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# Teacher-Child Relationships in Kenyan Primary Schools: A Mixed Methods Approach

Word Count: 19,998

Hannah van Vijfeijken

Supervised by Dr Katharina Ereky-Stevens

MSc Education (Child Development & Education)


University of Oxford

## Acknowledgements

First and foremost, I want to thank my supervisor Dr Katharina Ereky-Stevens for her continued support throughout the academic year, for her deep involvement and valuable input towards shaping this piece of work.

I am incredibly thankful to all the teachers who participated in this research. I am also deeply thankful to my Kenyan friends and colleagues, without whom this study might not have been possible at all. In particular, I want to thank Joseph Gicheha, Edna Ware, Eliud Samuel Muturi, Dr James Bill Ouda, Mr Zacharia Mulievi, and Mrs Judith Maramba. You helped make my time in Kenya consist of many cherished memories.

Thank you to the MSc Education academics who opened an entirely new intellectual world for me. Thank you to my CDE course mates Julien Nsanzabeza, Nicolette Lee, Divisha Bhavnani, Yucheng Liu, Ian Huang, Chilly Fang, Sophia Antonopoulou, Hetao Zhang, Shuwen Yin, Shuting Zhang, Yiman Yu, Lang Ju, Ivan Zhou, Yuanrong Wang, and Xinyue Li. Thank you to my Oxford friends, who have made the city feel like home. Thank you to Sven Martin Pettersen, for at du er min kjære tenkepartner.

Finally, thank you to my family. I am ever grateful to my parents, Arleen and Iwan, for your unconditional love and for working so hard to create opportunities like this for us.

## Abstract

Positive TCRs significantly improve children's developmental outcomes, such as social, emotional, regulatory, cognitive, and academic skills (Hamre & Pianta, 2001; Spilt & Koomen, 2022). Yet, little analytical attention has been given to TCRs in developing countries such as Kenya, meaning the TCR field lacks a nuanced, global understanding of TCRs.

To this end, the present study applied a mixed methods approach to 1) quantitatively assess whether Kenyan TCRs are associated with children's academic achievement in average grades, and in mathematics, Kiswahili and English, and 2) qualitatively explore contextual factors affecting TCRs and achievement.

Quantitative and qualitative data were collected in five primary schools in Kakamega, Kenya. 37 teachers participated. Students' anonymised grades were compiled, and teacher-child Closeness and Conflict was assessed using the teacher-reported Student-Teacher Relationship Scale (STRS; Pianta, 2001). Regression analyses were conducted with academic achievement as the outcome variable, and the STRS, teacher and child characteristics, and class size as predictor variables. Additionally, six teachers were interviewed and were asked about their perspective on TCRs and surrounding factors. Interviews were then analysed through thematic analysis.

Firstly, reliability and exploratory factor analyses showed that the STRS is a reliable and valid measure in a Kenyan setting. Furthermore, teacher-child Closeness was associated with higher achievement and Conflict with lower achievement. However, Closeness was more impactful towards children's grades. Secondly, the teacher interviews illustrated that TCRs often have a parental dimension. Close TCRs also enable teachers to provide targeted material and emotional support. This is particularly valuable in a context of challenges associated with poverty (e.g., children experiencing hunger and parental absence). TCRs partly alleviate but cannot compensate for the impact of these challenges. Lastly, parent-child and parent-teacher dynamics were found to influence the TCR, indicating a teacher-child-parent triad perspective encompasses a more precise view of TCRs. The study concludes that, particularly in low-resource settings, school leadership should leverage TCRs as much as possible for children's enhanced wellbeing and academic fulfilment.

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# Chapter 1: Introduction

## 1.1 Background

The relationship between teachers and students is a crucial component of children's educational trajectory, and therefore forms a crucial part of children's overall development. Teacher-child relationships (TCRs) can be described as the way in which a teacher and a child are emotionally connected, often as an accumulation of teacher-child interactions over time. TCRs, like any relationship, can consist of negative or positive affective exchanges. TCRs will also vary in closeness depending on factors such as individual differences, mood, and stress levels, and are subject to change over time.

Close, positive TCRs have been linked to several beneficial educational and developmental outcomes for children, including improved social, emotional, regulatory, and cognitive skills (Hamre & Pianta, 2001; Spilt & Koomen, 2022). Despite decades' worth of research on TCRs and their link to positive child outcomes, TCRs remain under-researched in low-resource settings such as Kenya.

## 1.2 Study Rationale and Aims

Many children in Kenya face a multitude of hurdles during their primary school education (e.g., poverty, hunger, lack of close parental care). This puts them at high risk for socioemotional and academic difficulties. Inevitably then, their capacity to learn and grow is affected. Within this context, TCRs may act as a support system for students, where teachers become 'ad hoc' attachment figures (Verschueren & Koomen, 2012) to provide both educational and socioemotional care.

In other countries, close, positive TCRs have been found to be associated with students' higher academic achievement (Baker et al., 2008; Hamre & Pianta, 2001; Klem & Connell, 2004; O'Connor & McCartney, 2007; Roorda et al., 2011; Spilt et al., 2022). There is currently a gap in the literature regarding research on the association between Kenyan TCRs and educational outcomes, despite academic achievement often leading to a better quality of life. Thus, the present study sought to investigate this association, whilst examining the socioecological context in which the TCRs exist. Solely investigating dyadic relationships would yield a limited representation; TCRs are a component of a complex and multi-level socioecological system (Bronfenbrenner, 1979; Sabol & Pianta, 2012) in which children develop.

Thus, through a mixed methods approach, this study sought to 1) quantitatively investigate associations between Kenyan TCRs and academic achievement, and 2) qualitatively explore Kenyan teachers' perspectives on contextual factors affecting TCRs and academic achievement. By doing so, this study aimed to contribute to a nuanced, global understanding of TCRs towards improved child outcomes.

# Chapter 2: Literature Review

## 2.1 Theoretical Foundations

Currently, it is universally acknowledged that children form attachment relationships with adults other than just their parents (Schuengel, 2012; Spilt & Koomen, 2022). Since that theoretical shift, research has focused on TCRs through the lens of attachment, finding that TCRs are crucial contributors to children's formative years (Hofkens et al., 2023; Pianta, 2001; Sabol & Pianta, 2012; Spilt & Koomen, 2022).

This section explores attachment (Bowlby, 1969) as the original underlying theory pertaining to TCR quality. Attachment theory has been foundational in TCR research for decades (Belsky & Cassidy, 1994; Pianta, 2001; Sabol & Pianta, 2012; Spilt & Koomen, 2022; Verschueren, 2015; Verschueren & Koomen, 2012). However, TCRs are qualitatively distinct from parent-child attachment, therefore attachment theory is an out-of-date theoretical foundation for TCRs research today. Due to attachment theory's inability to fully explain the nature of TCRs, this section draws on Developmental and Ecological Systems Theory (Bronfenbrenner, 1979). The present study seeks to highlight this perspective as an underleveraged theory for TCRs, considering the contextual view allows for deeper exploration of the relational dynamics impacting and surrounding TCRs.

### *2.1.1. Attachment*

Attachment theory stipulates that children's early affectional ties with primary caregivers create internal working models (Bowlby, 1969) that act as 'blueprints' for later relationships. These affective blueprints then guide children's views and experiences of interactions with other relational partners. Some scholars state that attachment to a primary caregiver is likely the single most impactful component in children's developmental trajectory (Sabol & Pianta, 2012). Secure parent-child attachments promote positive socio-emotional development and resilience (Bowlby, 1969). TCRs seemed to mirror parent-child attachment in many ways, as another form of affective and dyadic exchange. Considering these parallels, TCRs were hypothesised to be another form of adult-child attachment. TCRs appeared a promising focus for research (Belsky & Cassidy, 1994) to better understand adults' relative contributions to children's development.

However, TCRs are usually not exclusive or with significant longevity (Verschueren & Koomen, 2012) and a teacher's primary role is instructional (Hamilton & Howes, 1992;

Kesner, 2000). Therefore, in more recent years, teachers have been labelled 'ad hoc' attachment figures; the teacher may act as a safe haven and secure emotional base for the child without the TCR being an attachment bond as it is in parent-child relationships (Verschueren & Koomen, 2012).

Current TCR research therefore integrates select elements of attachment theory to help explain how children's relational models shape their learning (e.g., linking children's insecure attachment to internalising and externalising behaviour and the impact on TCRs and academic outcomes). However, attachment does not have comprehensive explanatory power for TCR quality, with teachers operating as 'ad hoc' attachment figures. As such, combining attachment theory with Developmental Systems Theory (Sabol & Pianta, 2012) carries potential to enhance its explanatory power.

### *2.1.2 Developmental and Ecological Systems Theory*

Early on, Developmental Systems Theory was identified as a valuable framework for TCR research (Pianta et al., 2003). Through the lens of Developmental Systems Theory, children are situated within a dynamic, multi-dimensional socioecological system. One such theory is Bronfenbrenner's (1979) Ecological Systems Theory, which maps social and environmental factors and their relative influence in child development. The model centres the child within layers of the microsystem (i.e., family, school, peers), mesosystem (i.e., interactions between figures in the microsystem, e.g., a parent-teacher meeting), exosystem (e.g., social services, government agencies, school board), macrosystem (i.e., culture, political systems, the economy), and chronosystem (i.e., socioecological change over time). Elements in each level differentially affect the child depending on whether they are proximal or distant, but these elements also intersect (Bronfenbrenner & Morris, 1998; Sabol & Pianta, 2012).

Developmental and Ecological Systems Theory are useful as conceptual maps to describe the context in which TCRs are situated, as well as the way that teachers, children, and TCRs are influenced by other figures. According to the theory, TCRs are positioned in the microsystem, highlighting teachers' proximity to the child as compared to other, external figures in the child's developmental context (e.g., local and national government, school board members).

Developmental and Ecological Systems Theory are frequently referenced as theoretical foundations for TCRs, both in early (e.g., Pianta et al., 2003) and more recent

studies and reviews (e.g., Spilt et al., 2022). All the while, TCR research in practice remains focused on the TCR dyad. Developmental and Ecological Systems Theory thus present an underleveraged research framework. Applying a larger socioecological framework in empirical research could illustrate interlinking factors that influence TCRs beyond the dyad and beyond the microsystem. For example, Ecological Systems Theory has been applied to better understand the many interconnected factors that influence child sexual abuse cases, from the level of the individual to that of families, professionals, perpetrators, media, curriculum, cultural beliefs, and societal practices around race, gender, power, and justice (Martinello, 2020). Because the theory cannot be proven, it is perhaps epistemologically more aligned with qualitative paradigms. Currently, TCR research is predominantly measured using quantitative scales, while the addition of qualitative data allows for more a comprehensive mapping of key figures' influences on the child and their outcomes. Overall, it appears that Developmental and Ecological Systems Theory are underleveraged in empirical TCR research, while these are frameworks that can structure and delineate the complexity of TCR factors.

### 2.2 Operationalising and Measuring Teacher-Child Relationships

TCRs can be reliably assessed via measurement tools (Sabol & Pianta, 2012), although these have seen varying levels of validity and reliability testing, often depending on their integrity and longevity in the field. Assessment of TCRs is frequently done by dissecting them into subdimensions ( e.g., teacher-child closeness, conflict and dependency; Koomen & Jellesma, 2015; Pianta, 2001; Vervoort et al., 2015). These dimensions are further operationalised as scale items reflecting aspects of each dimension (e.g., a child's reaction to separation from the teacher would be rated under the dependency dimension). The TCR construct therefore consists of relational dimensions represented by an assessment subscale.

For example, as the most widely used TCR measurement tool, the Student-Teacher Relationship Scale (STRS; Pianta, 2001) qualifies TCRs along dimensions of teacher-child closeness, conflict and dependency. The three STRS dimensions are derived from attachment theory, conceptualising the relationship in terms of whether the attachment figure is a secure base for exploration (Sabol & Pianta, 2012; Pianta, 2001). Notably, while the STRS is developed with attachment as a theoretical foundation, it does not measure attachment quality but relationship quality from the teacher's perspective. The STRS is a well-established teacher-informed questionnaire; its validity (accuracy) and reliability (consistency) has been

studied extensively by other researchers. Collectively, these confirm the STRS to be a robust measurement tool to describe the teacher-child relationship across multiple (cultural) settings (Chen et al., 2019, 2024; Doumen et al., 2009; Fraire et al., 2008; Gregoriadis & Tsigilis, 2008; Koca, 2010; Pianta & Nimetz, 1991; Sabol & Pianta, 2012; Seven & Ogelman, 2014; Vahidi et al., 2022; Verschueren & Koomen, 2012).

Measuring the TCR is important to assess how the TCR affects and relates to associated constructs (e.g., children's academic outcomes, wellbeing, and socioemotional learning). TCR assessment can be broadly categorised into observational, teacher-reported, or child-reported measures. Child-reported measures are most often applied to samples containing older children (i.e., middle school age) due to their growing abilities to contribute holistic assessments. These typically leverage dimensions such as perceived teacher support, utilisation of the teacher, and sense of relatedness (Sabol & Pianta, 2012) as opposed to attachment-based dimensions. Teacher-reported measures are most frequently used due to their relative ease of administration. Teacher-reported measures such as the STRS (Pianta, 2001) are also older than child-reported ones, making them more established in TCR research.

### 2.3 Teacher-Child Relationships and Child Outcomes

For many TCR scholars, capturing the impact of teacher-child relationships on child outcomes is a key objective (Verschueren & Koomen, 2012). Prior research has found that the impact of TCRs encompasses academic achievement (e.g., O'Connor & McCartney, 2007; Roorda et al., 2011; Hamre & Pianta, 2001), but also children's psychosocial functioning and socioemotional learning (Split et al., 2022).

Positive TCRs are related to lower cortisol levels in children throughout the school day (Hatfield, 2019). Positive TCRs are also related to better behavioural outcomes (i.e., reduced delinquency) and fewer socioemotional problems in children with learning difficulties (Al-Yagon & Mikulincer, 2004; Murray & Greenberg, 2001; Pianta et al., 1995). Additionally, students who report a supportive, understanding, and structured classroom environment created by their teacher show higher school engagement, which in turn is related to less absenteeism and higher scores (Klem & Connell, 2004). These two factors in turn predict school completion, pursuit of further education, and economic welfare (Klem & Connell, 2004).

On the other hand, negative teacher-child interactions are associated with behavioural and emotional challenges in students (Baker et al., 2008; Birch & Ladd, 1997). More specifically, teacher-child conflict has been linked to students' underachievement (Ansari et al., 2020), poorer social skills (Paes et al., 2023), school avoidance, low executive functioning, and low self-esteem (McGrath & Van Bergen, 2015; Spilt et al., 2022).

Because of TCRs wide-reaching impact, governments and non-governmental organisations have included TCR development in key educational policies and targets (Eurydice/EACEA, 2014; OECD, 2015)

### *2.3.1 Teacher-Child Relationships for Children at Risk*

Due to an abundance of research confirming the positive impact of TCRs, scholars hypothesised that they act as a protective, or even compensatory, factor for children who are at developmental risk. In this sense, TCRs would modify children's insecure relational models by providing an alternative, positive relational model as a non-parental attachment figure (Sabol & Pianta, 2012; Spilt & Koomen, 2022; Verschueren, 2015). Based on attachment theory and on previous TCR research, the teacher as a secure attachment figure is hypothesised to carry greater impact for children who are younger or more vulnerable (Verschueren & Koomen, 2012).

For one, O'Connor & McCartney (2007) found that children were 'buffered' from negative effects of insecure attachment on achievement through high-quality TCRs. In the United States, pupils from low socioeconomic backgrounds, homes with English as an additional language, or who struggle with self-regulation experience stronger effects of positive TCR than students from high-resource backgrounds (e.g., Ansari et al., 2020; Desimone & Long, 2010; Hamre & Pianta, 2005; Hofkens et al., 2023). Additionally, the longer the exposure to positive TCR, the higher the positive impact (Cash et al., 2019; Vernon-Feagans et al., 2019). 'Buffering' seems applicable across developmental stages. In preschool students, Buyse et al. (2011) found that insecurely attached children's risk of aggressive behaviour was lowered in the context of positive TCRs. In secondary school students, Ben-Gal Dahan & Mikulincer (2021) saw reduced negative effects of anxious attachment on students' task persistence for those who reported responsive and accepting teachers.

Collectively, these findings appear promising for TCRs to minimise children's developmental risk. However, an unanswered question is that of directionality: are students

who perform and behave better more likely to create close TCRs, or are students more likely to do better due to positive TCRs? For example, Eisenhower et al. (2007) found that underperforming children were more likely to develop less positive TCRs as opposed to children who are meeting academic expectations, while these are the children who presumably could benefit from positive TCRs the most (Eisenhower et al., 2007). Most likely, TCRs operate bidirectionally (Rudasill & Rimm-Kaufman, 2009), where academic achievement and TCR quality are mutually influential.

Unfortunately, it cannot reasonably be concluded that TCRs compensate for developmental risk, because of a lack of consistent evidence; TCR relationships appear to be moderating rather than fully compensatory (Sabol & Pianta, 2012; Split & Koomen, 2022). However, negative or irregular TCRs could form an additional attachment risk where insecure relational models are only reinforced (Split & Koomen, 2022). For instance, Roubinov et al. (2020) found that teacher-child closeness, as reported by children exposed to harsh parenting (e.g., corporal punishment, coercive techniques, or yelling), did not eliminate conduct problems in those children. Although, children who experienced a combination of harsh parenting and a lack of close TCRs saw increased conduct problems, indicating a 'double risk' towards undesirable child outcomes (Split & Koomen, 2022).

Beyond these issues, there is also the question of how 'risk' is conceptualised. Most TCR research operationalises developmental risk as behavioural and academic risk in children, with less of a focus on more severe adverse childhood experiences. In most TCR research in developed countries, risk is operationalised as minority status or low parental education levels (e.g., Baker et al., 2008; Burchinal et al., 2002; Hamre & Pianta, 2005; Meehan et al., 2003; Sabol & Pianta, 2012). However, in low-resource countries such as Kenya, 'risk' often constitutes social deprivation and poverty typically at more severe level than in developed countries (i.e., the contexts where the majority of TCR research is conducted). While TCRs may not be fully compensatory, they could be significant assets in children's development in these contexts.

### 2.4 Teacher-Child Relationships in Kenya

There is an abundance of evidence on the relationship between TCRs and students' academic engagement in Western contexts (Roorda et al., 2023), but research in developing countries remains scarce. A lack of TCR research in non-Western contexts risks a 'culture blindness' (Gregoriadis et al., 2019) that extrapolates Western findings as universal. To

situate the current study, this section examines the current body of TCR research conducted in Kenya.

Despite Kenya's efforts towards Universal Free Primary Education since 2003, school dropout rates remain high (Zuilkowski et al., 2016). In Kakamega, Kenya, this is especially the case for pupils with special educational needs (Nanyama, 2020). Dropouts are attributed to a mix of factors including gender, poverty, and opportunity costs. As children grow older, these factors are given increasingly more weight in their decision-making about their school trajectory and academic engagement (Zuilkowski et al., 2016). In a mixed methods study set in Eastern Kenya, primary school dropout risk was found to be strongly linked to students' academic achievement, in that low achievement combined with low education quality often precedes dropout (Zuilkowski et al., 2016). While they did not investigate TCRs, the study's qualitative analysis showed that students often felt disconnected from their teachers, explaining that teachers were not receptive or accommodating to students' challenges. Combined with earlier findings that more interactive classrooms are related to higher grades (e.g., Ngware et al., 2010), this indicates that positive TCRs may increase student motivation, lower dropout risk and allow students to feel more belonging in schools.

