)	Socio-Legal Studies Association: Statement of Principles of Ethical Research	
Management	Academy of Management's Professional Code of Ethics	
Political Science	American Political Science Association (APSA) Guide to Professional Ethics in Political Science	
Politics	Political Studies Association. Guidelines for Good Professional Conduct	
Psychology	British Psychological Society Code of Ethics and Conduct	
Social Research	Social Research Association: Ethical Guidelines	
Sociology	The British Sociological Association: Statement of Ethical Practice	
Visual Research	ESRC National Centre for Research Methods Review Paper: Visual Ethics: Ethical Issues in Visual Research	
Other professional guidelines. Please specify the other guidelines used here*:*		

Please indicate what training in research ethics the researchers involved with this study have received, e.g. the title of the course and date completed (online training available at http://researchsupport.admin.ox.ac.uk/support/training/ethics).

If no formal training has been undertaken, please indicate any discussions of research methodology between researchers and supervisors here.

Researcher has complete modules Foundations in Educational Research 1 & 2.

The researcher and supervisor have discussed how to approach caregivers – it is preferred to invite caregivers to an informal meeting to discuss participation before approaching them directly to avoid the obligation to consent. They have also discussed the potential outside effects due the researcher being 130aucasian and British. This will be acknowledged as a limitation, and the researcher will dress according to local customs and speak to the children in Swahili to limit these effects.

The research assistant has been trained as an IDELA enumerator by qualified IDELA trainers in Tanzania.

SECTION E: Signatures (The SSH IDREC Secretariat accepts either option below. If you have a DREC, check which signature option it prefers.)

- **Option 1:** 'Electronic signatures', i.e. email confirmations from a University of Oxford email address, can be accepted. Separate emails should come from each of the relevant signatories as outlined below, indicating acceptance of the relevant responsibilities. **Pasted images of signatures cannot be accepted in the sections below.**
- **Option 2:** Handwritten (wet-ink) signatures. Please scan them and the rest of the checklist pages to create a single PDF document and email through.

Please ensure this checklist is signed by:

For staff research:	**For student research**:
1. **Principal investigator**	1. **Principal investigator (project supervisor)**
2. **Head of Department (or nominee)**	2. **Head of Department (or nominee)**
	3. **Student researcher**

1. **Principal investigator signature/supervisor signature (if student research)**

I understand my responsibilities as **principal investigator** as outlined in the CUREC glossary and guidance on the CUREC website.

I declare that the answers above accurately describe the research as presently designed, and that a new checklist will be submitted should the research design change in a way which would alter any of the above responses so as to require completion of CUREC 2 (involving full scrutiny by an IDREC). I will inform the relevant IDREC if I cease to be the principal investigator on this project and supply the name and contact details of my successor if appropriate.

Signature: ……[redacted]……..

Print name (block capitals): ……[redacted]…….. **Date**: [redacted]

2. **Departmental endorsement signature**

I have read the research project application named above. On the basis of the information available to me, I:

i) consider the principal investigator to be aware of her/his ethical responsibilities in regard to this research;
(ii) consider that any ethical issues raised have been satisfactorily resolved or are covered by relevant professional guidelines and/or CUREC approved procedures, and that it is appropriate for the research to proceed (noting the principal investigator's obligation to report should the design of the research change in a way which would alter any of the above responses so as to require completion of a CUREC 2 full application);
(iii) am satisfied that: the proposed project design and scientific methodology is sound; the project has been/will be subject to appropriate **peer review**; and is likely to contribute to existing knowledge and/or to the education and training of the researcher(s) and that it is in the **public interest**.

Signed by Head of Department or nominee *(example nominees for student research include the Director of Graduate Studies/ Director of Undergraduate Studies)*:

Signature: ……[redacted]……..

Print name (block capitals): ……[redacted]..... **Date**: [redacted]

3. **Student signature (if student research)**

I understand the questions and answers that have been entered above describing the research, and I will ensure that my practice in this research complies with these answers, subject to any modifications made by the principal investigator properly authorised by the CUREC system.

Signed by student: ……[redacted]……

Date: [redacted]

Print name (block capitals): [redacted]

Appendix G – Research Permit

REVOLUTIONARY GOVERNMENT OF ZANZIBAR

SECRETARY
ZANZIBAR RESEARCH COMMITTEE
P. O Box 239
Tel: 2230806
FAX: 2233788

RESEARCH/FILMING PERMIT
(This Permit is only Applicable in Zanzibar for a duration specified)

SECTION

Name:	[redacted]
Sex	[redacted]
Date and Place of Birth	[redacted]
Nationality:	[redacted]
Passport Number:	509335461
Date and Place of Issue	27/04/2012
Date of arrival in Zanzibar	28/03/2019
Expected date of departure	02/06/2019
Duration of study	40 Days
Research Tittles:	Tufikirie Hisia: An exploratory study of emotion understanding in Zanzibar Preschooler's

Full address of Sponsor: **Department of Education University of Oxford 15 N. G. OX. 0X2 6PY.UK**

This is to endorse that I have received and duly considered applicant's request I am satisfied with the descriptions outlined above.

Name of the authorizing officer:	Abdalla M. Denge
Signature and seal:	
Institution:	Office of Chief Government Statistician
Address:	P. O Box 2321 Zanzibar.
Date:	03/04/2019

Appendix H – Consent Form for Headteacher (English)

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION
15 Norham Gardens, Oxford
OX2 6PY
United Kingdom
www.education.ox.ac.uk

_____ (Supervisor)
Phone:
Email:

_____ (Researcher)
Email:
Phone:

HEADTEACHER CONSENT FORM
CUREC Approval Reference:

Tufikirie Hisia: An exploratory study of emotion understanding in Zanzibari pre-schoolers

Purpose of Study: This study explores what young children know about emotions. Understanding different emotions helps us to build positive relationships at school and at home. We would like to do some activities about emotions with children from your school to help us understand what they know.