For Kenyan secondary school students, Kariuki and Mbugua (2018) sought to investigate whether TCRs impacted academic performance. They concluded that this is the case, although the methodology did not sufficiently address the research aim. They asked headteachers, class teachers, and students via surveys whether they believed teachers' encouragement impacted student achievement, therefore yielding an answer about stakeholders' *beliefs* rather than an empirical confirmation of associations. Additionally, survey questions were not reported, so the choice of measures is ambiguous. In another study involving secondary school students, Mwaniki et al. (2016) found that TCRs were related to students' indiscipline. However, TCRs were measured through original 4-item questionnaires containing only negative aspects of TCRs (e.g., "Teachers threaten students that they will fail"). Including positive aspects of TCRs would provide a much-needed comprehensive appraisal of the complexity of TCRs.

While not investigating TCRs directly, Kimani et al. (2013) examined secondary school student-teacher interactions and academic achievement through the lens of teacher characteristics. Their linear regression revealed that teacher characteristics including age, gender, qualification level, and teaching experience did not contribute to student achievement. On the other hand, factors such as teachers' weekly teaching workload, diligence in administering assignments, setting performance targets, and providing individual

attention to students with larger educational needs did statistically predict students' academic achievement. This suggests that teachers' behaviour towards and interaction with students carry importance, but teachers' demographic characteristics do not. These findings also illustrate the benefits of teachers being meaningfully engaged with students, especially to offer consistency and need-based support.

The attachment relationship between secondary students and teachers might be qualitatively different from the relationship for primary school pupils (Sabol & Pianta, 2012), but the benefits of Kenyan teachers' steady engagement is seemingly shared between both age groups. Gatundu et al. (2023) studied teacher-child interactions and their effect on primary school students' academic self-concept. Strengths of this research included prior validity and reliability testing in a pilot study, as well as having both students and teachers report via a survey. Teacher support, supervision, encouragement and tailored teaching strategies were found to be significant contributors to students' view of their academic abilities. If positive student-teacher interactions improve children's confidence, bringing about better educational outcomes, perhaps an association between Kenyan TCRs and academic outcomes is mediated by students' improved academic self-concept.

Moreover, Kodzi et al. (2014) broadened research on TCRs to include interpersonal relationships between principals, teachers, parents and primary school students, investigating their effect on sixth graders' mathematics achievement. Similar to Kimani et al (2013), they found teachers' teaching style and individual attention to students to be linked to better student performance, even when accounting for school characteristics and teachers' impression of social dynamics in the school. These results corroborate TCR theory and findings from other studies, but the researchers used proxy variables for the TCR. Namely, these were the teachers' class engagement score and views on teacher absenteeism, student discipline and social behaviour, combined with students' reports of teachers' corporal punishment and homework correction consistency (Kodzi et al., 2014). Due to their circumlocution, using proxy variables risks measuring phenomena outside of TCRs and thus creates confounds.

Using an original Teacher-Pupil Interaction Rating Scale, Mungai et al. (2017) examined associations between teacher-child interactions and primary school readiness. The scale consisted of 26 items containing 4 dimensions (Positive Relationship, Harshness, Detachment, and Permissiveness); teachers rated items on a 1-3 scale (1=Never, 2=Sometimes, 3=Very Much). Primary school readiness was mainly researcher-reported but contained teacher-reported elements. Mungai et al. (2017) found that the positive TCR

dimension was positively related to readiness, while the harshness and detachment dimensions were negatively associated to readiness. Primary school readiness is an important outcome considering far-reaching implications (e.g., Taggart et al., 2015). Yet, the researchers did not share what the 26 items consisted of, or what the school readiness test assessed. The study can therefore not be replicated, and the measurement robustness is ambiguous. Additionally, a 3-point scale might not allow for enough variance in the data to meaningfully detect differences in a given sample. Taken together, this highlights the need for a more direct and standardised measure of TCRs for research in Kenya.

As an established TCR measurement tool, the Student-Teacher Relationship Scale (STRS) was administered in Gladys et al's (2016) study using TCRs as the outcome variable. They investigated whether Closeness, Conflict, and Dependency ratings varied between different categories of teacher-reported student behaviour. Researchers operationalised student behaviour by asking teachers to categorise pupils as "good" or "bad". Teacher-child Closeness and Conflict differed between "good" and "bad" students, in that Closeness was rated higher and Conflict rated lower for "good" pupils. There was no difference in Dependency. The study failed to recognise that categorising students in this way could have acted as a 'self-fulfilling prophecy'; teachers labelling students as "bad" before an assessment of their dyadic relationship is likely to prime that assessment. Essentially, this study investigated whether teacher-reported perceptions of students relate to teacher-reported perceptions of students, which might not yield substantial insights. All in all, there remains a shortage of research on Kenyan TCRs that robustly measures TCRs, rigorously incorporates teachers' perspectives on TCRs, and correlates TCRs to quantitative outcomes.

### 2.5 Gaps in the Literature

Combining attachment theory (Bowlby, 1969) and Ecological Systems Theory (Bronfenbrenner, 1979), it becomes apparent that the influence of children's relational models and developmental context cannot easily be overstated. Kenyan children often experience severe risk factors in both domains and TCRs provide an opportunity to counterbalance this risk.

As of 2017, only 14.8% of studies on student-teacher relationships had been conducted in non-Western settings (Roorda et al., 2017). To further investigate TCRs as a possible developmental asset, there is a need for empirical studies on associations between Kenyan TCRs and child outcomes, particularly academic achievement. To ensure findings are sufficiently comprehensive and meaningful, a qualitative component is needed to explore

the complexity of factors influencing TCRs in Kenya. In other words, there is a gap in the literature regarding the impact of Kenyan TCRs on academic achievement and regarding an understanding of contextual factors surrounding and impacting dyadic teacher-child interactions.

## 2.6 Research Questions

In light of the identified gaps in the literature, the present study sought to answer the following research questions:

1) What are the associations between Kenyan teacher-reported TCRs and pupils' grades in primary school, specifically
   a. pupils' average score across their subject grades?
   b. pupils' grades in mathematics?
   c. pupils' grades in Kiswahili?
   d. pupils' grades in English?
2) From Kenyan teachers' perspectives, what contextual factors affect TCRs?

# Chapter 3: Methodology

## 3.1. Research Design Overview

This study employed a mixed methods approach to answer the research questions presented in the previous chapter. The study encompassed primary data collection in Kakamega, Kenya, with primary school teachers as participants.

The research was conducted from the perspective that qualitative and quantitative paradigms are not opposed to each other (Pring, 2015), working from an objectivist ontology and interpretivist epistemology.

Notably, mixed methods allow for triangulation of results (Morse, 2003), comparing qualitative and quantitative findings to analyse whether these remain consistent across paradigms. Furthermore, this study used the two paradigms to explore different aspects of Kenyan teacher-child relationships. The study was designed to employ complementary mixed methods conducted simultaneously and using a deductive theoretical drive (Morse, 2003); Kenyan teacher-child relationships were investigated in reference to the theoretical and empirical lens as outlined in the Literature Review.

The quantitative component mainly comprised data on teacher characteristics (age, gender, experience level, etc.), student characteristics (age, gender and grades) and the short form of the Student-Teacher Relationship Scale (Pianta, 2001), a 15-item teacher-informed questionnaire. The STRS is firmly rooted in the literature as a standardised scale. The STRS is a useful measurement tool to employ in an under-researched context, while not without its caveats, as will be discussed in the Materials section.

The qualitative component comprised semi-structured teacher interviews on teacher-child relationships, lasting 30-60 minutes. While less dominant than the quantitative component, the qualitative component was crucial to a) have sufficient contextual understanding to meaningfully interpret the quantitative results, and b) carry a semi-structured design that allows for the researcher's own 'blind spots' to be identified. However, teacher interviews were not simply supplementary to the design. The qualitative component was expected to generate rich data, enough for it to function as an independent empirical investigation through Research Question 2. Quantifying the cultural-ecological significance of the teacher-child relationship could lead to inappropriate reductionism. Additionally, the research design allowed for both quantitative and qualitative data to contribute to all research questions where appropriate, and so quantitative and qualitative components are somewhat interwoven in the discussion and conclusion.

This chapter contains further details on the research setting, the participants, procedure, materials, and ethical considerations. Lastly, the analytical approach and data preparation techniques are recorded.

### 3.2. Setting

This project focuses on Kakamega County, Kenya because of pre-existing connections to schools and community leaders in this area, as the researcher has worked in Kakamega with an education-focused charity since 2019.

Kakamega County is located in Western Kenya and contains a population of approximately 1.8 million (Kenya Population and Housing Census, 2019). The dominant ethnic group consists of Luhya people, although other ethnic groups are also present, such as the Kikuyu. Languages spoken in Kakamega County are mainly Kiswahili, Luhya and English (often as a mix), as well as some Kikuyu. The government encourages local languages as the language of instruction in primary schools (USAID, 2021), but in practice it is mainly Kiswahili (UNICEF, 2016), particularly in the younger year groups. Often, teachers and older pupils are trilingual (i.e., speak their mother tongue, Kiswahili, and English).

An estimated 37.5% of the Kenyan population live in poverty, and an estimated 12.4% live in severe poverty (Oxford Poverty and Human Development Initiative, 2023). Kakamega County contains several rural communities, where poverty rates are higher than in urban centres. Here, families have fewer resources (financial and otherwise) to support their children's education, although schools remain important community hubs. Within this context and despite the government's 2003 free primary education policy, Kenya's children continue to face overwhelming challenges in accessing quality education (Achoka et al., 2007; Cunningham, 2012; Duflo et al., 2015). For one, the Kenyan Ministry of Education, Science & Technology recommends a maximum teacher-to-pupil ratio of 1 to 40, when in practice class sizes are much larger.

The discrepancy in resources was also observed in this study's 3 rural and 2 urban schools. Due to convenience sampling, the degree to which these five schools are representative of the country's (school) population is uncertain. However, the inclusion of both urban and rural schools was an attempt to mitigate this. Typically, urban schools have higher student populations than rural schools, which brings increased revenue. Additionally, urban schools may draw enrolment from families of a higher socioeconomic level than rural families, although the urban schools in this study also included children living in Kakamega's

slum neighbourhoods. This study only recruited public schools, as especially in this small sample the private school system might introduce significant confounding variables (e.g., higher socioeconomic status of students and more stringent teacher recruitment specifications).

In 2017, Kenya transitioned from the 8-4-4 system (i.e., 8 years in primary school, 4 years in secondary school, and 4 years in tertiary education), to the 2-6-3-3-3 system (i.e., 2 years in pre-primary education, 6 years in primary education, 3 years both in junior and senior secondary education, and 3 years in tertiary education). The new system saw the introduction of the Competency-Based Curriculum (CBC), designed to be more learner-focused than instructor-focused. Compared to the 8-4-4, the CBC prioritises practical skills, knowledge and competencies and has a reduced focus on exams (Amutabi, 2019). The CBC also brought a new categorical marking system represented by a numeric grade: Exceeding Expectations (4), Meeting Expectations (3), Approaching Expectations (2), and Below Expectations (1). Kenya has experienced challenges in implementing the CBC effectively (Nyaboke et al., 2021), but the CBC has generally been positively received by educators (Micheni, 2021). Primary schools are divided into Pre-Primary (PP1-PP2), Lower Primary (Grade 1-3), and Upper Primary (Grade 4-6). Some primary schools also include Junior Secondary (Grade 7-8) students.

Data collection was conducted throughout May 2024. In the Kenyan academic system, the academic year commences at the start of the year, so data collection fell at the beginning of Term 2. Sadly, at this time, Kenya was hit with heavy rains and flooding causing national upheaval: more than 200 people were killed, approximately 150,000 people were displaced, and infrastructure was destroyed (Musambi, 2024). Kenya's government ruled that the reopening of schools was to be postponed until May 13th. These events are not believed to have significantly altered the findings, especially as Western Kenya was not the most affected area, but they do provide context for the challenges faced by schools and teachers upon reopening, at the time of data collection.

## 3.3 Recruitment and Selection Criteria

### *3.3.1 School Recruitment and Selection Criteria*

Several recruitment strategies were employed to invite the participation of schools. This study drew on existing contacts with secondary schools, through snowball recruitment, and by approaching schools in person. Throughout the recruitment process, schools were checked to ensure they met the selection criteria.

Initially, recruitment was steered by leveraging prior connections with schools in the Kakamega area. For two out of five participating schools, contact details were obtained from a former colleague, a secondary school head teacher. For these two schools, head teachers were contacted by phone. After receiving an invitation letter (provided in Appendix A) via email, they agreed to take part in the study. The other three schools were recruited through an in-person approach, where the researcher met with the head teacher at the school to explain the research and invite the school to participate. These schools' head teachers received detailed research information over the phone in the days leading up to in-person visits and then received printed school information sheets (presented in Appendix B) during the in-person visits. All participating schools met the inclusion criteria: being located in Kakamega County, and not being focused on special needs education.

In the days leading up to data collection, follow-up calls with all head teachers were made to confirm the schools' participation and to confirm research logistics, if applicable. On the day of data collection, all head teachers were given research approval documents, school information sheets (Appendix B) and school consent forms (Appendix C), the latter of which they signed before data collection began.

### *3.3.2 Teacher Recruitment and Selection Criteria*

Initially, this study aimed to recruit 20 primary school teachers. This was an estimation based on schools' availability, approximate school sizes, the number of teachers who might be available to participate, and time constraints. However, more teachers were available than expected, and recruited schools were larger than initially predicted. As such, 38 teachers were recruited for this study.

After schools had been recruited for the study, teachers were approached to explain the study, what it entails, and were invited to participate. Schools supported and steered the teacher recruitment process by informing their teaching staff of the research plan several days in advance of the data collection visit, so teachers received information about the project

ahead of time. On the day of data collection visits, schools gathered available class teachers in the staff room to be given further study details as a group. One school invited available class teachers to meet one-on-one with the researcher when their teaching schedules permitted. In both cases, the teachers were given details about what participation involved, as well as teacher information sheets (displayed in Appendix D) and teacher consent forms (displayed in Appendix E).

The information sheets contained information about the interview, on the basis of which class teachers could decide to participate in the interview in addition to the STRS component. For the interviews, teachers were also approached with an informal invitation to participate, then referred to the additional section in the consent form to formally confirm their participation. One to two teachers were recruited from each school except for the final one, as the maximum number of interviews had been reached.

After the research details were clarified for participants and informed consent was obtained, data collection was either conducted that same day or later in the week, depending on the schools' availability. The selection of teachers was not made by the researcher, but instead was subject to teacher availability and selection criteria as outlined below.

Teachers were not selected based on specific year groups or classes. For the interview, teachers were selected based on availability and willingness to share their perspective. Participation in the interviews was open to all teachers, not just class teachers.

As mentioned in the previous chapter, under the Kenyan primary education system, year groups are taught not by a single teacher but by multiple teachers, each covering various subjects. In this system, the class teacher is the teacher who carries the main responsibility for monitoring and supporting students throughout the academic year. This study recruited only class teachers as teacher informants for the STRS.

There was an assumption made that the class teacher would be the one with the most contact hours with the class. In hindsight, that was not always the case in this sample. The participating teachers spent relatively few hours per week teaching the class in question. This ranged from 2 to 15.5 hours per week ($M = 6.33$, $SD = 4.18$). Selecting teachers based on contact hours might have made for more robust teacher informants. Nevertheless, class teachers are responsible for the overall progression and wellbeing of the class, therefore it was postulated that they have a strong investment in the class and would know each child on an individual level, regardless of the size of the class. Class teachers were excluded if they had not taught the class from the beginning of the academic year, to ensure participants have had sufficient time to build relationships with their students.

### 3.4 Participants

Thirty-seven primary school teachers participated in the study. 36 teachers (8 male, 25 female, 1 teacher gender missing) submitted questionnaires and 6 teachers (2 male, 4 female) participated in the interview. Teachers were asked about their gender identity with an open-ended question and only reported male and female genders. Only one of six teachers who participated in the interview did not participate in the quantitative part, meaning that all other interview participants completed both components and that 36 teachers completed the STRS. Originally, 38 teachers were invited to participate, but one teacher dropped out of the study after signing the consent form, citing the workload as the reason. No teachers were interviewed in the fifth school only because the MSc timeline limited capacity to six interviews. Teachers' average age was 41.6 years, and the average years of teaching experience was 14.5.

*Table 1.* Participating schools and their location, pupil population, and the number of teachers recruited for the quantitative and qualitative components

| School ID | Rural/Urban | Pupil Population | Teachers Recruited for the STRS | Teachers Recruited for the Interview | Class Size Range for Participating Class Teachers |
|---|---|---|---|---|---|
| S01 | Rural | 428 | 7 | 1 | 36-63 |
| S02 | Rural | 442 | 6 | 2 | 30-52 |
| S03 | Urban | 649 | 8 | 2 | 37-62 |
| S04 | Rural | 387 | 5 | 1 | 47-75 |
| S05 | Urban | 2763 | 10 | 0 | 62-81 |
| | | Total | 36 (*) | 6 | |

(*) Two teachers from S03 were excluded from the analysis, leaving 34 teachers in total; see 3.10 Data Preparation.

As shown in Table 1, class sizes ranged from 30 to 81 pupils, with 24 out of 34 classes (70.6%) being larger than the national recommended maximum of 40. Classes generally had a balanced female and male student population ($M_{percent\ of\ girls}$ = 49.31, $SD$ = 6.90).

With the academic year starting in January, teachers potentially only knew their students for around three months before administering the end-of-term exams that provided the grades for analysis in this study, and around four to five months (including the break) before completing the STRS. It is possible that the class teachers knew their students before this academic year, and the level of familiarity will vary greatly between teachers. Ideally, the

data would have been collected at the end of the academic year, but the MSc timeline did not allow for this.

### 3.5 Procedure

The quantitative and qualitative components were conducted simultaneously. After obtaining informed consent, participating class teachers were asked to complete the STRS and provide Term 1 examination grades. Interview participants were asked for about an hour of their time for the teacher interview. Fieldnotes were taken throughout the process.

For the quantitative component, class teachers were asked to complete the STRS for a subset of their students. Classes could contain up to 80 students, so reducing the number of questionnaires reduced the burden for participating teachers. To this end, 24 students (12 boys and 12 girls) from each class were pre-selected for the STRS. Students with special educational needs (SEN) were excluded from the STRS selection, to minimise confounds.

With the help of the school's administrative staff, a systematic stratification of the class sample was conducted first. Class teachers or administrative staff provided a numbered list of all students in each class, separated by gender. Next, the researcher drew random numbers, each corresponding to a particular child on the numbered class list. Throughout the process, the class list was only visible to the teacher or administrative staff member, to maintain students' anonymity. Once 12 boys and 12 girls had been drawn by the researcher and marked with the help of the teacher or administrative staff member, the class list indicated which 24 students the teacher would complete the STRS for. Each class was also given a teacher code (e.g., Teacher A), to ensure no identifying personal information was linked to the data. While the school was aware of which teacher code represented which teacher, the researcher was shielded from this information. For the duration of the project, school management securely stored the list linking student names and codes. To ensure the school was not privy to teachers' STRS entries, the questionnaires were stored in sealed envelopes throughout the data collection process.

At this stage, teachers were asked to share anonymised information about themselves, using the teacher codes instead of names: age, gender, years of teaching experience, and teacher education level. They were also asked to provide anonymised class data: class size, number of girls in the class, the subjects taught to this class and the number of lessons per week for each subject.

Then, teachers completed the STRS, including the child number, the child's age, gender and class on the form. Teachers also compiled student grades for the selected 24 students, as these were stored by them and not in the school's office records. Data collected on student attainment consisted of the following standardised Term 1 examination grades: average grades, and subject grades for Kiswahili, English, Mathematics, Science (or Lower Primary equivalent), Social Studies/Christian Religious Education. Because class teachers do not teach all subjects to a class, this study also collected data on which subjects were taught by the participating teachers, as well as the number of lessons per week. The standardised examination grades are administered by the teacher of the given subject.

In this study's design, grades, as opposed to socioemotional outcomes, were used as the outcome measure (with teacher-child relationships as a predictor) mostly due to practical constraints of the MSc timeline. Originally, mean scores across the school were to be collected to quantify relative differences in schools' performance, but the CBC has discontinued the practice of mean standardised scores.

While teachers completed the STRS and recorded student grades using child numbers, the researcher collected school data (i.e., enrolment numbers) and conducted interviews with available teachers. At the start of the interviews, details shared in the teacher information sheet were reiterated to re-confirm participants' consent. After introductions, rapport building and light conversation, teachers were asked to share their age, gender, years of teaching experience, and teacher education level. As per the Interview Guide in Appendix H, teachers were then asked questions about their perspective on teacher-child relationships. More details are provided in the Materials section below. Interviews lasted between 25 and 50 minutes, averaging around 35 minutes. The length of the interview depended primarily on how much participants wanted to share, which in turn also influenced the number of follow-up questions posed. With participants' consent, interviews were audio recorded to ensure an accurate record of the conversation. After data collection, the audio recordings were used to generate transcripts using Microsoft 365's Word transcription software. Transcripts were then manually checked one by one for accuracy and for information that could identify participants. Transcript inaccuracies were corrected throughout, to prepare for data analysis as described in the Analytical Approach section.

Due to a limited budget, this study did not offer incentives to participants. However, participating teachers, head teachers and administrative staff were gifted a sleek notebook, and schools were gifted a football for the students' use. This choice of gift was decided based on input from Kenyan colleagues, teachers and administrators.

## 3.6 Materials

### *3.6.1 Student-Teacher Relationship Scale (STRS; Pianta, 2001), Short Form*

As a teacher-reported measure, the STRS was chosen to include students aged 3 and up (Pianta, 2001). A student-reported measure would have made for a more limited age range, because the language(s) of instruction include English only for the Upper Primary year groups, and the researcher is not fluent in Kiswahili or Luhya. Additionally, younger children may be more influenced by the recency effect, in which the latest or most salient interactions are recalled over a more holistic reflection of the TCR.

This study employed the 15-item short form STRS. The short form was chosen to reduce burden on teachers, who are often already overworked. Additionally, the Dependency dimension included in the long form STRS often yields incompatible results when tested for validity and applicability in different settings (e.g., Sclavo et al., 2012). The Dependency dimension has carried a relatively low internal consistency across studies, including Pianta's original STRS study (Koomen et al., 2012; Pianta, 2001; Vahidi et al., 2022), from $\alpha$=0.40 to $\alpha$=0.74 (e.g., Doumen et al., 2009; Hamre & Pianta, 2001; Rey et al., 2007). The dimension is also more vulnerable to confounds of child age and temperament (Rudasill, 2021). Furthermore, cultural understandings of Dependency in the given research setting can differ significantly from the US-based one that the STRS's design uses as a reference (Chen et al., 2019). On the basis of these factors, the short form STRS was selected.

The short form covers two relationship dimensions: Closeness (e.g.," This child openly shares his/her feelings and experiences with me") and Conflict (e.g., "This child and I always seem to be struggling with each other."). 8 of the 15 statements belong to the Closeness dimension, while 7 of the 15 statements belong to the Conflict dimension. Teachers choose their answers to the statements according to a 5-point Likert scale, ranging from "Definitely applies" to "Definitely does not apply". Child age, child gender, and the teacher code was collected along with each STRS form. The form used in this study is displayed in Appendix F. To score teachers' STRS entries, the 8 Closeness and 7 Conflict items are tallied according to the scoring guide in Appendix G.

To ensure the items on each subscale were measuring the same underlying construct, tests for internal consistency were conducted before further analysis took place. A scale's reliability can vary depending on the sample it is administered to (Pallant, 2020), so testing for internal consistency was especially crucial in this new, Kenyan sample. Internal

consistency was calculated for the subscales individually instead of for the scale as a whole (Tavakol & Dennick, 2011), and accounting for the reverse-coded item 4 on the Closeness subscale (see Appendix G for the STRS scoring guide).

Pianta (2001) previously reported high internal consistency on the long form Closeness (α = .86) and Conflict (α = .92) subscales, in a total normative sample. In this sample, the subscales also demonstrated good internal consistency for both Closeness (α = .81) and Conflict (α = .82). Here, Cronbach's alphas are interpreted as acceptable when above .7 (DeVellis, 2012; Pallant, 2020), while a Cronbach's alpha above .90 could indicate redundant items (Tavakol & Dennick, 2011). Therefore, the STRS's internal consistency is interpreted to be highly reliable for this study, especially considering the test length for each subscale is relatively short (Tavakol & Dennick, 2011), at 8 and 7 items, respectively.

### *3.6.2 Semi-Structured Teacher Interviews*

The qualitative aspect encompassed semi-structured teacher interviews. Semi-structured interviews have pre-specified questions but, through prompts and probes, allow the interviewer more freedom than structured interviews. Interviewers use an interview guide with pre-specified, uniform questions, but with flexibility regarding the addition of unplanned questions (Robson & McCartan, 2012). Semi-structured interviews aim for clarification and elaboration, as opposed to standardisation and comparability in structured interviews (May 2011).

Seven questions, as listed below and in the Interview Guide in Appendix H, were designed prior to conducting the interview. As mentioned in the Research Design Overview, semi-structured interviews were chosen as method to generate contextual data, but also to check for any unconscious assumptions made in the design or data collection period (e.g., assumptions about the impact of the new CBC). The qualitative paradigm often takes on a constructivist foundation, where the researcher is believed to have an active role in the shaping of the findings; phenomena cannot be objectively observed as the researcher is always a part of the research, bringing preconceived notions that shape data collection and analysis (Laher et al., 2019). The semi-structured approach was an attempt to minimise the researcher's shaping of the direction of the interview, and thus of the data generated. The pre-prepared interview questions were designed to be rather open-ended to derive nuances.

Follow-up questions fell into two categories: 1) clarifying questions, and 2) questions that attempted to prompt deeper exploration. Follow-up questions were not devised

beforehand, for the reasons outlined above. As much as possible, they were phrased in a clear and straightforward manner, avoiding multiple questions in one utterance (Robson & McCartan, 2012).

Pre-prepared Teacher Interview Questions:

1. How would you describe the role of the teacher?
2. What is the role of the teacher compared to the role of parents, family, and the community?
3. How do you establish and maintain teacher-child relationships?
4. What are the challenges that your pupils face? (socio-economic, socio-emotional, academic)
5. How do you support pupils who face these challenges?
6. What is your perspective on the effect of teacher-child relationships in child outcomes?
7. What recommendations would you make to schools or to the government on this topic?

Additionally, at the end of each interview, teachers were asked if there was anything else they wanted to share.

### 3.7 Ethical Considerations

Following University of Oxford research protocol, this study was approved by the Central University Research Ethics Committee (CUREC). The CUREC approval letter (reference: EDUC_C1A_24_106) is provided in Appendix I. The following of CUREC's Best Practice Guides were used to inform the study's design, planning, and execution: Researcher Safety; Conducting Research Interviews; Data Collection, Protection and Management; Payments and Incentives in Research; Social Science Conducted Outside of the UK; Ethical Fieldwork Code of Conduct; Ethical Fieldwork Code of Conduct Supplementary Toolkit. This study also leveraged and drew from the British Educational Research Association *Ethical Guidelines for Educational Research* and the British Psychological Society *Code of Ethics and Conduct*. Additionally, while the study did not include direct interaction with children, as an extra ethical precaution, the researcher carries a Basic Disclosure and Barring Service (DBS) check from 2022 and an Enhanced DBS check from 2017.

To conduct data collection in Kenya, obtaining national and local ethic approval and research permits was crucial. The researcher followed the three-step application process as follows: 1) obtaining approval and a letter of affiliation through an accredited Institutional Scientific and Ethics Review Committee (ISERC), 2) obtaining a research permit from Kenya's National Commission for Science, Technology and Innovation on (NACOSTI), 3) obtaining local approval from the Ministry of Education, Kakamega Branch.

Firstly, after obtaining CUREC approval, ethical approval was sought from an accredited ISERC. The ISERC at Masinde Muliro University of Science and Technology (MMUST) was selected by the researcher, due to the central location in Kakamega and due to prior connections to professors of MMUST's School of Education. The MMUST ISERC reviewed and approved the application (approval number MMUST/ISERC/046/2024). The approval letter is included in Appendix J. Secondly, an application was submitted to NACOSTI, with the MMUST approval letter serving as the required letter of affiliation with a Kenyan institution. NACOSTI approved the submission and granted a Research License (reference number 744295), which is provided in Appendix K. This License granted approval with national coverage, but the researcher also intended to notify Kakamega's Ministry of Education, so as to conduct the data collection will full transparency to and oversight of local authorities. As such, thirdly, the NACOSTI Research License was brought to Kakamega's Ministry of Education for review. The Ministry granted their approval; the endorsement is included Appendix L.

Research data (i.e., digitised files, audio recordings and transcripts) were securely stored and password protected on the researcher's Nexus 365 OneDrive for Business account, the University's secure storage system. Individual participating schools or teachers were not identifiable in the research data, having received codes.

At the level of the participant, ethical considerations were mainly in terms of language and clarity around the freedom not to participate. Firstly, participant-facing documents (i.e., information sheets and consent forms, provided in Appendices B, C, D and E) were provided in English as opposed to Kiswahili. Kiswahili might have made the text more accessible to some participants, although English is widely used in Kakamega as one of Kenya's official languages. English was chosen to avoid any miscommunication in case the participants needed clarification from the researcher on a specific part of the text. Importantly, use of accessible language was prioritised in writing the participant-facing documents. Additionally, participants were repeatedly invited to ask any questions about the research, either in person or using the contact details provided. A relatively frequent request

was to clarify the meaning of 'pseudonymised'. This suggests the need for a re-write in this section of the teacher information sheet and presents an opportunity for increased accessibility in future iterations or for similar studies.

Secondly, teachers might have felt unspoken pressure to participate, especially as the head teacher had already endorsed the study before their participation was offered. To minimise this, the freedom not to participate was orally made explicit in every conversation, from teachers receiving initial study information until the end of the study.

### 3.8. Qualitative Analytical Approach

For the qualitative research question (*From Kenyan teachers' perspectives, what contextual factors affect teacher-child relationships?*), full transcripts from 6 semi-structured teacher interviews were examined through thematic analysis (TA) using NVivo Version 14. TA is a commonly-used approach to coding qualitative data (Braun & Clarke, 2006; Silverman, 2024). Braun and Clarke (2006; 2020) describe six phases of TA, which adhered to:

1) data familiarisation, transcription, and writing familiarisation notes,
2) systematic data coding,
3) generating initial themes from coded and collated data,
4) developing and reviewing themes,
5) refining, defining, and naming themes, and
6) writing the report.

Braun and Clarke (2006) primarily leverage reflexive TA. Reflexive TA is a highly iterative process where the researcher transitions back and forth between phases, evaluating codes and themes throughout. This approach is especially appropriate for research focusing on "how personal experiences are located within wider sociocultural contexts" (Clarke & Braun, 2020, p.40). As such, thematic analysis for this study mirrored this iterative process; Phase 4 and 5 in particular were revisited in turn multiple times. However, this study deviated from the constructionist perspective associated with reflexive TA (Braun & Clarke, 2006; Byrne, 2022) in favour of 'codebook' TA. As opposed to reflexive TA, in which researchers conduct an inductive analysis, 'codebook' TA adopts a deductive approach, providing more methodological structure in favour of qualitative pragmatism (Braun & Clarke, 2020). This is not to say that the inductive or deductive approach each belong to one epistemology exclusively (Byrne, 2021). However, as mentioned earlier, this study primarily applied a

deductive approach throughout. Therefore, 'codebook' TA provided stronger ontological and epistemological cohesion between the quantitative and qualitative components (Holloway & Todres, 2003; Levitt et al., 2018).

In practice, this 'codebook' TA approach entailed 1) prior engagement with the literature, as per the deductive approach (Braun & Clarke, 2020; Tuckett, 2005), 2) coding with specific theoretical underpinnings and research questions in mind (Braun & Clarke, 2006), and 3) using framework, matrix and cluster analyses to sort codes into themes and sub-themes (Braun & Clark, 2020; Braun & Clarke, 2006). Fieldnotes, interview notes, and audio recordings were used to supplement the TA and ensure insights gained at the time of data production were included, where appropriate. Throughout, NVivo 'memo notes' were kept to draft coding schemes and to record decisions (Braun & Clarke, 2006). Finally, constructed themes and sub-themes were reviewed against the entire data set to ensure the analysis was duly representative, in the context of the research questions.

### 3.9. Quantitative Analytical Approach

For the quantitative research question (*What are the associations between Kenyan teacher-reported teacher-child relationships and pupils' grades in primary school?*), first a reliability analysis was conducted to confirm whether the STRS was a valid measurement tool in this sample and setting. Next, an exploratory factor analysis was conducted to ascertain whether STRS items loaded onto their respective subscales for this sample and setting. Lastly, hierarchical linear and logistic regressions were conducted to test for associations between the STRS, pupil grades, and additional explanatory variables. Here, grades (i.e., on average, in mathematics, Kiswahili, and English) acted as the outcome variables. To recompute subject grades from ordinal to dichotomous variables, Below (1) and Approaching Expectations (2) were computed as 0, while Meeting (3) and Exceeding Expectations (4) were computed as 1. In other words, children satisfying the academic expectations in these three subjects was coded as 1.

Scale types, as presented in Table 2, were determined based on Stevens' (1946) guidance. All statistical analyses were conducted in SPSS Version 29.

*Table 2*. Scale types for all variables included in the statistical analyses.

| Data Type | Scale Type |
|---|---|
| STRS | |
| Closeness subscale mean | Continuous |

| | |
|---|---|
| Closeness items | Ordinal |
| Conflict subscale mean | Continuous |
| Conflict items | Ordinal |
| Teacher Characteristics | |
| Age | Continuous |
| Gender | Nominal |
| Years of teaching experience | Continuous |
| Teacher education level (i.e., certificate, diploma, or degree) | Nominal |
| Class size | Continuous |
| Child Characteristics | |
| Age | Continuous |
| Gender | Nominal |
| Grades | |
| Average | Continuous |
| Mathematics, Kiswahili and English | Dichotomous |

### *3.9.1. Excluding Cases*

STRS data from two class teachers (both from school S03) were excluded due to their STRS questionnaires containing near-identical answers throughout. Of these, one teacher (T15) produced identical answers for 23 out of 24 children. The other teacher (T21) had produced identical answers for all forms bar one item, although this one item was missing and therefore did not have any answer selected. It was deemed implausible for these teachers to have the exact same relationship with these students, and so there was a risk of not having sufficiently engaged with the STRS for the analysis to produce meaningful results. It was on this basis that the two teachers were excluded from the analysis, leaving 34 participants.

In the data from the remaining 34 teachers, 3 pupils' STRS and grades were missing. Additionally, one class teacher (T08) led a class that contained only 10 girls, so 24 questionnaires could not be obtained. Therefore, instead of 816 (i.e., 24x34) pupils, 811 pupils were included in the analysis. Additionally, individuals' STRS item values and grades were sporadically missing (see Table 3 in the Results for the descriptive statistics). Because of this negligible number of missing cases and because SPSS automatically accounts for this, data imputation was not deemed necessary.

Participating teachers did not teach all subjects to their classes. Teachers were dummy coded to reflect whether or not they were a teacher in mathematics, Kiswahili, and English. Only the class teachers who taught each particular subject to the given class were included. In this way, the descriptive statistics for these subjects and the regression models did not include

class teachers who did not teach the given subject. This method produced subgroups consisting of 204 children for the mathematics logistic regression model, 183 children for the Kiswahili model, and 238 children for the English model (see Table 5 in the Quantitative Results chapter).

### *3.9.2. Data Inconsistencies*

To compensate for missing STRS items, instead of using the raw scores, the mean was extracted from the Closeness and Conflict dimensions for each question. The means were then used in subsequent statistical analyses. This changed the dimension scale type from ordinal to continuous.

Some questionnaires contained STRS items with two answers selected; this occurred 26 times across the data set with T15 and T21 excluded. If the average of the two selected answers was a whole number (e.g., 1 and 5 selected), then the mean was taken as the answer to that item (e.g., 3). If the average of the two selected answers was not a whole number (e.g., 2 and 4 selected), then the lowest middle number was taken as the answer. This approach was the same for both Closeness and Conflict items, to not skew the subscales in opposite directions. In this approach, the item values remained on the ordinal scale.

Additionally, lesson times varied across year groups. Lessons had a duration of 30 minutes for Grades PP1-PP2 and 1-3, 35 minutes for Grades 4-6, and 40 minutes for Grades 7-8. To ensure the teachers' time spent with the class was standardised, the lessons were converted to hours.

Furthermore, average grades consisted of different subjects depending on the year group. Table 3 presents the varying subject compositions for participating classes.

*Table 3.* Subject compositions for students' average grade

| CBC Level | Classes | Subjects |
|---|---|---|
| Pre-Primary | PP1-PP2 | Mathematics, Language, Environment, Creative Arts, Religion |
| Lower Primary | 1-3 | Mathematics, Indigenous Languages, Kiswahili, English, Environment, Creative Arts, Religion |
| Upper Primary | 4-6 | Mathematics, Kiswahili, English, Science and Technology, Agriculture and Nutrition, Social Studies, Creative Arts, Religion |
| Junior Secondary | 7-8 | Mathematics, Kiswahili, English, Integrated Science, Pre-Technical Studies, Agriculture and Nutrition, Social Studies, Creative Arts, Religion |

# Chapter 4: Quantitative Results

## 4.1 Descriptive Statistics for Participants and the STRS

Outliers were screened for, and none were identified. As stated in the Participants section of the Methodology chapter, teachers' average age was 41.6 years. The sample contained significantly more female teachers (73.6%) than male teachers (23.4%). Years of teaching experience ranged from 3 to 34, averaging at 14.5 years. Teachers' education level was categorised by certificate (23.4%), diploma (47.3%, or degree (20.3%). Participating class teachers spent between 2 and 15.5 hours per week with the given class, averaging at 6.33 hours.