1	I confirm that I have read and understand the information sheet version_____dated _____ for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2	I understand that my school's participation is voluntary and that I am free to withdraw my school at any time, without giving any reason, and without any adverse consequences for myself, my staff or students.	☐
3	I understand that research data collected during the study may be looked at by designated individuals from the University of Oxford where it is relevant. I give permission for these individuals to access my data and the data of my students.	☐
4	I understand that this project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee.	☐
5	I understand who will have access to personal data provided, how the data will be stored and what will happen to the data at the end of the project.	☐
6	I understand how this research will be written up and published.	☐

7	I understand how to raise a concern or make a complaint.	☐
8	I consent to students being audio recorded.	☐
9	I understand how audio recordings will be used in research outputs.	☐
10	I agree for my school to take part in the study.	☐
Optional:	I agree for research data collected in this study to be given to researchers, including those working outside of the EU, to be used in other research studies. I understand that any data that leave the research group will be fully anonymised so that myself, my school and students cannot be identified.	☐

_____	Dd / mm / yyyy	_____
Name of participant	Date	Signature

_____	dd / mm / yyyy	_____
Name of person taking consent	Date	Signature

Consent Form for Headteacher (Swahili)

CHUO KIKUU CHA OXFORD
IDARA YA ELIMU
15 Norham Gardens, Oxford
OX2 6PY
United Kingdom
www.education.ox.ac.uk

_____ (Msimamizi)
Barua pepe:
Simu:

_____ (Mtafiti)
Barua pepe:
Simu:

FOMU YA MWALIMU MKUU KURIDHIA USHIRIKI WA SKULI YAKE KWENYE UTAFITI
Namba ya kibali kutoka kwa Kamitii ya Maadili ya Utafiti ya Chuo Kikuu cha Oxford: ED-CIA-19-171

Tufikirie Hisia: Utafiti wa kuchungua watoto wa skuli ya maandalizi ya Zanzibar wanavyoelewa hisia

Lengo la utafiti: Utafiti huu unalenga kuchunguza wanachojua watoto wadogo kuhusu hisia zao. Kuelewa hisia kunatusaidia kujenga mahusiano mazuri shuleni na nyumbani. Tungependa kufanya mazoezi mbalimbali na watoto wa skuli yako ili kutusaidia kufahamu uelewa wao.

1	Nimesoma na kuelewa maelezo ya utafiti huu kwa maandishi ya tarehe _____. Nimepewa nafasi ya kuzingatia maelezo na kuuliza maswali, na maswali niliyouliza yamejibiwa vizuri.	☐
2	Ninaelewa kwamba ushiriki wa skuli yangu ni huru, na nipo huru kukataa ushirikisho wa skuli yangu muda wowote bila ya kutoa sababu. Ntambua kuwa kujitoa/kukataa kushiriki kabla au katikati ya mradi hakutakuwa na athari zozote mbaya kwangu, kwa wafanya kazi wangu, kwa wanafunzi wangu au kwa shule kwa ujumla.	☐
3	Ninaelewa kwamba takwimu zitakayokusanywa kwenye utafiti huu zitasomwa na watu mbalimbali wa Chuo Kikuu cha Oxford. Ninatoa ruhusa kwa watu hao kusoma takwimu zangu na za wanafunzi wangu.	☐
4	Nimeeleweshwa kwamba mradi huu umepitishwa na kukubaliwa na Kamitii ya Maadili ya Utafiti ya Chuo Kikuu cha Oxford.	☐

5	Ninaelewa nani ataeweza kuona takwimu zitakazotambulika kwa jina, na jinsi gani takwimu hizi zitakavyohifadhiwa, na zitakavyofutwa au kuhifadhiwa mwishoni mwa mradi.	☐
6	Ninaelewa jinsi utafiti utakavyoandikwa na kuchapishwa.	☐
7	Ninaelewa jinsi ya kutoa lalamiko au kuuliza maswali.	☐
8	Ninaridhia wanafunzi wangu kurekodiwa kisauti.	☐
9	Ninaelewa jinsi gani nakala za kisauti zitatumiwa kwenye mradi.	☐
10	Ninaridhia skuli yangu kushiriki kwenye utafiti huu.	☐
Nafasi:	Ninaridhia kuwa takwimu zinazokusanywa kwenye utafiti huu zinaweza kugawiwa kwa watafiti wengine nje ya Umoja wa Ulaya, ili kutumika kwenye miradi mingine ya utafiti. Ninaelewa kwamba takwimu yoyote itakayotumiwa kwenye miradi mingine haitatumia majina yangu binafsi, wanafunzi wangu au skuli yangu kwa hiyo hatutatambulika.	☐

_____ Dd / mm / yyyy _____

Jina la Mwalimu Mkuu Tarehe Sahihi

_____ dd / mm / yyyy _____

Jina la mtafiti Tarehe Sahihi

Appendix I – Information Sheet for Headteacher (English)

TUFIKIRIE HISIA:

WHAT DO CHILDREN KNOW ABOUT EMOTIONS?

100 YEARS LEADING RESEARCH IN EDUCATION

UNIVERSITY OF OXFORD

DEPARTMENT OF EDUCATION

INTRODUCTION

My name is _____. I am studying for an MSc in Education and Child Development at the University of Oxford, England. Before beginning my studies, I studied Swahili at SUZA and worked for Ubongo Learning in Tanzania. I would like to invite your school to take part in a research project I am doing about children's understanding of emotions. The project is supervised by _____, _____.

WHY HAS YOUR SCHOOL BEEN CHOSEN?

This research explores what Zanzibari preschool children know about emotions.

Your school has been chosen because it is a government preschool in Zanzibar.

WHAT IS THE STUDY ABOUT?

Understanding emotions is an important socio-emotional skill. It helps us to form healthy relationships with others, and to recognise our own needs and the needs of others. In preschool, good emotion understanding can help children to build positive relationships with their peers and teachers. That is why we are interested in what pre-school children in Zanzibar understand about emotions.

WHAT WILL HAPPEN?

Teachers will come to your school to talk to the children. ___ children from each class will be chosen at random to participate.

Each child will complete two different activities about emotions over two days. Each activity session will last about 15 minutes.

The activities are made up of different matching and naming activities.

All children will be free to stop or take a break if they want to.

Example Activity:

Point to the sad face.

DATA

At the beginning of the study all participating children will be assigned a unique ID number. This will be used on all documents to protect the child's identity. The only people who will be able to link the child's name with their ID number will be the researcher and the supervisor.

The child's answers during the activities will be recorded with pen and paper, using only their unique ID number. These will be immediately scanned and uploaded and securely stored on the university server. The paper copies will then be shredded.
An audio recorder will also be used to record the child. The audio files will be named with the child's unique ID number and will be stored securely on the University server.

We will also ask the child's teacher to provide data on the child's age, gender and how many years they have been in school. This data will only be identified by the child's ID number. It will be kept on a password-protected Excel file, and stored securely on the university server.

All data will only be used for the purpose of this research. The audio files will be deleted after the research project is complete, however all other data will be retained for 3 years. It will remain confidential and will be stored securely on the University server.

After finishing our data collection at the school, we will visit the homes of ____ participating children. This will be to enquire about recording an interaction between the child's caregiver and the child. This will only be done with full consent from the caregiver.

RESULTS

The results of the research will appear in my dissertation. They may also appear in future journal articles and presentations. On all occasions the identities of the children and the school will remain anonymous.

A report of the results will be presented to the school at the end of the research. The school staff and parents will also be invited to a meeting to discuss them.

WHAT DO YOU NEED TO DO?

If you agree for your school to take part, please sign and return the attached letter.

If you have any questions, please contact the researcher:
[email address]

Or the supervisor, _____:
[email address]

Information Sheet for Headteacher (Swahili)

TAKWIMU

Mwanzoni mwa mradi watoto wote wanaoshiriki watapewa namba ya pekee itakayotumiwa kwenye nakala zote za utafiti ili kulinda majina yao. Watakaoweza jua zote mbili, jina la mtoto na namba yake inayotumika kwenye utafiti, watakuwa mtafiti na msimamizi wake tu.

Majibu yatakayotolewa na mtoto wakati anafanya mazoezi yatahifadhiwa kwa kuandikwa na mtafiti kwenye karatasi. Karatasi haitatumia jina la mtoto, itatumia tu namba yake ya pekee. Nakala za kijitali zitatengenezwa na zitahifadhiwa kwenye mtandao wa chuo kikuu. Nakala za karatasi zitaharibiwa.

Tutarekodi sauti ya mtoto wakati anafanya shughuli. Nakala za kisauti zitatumia tu namba ya pekee ya mtoto na zitahifadhiwa kwenye mtandao wa chuo kikuu.

Pia, tutaomba mwalimu atuambie umri wa kila mtoto atakaeshiriki, pamoja na jinsia yake na miaka yake skuleni. Taarifa hii itatambulika kwa namba ya pekee ya mtoto tu. Itahifadhiwa kwenye nakala ya kidijitali ya 'Excel', itakayohifadhiwa kwenye mtandao wa chou kikuu.

Takwimu zote zitatumiwa kwa ajili ya utafiti huu tu. Nakala za kisauti zitafutwa baada ya utafiti kukamilika, lakini takwimu nyingine zote zitahifadhiwa kwa miaka mitatu. Kwa muda wote zitahifadhiwa kwenye mtandao wa chuo kikuu na kubaki nakala za siri.

Baada ya kumaliza kupata takwimu skuleni, tutatembelea nyumbani kwa watoto 20 ambao wameshiriki ili kuomba kurekodi mawasiliano kati ya mlezi na mtoto. Hii itafanyika pale tu mlezi atakapoiridhia.

MATOKEO

Matokeo ya utafiti yatachapishwa tasnifu yangu. Inawezekana yatachapishwa pia kama makala kwenye majarida na mawasilisho mbalimbali baadae. Nyakati zote, majina ya watoto pamoja na jina la skuli hayatatumiwa.

Ripoti ya matokeo italetwa skuleni mwishoni mwa mradi. Walimu pamoja na wazazi wa wanafunzi wataalikwa kujadili kuhusu matokeo.

UNATAKIWA KUFANYA NINI ILI KUSHIRIKISHA SKULI YAKO?

Ukikubal skuli yako kushiriki kwenye utafiti huu, tafadhali tia saini barua na kututumia.

Kama una maswali yoyote tafadhali muulize mtafiti:

[email address]

Au msimamizi wa utafiti, _____:

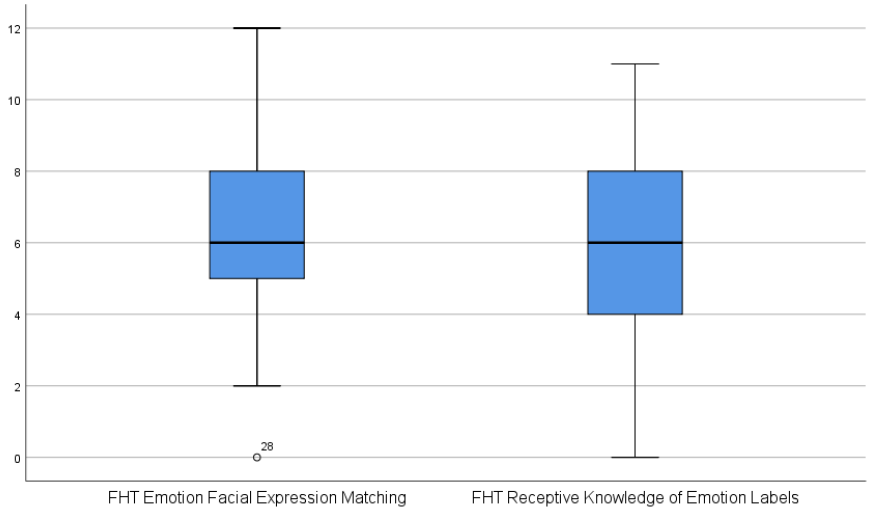
[email address]