Of the 811 children for which the STRS was completed, 72 were in Pre-Primary, 286 were in Lower Primary, 205 were in Upper Primary and 48 were in Junior Secondary. Children's mean age was 9.6 years ($SD$ = 2.40). Notably, the children's ages ranged from 3 to 14, while the STRS was originally designed for children aged 3 to 12 (Pianta, 2001). As displayed in Table 3 and contrary to previous findings, teachers reported similar levels of Closeness and Conflict with boys ($N$=405) and girls ($N$=405). Histograms for the STRS Closeness and Conflict subscales are displayed in Appendix M. Table 4 displays the item-level and mean-level descriptive statistics for the STRS.

*Table 4.* Descriptive statistics for the STRS

| | *N* | *M* | *SD* | Range | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| STRS Closeness | 804 | 4.03 | .75 | 1—5 | -.83 | .46 |
| Girls | 399 | 4.08 | .72 | 1—5 | | |
| Boys | 404 | 3.96 | .77 | 1.5—5 | | |
| Item 1 | 804 | 4.41 | .91 | 1—5 | | |
| *I share an affectionate, warm relationship with this child.* | | | | | | |
| Item 3 | 798 | 4.04 | 1.09 | 1—5 | | |
| *If upset, this child will seek comfort from me.* | | | | | | |
| Item 4 (Reverse) | 799 | 2.29 | 1.29 | 1—5 | | |
| *This child is uncomfortable with physical affection or touch from me.* | | | | | | |
| Item 5 | 800 | 4.28 | .94 | 1—5 | | |
| *This child values his/her relationship with me.* | | | | | | |
| Item 6 | 799 | 4.42 | .96 | 1—5 | | |
| *When I praise this child, he/she beams with pride.* | | | | | | |
| Item 7 | 796 | 3.76 | 1.31 | 1—5 | | |
| *This child spontaneously shares information about himself/herself.* | | | | | | |
| Item 9 | 795 | 3.69 | 1.71 | 1—5 | | |
| *It is easy to be in tune with what this child is feeling.* | | | | | | |
| Item 15 | 802 | 3.91 | | 1—5 | | |
| *This child openly shares his/her feelings and experiences with me.* | | | | | | |
| STRS Conflict | 804 | 2.17 | .87 | 1—4.86 | .79 | -.01 |
| Girls | 399 | 2.14 | .85 | 1—4.57 | | |
| Boys | 404 | 2.20 | .88 | 1—4.86 | | |
| Item 2 | 802 | 2.12 | 1.28 | 1—5 | | |
| *This child and I always seem to be struggling with each other.* | | | | | | |
| Item 8 | 794 | 1.95 | 1.16 | 1—5 | | |
| *This child easily becomes angry with me.* | | | | | | |
| Item 10 | 795 | 2.11 | 1.30 | 1—5 | | |
| *This child remains angry or is resistant after being disciplined.* | | | | | | |
| Item 11 | 800 | 1.95 | 1.19 | 1—5 | | |
| *Dealing with this child drains my energy.* | | | | | | |
| Item 12 | 803 | 2.15 | 1.27 | 1—5 | | |
| *When this child is in a bad mood, I know we're in for a long and difficult day.* | | | | | | |
| Item 13 | 800 | 2.39 | 1.21 | 1—5 | | |
| *This child's feelings toward me can be unpredictable or can change suddenly.* | | | | | | |
| Item 14 | 803 | 2.52 | 1.33 | 1—5 | | |
| *This child is sneaky or manipulative with me.* | | | | | | |

Note: skewness and kurtosis values were deemed acceptable within the range of ±2 and ±7, respectively (Hair et al., 2010)

### 4.2 Exploratory Factor Analysis

The 15 items of the STRS were analysed through exploratory factor analysis (EFA) in order to validate the scale's multidimensional construct structure (i.e., Closeness and Conflict dimensions). Factor analysis is used to assess applicability in terms of construct validity, i.e., the degree to which the underlying constructs of the measurement tool measure what it intends to measure. EFA is typically conducted to uncover latent factors, without imposing factors (in this case, the two STRS dimensions) onto the model. It is especially appropriate to test construct validity for new scale or novel samples (Tabachnick & Fidell, 2018). Pallant (2020) advises EFA requires sample sizes of at least 150, while Tabachnick and Fidell (2013) suggest 300 cases. This study contained 811 STRS cases, and therefore met these criteria.

In using established measurement tools in new settings, such as the STRS, researchers have opted for either exploratory or confirmatory factor analysis (CFA). However, factor analysis is less standardised than other statistical tests (Teo, 2013) and there are no set guidelines for this choice of analysis (Orçan, 2018). This study opted for EFA and not CFA, because prior STRS studies that use CFA hold the validity and applicability of their respective student-teacher relationship scale as the sole focus (e.g., Koomen & Jellesma, 2015; Milatz et al., 2014; Solheim et al., 2012; Vahidi et al., 2022; Vervoort et al., 2015; Webb & Neuharth-Pritchett, 2011). Pianta's (2001) original launch of the STRS only included EFA, as is the case in research testing the applicability of the STRS in a new cultural setting (Beyazkurk & Kesner, 2005; Gregoriadis & Tsigilis, 2008; Koca, 2010). Therefore, CFA was deemed to be outside of the scope of this study.

Firstly, as stipulated by Hair et al. (2010), a correlation matrix should contain at least some correlations of $r$=.3 or greater to meet EFA suitability requirements. The correlation matrix contained many coefficients of $r$=.3 and above (see Appendix N). Secondly, the Kaiser-Meyer-Olkin value was .898, which is well-above the accepted .6 value (Kaiser, 1974; Tabachnick & Fidell, 2013). Thirdly, Bartlett's Test of Sphericity was statistically significant ($p$<.001), meeting the standards for EFA (Watkins, 2018).

The exploratory factor analysis leveraged maximum likelihood estimation (MLE), used a promax rotation, and extracted two factors. MLE was selected due to this study's characteristics; MLE is especially recommended for samples above 300, where the number of factors are correctly stipulated (i.e., the Closeness and Conflict dimensions being somewhat predetermined), and where the factor-variable relationships are above .40 (see Table 5 for factor loadings) (Fabrigar et al., 1999; Gaskin & Happell, 2014; Watkins, 2018). Promax, as an oblique or non-orthogonal rotation, was chosen following both theoretical underpinnings

and the factor correlation matrix. Pianta (2001) used the orthogonal varimax rotation in the EFA. However, deciding on the rotation should initially be guided by the underlying theory (Teo, 2013); the STRS theory positions Conflict and Closeness as negatively correlated (i.e., student-teacher closeness is less likely to be high if conflict is high). This pointed to a non-orthogonal rotation, where factors are permitted to correlate. Additionally, using promax, the factor correlation matrix displayed a correlation of $r$=-.51, which fell well beyond the established threshold of $r$=±.32 for non-orthogonal rotations (Gabriel, 2019; Tabachnick & Fidell, 2018). Therefore, promax was selected. Other extraction methods and rotations such as oblimin were also applied. This did not substantially alter the factor loadings or overall model fit, as was to be expected based on literature stating that rotation decisions are typically substantially inconsequential (Teo, 2013).

The EFA extracted two factors. The scree plot showed a slight break after 3 factors (see Appendix O). However, following Kaiser's criterion, the eigenvalues exceeded 1 (Pallant, 2020) for only two factors: 5.41 for Factor 1 and 2.12 for Factor 2. An EFA was conducted with 3 factors, but only item 2 loaded onto it, at -.804. Being guided by Kaiser's criterion and considering the STRS short form consists of two dimensions, 2 factors were retained as the most appropriate model. Because of the low number of factors, common criticism of Kaiser's criterion retaining too many factors (Pallant, 2020) did not apply. Factor 1 explained 36.1% while Factor 2 explained 14.1% of the variance; the combined explained variance was thus 50.2%. The EFA's eigenvalues, pattern matrix, and structure matrix are displayed in Table 5.

Examining the pattern matrix as the leading output (Tabachnick & Fidell, 2013), the promax rotation showed that all variables loaded substantially on only one component, except for Item 4 (*This child is uncomfortable with physical affection or touch from me*). Values above .3 in the pattern matrix were considered 'substantial loadings' (Pallant, 2020). Minus Item 4, the interpretation of the two factors was consistent with the Closeness and Conflict dimensions of the STRS. Because of this near-consistency, Factor 1 was interpreted to be associated with the Closeness subscale, and Factor 2 with the Conflict subscale.

The reverse-coded Item 4 is designed to fall under Closeness, but in the initial EFA it unexpectedly loaded onto Factor 2 at -.52. This did not change when an oblimin rotation was applied. Therefore, in the final analysis as reported here, Item 4 was removed from the scale. This decision was made primarily due to an increase in Cronbach's alpha from .81 to .84 when removed. However, the overall factor structure was not substantially impacted. The

eigenvalues, pattern and structure matrices from the analysis including Item 4 are presented in Appendix P.

*Table 5.* The eigenvalues, pattern matrix, and structure matrix revealed through maximum likelihood estimation with a promax rotation

| | Item | Eigenvalues | | Pattern Matrix | | Structure Matrix | |
|---|---|---|---|---|---|---|---|
| | | Initial | Extraction | Factor 1 | Factor 2 | Factor 1 | Factor 2 |
| 1 | *I share an affectionate, warm relationship with this child.* | .42 | .42 | .59 | -.10 | .64 | -.40 |
| 2 | *This child and I always seem to be struggling with each other.* | .26 | .24 | .06 | .51 | -.20 | .48 |
| 3 | *If upset, this child will seek comfort from me.* | .38 | .41 | .64 | .001 | .64 | -.32 |
| 5 | *This child values his/her relationship with me.* | .44 | .45 | .62 | -.10 | .67 | -.41 |
| 6 | *When I praise this child, he/she beams with pride.* | .27 | .26 | .48 | -.06 | .51 | -.30 |
| 7 | *This child spontaneously shares information about himself/herself.* | .54 | .61 | .82 | .08 | .78 | -.33 |
| 8 | *This child easily becomes angry with me.* | .37 | .43 | .13 | .72 | -.23 | .65 |
| 9 | *It is easy to be in tune with what this child is feeling.* | .30 | .31 | .57 | .02 | .56 | -.27 |
| 10 | *This child remains angry or is resistant after being disciplined.* | .50 | .56 | -.14 | .67 | -.48 | .74 |
| 11 | *Dealing with this child drains my energy.* | .54 | .82 | -.02 | .78 | -.41 | .79 |
| 12 | *When this child is in a bad mood, I know we're in for a long and difficult day.* | .39 | .41 | -.11 | .57 | -.40 | .63 |
| 13 | *This child's feelings toward me can be unpredictable or can change suddenly.* | .49 | .54 | -.11 | .67 | -.45 | .73 |
| 14 | *This child is sneaky or manipulative with me.* | .25 | .25 | .09 | .53 | -.18 | .49 |
| 15 | *This child openly shares his/her feelings and experiences with me.* | .58 | .69 | .89 | .14 | .83 | -.32 |

Taken together, after removal of Item 4, the EFA and internal consistency findings suggested that the short form STRS was a reliable and valid measure for this sample.

### 4.3. Descriptive Statistics for the Regression Models

The regression models involved recoding of the variables, therefore descriptive statistics are displayed here in advance of the regression results. The linear regressions leveraged average grades ($M$ = 2.46, $SD$ = .81) from 805 children. This outcome variable had a skewness of .23 and kurtosis of -.62; these values were judged to fall within the acceptable range of ±2 and ±7, respectively (Hair et al., 2010).

As mentioned in section 3.10, children's subject outcomes were recoded to reflect whether they satisfied academic expectations. Meeting Expectations (3) and Exceeding Expectations (4) were coded to 1, while Below (1) and Approaching Expectations (2) were coded to 0. For the logistic regression in particular, dummy variables were created for the categorical explanatory variables of gender (Female=0) and teacher education level (Certificate=0). Table 6 contains descriptives for each of the three subjects.

*Table 6.* Descriptive statistics for mathematics, Kiswahili and English subgroups.

| | *N* | M/EE | Child Age | | Girls (%) | Teacher Age | | Female Teachers (%) | Class Size | | Closeness | | Conflict | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *M* | *SD* | | *M* | *SD* | | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Mathematics | 204 | 60.7% | 7.6 | 2.2 | 49.5 | 38.1 | 6.2 | 88.8 | 63.2 | 16.6 | 4.00 | .76 | 2.29 | .85 |
| Kiswahili | 183 | 63.1% | 10.4 | 2.2 | 50.5 | 36.3 | 7.0 | 56.1 | 59.8 | 18.4 | 4.04 | .65 | 2.49 | .99 |
| English | 238 | 50.0% | 10.1 | 2.0 | 50.0 | 41.0 | 9.2 | 84.5 | 57.9 | 12.4 | 4.15 | .75 | 2.24 | .90 |

Note: M/EE = Meeting or Exceeding Expectations, i.e., satisfying the academic expectations.
15.5% of English grades were missing; the English M/EE value reflects the valid percent.

### 4.4 Regression Models

To address research question 1 (*What are the associations between Kenyan teacher-reported teacher-child relationships and pupils' grades in primary school?*), two types of regression analyses were conducted. For average grades (i.e., a continuous outcome), two hierarchical regression analysis were conducted on Closeness and Conflict. For children's academic achievement in individual subjects (i.e., a dichotomous outcome), one Closeness and one Conflict model were run for each subject outcome (mathematics, Kiswahili, and English), yielding six logistic regression analyses.

Teacher characteristics (i.e., age, gender, education level), child characteristics (i.e., age and gender), class size, and STRS (i.e., Closeness and Conflict subscales) served as predictor variables. Teacher age and years of experience were highly correlated ($r$=.86), so years of experience was excluded from the analysis. Correlations are displayed in Table 7.

*Table 7.* Pearson's correlation matrix for variables included in the regression analyses.

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Teacher Age | | -.12*** | -.09** | .01 | -.25*** | .09** | -.26*** | .02 | -.03 | .12** | .02 |
| 2. Teacher Gender | -.12*** | | .30*** | -.01 | -.23*** | -.09** | .16*** | -.21*** | -.17*** | -.11** | -.24*** |
| 3. Child Age | -.09** | .30*** | | .05 | -.22*** | -.04 | .01 | -.20*** | -.33*** | -.01 | -.19*** |
| 4. Child Gender | .01 | -.01 | .05 | | -.01 | -.09* | .03 | -.01 | .05 | -.07* | -.03 |
| 5. Class Size | -.25*** | -.23*** | -.22*** | -.01 | | .03 | .11** | .26*** | .16*** | .11** | .27*** |
| 6. Closeness | .09** | -.09** | -.04 | -.09* | .03 | | -.49*** | .32*** | .15*** | .24*** | .28*** |
| 7. Conflict | -.26*** | .16*** | .01 | .03 | .11** | -.49*** | | -.12*** | .01 | -.13*** | -.09* |
| 8. Average Grade | .02 | -.21*** | -.20*** | -.01 | .26*** | .32*** | -.12*** | | .65*** | .63*** | .67*** |
| 9. Mathematics: M/EE | -.03 | -.17*** | -.33*** | .05 | .16*** | .15*** | .01 | .65*** | | .39*** | .50*** |
| 10. Kiswahili: M/EE | .12** | -.11** | -.01 | -.07* | .11** | .24*** | -.13*** | .63*** | .39*** | | .57*** |
| 11. English: M/EE | .02 | -.24*** | -.19*** | -.03 | .27*** | .28*** | -.09* | .67*** | .50*** | .57*** | |

Note: * = $p$<.05; ** = $p$<.01; *** = $p$<.001. M/EE = Meeting or Exceeding Expectations

Associations between child age and outcomes were negative and generally moderate, suggesting that older children saw lower academic achievement than younger children. Class size was correlated with academic achievement, particularly in average grades and English achievement. Interestingly, these correlations were positive, indicating that larger class sizes were associated with higher achievement. Not surprisingly, correlations between students' achievement on average and in the three subjects were positive and moderate to high. Closeness and Conflict were negatively correlated with each other, confirming theoretical underpinnings of an inverse relationship between the two dimensions.

Next, assumptions for the hierarchical linear regression were checked, as per Field's (2018) guidelines. SPSS output pertaining to the checking of these assumptions is displayed in Appendix Q. The residuals were normally distributed and there was no evidence of multicollinearity; the correlation matrix (Table 6) displayed only small to moderate correlations, the Variance Inflation Factor was below 10, and Tolerance was higher than .20.

However, the residuals were not homoscedastic. This could have been due to the low range of possible values (i.e., 1-4), combined with the possibility of teachers rounding up average grades to whole numbers, which would have concentrated the average grades around 1, 2, 3, and 4. In their seminal study on TCRs and children's academic outcomes, Hamre and Pianta (2001) conducted a hierarchical regression using letter grades (A-E = 1-5) as the outcome, which most likely also would not have met the homoscedasticity assumption. Because of this precedent, it was deemed acceptable to conduct the regression, albeit not without caution.

Assumptions for the logistics regression models were checked and most were met. This study did not involve clustering at multiple hierarchical levels, so the independent errors assumptions was considered met. Multicollinearity was checked for; coefficients displayed only small or moderate correlations between variables. As stated in 4.1, outliers were previously screened for. Linearity was partially confirmed; the Hosmer and Lemeshow Test did not find statistical significance for half of the regression analyses. However, for the Conflict regression using English achievement as the outcome variable, the test was found to be significant. Additionally, the test found statistical significance for both the Closeness and Conflict regressions with mathematics achievement as the outcome variable. However, when observing the contingency table for the Hosmer and Lemeshow Test, there were few observed differences between the observed and expected model. The contingency tables for the four models are in Appendix R. Furthermore, the Omnibus Tests of Model Coefficients was highly significant for all four models, indicating that goodness-of-fit was achieved. Considering these additional controls, the linearity assumption was waived. Still, the results should be interpreted with caution.

To conduct the regressions, predictor variables were entered into the hierarchical linear and logistic models, with the teacher characteristics (i.e., age, gender, and education level) first, followed by child characteristics (i.e., age and gender), class size, and the Closeness or Conflict STRS subscale. Regression results are displayed in Table 8, 9, 10 and 11.