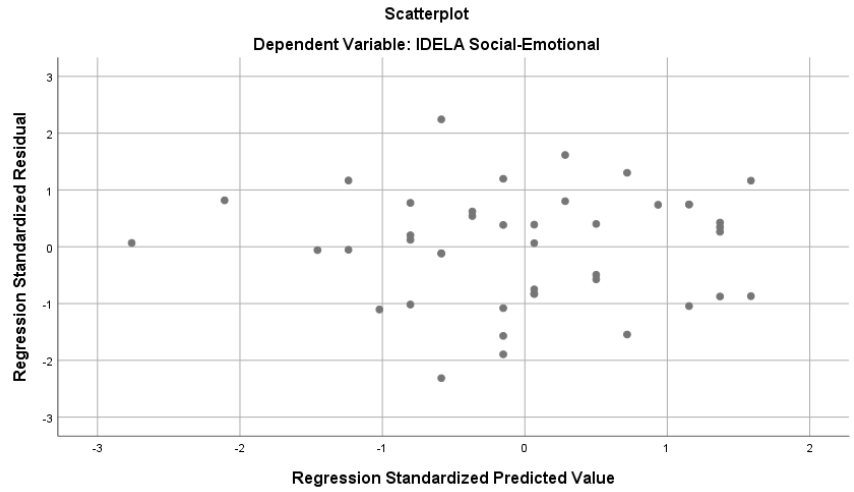
Appendix J – Assumption Tests

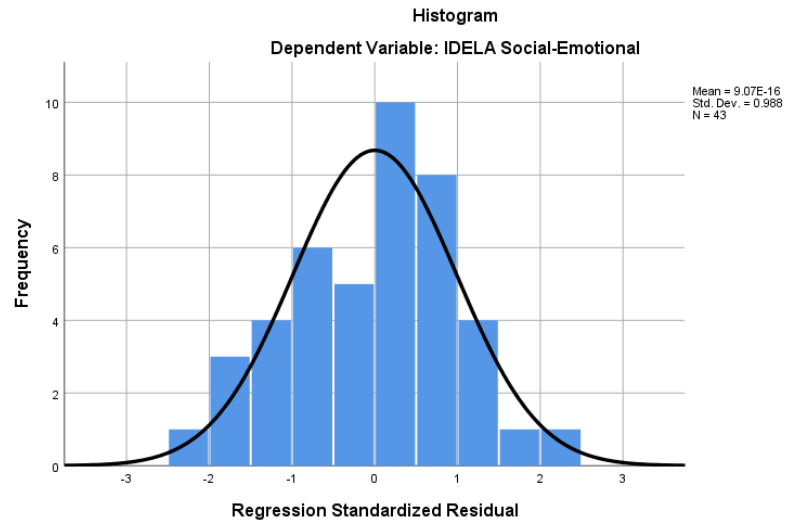
Correlations between IDELA and FHT variables

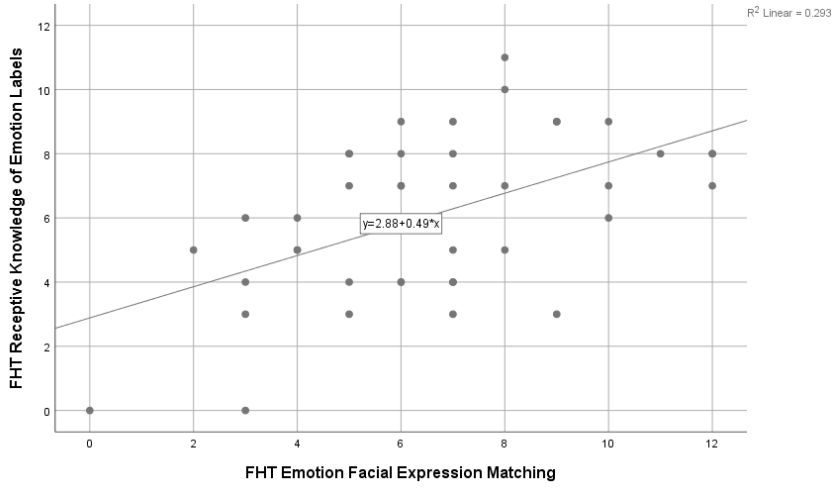
	FHT Emotion Facial Expression Matching	FHT Receptive Knowledge of Emotion Labels	FHT Expressive Knowledge of Emotion Labels	FHT Expressive Understanding of Emotion Situations	IDELA Self-Awareness	IDELA Friends	IDELA Emotional Awareness	IDELA Empathy	IDELA Conflict Resolution	IDELA Expressive Language	IDELA Emergen Math
FHT Emotion Facial Expression Matching	1	.542**	0.154	0.294	.346*	0.214	-.374*	0.166	.346*	0.075	0.297
FHT Receptive Knowledge of Emotion Labels	.542**	1	0.244	.318*	.540**	0.300	-0.238	0.134	0.258	.347*	0.111
FHT Expressive Knowledge of Emotion Labels	0.154	0.244	1	.385*	0.236	0.086	-0.109	.357*	0.111	0.154	0.155
FHT Expressive Understanding of Emotion Situations	0.294	.318*	.385*	1	0.121	-0.189	0.031	0.182	0.289	0.121	0.182
IDELA Self-Awareness	.346*	.540**	0.236	0.121	1	0.284	-0.197	0.210	-0.022	0.277	0.203
IDELA Friends	0.214	0.300	0.086	-0.189	0.284	1	-0.169	0.135	-0.054	0.203	0.198
IDELA Emotional Awareness	-.374*	-0.238	-0.109	0.031	-0.197	-0.169	1	0.051	0.038	0.201	0.290
IDELA Empathy	0.166	0.134	.357*	0.182	0.210	0.135	0.051	1	0.033	.496**	0.273
IDELA Conflict Resolution	.346*	0.258	0.111	0.289	-0.022	-0.054	0.038	0.033	1	-0.053	-0.037
IDELA Expressive Language	0.075	.347*	0.154	0.121	0.277	0.203	0.201	.496**	-0.053	1	0.098
IDELA Emergen Math	0.297	0.111	0.155	0.182	0.203	0.198	0.290	0.273	-0.037	0.098	1

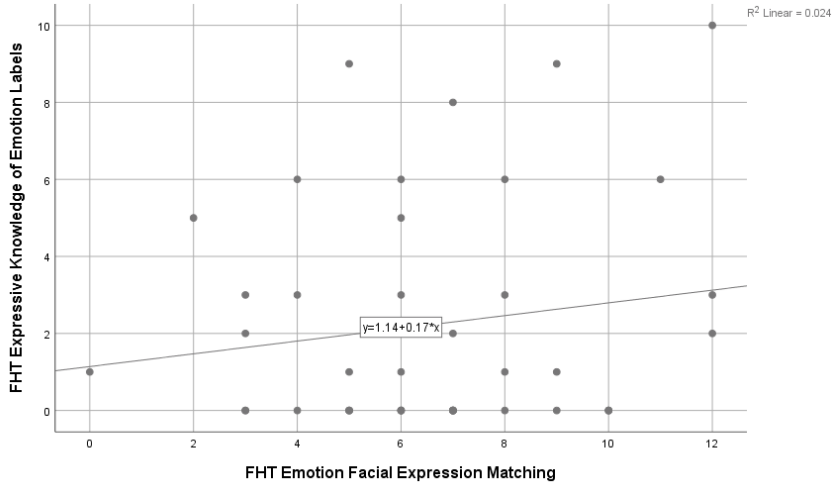
*Notes: **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).*

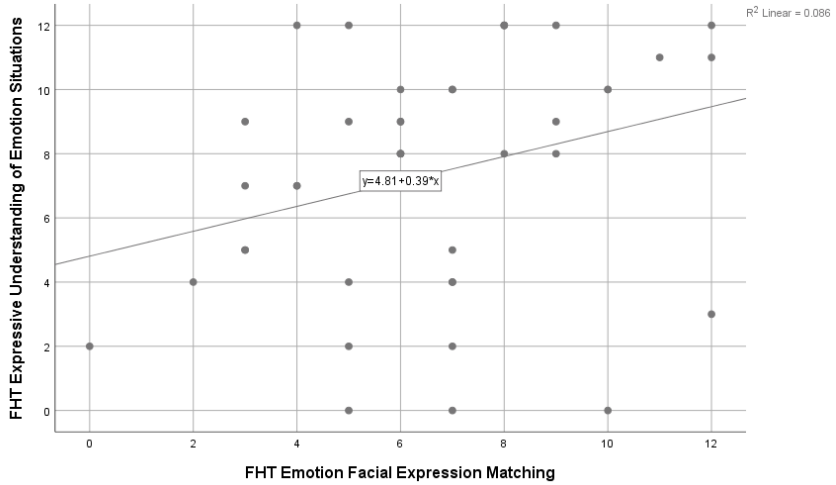

12
10
8
6
4
2
0
28
FHT Emotion Facial Expression Matching
FHT Receptive Knowledge of Emotion Labels

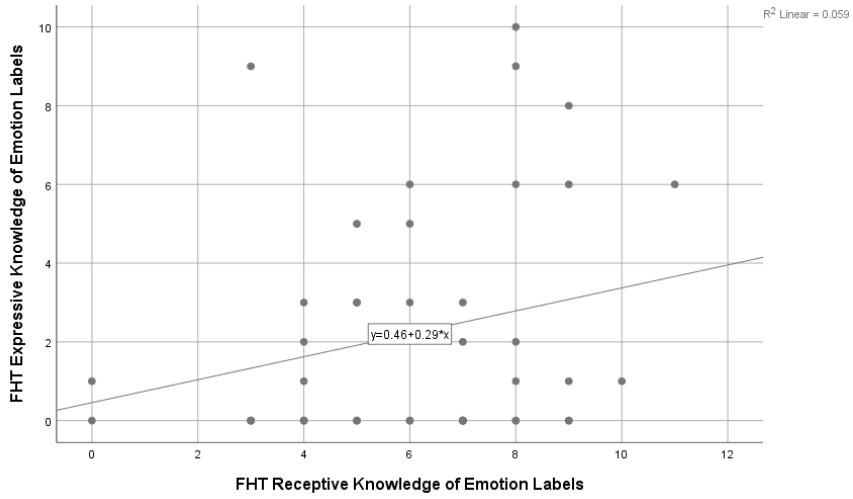

Scatterplot
Dependent Variable: IDELA Social-Emotional
Regression Standardized Residual
Regression Standardized Predicted Value

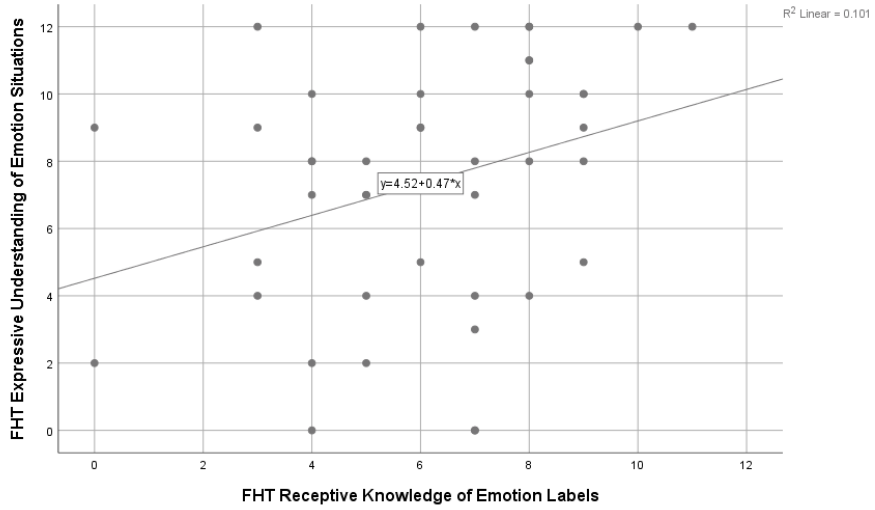

Histogram
Dependent Variable: IDELA Social-Emotional
Mean = 9.07E-16
Std. Dev. = 0.988
N = 43
Frequency
Regression Standardized Residual