*Table 8.* Hierarchical linear regression analyses: Associations between children satisfying overall grade expectations and Closeness and Conflict dimensions of TCRs

| | Closeness | | Conflict | |
|---|---|---|---|---|
| Block | $\Delta R^2$ | β | $\Delta R^2$ | β |
| 1. Teacher Age | .04*** | .04 | .04*** | .04 |
| Teacher Gender | | -.08* | | -.08 |
| Teacher Education Level | | -.02 | | .02 |
| 2. Child Age | .04*** | -.14*** | .04*** | -.15*** |
| Child Gender | | .05 | | .02 |
| 3. Class Size | .03*** | .21*** | .03*** | .22*** |
| 4. STRS Subscale | .10*** | .32*** | .01** | -.11** |
| Total $R^2$ | .21 | | .13 | |
| F-Statistic | 26.81*** | | 14.55*** | |

*Note*: The standardised β coefficients were the values produced in the final analysis, with all variables included in the model. * = $p$<.05; ** = $p$<.01; *** = $p$<.001

*Table 9.* Logistic regression analyses: Associations between children satisfying academic expectations in mathematics and Closeness and Conflict dimensions of TCRs

| | Closeness | | | | | Conflict | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variable | *B* | | S.E. | Wald | Odds Ratios | *B* | | S.E. | Wald | Odds Ratios |
| Teacher Age | -.01 | | .01 | .55 | .99 | -.003 | | .01 | .11 | .99 |
| Female vs Male Teacher | -.21 | | .24 | .76 | .81 | -.26 | | .24 | 1.19 | .77 |
| Teacher Education: Certificate | | | | 9.69 | | | | | 7.71 | |
| Teacher Education: Diploma | -.61 | *** | .23 | 7.11 | .55 | -.62 | *** | .23 | 7.57 | .54 |
| Teacher Education: Degree | -.83 | *** | .30 | 7.67 | .44 | -.55 | | .30 | 3.34 | .58 |
| Child Age | -.33 | *** | .05 | 46.86 | .72 | -.34 | *** | .05 | 52.52 | .71 |
| Girl vs Boy | .42 | ** | .17 | 6.29 | 1.53 | .34 | * | .17 | 4.12 | 1.40 |
| Class Size | .01 | | .01 | 2.69 | 1.01 | .01 | | .01 | 1.75 | 1.01 |
| STRS Subscale | .62 | *** | .13 | 24.07 | 1.85 | -.06 | | .10 | .30 | .95 |
| Nagelkerke pseudo $R^2$ | 23.9% | | | | | 19.8% | | | | |
| $\chi^2$ | 140.64, *df* = 8, $p$<.001 | | | | | 114.95, *df* = 8, $p$<.001 | | | | |

*Note*: The coefficients for Teacher Gender and Child Gender are contrasted against being Female. Teacher Education Level is contrasted against Certificate level. * = $p$<.05; ** = $p$<.01; *** = $p$<.001

*Table 10.* Logistic regression analyses: Associations between children satisfying academic expectations in Kiswahili and Closeness and Conflict dimensions of TCRs

| | Closeness | | | | | Conflict | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variable | *B* | | S.E. | Wald | Odds Ratios | *B* | | S.E. | Wald | Odds Ratios |
| Teacher Age | .04 | *** | .01 | 15.78 | 1.04 | .04 | *** | .01 | 14.89 | 1.04 |
| Female vs Male Teacher | -.54 | * | .24 | 5.4 | .58 | -.57 | ** | .24 | 5.77 | .57 |
| Teacher Education: Certificate | | | | 27.50 | | | | | 36.04 | |
| Teacher Education: Diploma | -1.09 | *** | .23 | 23.68 | .34 | -1.21 | *** | .23 | 27.20 | .30 |
| Teacher Education: Degree | -.27 | | .30 | .81 | .77 | -.20 | | .30 | .42 | .82 |
| Child Age | -.02 | | .05 | .14 | .98 | -.05 | | .05 | 1.04 | .95 |
| Girl vs Boy | -.21 | | .17 | 1.51 | .81 | -.25 | | .17 | 2.20 | .78 |
| Class Size | .02 | *** | .01 | 12.26 | 1.02 | .03 | *** | .01 | 15.44 | 1.03 |
| STRS Subscale | .55 | *** | .13 | 20.20 | 1.73 | -.27 | *** | .13 | 6.82 | .76 |
| Nagelkerke pseudo $R^2$ | 18.3% | | | | | 15.7% | | | | |
| $\chi^2$ | 95.73 *df* = 8, *p*<.001 | | | | | 81.39, *df* = 8, *p*<.001 | | | | |

Note: The coefficients for Teacher Gender and Child Gender are contrasted against being Female.
Teacher Education Level is contrasted against Certificate level. * = *p*<.05; ** = *p*<.01; *** = *p*<.001

*Table 11.* Logistic regression analyses: Associations between children satisfying academic expectations in English and Closeness and Conflict dimensions of TCRs

| | Closeness | | | | | Conflict | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variable | *B* | | S.E. | Wald | Odds Ratios | *B* | | S.E. | Wald | Odds Ratios |
| Teacher Age | .03 | * | .02 | 1.78 | 1.03 | .05 | * | .02 | 4.95 | 1.05 |
| Female vs Male Teacher | -.53 | * | .86 | .39 | .59 | -1.91 | * | .94 | 4.09 | .15 |
| Teacher Education: Certificate | | | | 2.71 | | | | | 4.49 | |
| Teacher Education: Diploma | .28 | | .80 | .12 | 1.32 | -.96 | | .84 | 1.30 | .38 |
| Teacher Education: Degree | .95 | | .82 | 1.35 | 2.58 | -.11 | | .88 | .02 | .90 |
| Child Age | -.39 | ** | .14 | 8.27 | .68 | -.40 | ** | .13 | 9.44 | .67 |
| Girl vs Boy | -.27 | | .32 | .90 | .77 | -.31 | | .31 | .97 | .74 |
| Class Size | .04 | ** | .02 | 5.45 | 1.05 | .03 | | .02 | 3.54 | 1.04 |
| STRS Subscale | 1.16 | *** | .28 | 17.84 | 3.20 | -.78 | *** | .24 | 10.31 | .46 |
| Nagelkerke pseudo $R^2$ | 41.6% | | | | | 37.4% | | | | |
| $\chi^2$ | 88.98, *df* = 8, *p*<.001 | | | | | 158.45, *df* = 8, *p*<.001 | | | | |

Note: The coefficients for Teacher Gender and Child Gender are contrasted against being Female.
Teacher Education Level is contrasted against Certificate level. * = *p*<.05; ** = *p*<.01; *** = *p*<.001

Overall, teacher-child Closeness was an important contributor to children's academic achievement. Closeness accounted for the largest $R^2$ change in the model for average grades, and the logistic models revealed Closeness odds ratios at 1.73 (for Kiswahili), 1.85 (for mathematics), and 3.20 (for English). Odds ratios provide an indication of the size of the predictor variables' effect, showing how the likelihood of achieving 'Meeting Expectations' or 'Exceeding Expectations' changes in association with each of the predictor variables. Teacher-child Conflict was not as pronounced in academic outcomes as Closeness. However, as expected, Conflict odds ratios were consistently under 1, indicating that children were less likely to satisfy academic expectations in the given subject if teacher-child conflict was high.

For children's average grades, child age, class size and teacher-child Closeness and Conflict were significant contributors to average grade outcomes. Notably, the Closeness model was able to account for a much larger proportion of the variance in this outcome (20.9%) than the Conflict model (12.5%).

For mathematics, Closeness was found to be a significant contributor while Conflict was not, suggesting that only Closeness impacted whether children satisfied academic expectations. The Kiswahili regressions produced the lowest Nagelkerke pseudo $R^2$ of all logistic models (18.3% for Closeness and 15.7% for Conflict), showing that the predictor variables were only able to account for a relatively small proportion of Kiswahili achievement. On the other hand, the English models were able to explain the most variance in children's achievement out of all models, with a Nagelkerke pseudo $R^2$ at 41.6% for Closeness and 37.4% for Conflict. This suggested that children's English achievement is especially related to TCRs, more so than average, Kiswahili and mathematics outcomes.

Generally, teacher characteristics (i.e., age, gender, and education level) were not highly impactful towards children's achievement. However, these characteristics were found to be statistically significant contributors for Kiswahili and English outcomes; this may be attributable to the relatively large sample size rather than the presence of a substantial effect. While teacher education level was a significant component of the subject models, it was not so in the models for average grades.

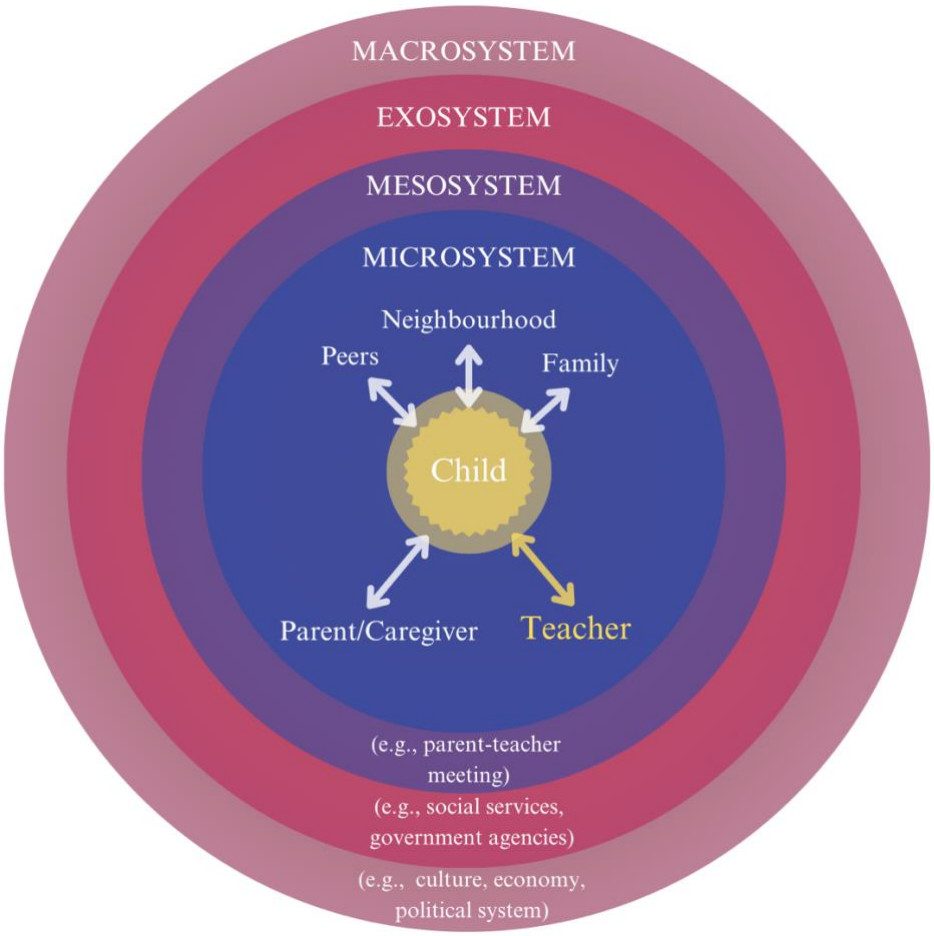
Child gender was not found to be a significant contributor in any of the models, except in mathematics achievement. Child age was found to be an important contributor to mathematics achievement and average grades, in that older children's academic achievement was lower. Class size was found to be significant across all regression models except mathematics, in that larger class sizes were associated with higher academic achievement.

# Chapter 5: Qualitative Results

## 5.1 Qualitative Results Overview

Four main themes emerged through thematic analysis: 1) teachers' recognition of teacher-child relationship benefits, 2) the teacher-child-parent triad, 3) government decisions impacting teacher-child relationships, and that 4) teacher-child relationships partly alleviate shared challenges. The qualitative analysis drew significantly from Ecological Systems Theory (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998), as illustrated in Figure 1. Figure 1 presents a contextual map of factors affecting TCRs that emerged from the qualitative data, from the perspective of Kenyan primary school teachers. The first two themes were conceptualised as belonging to the microsystem and mesosystem, the third to the exosystem, and the fourth related to the exosystem and macrosystem.

*Figure 1.* A conceptual map for categorising identified themes influencing TCRs (i.e., at the level of the microsystem, mesosytem, exosystem, and macrosystem) (adapted from Bronfenbrenner, 1979).



## 5.2 Theme 1: Teachers' Recognition of Teacher-Child Relationship Benefits

The first theme encompassed teachers' descriptions of the nature, quality, and benefits of TCRs. More specifically, teachers described how they valued TCRs, as well as the hurdles that counter teacher-child closeness.

### *5.2.1 Teacher-Child Closeness*

All teachers stated that positive TCRs foster a positive learning environment for teachers and students alike. Most teachers pointed to an increase in students' academic engagement as learning became more enjoyable through positive TCRs:

> "What I did was to bring the learners close to me, and we became friends. I understood them and they understood me very well. Then from there it was very easy to handle them. It was very easy to teach, to pass knowledge to these learners" (Teacher 5, male, 38).

When describing outcomes from close TCRs, teachers placed less emphasis on academic achievement and more on the general wellbeing of the child. Some teachers expressed that cultivating TCRs is inherent to the role of a teacher, where teachers are a role model in children's socioemotional learning:

> If you mold this child, you show him or her the ways in which he is supposed to do… Actually, he can be an excellent person. Not only in education, even some other parts like the co-curricular activities. (Teacher 1, male, 33).

Frequently, close TCRs were described as a gateway for students to share personal problems they were experiencing, particularly challenges in the home:

> These children have a lot of challenges. And at times, you just laugh with them. You just talk to them. You play with them. And then, when they have a challenge, they now feel free and come and ask you. So, I think when the relationship is good, you are not harsh to them, they will now tell you what maybe their problem is. (Teacher 2, female, 39)

### *5.2.2 Hurdles and Unease in Teacher-Child Relationships*

All teachers wanted to create positive relationships with their students and saw many benefits. However, in practice, this was not straightforward. For one, teachers observed that children who were less academically strong were also more distant from teachers:

> There are those children that have created that fear between the teacher and the pupil, especially those children that are struggling to do well in class. Such a pupil will find it difficult to come to you to explain maybe his or her problem. Unlike those pupils that do well in class, they are outgoing. (Teacher 2, female, 39).

Children's age and gender also played a role. Teachers of Upper Primary and Junior Secondary classes found it more challenging to establish close relationships. One female Grade 8 class teacher said she found cultivating relationships with her male students especially tricky, and expressed: "For younger ages, it's not as hard. They will actually tell you anything. (…) But for the Upper ones, they're reserved" (Teacher 6, female, 24). A few teachers also mentioned that as students grow older, dropout risk increases as formal education becomes less and less appealing.

A few teachers spoke about the skill required to maintain a balance of teacher-child friendliness and discipline, with some finding that balance more naturally than others:

> It's very hard to find a teacher-student relationship because you're not supposed to be so friendly to the learner. At the same time, you are supposed to be friendly. So, I find it hard to maybe create that boundary and still be friendly. But we try through games and sports. (Teacher 6, female, 24).

In some of the more difficult cases, teachers were able to draw on mentorship from experienced colleagues.

## 5.3 Theme 2: The Teacher-Child-Parent Triad

In discussions of TCRs, many teachers touched on the influence of parents and caregivers on the quality of their interactions with their students. TCRs emerged as dyadic relationships but were not entirely separable from parental influences. In Ecological Systems Theory (Bronfenbrenner, 1979), TCRs operate in the microsystem, with parent-teacher interactions operating in the mesosystem. The subthemes below explore how the lines between the microsystem and mesosystem are often blurred, with TCRs being woven into the teacher-child-parent relational context.

### *5.3.1 Teachers' Parental Role and Personal Sense of Responsibility*

While some parent-child relationships are consistent, many children in Kakamega do not live with their parents but instead their grandparents act as caregivers. Children who do live with parents often feel the pressures of a single-parent home: "In our school, most of the parents are single mothers, and the single mothers are struggling to raise the basic needs for these children. So, they don't have time for their children" (Teacher 5, male, 38). Teachers who invest in positive TCRs become trusted figures for children missing parental presence, and close TCRs allow teachers to become aware of children's homelife situations:

> Whenever you ask about the mother, [the child says] "The mother, I don't know. She has gone". "Where?" "Looking for a job." Maybe she's married somewhere else. Some of these learners, yes, they stay with their parents, but their parents are not living well. They do even fight. The child even comes to school crying, "My mother was beaten. Talk to my father, not to beat my mother". You see, such things really affect these learners. (Teacher 3, female, 35)

Parents might well want to be fully supportive and present in their children's lives, but economic constraints limit parent-child closeness:

> There's that pressure for provision, and you see our school is next to the market. So, most of our parents are just merchants around it. So, this parent will come home very late in the evening. The parent doesn't know if the learner had been given some assignments. The parent doesn't know if this learner can clean the uniform. Doesn't know if this boy or girl came with the shoes. Then in the process, this learner will come back to school the next day without doing the assignment. The next day, with dirty clothes. Some have not even showered. So, the teacher has to chip in. The teacher has to now perform the parental roles. So, we discover that the burden has now come through the teachers. Yet, it's supposed to be a collective responsibility. (Teacher 5, male, 38)

All six teachers described their role as a teacher as a parental role: "The reality of it, it's more of being a parent" (Teacher 6, female, 24). Some teachers outright called themselves mothers or fathers to their students: "Apart from being a teacher, we are their mothers in school" (Teacher 4, female, 32). Half of the teachers referenced the amount of time spent in school (i.e., usually, from 7am until 4 or 5pm) to highlight the relative proportion of the day the child spends with teachers versus with parents. The majority of teachers noted the magnitude of their role as a caregiver, portraying a personal sense of responsibility that emerges from the awareness that their students lack parental presence:

> You are supposed to fill the gap that is somehow left to the parent. Most of the learners, especially in [School 4], they are coming from very, I can say, dysfunctional families. OK. Most of them are staying with their grandmothers, their grandfathers, or guardian. So they are, they have that a little bit of… lack of parental love. So as a teacher, you need to fill that up. (Teacher 6, female, 24).

### *5.3.2 Tensions Between Teachers and Caregivers Impacting Teacher-Child Relationships*

According to Ecological Systems Theory (Bronfenbrenner, 1979), parent-teacher interactions occur in the mesosystem. The interviews reflected that parent-teacher interactions in the mesosystem affect TCR quality in the microsystem, especially if these interactions carry tensions.

Tensions highlighted in the interviews pertained primarily to 1) disagreements about a child's needs, and 2) disagreements about school rules or the school curriculum. The second point is explored in more detail under the Competency-Based Curriculum subtheme. One

example and common source of tension surrounds primary school dropout, where caregivers see this as an income opportunity while teachers advocate for students' academic potential. In these cases, the TCR often breaks down as both parents and students distance themselves from teachers:

> Some of them in the villages are now riding motorbikes so that they can transport people, transport goods and get money. What happens? They drop out of, out of school. I know that alone, it brings a rift between the teacher and the parents, the teacher and the learner. [The parent says:] "Why are you insisting that he comes?" Well, he doesn't see the reason why you are really insisting. Some of [the students who have dropped out], when they see you, they run away. Then the parents also… They develop a contemptuous attitude towards the teachers because, "Why is this teacher insisting much, and this boy is bringing money?" (Teacher 5, male, 38)

Overall, parents' shortcomings were emphasised more than collaborative aspects of parent-teacher relationships. Possibly, the interviews became outlets for teachers' grievances, making parent-teacher collaboration less salient in the data.

### *5.3.3 Children Triangulated in Parent-Teacher Relationships*

While not all parent-teacher interactions involve the child, many times the child ends up being a communicator between teachers and parents. At times, triangulation brings about misunderstandings, causing tension between teachers and parents (e.g., as explored under the Competency-Based Curriculum subtheme).

Triangulation can also foster harmony between students, teachers, parents, and the community:

> Teacher-pupil relationship is very, very important. And again, the relationship can also be transferred to the teacher, to their parents at home. The learner can talk good about the teacher. "Our teacher is good..." We see now the relation between the school and the community will also be good through that good relationship with the pupil. And the parents can love the school and can also support the school programs, because they know the teachers are well understanding and they're caring to their children. (Teacher 3, female, 35)

While the mesosystem does not implicate the child in theory, these findings show that parent-teacher interactions often implicate the child in practice. These findings also show how parent-teacher interactions both influence and are influenced by TCRs, in that relationships between teachers, children, and parents appear interconnected. A solely dyadic focus of TCRs seemingly falls short in contributing towards understanding complexities of TCRs.