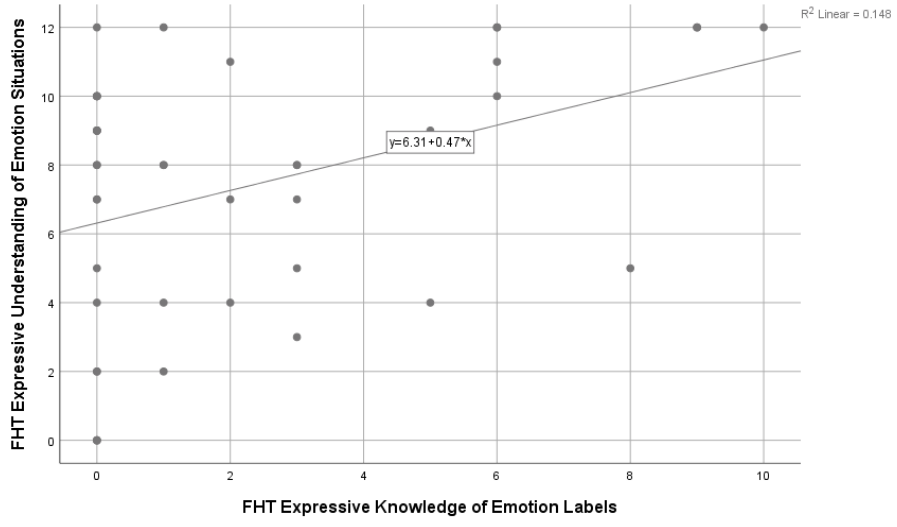

R² Linear = 0.293
y=2.88+0.49*x
FHT Receptive Knowledge of Emotion Labels
FHT Emotion Facial Expression Matching

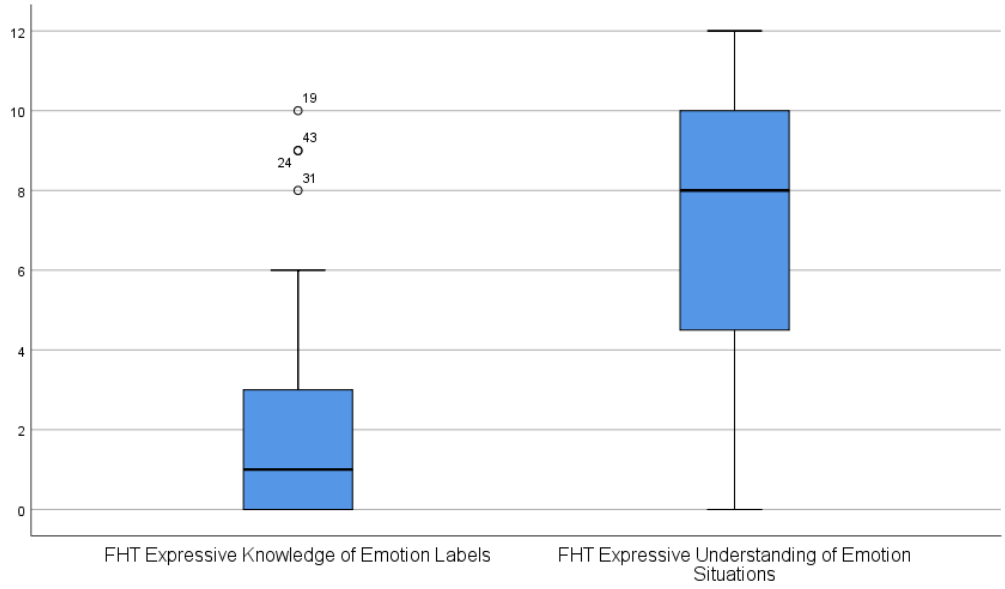

R² Linear = 0.024
y=1.14+0.17*x
FHT Expressive Knowledge of Emotion Labels
FHT Emotion Facial Expression Matching

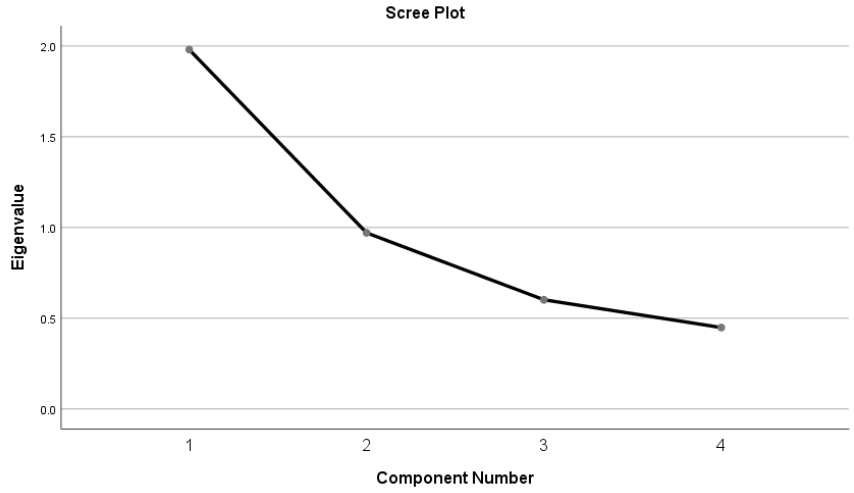

R² Linear = 0.086
y=4.81+0.39*x
FHT Expressive Understanding of Emotion Situations
FHT Emotion Facial Expression Matching