## 5.4 Theme 3: Government Decisions

According to Ecological Systems Theory (Bronfenbrenner, 1979), government decisions belong to the exosystem and are not directly influencing the child. Indirectly, however, children and TCRs are affected. Influential government decisions include educational policy, curriculum development, and limited public funding.

### *5.4.1 The Competency-Based Curriculum*

Consistent with prior research (Micheni, 2021), all teachers spoke positively about the CBC, highlighting the child-centred approach as an asset towards positive TCRs.

However, the CBC relies on practical exercises that require material provision, which caregivers often cannot afford: “There are a lot of things that have to be put in order and these things, the learning tools, the learning areas, the learning resources... Once they are not there, learning becomes a bit challenging” (Teacher 2, female, 39). The CBC is therefore at odds with Kenya’s 2003 Universal Free Education initiative: “They talk of ‘free education system’ and in real sense it is not free” (Teacher 2, female, 39).

The provision of CBC materials has become a source of tension in TCRs and in teacher-caregiver relationships, due to ambiguity regarding responsibility:

> We have some work that is supposed to be from home. (…) It's under the guidance of the parent. (…) Sometimes they're supposed to improvise… Learning materials that they come with, at home. So, it becomes a challenge because the parent will complain, “I'm not the one planning, it's [the teacher] who is planning”. (…) In the process, this learner believes that this parent has been telling the truth. So, it brings drifts between the parent and the teacher. Because the teacher wants this work to be done, this material to be improvised. But has not been improvised. Why? Because the parent doesn't want it to be done. The parent is not supportive. (…) You see, there's a rift… So, to them, everything has to be done by teachers. (Teacher 5, male, 38)

Again, the child is triangulated in teacher-parent tension, which is likely a consequence the government did not foresee.

## 5.5 Theme 4: Teacher-Child Relationships Partly Alleviate Shared Challenges

The macrosystem surrounding aforementioned themes and subthemes carries challenges shared by children, teachers, parents and caregivers, and communities. More than anything, poverty appears to be the biggest hurdle. Teachers, schools, communities and churches work to alleviate economic pressures. Teachers’ efforts both leverage TCRs and improve TCRs. However, the breadth of challenges often extends beyond the scope of teachers.

### *5.5.1 Economic Challenges*

The TCR is shaped by microsystem teacher-child interactions that are subject to stressors (e.g., hunger, exhaustion, worries about finances) associated with economic challenges and poverty in the macrosystem. As one teacher stated, "Number one [challenge] is poverty" (Teacher 1, male, 33). Students of the interviewed teachers frequently experience hunger: "Find that a student may wake up, come in school, no breakfast, no lunch. God willing, maybe they will have something in the evening. So, you can imagine, from evening to evening" (Teacher 1, male, 33). Many schools do not have meals covered for students, "so a learner who has not eaten in class, who is hungry, and the one who has taken something, these are two different learners in the same class. We expect the same results. It has become a challenge" (Teacher 5, male, 38). Additionally, children often travel far on foot to reach their schools, meaning they are very tired by the time they reach their destinations. Furthermore, the provision of essential school supplies and materials such as pens, books, and uniforms is a challenge for families. These are challenges that positive TCRs cannot eliminate.

Moreover, national salary cuts for teachers cause financial stress that diminishes teachers' capacity to be impactful educators and cultivate positive TCRs. One teacher at a school marked by particularly low morale expressed how salary cuts decreased his ability to be receptive to students' needs: "I have been demoralised by the government. Even when I go to class, maybe I may not be able to deliver the same… same way I used to deliver" (Teacher 1, male, 33). Thus, while most teachers felt a personal sense of responsibility towards caring for pupils, financial stress detracts from teachers' capacity for close TCRs:

> Looking at the economy, the amount that we earn is little and we have a lot on our back. So sometimes even in the stress that we have at home is also transferred to school. We are in school, are supposed to teach, supposed to be happy with the learner, to teach well, but there is a stress. (…) We try our level best and leave it at the gate. But it's hard. (Teacher 3, female, 35).

### *5.5.2 School as a Second Home*

On the other hand, schools provide the opportunity for children to have a safe haven outside of their homes. Support can come in material form (e.g., free lunch programmes) or can be emotional support. The TCR is the key source of information to identify children's needs:

> That teacher-learner relationship is very important because if you have a bond with your students, you know that 'My student is lacking this'. You are able to pinpoint and highlight

> instantly. In my class, I can be able to pinpoint, and I know these students are needy students. (Teacher 4, female)

Often, teachers and schools leverage existing systems to enhance TCRs and provide support to students:

> We also have this, these guiding and counselling sessions. And so, you sit down with them, we talk, we tell them what to expect from them and they're so open. And from that, we discover a lot from their homes. And we try to come in, chip in, help where necessary. (Teacher 5, male, 38).

However, teachers also expressed that there were limits to the extent that they could help, both due to personal capacity and monetary constraints: “These issues require financial support, most of them. Financially, there is no way how I can finance these children” (Teacher 1, male, 33).

Notably, there are many ways in which schools and their leadership are successful in leveraging the resources they have. A teacher from a school with particularly strong leadership stated: “As a school, I've said, we are really trying. Even the administration, my head teacher, my deputy, they are really trying. Other teachers are also trying. We look for that vulnerable case. And you make sure you do something” (Teacher 2, female, 39). Fostering and leveraging TCRs becomes easier for teachers when school leadership values positive TCRs as well.

As one teacher stated: “Sometimes the environment at school becomes better than the environment at home” (Teacher 5, male, 38). Schools and teachers might provide material comfort (e.g., school meals, donating books, pens, and uniforms) that some families cannot, but most teachers emphasised the importance of emotional support in particular: “To some, in school, they find that comfort, they find that parental love. We make sure as teachers we provide for them” (Teacher 2, female, 39).

Overall, TCRs emerge as an asset within the described context, depending on the degree that teachers have capacity to take on the magnitude of their role: “Most of the learners are motivating. Some of them, their cases can be traumatizing, but… I don't know what I can say. Just love teaching. I love the kids. I love the kids so much, and that's it” (Teacher 6, female, 24).

# Chapter 6: Discussion

## 6.1 Summary of Findings

Building on the body of research on TCRs and children's developmental outcomes, the present study aimed to find associations between Kenyan TCRs and students' academic achievement. Additionally, this study aimed to qualitatively explore teachers' perspectives on contextual factors affecting TCRs and academic achievement, unpacking the complexity of TCRs and the surrounding context.

Firstly, the use of the STRS in a Kenyan primary school setting with multiple teachers per class is novel. The STRS was found to be a valid and reliable measurement of the TCR in Kenya, with Item 4 (*This child is uncomfortable with physical affection or touch from me*) removed. Children's level of comfort with physical affection could be influenced by several factors external to the TCR (e.g., prior experiences at home) and therefore this item is perhaps not a direct measure of teacher-child Closeness. Additionally, teachers possibly misread the negation and interpreted "uncomfortable" as "comfortable" when completing the STRS, particularly as it is situated between multiple Closeness statements which could have primed participants.

Importantly, teacher-child Closeness and Conflict were both found to be significant contributors in children's academic achievement in average grades, as well as in mathematics, Kiswahili and English performance. The Conflict model for mathematics outcomes was the exception to this trend. Moreover, teacher-child Closeness was found to be more impactful towards students' achievement than Conflict.

Secondly, teacher interviews were analysed through thematic analysis. Several themes and subthemes were identified. Firstly, teachers described relationship-building with students as a valuable endeavour, but not one without hurdles. The primary caregivers of Kakamega's children are not always their parents, and teachers often carry a personal sense of responsibility that adds a parental dimension to TCRs. At times, teachers experience tension with children's caregivers, which affects the TCR particularly when children become triangulated. Additionally, government decisions impact the quality of TCRs through national curriculum design and teacher compensation, as reduced or low teacher compensation adds to teachers' stress and capacity to fully connect with their pupils. Lastly, poverty is a shared challenge for many TCR stakeholders (i.e., children, teachers, parents and caregivers, schools, and communities), but schools are sometimes successful in mitigating this by

becoming a second home for children. Here, teachers provide material and emotional support to children, through which the TCR is both leveraged and improved upon.

### 6.2 Research Question 1: What are the associations between Kenyan teacher-reported teacher-child relationships and pupils' grades in primary school?

The findings showed that teacher-child Closeness and Conflict are associated with children's academic achievement. Closeness was more strongly associated with children's academic achievement than Conflict across all models (i.e., for average grades, mathematics, Kiswahili and English), and the Closeness model was able to account for a significantly larger proportion of the variance in average grades (21%) than the Conflict model (13%). However, regression results also indicated that children were less likely to satisfy academic expectations if teacher-child Conflict was high. These findings align with the idea that positive TCRs help provide a learning environment conducive to children's educational development (Hofkens et al., 2023; Roorda et al., 2011), and that positive TCRs may alleviate adverse factors as described in the Qualitative Results chapter. However, this study is not methodologically suited to attest to a compensatory quality of TCRs.

The TCR-achievement association was also mirrored in the qualitative findings of this study. Teachers described how children who distance themselves from academics might then become increasingly less engaged and less likely to meet academic expectations; this decrease in engagement is likely mediated by lowered academic self-esteem (Gatundu et al., 2023). Prior studies have also found that Closeness is a stronger contributing factor to children's academic achievement than Conflict. These researchers argue that children with high-conflict TCRs are more likely to distance themselves from academics (Spilt & Koomen, 2022), meaning the TCR effect diminishes with distance. This is mirrored in this study's smaller TCR-achievement associations for Conflict than for Closeness.

This study's findings also complement previous research describing how a combination of low academic achievement and a lack of support from teachers forms dropout risk for primary school students (Zuilkowski et al., 2016). Taken together, this suggests that Kenyan children who experience less close and more conflictual TCRs are less likely to meet academic expectations, and therefore at higher risk of primary school dropout.

### *6.2.1 Additional Predictor Variables*

Unexpectedly, girls' and boys' Closeness and Conflict ratings were very comparable. Also, child gender was not a contributing factor in any of the models except mathematics, where boys performed better than girls. This general lack of gender differences is contrary to previous studies finding gender differences in teacher-reported TCRs in countries such as the United States and the Netherlands (Birch & Ladd, 1997; Hamre & Pianta, 2001; Koepke & Harkins, 2008; Spilt et al., 2010). In these cases, teachers experience more conflictual relationships with boys and closer relationships with girls. The lack of gender differences in this study could indicate that Kenyan TCRs are less influenced by child gender, but further corroborative research is required before drawing conclusions.

Child age was found to be an important contributor to mathematics achievement and average grades, in that older children's academic achievement was lower. Child age being a contributing factor is as expected based on prior research as well as underlying theory (Spilt & Koomen, 2022); younger children are more likely to have close relationships with their teachers than older children, while older children are more likely to be less academically engaged as formal education might become less appealing. This phenomenon was mirrored in this study's qualitative data, as well as in earlier studies on the effect of child age on academic engagement in Kenyan settings (Zuilkowski et al 2016). In international TCR studies, younger children are more likely than older children to seek comfort from their teacher when they are upset (Koomen et al., 2012; Spilt & Koomen, 2022). Despite this sample reporting less close TCRs with older students, older children are probably not less in need of close TCRs. This appears to be the case especially when considering children's context of challenges as explored in the Qualitative Results chapter. Remarkably, in a Dutch sample, Roorda et al. (2011) found TCRs were more important for older children's academic adjustment than for younger children. Additionally, older children may seek support from teachers to undertake new goals (De Laet et al., 2014) or with identity formation (Verhoeven et al., 2019) rather than comfort seeking. Most likely, close TCRs with older children successfully adapt to students' changing needs as they develop.

Teacher characteristics (i.e., age, gender, and education level) were generally not highly impactful, except in children's Kiswahili and English achievement. Similarly, Roorda et al. (2011) found no effects for teacher characteristics. In Kenyan studies, teacher characteristics including age, gender, education level, and teaching experience were not related to students' achievement (Kimani et al., 2013) or to teachers' quality of teaching (Chemwei et al., 2016). This suggests that teachers can cultivate positive, impactful TCRs

regardless of their age, gender, or educational background, and that investigating these characteristics should not be a priority for future TCR research.

Furthermore, class size (i.e., up to 80 children) was expected to contribute to academic outcomes, but the effect was found in the unexpected direction: larger classes were associated with higher grades. Perhaps teachers with larger classes put in more concerted effort to engage every single student to compensate, or perhaps the 'momentum' of good achievement in a class is stronger the larger the class. For example, larger classes may have a larger number of high-performing students stimulating positive competition. However, this is a finding that cannot be explained with the data in this study, particularly as earlier Kenyan studies (e.g., Shimada, 2010) found students' performance to be negatively affected in larger classes (i.e., due to less attention to individual students).

### *6.2.2 Differences in Mathematics and Language Achievement*

Interestingly, there were key distinctions in the mathematics model versus the Kiswahili and English models. For mathematics, Closeness was found to be a significant contributor while Conflict was not, suggesting that only Closeness impacted whether children satisfied academic expectations. Additionally, the mathematics models were the only one to show male gender and smaller class sizes contributing to higher academic achievement. Furthermore, teacher characteristics were contributors to Kiswahili and English outcomes, but not in mathematics.

Prior research has found that students may experience more closeness with their English language teacher (Wallace et al., 2012) or to their social studies teacher (Lee et al., 2012) compared to their mathematics teacher. While these studies did not compare TCRs for English and Kiswahili teachers, this study demonstrated that the English models accounted for the greatest variance in children's achievement, with a Nagelkerke pseudo $R^2$ of 41.6% for Closeness and 37.4% for Conflict. This suggests that different subject teachers have different TCRs depending on the subject they teach.

However, child gender and class size being significant in the mathematics model indicates that TCR differences are not only attributable to the subject. Taken together, the findings indicate that mathematics and language achievement are characterised by differing TCR quality but are also susceptibility to child-level factors. Perhaps mathematics teachers share characteristics that lower TCR quality, or perhaps children view mathematics as inherently more challenging than language classes. If children have a lower academic self-

concept for mathematics (e.g., due to perceptions of subject difficulty), they would be more likely to distance themselves from the subject and their mathematics teacher (Spilt & Koomen, 2022). These results can be seen to support a bidirectional association between TCRs and achievement; children and child factors not measured in this study (e.g., academic self-concept, internal working models for relationships) also actively shape TCRs.

### *6.2.3 The Role of the School System*

With the Kenyan primary school system having multiple teachers per class, results from the two average grades models need to be interpreted with care as TCRs were not reported by all subject teachers. On the other hand, interestingly, the average grades and subject grades have comparable associations with TCR quality; the class teachers' TCR report explained a large proportion of the variance in achievement across all subjects. Again, this suggests that children actively shape the TCR, and that children's contributions to the TCR might be relatively consistent across teachers. Also, Kenya's primary schools have relatively long hours (i.e., 7am until 4 or 5pm), meaning that Kenyan teachers have comparatively more time to cultivate relationships with their students than in most Western settings.

Alternatively, the school climate may shape TCRs. School climate is defined as "the affective and cognitive perceptions regarding social interactions, relationships, values, and beliefs held by students, teachers, administrators, and staff within a school." (Rudasill et al., 2018, p.35). Positive school climates are associated with higher teacher self-efficacy, job satisfaction and commitment (Aldridge & Fraser, 2016; Hosford & O'Sullivan, 2016). This study's qualitative findings indicated that for schools with positive, TCR-focused leadership, teachers felt more empowered to address the emotional and material needs of children. Interestingly, declines in teacher-child closeness between primary and secondary school have been attributed to school organisation instead of children's developmental trajectory, because the decline occurs so rapidly in the school transition (Hughes & Cao, 2018). A focus on emotional support and relationships in primary school is replaced by a focus on achievement and discipline in secondary school, which stimulates conflict and diminishes closeness (Spilt & Koomen, 2022). Taken together, school climate in the exosystem may be impactful for TCRs in the microsystem.

### 6.3 Research Question 2: From Kenyan teachers' perspectives, what contextual factors affect teacher-child relationships?

Contextual factors identified in teacher interviews were linked to the children's developmental microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner, 1979). The teacher-child conflict did not emerge from the thematic analysis. This could be partly attributed to social desirability bias (Bergen & Labonté, 2020), in that teachers felt less free to discuss conflict with their students.

Complementary to the quantitative findings, a few teachers remarked that children who were less academically strong were also more distant from teachers. This was not a point made by all teachers. However, it again suggests a bidirectional association between TCR quality and students' academic achievement. The two appear both drivers and outcomes of each other (Spilt et al., 2012; Wu et al., 2018). Teachers expressed that TCR is used to identify child needs, therefore used to provide children with (tailored) emotional support and material support. In turn, the TCR is improved.

Teachers described feeling a personal sense of responsibility, especially if children experience parental absence. As such, the TCR takes on a parental quality. Overall, the TCR is intimately related to parent-child relationships but not as a mirror of parent-child relationships, to be investigated through similar attachment theory mechanisms (e.g., Verschueren & Koomen, 2012). Importantly, these findings do not necessarily illustrate TCRs as attachment relationships. Rather, it can be viewed as supportive evidence for teachers as 'ad hoc' attachment figures.

The interview data showed that caregiver-teacher relationships affect TCRs, even more so when children are triangulated. Interactions in the mesosystem therefore impact the TCR in the microsystem; parent-child, parent-teacher, and teacher-child relationships are all implicated. Furthermore, the findings support and mirror Ecological Systems Theory (1979) where through the mesosystem, a dyad becomes a three-person system that brings second-order effects:

> The extent of this catalytic power of the intermediary depends on his relation with the developing person as well as on the nature of the dyads established in the new setting, that is, whether they are only observational (the mother acts purely as a visitor), involve joint activity (the mother converses with the teacher), or develop into a primary dyad (the mother and teacher become good friends). (p.211)

While fathers should be involved more than is highlighted in this excerpt (Ferreira et al., 2016), this study concurs that TCRs are best studied as triads. In this sense, parent-child, parent-teacher, and teacher-child relationships are purposely implicated in order to better understand relational nuances.

### 6.4 Limitations

Firstly, the timing of data collection (i.e., at the start of Term 2, collecting grade data from Term 1) meant that students and teachers possibly had only one academic term to form a relationship. Unfortunately, the MSc timeline did not allow for flexibility in the timing of data collection. However, previous TCR research has conducted data collection at the start of the year (e.g., teachers knowing students for "at least one month", Paes et al., 2023), indicating that there are no confirmed standards concerning minimum relationship length.

Secondly, the children included in this sample were older than most STRS studies. While the STRS is typically used for children up to 12 years old, unexpectedly, some children in this sample were 13 and 14. However, analyses including and excluding children above 12 demonstrated that including them did not substantially affect the results. Furthermore, teachers completed STRS questionnaires for a relatively large group of children (i.e., 24 children), often in one sitting. This risks task fatigue for participants, which may have impacted STRS ratings. However, the possibility and impact of this is difficult to gauge exactly.

Another methodological limitation of this study is that the TCR was measured only with the STRS. As mentioned in the Literature Review, alternative forms of measurement to exist, including observational methods. The STRS was chosen as it is the most established measure, and this study confirmed it to be a valid and reliable measure in the Kenyan context. However, including the perspective of children would have made for richer data illustrating a more comprehensive view of the TCR. While corporal punishment has been banned in Kenyan education since 2001, the practice persists in both rural and urban schools (Mweru, 2010; Zuilkowski et al., 2016) and would inevitably impact the quality of TCRs and children's ability to flourish in school. For instance, in a study conducted in Tanzania, corporal punishment by caregivers was associated with children's externalising problems (Hecker et al., 2014). This study's teacher-reported data did not include reports of corporal punishment. Including child-informed measures might have brought this undesirable aspect of TCRs to light, aside from the general benefit of comprehensiveness.

Moreover, introducing multiple coders in the qualitative analysis would have enhanced dependability and confirmability (Guba & Lincoln, 2005). Multiple coders are especially beneficial for reflexive analysis, to identify assumptions in data interpretation (Byrne, 2022; Wilson et al., 2022). Considering the researcher is not Kenyan and therefore this study is conducted from an 'outsider researcher' perspective, an additional coder native to Kakamega could have mitigated any latent assumptions embedded in this study's interpretivism.

More broadly, the 'outsider' position is sometimes considered a barrier in obtaining cross-cultural fieldwork data (e.g., Griffith, 1998; Mullings, 1999), considering the many ways that participants' quantitative and qualitative contributions may have been influenced biases such as social desirability. Furthermore, particularly in the qualitative paradigm, data is co-produced between interviewer and interviewee. The 'outsider' perspective may have brought assumptions and epistemological 'blind spots' throughout data production, analysis, and the interpretation.

Finally, associations were found between positive TCRs and students' higher achievement. However, achievement could both influence and be influenced by TCRs, and TCRs can influence and be influenced by student achievement. A key limitation of this study is that the quantitative analytical approach cannot allow for conclusions about directionality.

### 6.5 Implications and Directions for Future Research

This study's findings are relevant for child development and education policy and practice in both Global South and Global North settings. Close, positive TCRs can substantially improve students' academic achievement even in a context of many challenges for individual stakeholders and to the TCR itself. This research contributes to a nuanced, global understanding of the significance of TCRs, as the presented findings are valuable for cross-cultural TCR comparisons. In this way, the study encourages enhanced awareness of 'culturally blind' assumptions in TCR research (Gregoriadis et al., 2019).

Investing in positive TCRs (e.g., through continued teacher training and strengthened school leadership) forms a relatively low-cost but high-impact initiative for school leadership teams. Future research might invest in the intersection of TCRs and organisational psychology to ascertain the impact of school climate on TCR quality (e.g., conduct multi-level modelling, accounting for school effects).

The present study was cross-sectional, yielding insight about TCRs in Kakamega at one point in time. Notably, TCR are subject to change over time as affective states of children and teachers are subject to change. Future research could focus on longitudinal designs that capture TCR fluctuations, both within an academic year and across primary school stages. Furthermore, in this study, Kenyan children's outcomes were operationalised in terms of short-term academic achievement. Future research should expand knowledge of developmental outcomes to assess long-term academic achievement and, crucially, children's socioemotional learning.

# Chapter 7: Conclusion

The data from this mixed methods study combines to describe associations between TCRs and students' academic achievement, as well as teachers' views on contextual, socioecological factors surrounding TCRs.

Firstly, this study demonstrated that teacher-child Closeness and Conflict significantly impact children's academic achievement in Kenyan primary schools. Importantly, this study established that the STRS (Pianta, 2001) is a valid and reliable measure of the TCR in Kakamega, Kenya.

Secondly, close TCRs help Kenyan teachers identify children's needs, as teachers frequently adopt a personal sense of responsibility and a parental role. A solely dyadic focus seemingly falls short in understanding complexities of TCRs and surrounding factors. Instead, a view of the teacher-child-parent triad is more precise, particularly to understand the TCR's positioning in the child's microsystem and mesosystem (Bronfenbrenner, 1979).

Overall, while positive TCRs are not compensatory for parental absence, adverse childhood experiences and risk factors associated with poverty, close TCRs contribute to Kenyan children's higher educational outcomes, improved wellbeing and enhanced emotional and material support. Therefore, TCRs present a low-risk, low-cost, and high-reward opportunity for school leadership to invest in. This means supporting teachers in their fostering of close TCRs and cultivating positive school climates. As much as possible, TCRs should be leveraged as developmental assets in Kenyan primary schools.

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# Appendices

## Appendix A: School Invitation Letter

[Head Teacher name]
[School name and address]
[Date]

**Teacher-Child Relationships in Kenyan Primary Schools: A Mixed Methods Approach**
Ethics Approval Reference: [insert]

Dear [Head teacher name],

I am writing to enquire about conducting some research in your school in early May 2024. I am a MSc Education (Child Development and Education) student at the University of Oxford, supervised by Dr Katharina Ereky-Stevens. In my research study, 'Teacher-Child Relationships in Kenyan Primary Schools: A Mixed Methods Approach, I will explore the nature of these relationships by asking teachers to complete questionnaires and by interviewing teachers about their perspective on the teacher-child relationship.

The research will take place with classes in Lower Primary. Participants would be teachers only (not students). I am looking to collect data with one teacher from each form: the teacher who has the highest number of academic contact hours with the students in that form. I am not aiming to change what or how the teacher chooses to teach, and will not be making any judgements about teaching.

By participating in the research, your school would be contributing to research that will investigate the correlation between teacher-child relationships and educational performance, and that will illustrate the cultural significance of the teacher-child relationship (which is helpful for cross-cultural comparison of research in other geographies).

The commitment from the school would be to allow me to collect questionnaire and interview data over the course of around 1 week in May 2024. I would ask teachers to complete the Student-Teacher Relationship Scale for a subset of their students. I would also interview teachers for around 45-60 minutes, asking them to share their perspective about the meaning of the teacher-child relationship in education. This interview would be recorded, but only the audio. All data will remain anonymous and will be handled with care, according to ethical guidelines from the University of Oxford and from Kenya's National Commission for Science, Technology and Innovation.

Oxford University has strict ethical procedures on conducting ethical research with teachers and students, consistent with current British Educational Research Association guidelines. Before beginning the research, with the help of your school, I would inform parents/guardians about the research and offer the students and

parents/guardians the opportunity to refuse to participate. Throughout the research, students and parents/guardians will be able to refuse to participate at any time.

All participants, including students, teachers and the school, would be made anonymous in all research reports. The data collected would be kept strictly confidential, available only to my supervisor and myself and not used other than specified without the further consent of all involved being obtained. All recordings would be destroyed at the end of the research period, and kept in locked conditions until then. I have an enhanced Disclosure and Barring Service (DBS) check from 2022. I have enclosed copies of the information for parents/guardians and students with this letter.

If your school would like to take part in the study, or you need more information about what is involved, please contact me. Whether or not you feel it would be appropriate for your school to participate, I would be grateful if you would complete the pro-forma below, and return it to via email at _____.

Thank you for your time and attention. I look forward to hearing from you.

**Teacher-Child Relationships in Kenyan Primary Schools: A Mixed Methods Approach**

Department of Education, University of Oxford

[School name]

[School address]

[Head Teacher name]

☐ We do not wish to participate in this project.

☐ We would like to find out more about this project.

☐ We would like to take part in this project.

If you would like further information, or are interested in taking part, please give the name of a contact person for your school, and details of the best way to contact him or her.

Contact name: _____

Contact email: _____

Contact telephone number: _____

Please return this form to _____.

*Thank you for your help.*

## Appendix B: School Information Sheet

Study: 'Teacher-Child Relationships in Kenyan Primary Schools:
A Mixed Methods Approach'

**INFORMATION SHEET FOR SCHOOLS**

Central University Research Ethics Committee Approval Reference: EDUC_C1A_24_106

1. **Introductory paragraph**

Your school is being invited to take part in a research project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you wish to take part.

2. **Why is this research being conducted?**

Previous research has found that positive teacher-child relationships are related to positive educational and developmental outcomes for children, but this has not yet been studied in depth in Kenya. This research is focused on teacher-child relationships and children's educational achievement, as well as the cultural significance of the teacher-child relationship in Kenya. This research consists of questionnaires (quantitative data) and interviews (qualitative data). Participants are teachers only, not students.

3. **Why have I been invited to take part?**

This study focuses on primary schools in and around Kakamega County, Kenya. Your school has been invited to take part because your school contains a Lower Primary section and is not concentrated in special educational needs.

4. **Does my school have to take part?**

No. It is up to your school's management to decide whether to take part. You can withdraw yourself from the research, without giving a reason, and without negative consequences, by advising me of this decision. The deadline by which you can withdraw any information you have contributed to the research is 3 June 2024. After this date, data will be fully anonymised or pseudonymised. If you decide to withdraw before the deadline, data that has been collected through your participation will be deleted.

5. **What will happen to my school if we take part in the research?**

The research will take place within the school premises. Only teachers would be participating, not students. Teachers' participation is only confirmed after they sign an individual consent form.

If your school takes part, there are two components: data collection from the school's existing records and data collection with teachers. Data collection from school records involves the school sharing students' anonymised grades (subject grades and averages). Data collection with teachers requires teachers to complete questionnaires and share their perspectives in an interview.

In total, one teachers for each year group in Pre-Primary, Lower Primary and Upper Primary (if possible) will be identified to participate in this study. The teacher with the highest number of contact hours with each year group will be selected to participate. Participating teachers will complete questionnaires about the relationship with your

students. A subgroup of students will be selected (24 students out of the year group, 12 boys and 12 girls) for which teachers would fill in the questionnaire. This is expected to take around 1-1.5 hours, and can be done over the course of a few days. Teachers' participation and student information will be fully anonymous. Teachers are also invited to take part in an interview, and one will be selected based on availability. In the interview, the teacher can share their perspective on the teacher-child relationship. The teacher will be asked questions about how they view the significance of the teacher-child relationship, the role of the teacher in relation to other figures (e.g., parents, the community), and how the teacher-child relationship affects educational and developmental outcomes. This is expected to take around 1 hour. The teacher may ask to pause or stop the research activities at any time. With your consent, the researcher will take notes and record the interview (audio only, no video) so that there is an accurate record of the conversation. The teacher will remain anonymous in the study, although a pseudonym might be used in the write-up of the study.

This research project will be linking teacher-child relationships to educational achievement. To do this, the research project requires school grades: grade point averages and subject grades for all students who are included in the questionnaire (24 per participating teacher). The project also requires students' age and gender, but this would be shared by teachers when completing the questionnaires. Additionally, this study would like to collect contextual data: classroom size for each year group, number of teachers per year group, teachers' educational level, employment status (Board of Governors or government/TSC), school enrolment, and mean standard scores across the entire school.

Lastly, participating schools will be asked to help with ensuring anonymity of students and with securely storing questionnaires at the school until the researcher is able to collect them. The school would help ensure anonymity of students by holding a list of students who are included in the questionnaires, along with their participant number. To ensure anonymity, the researcher will not have access to this list. The school will be asked to keep this list safe for the duration of the research project, in case we would need to refer back to it.

**6. What are the possible disadvantages and risks in taking part?**

There are no disadvantages or risks in taking part. Questionnaire data will be anonymised, and interview data will be pseudonymised, meaning that participants will not be identifiable.

**7. Are there any benefits in taking part?**

While there are no immediate benefits to you in participating in the research, it is hoped that this research will lead to a greater understanding of the significance of the teacher-child relationships in countries across the world.

**8. What information will be collected and why is the collection of this information relevant for achieving the research objectives?**

The researcher (Hannah van Vijfeijken) and supervisor (Dr Katharina Ereky-Stevens) will have access to the research data. Identifiable data (including consent forms) will be safely stored in the school in a locked cabinet until they are passed on to the researcher. Only anonymised questionnaire data will be shared with the researcher. This data will then be uploaded to a secure online drive. Similarly, interview notes and transcripts from audio recordings will be stored on a secure online drive. The

school will share anonymised school grades and contextual data from existing school records, as outlined above. Collecting questionnaire, interview and school data is important in order to analyse and draw conclusions about the teacher-child relationship. Following university guidelines, the data will be stored on the drive for 3 years, and then it will be safely destroyed. I will send a brief report on the research to your school at the end of the research, and you are welcome to see this. I will not identify the school, participants or any students in any reports of the research.

**9. Will the research be published? Could I be identified from any publications or other research outputs?**

The findings from the research will be written up in a dissertation and may be written up in an academic publication. Participants will not be identifiable in these outputs. Questionnaire data will be anonymised, and interview data will be pseudonymised (i.e., teacher's real name will not be used). School names will not be used. A copy of my thesis/ dissertation will be deposited both in print and online in the Oxford University Research Archive where [it will be publicly available to facilitate its use in future research/ its access will be restricted].

**10. Data Protection**

The University of Oxford is the data controller with respect to your personal data, and as such will determine how your personal data is used in the research. The University will process your personal data for the purpose of the research outlined above. Research is a task that is performed in the public interest. Further information about your rights with respect to your personal data is available from the University's Information Compliance website at https://compliance.admin.ox.ac.uk/individual-rights.

**11. Who has reviewed this research?**

This research has received ethics approval from a subcommittee of the University of Oxford Central University Research Ethics Committee. (Ethics reference: EDUC_C1A_24_106). This research has also received ethics approval from Masinde Muliro University of Science and Technology (Approval number: MMUST/ ISERC/046/2024).

**12. Who do I contact if I have a concern about the research or I wish to complain?**

If you have a concern about any aspect of this research, please contact Hannah van Vijfeijken (contact details below). I will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the Chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter as soon as possible:
The Chair, Social Sciences & Humanities Interdivisional Research Ethics Committee;
Email: ethics@socsci.ox.ac.uk;
Address: Research Services, University of Oxford, Boundary Brook House, Churchill Drive, Headington, Oxford OX3 7GB

Further Information and Contact Details
If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact:

# Appendix C: School Consent Form

**CONSENT FORM FOR SCHOOLS**

Central University Research Ethics Committee (CUREC) Approval Reference: EDUC_C1A_24_106

**'Teacher-Child Relationships in Kenyan Primary Schools: A Mixed Methods Approach'**

| | | *Please initial each box* |
|---|---|---|
| 1 | I confirm that I have read and understand the information sheet 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 participation of my school is voluntary and that I am free to withdraw at any time, without giving any reason, and without any adverse consequences or penalty. | ☐ |
| 3 | I understand that research data collected during the study may be looked at by authorised people outside the research team. I give permission for these individuals to access my data. | ☐ |
| 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 may be written up and published. | ☐ |
| 7 | I understand how to raise a concern or make a complaint. | ☐ |
| 8 | I consent to sharing existing school records on students' grades, classroom sizes, school enrolment numbers, and teacher education level and employment status (Board of Governors or government/TSC) | ☐ |
| 9 | I consent to teachers being audio recorded during the interview | ☐ |
| 10 | I understand how audio recordings will be used in research outputs | ☐ |
| 11 | I agree for my school take part in the study | ☐ |
| **Optional:** | I agree that my contact details can be retained in a secure database so that the researchers can contact me about future studies. | YES/ NO |

_____

Name of School

| | | |
|---|---|---|
| _____ | dd / mm / yyyy | _____ |
| Name of Head Teacher | Date | Signature |
| _____ | dd / mm / yyyy | _____ |
| Name of person taking consent | Date | Signature |

# Appendix D: Teacher Information Sheet

Study: 'Teacher-Child Relationships in Kenyan Primary Schools:
A Mixed Methods Approach'

**INFORMATION SHEET FOR TEACHERS**

Central University Research Ethics Committee Approval Reference: EDUC_C1A_24_106

1. **Introductory paragraph**

You are being invited to take part in a research project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you wish to take part.

2. **Why is this research being conducted?**

Previous research has found that positive teacher-child relationships are related to positive educational and developmental outcomes for children, but this has not yet been studied in depth in Kenya. This research is focused on teacher-child relationships and children's educational achievement, as well as the cultural significance of the teacher-child relationship in Kenya. This research consists of questionnaires (quantitative data) and interviews (qualitative data).

3. **Why have I been invited to take part?**

This is a research project focused on teacher-child relationships in Lower Primary. The head teacher of your school is informed about the study and has agreed for the school to take part. You have been identified as the teacher with the most contact hours with your year group. For each year group, one teacher is selected.

4. **Do I have to take part?**

No. It is up to you to decide whether to take part. You can withdraw yourself from the research, without giving a reason, and without negative consequences, by advising me of this decision. The deadline by which you can withdraw any information you have contributed to the research is 3 June 2024. After this date, data will be fully anonymised or pseudonymised. If you decide to withdraw before the deadline, data that has been collected through your participation will be deleted.

5. **What will happen to me if I take part in the research?**

This study has two parts: questionnaires and optional interviews. The research will take place within the school only. Your participation is only confirmed after signing the consent form.

Firstly, you will be asked to complete questionnaires about the relationship with your students. A subgroup of students will be selected (24 students out of the year group, 12 boys and 12 girls) for which you would fill in the questionnaire. This is expected to take around 1-1.5 hours of your time, and can be done over the course of a few days. Your participation and student information will be fully anonymous.

Secondly, you are invited to take part in an interview where you can share your perspective on the teacher-child relationship. You will be asked questions about how you view the significance of the teacher-child relationship, the role of the teacher in relation to other figures (e.g., parents, the community), and how the teacher-child relationship affects educational and developmental outcomes. This is expected to take around 1 hour. You may ask to pause or stop the research activities at any time.
With your consent, the researcher will take notes and record the interview (audio only, no video) so that there is an accurate record of our conversation. You will remain anonymous in the study, although a pseudonym might be used in the write-up of the study.
This interview will not apply for every teacher who is participating, as one teacher from each participating school will be interviewed. If you are interested in being interviewed, please indicate this on the consent form.

6. **What are the possible disadvantages and risks in taking part?**

There are no disadvantages or risks in taking part. Questionnaire data will be anonymised, and interview data will be pseudonymised, meaning that participants will not be identifiable.

7. **Are there any benefits in taking part?**

While there are no immediate benefits to you in participating in the research, it is hoped that this research will lead to a greater understanding of the significance of the teacher-child relationships in countries across the world.

8. **What information will be collected and why is the collection of this information relevant for achieving the research objectives?**

The researcher (Hannah van Vijfeijken) and supervisor (Dr Katharina Ereky-Stevens) will have access to the research data. Identifiable data (including consent forms) will be safely stored in the school in a locked cabinet until they are passed on to the researcher. Only anonymised questionnaire data will be shared with the researcher. This data will then be uploaded to a secure online drive. Similarly, interview notes and transcripts from audio recordings will be stored on a secure online drive. Collecting questionnaire and interview data is important in order to analyse and draw conclusions about the teacher-child relationship. Following university guidelines, the data will be stored on the drive for 3 years, and then it will be safely destroyed.
I will send a brief report on the research to your school at the end of the research, and you are welcome to see this. I will not identify the school, participants or any students in any reports of the research.

9. **Will the research be published? Could I be identified from any publications or other research outputs?**

The findings from the research will be written up in a dissertation and may be written up in an academic publication. Participants will not be identifiable in these outputs. Questionnaire data will be anonymised, and interview data will be pseudonymised (i.e., your real name will not be used).