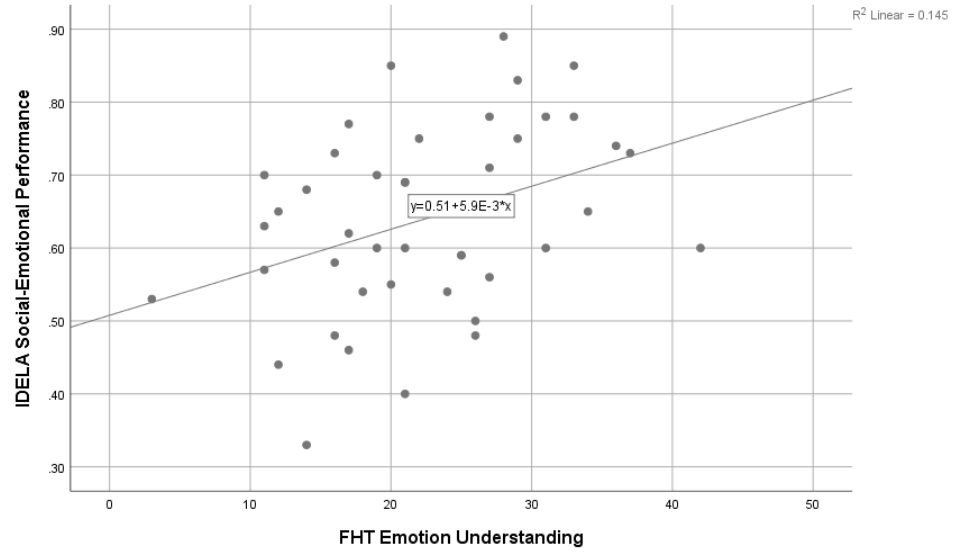

R² Linear = 0.059
y=0.46+0.29*x
FHT Expressive Knowledge of Emotion Labels
FHT Receptive Knowledge of Emotion Labels

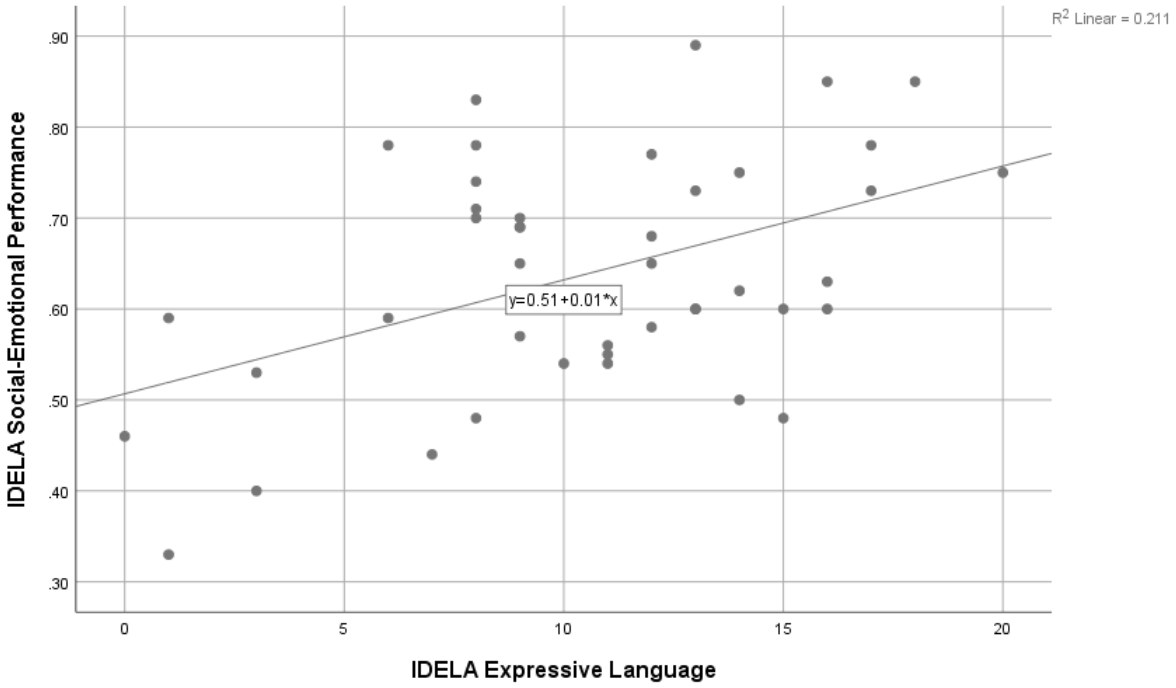

R² Linear = 0.101
y=4.52+0.47*x
FHT Expressive Understanding of Emotion Situations
FHT Receptive Knowledge of Emotion Labels

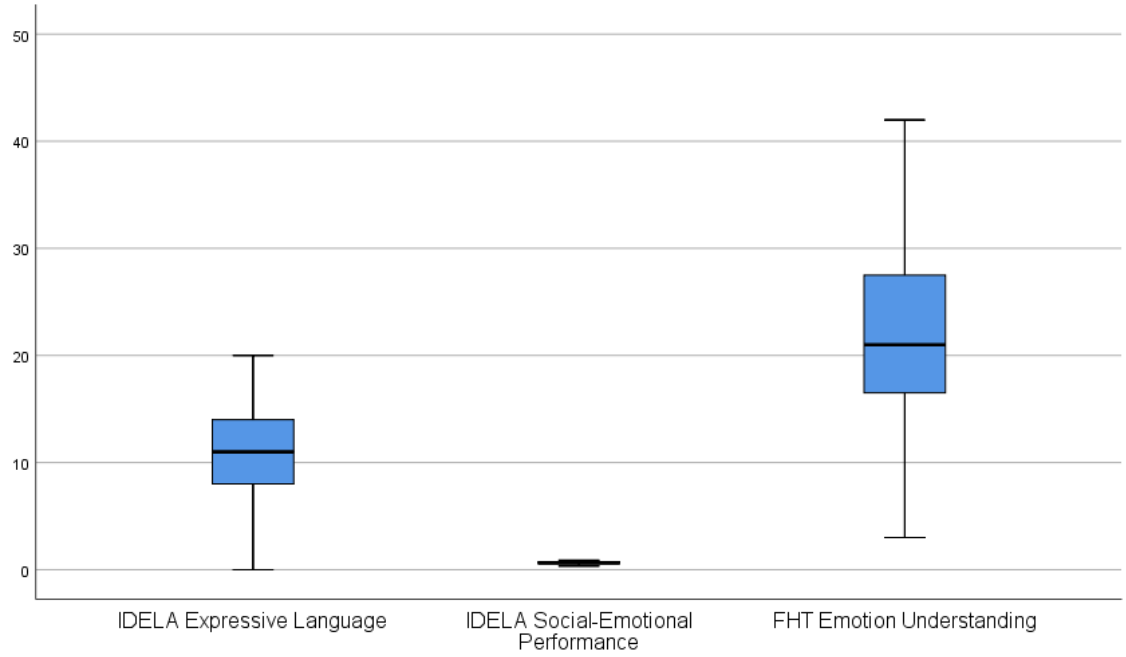

R² Linear = 0.148
y=6.31+0.47*x
FHT Expressive Understanding of Emotion Situations
FHT Expressive Knowledge of Emotion Labels

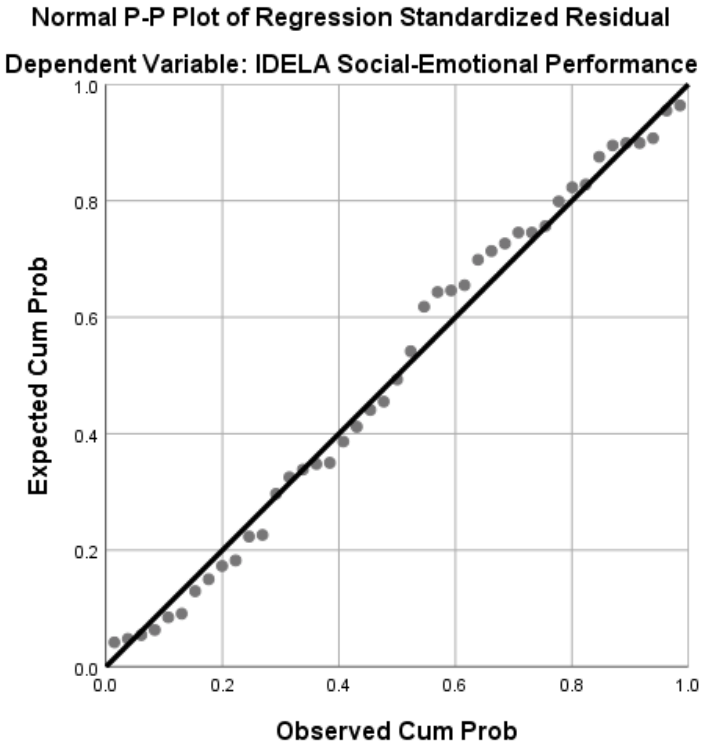

12
10
8
6
4
2
0
19
43
24
31
FHT Expressive Knowledge of Emotion Labels
FHT Expressive Understanding of Emotion Situations

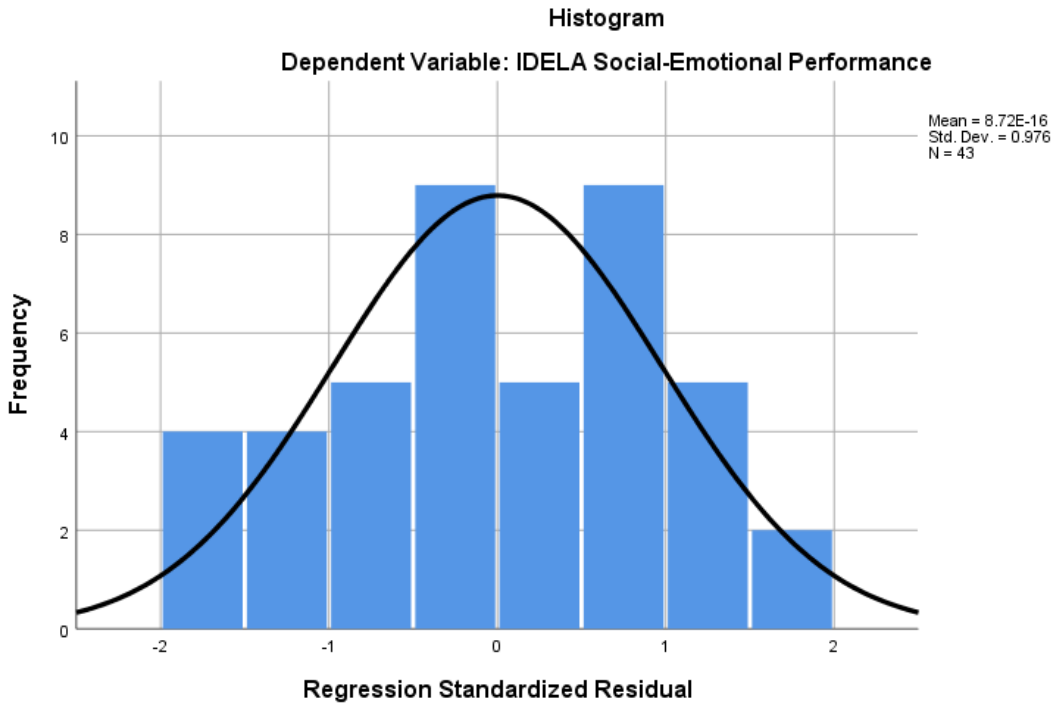

Scree Plot
Eigenvalue
2.0
1.5
1.0
0.5
0.0
1
2
3
4
Component Number


R² Linear = 0.145
IDELA Social-Emotional Performance
.90
.80
.70
.60
.50
.40
.30
y=0.51+5.9E-3*x
0
10
20
30
40
50
FHT Emotion Understanding


R² Linear = 0.211
IDELA Social-Emotional Performance
.90
.80
.70
.60
.50
.40
.30
y=0.51+0.01*x
0
5
10
15
20
IDELA Expressive Language


50
40
30
20
10
0
IDELA Expressive Language
IDELA Social-Emotional Performance
FHT Emotion Understanding


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: IDELA Social-Emotional Performance
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Histogram
Dependent Variable: IDELA Social-Emotional Performance
Mean = 8.72E-16
Std. Dev. = 0.976
N = 43
Frequency
Regression Standardized Residual
0
2
4
6
8
10
-2
-1
0
1
2