A copy of my dissertation will be deposited both in print and online in the Oxford University Research Archive where it will be publicly available to facilitate its use in future research.

Data Protection
The University of Oxford is the data controller with respect to your personal data, and as such will determine how your personal data is used in the research. The University will process your personal data for the purpose of the research outlined above. Research is a task that is performed in the public interest. Further information about your rights with respect to your personal data is available from the University's Information Compliance website at https://compliance.admin.ox.ac.uk/individual-rights.

**10. Who has reviewed this research?**

This research has received ethics approval from a subcommittee of the University of Oxford Central University Research Ethics Committee. (Ethics reference: EDUC_C1A_24_106).
This research has also received ethics approval from Masinde Muliro University of Science and Technology (Approval number: MMUST/ ISERC/046/2024).

**11. Who do I contact if I have a concern about the research or I wish to complain?**

If you have a concern about any aspect of this research, please contact Hannah van Vijfeijken (contact details below). I will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the Chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter as soon as possible:
The Chair, Social Sciences & Humanities Interdivisional Research Ethics Committee;
Email: ethics@socsci.ox.ac.uk;
Address: Research Services, University of Oxford, Churchill Drive, Oxford OX3 7GB

Further Information and Contact Details
If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact:

# Appendix E: Teacher Consent Form

**CONSENT FORM FOR TEACHERS**

Central University Research Ethics Committee (CUREC) Approval Reference: EDUC_C1A_24_106

**Teacher-Child Relationships in Kenyan Primary Schools: A Mixed Methods Approach**

| | | *Please initial each box* |
|---|---|---|
| 1 | I confirm that I have read and understand the information sheet 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 participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without any adverse consequences or penalty. | ☐ |
| 3 | I understand that research data collected during the study may be looked at by authorised people outside the research team. I give permission for these individuals to access my data. | ☐ |
| 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 may be written up and published. | ☐ |
| 7 | I understand how to raise a concern or make a complaint. | ☐ |
| 8 | I agree to take part in the study | ☐ |
| **Optional:** | I agree that my contact details can be retained in a secure database so that the researchers can contact me about future studies. | YES/ NO |
| **Optional:** | I am interested in being interviewed as part of this research project (45-60 minutes) This involves sharing my perspective on the significance of the teacher-child relationship, the role of the teacher in relation to other figures (e.g., parents, the community), and how the teacher-child relationship affects educational and developmental outcomes. | YES/ NO |
| 9 | I consent to being audio recorded | ☐ |
| 10 | I understand how audio recordings will be used in research outputs | ☐ |
| 11 | I give permission to be quoted directly in research outputs against a pseudonym | ☐ |

| | dd / mm / yyyy | |
|---|---|---|
| Name of Participant | Date | Signature |
| | dd / mm / yyyy | |
| Name of person taking consent | Date | Signature |

## Appendix F: Student-Teacher Relationship Scale (STRS), short form

[3]Teacher: _____

STUDENT-TEACHER RELATIONSHIP SCALE – SHORT FORM

Child Code: _____ Gender: _____ Age: _____ Year Group:_____

*Please reflect on the degree to which each of the following statements currently applies to your relationship with this child. Using the scale below, circle the appropriate number for each item.*

| Definitely does not apply 1 | Not really 2 | Neutral, not sure 3 | Applies somewhat 4 | Definitely applies 5 |
|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | I share an affectionate, warm relationship with this child. | 1 | 2 | 3 | 4 | 5 |
| 2. | This child and I always seem to be struggling with each other. | 1 | 2 | 3 | 4 | 5 |
| 3. | If upset, this child will seek comfort from me. | 1 | 2 | 3 | 4 | 5 |
| 4. | This child is uncomfortable with physical affection or touch from me. | 1 | 2 | 3 | 4 | 5 |
| 5. | This child values his/her relationship with me. | 1 | 2 | 3 | 4 | 5 |
| 6. | When I praise this child, he/she beams with pride. | 1 | 2 | 3 | 4 | 5 |
| 7. | This child spontaneously shares information about himself/herself. | 1 | 2 | 3 | 4 | 5 |
| 8. | This child easily becomes angry with me. | 1 | 2 | 3 | 4 | 5 |
| 9. | It is easy to be in tune with what this child is feeling. | 1 | 2 | 3 | 4 | 5 |
| 10. | This child remains angry or is resistant after being disciplined. | 1 | 2 | 3 | 4 | 5 |
| 11. | Dealing with this child drains my energy | 1 | 2 | 3 | 4 | 5 |
| 12. | When this child is in a bad mood, I know we're in for a long and difficult day. | 1 | 2 | 3 | 4 | 5 |
| 13. | This child's feelings toward me can be unpredictable or can change suddenly. | 1 | 2 | 3 | 4 | 5 |
| 14. | This child is sneaky or manipulative with me. | 1 | 2 | 3 | 4 | 5 |
| 15. | This child openly shares his/her feelings and experiences with me. | 1 | 2 | 3 | 4 | 5 |

# Appendix G: Student-Teacher Relationship Scale (STRS) Short Form Scoring Guide

## Student Teacher Relationship Scale (STRS)

Examines teachers' relationships with an individual child in their classroom (Pianta, 2001). The 15-item, 5-point scale yields scores on Conflict and Closeness and has excellent psychometric properties across multiple studies and samples (Pianta, 1992), including internal consistency from .86-.89 in the MTP sample, and predicts children's classroom behavior, school retention, and academic outcomes (Hamre & Pianta, 2001; Pianta, Steinberg, & Rollins, 1995).

### *References*

Pianta, R. (2001). Student–Teacher Relationship Scale–Short Form. *Lutz, FL: Psychological Assessment Resources, Inc*.
Pianta, R. C., & Steinberg, M. (1992). Teacher-child relationships and the process of adjusting to school. *New Directions for Child and Adolescent Development*, *1992*(57), 61-80.
Pianta, R. C., Steinberg, M. S., & Rollins, K. B. (1995). The first two years of school: Teacher-child relationships and deflections in children's classroom adjustment. *Development and Psychopathology, 7*(02), 295-312.

### *Response Scale*

Please reflect on the degree to which each of the following statements currently applies to your relationship with this student.
1=Definitely does not apply
2=Not really
3=Neutral, not sure
4=Applies somewhat
5=Definitely applies

### *Items*

1. I share an affectionate, warm relationship with this child.
2. This child and I always seem to be struggling with each other.
3. If upset, this child will seek comfort from me.
4. This child is uncomfortable with physical affection or touch from me.
5. This child values his/her relationship with me.
6. When I praise this child, he/she beams with pride.
7. This child spontaneously shares information about himself/herself.
8. This child easily becomes angry at me.
9. It is easy to be in tune with what this student is feeling.
10. This child remains angry or is resistant after being disciplined.
11. Dealing with this child drains my energy.
12. When this child arrives in a bad mood, I know we're in for a long and difficult day.
13. This child's feelings toward me can be unpredictable or can change suddenly.
14. This child is sneaky or manipulative with me.
15. This child openly shares his/her feelings and experience with me.

### *Factors*

| Name | Items |
|---|---|
| Closeness | 1, 3, 4R, 5, 6, 7, 9, 15 |
| Conflict | 2, 8, 10, 11, 12, 13, 14 |

### *Scoring*

Subscale scores are the mean of included items. Item 4 is reverse-scored.

## Appendix H: Interview Guide

*Number of Interviewees*: 4-6 primary school teachers

*Type of Interview*: Semi-structured, covering topics listed below with some scope for follow-up questions based on the interviewee's responses

*Duration of Interview*: Approximately 1 hour

*Topics to be covered in the interview*:

- How is the role of the teacher defined or conceptualised?
- What is the role of the teacher in relation to (attachment) figures in other ecological systems (microsystem, mesosystem, exosystem, macrosystem), e.g., parents, extended family, and the community?
- What is the teacher's perspective on the effect of teacher-child relationship for wider educational and developmental outcomes?

*Location of the Interview*: On the school premises, in an available space that allows for privacy (the staff room, a classroom, outside seating area, …)

# Appendix I: Central University Research Ethics Committee (CUREC, University of Oxford) Approval Letter

**UNIVERSITY OF OXFORD**
DEPARTMENT OF EDUCATION
15 Norham Gardens, Oxford OX2 6PY
Tel:+44(0)1865 274024
general.enquiries@education.ox.ac.uk
www.education.ox.ac.uk
**Director Professor Victoria Murphy**

15th April 2024

Dear Hannah,

**RESEARCH ETHICS APPROVAL**

**Research title: Teacher-Child Relationships in Kenyan Primary Schools: A Mixed Methods Approach**

**Research ethics reference: EDUC_C1A_24_106**

The above research has been considered on behalf of the Department of Education Departmental Research Ethics Committee (DREC) in accordance with the University's procedures for ethical approval of all research involving human participants.

I am pleased to confirm that, on the basis of the information provided to the DREC, ethics approval has now been granted for this research. Please note the following:

**Reference**: Please ensure that you **use this ethics reference number** on all your own consent processes with participants.

**Personal data**: It is the responsibility of the PI to ensure that all personal data collected during the project is managed in accordance with the University's guidance and legal requirements.

**In-person activities**: Any data collection involving in-person interactions with participants must have an up-to-date fieldwork risk assessment in place; further guidance is available from the Safety Office's website.

**Amendments**: Please notify the committee if you intend to make any amendments to the information in your ethics application as submitted at date of this approval, as all changes must receive ethical approval prior to implementation. The amendment form is available on the SSH IDREC webpage.

We welcome feedback on your experience of the ethical review process and suggestions for improvement. Please email any comments to staff.curec@education.ox.ac.uk / student.curec@education.ox.ac.uk or ethics@socsci.ox.ac.uk.

Yours sincerely

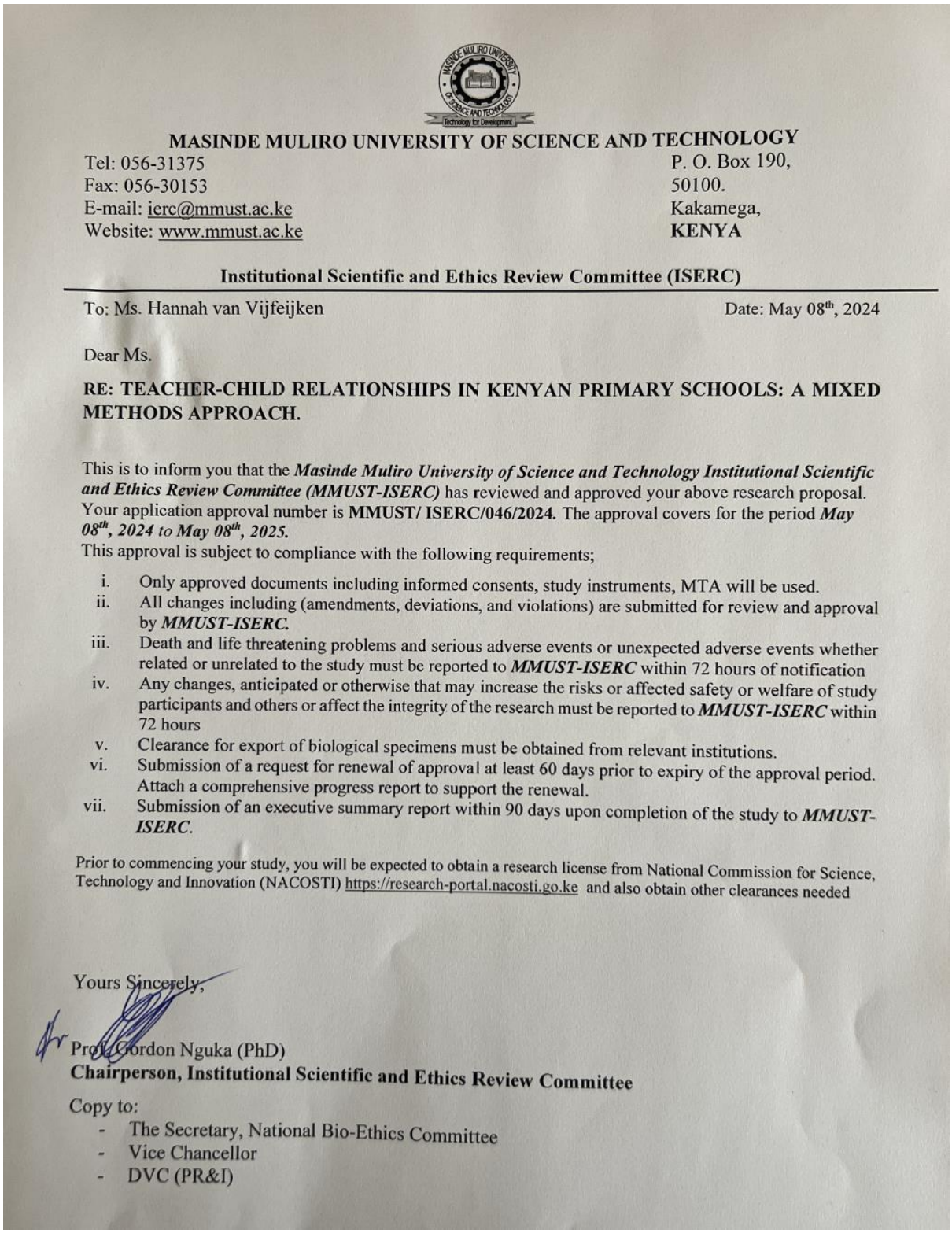
Dr Nigel Fancourt,

Associate Professor of Education and Values

DREC member

cc: student.curec@education.ox.ac.uk katharina.ereky@education.ox.ac.uk

# Appendix J: Institutional Scientific and Ethics Review Committee (ISERC, Masinde Muliro University of Science and Technology) Approval Letter



**MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY**

Tel: 056-31375
Fax: 056-30153
E-mail: ierc@mmust.ac.ke
Website: www.mmust.ac.ke

P. O. Box 190,
50100.
Kakamega,
**KENYA**

**Institutional Scientific and Ethics Review Committee (ISERC)**

To: Ms. Hannah van Vijfeijken

Date: May 08th, 2024

Dear Ms.

**RE: TEACHER-CHILD RELATIONSHIPS IN KENYAN PRIMARY SCHOOLS: A MIXED METHODS APPROACH.**

This is to inform you that the ***Masinde Muliro University of Science and Technology Institutional Scientific and Ethics Review Committee (MMUST-ISERC)*** has reviewed and approved your above research proposal. Your application approval number is **MMUST/ ISERC/046/2024.** The approval covers for the period ***May 08th, 2024 to May 08th, 2025.***
This approval is subject to compliance with the following requirements;

i. Only approved documents including informed consents, study instruments, MTA will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***MMUST-ISERC.***
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***MMUST-ISERC*** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***MMUST-ISERC*** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to ***MMUST-ISERC.***

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed

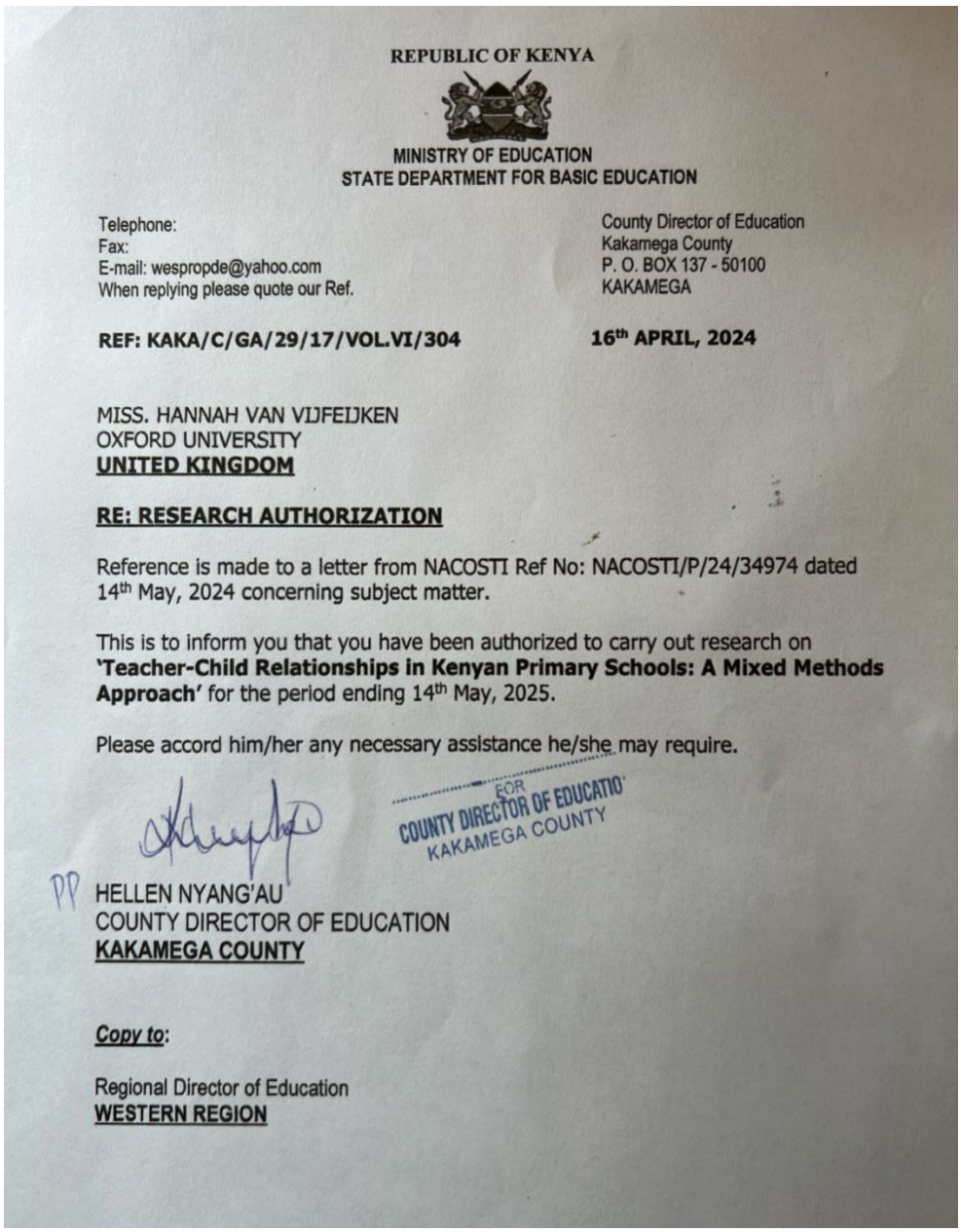
Yours Sincerely,

Prof. Gordon Nguka (PhD)
**Chairperson, Institutional Scientific and Ethics Review Committee**

Copy to:
- The Secretary, National Bio-Ethics Committee
- Vice Chancellor
- DVC (PR&I)

## Appendix K: National Commission for Science, Technology and Innovation (NACOSTI) Research License

# Appendix L: Kakamega County Ministry of Education Approval Letter



REPUBLIC OF KENYA

MINISTRY OF EDUCATION
STATE DEPARTMENT FOR BASIC EDUCATION

Telephone:
Fax:
E-mail: wespropde@yahoo.com
When replying please quote our Ref.

County Director of Education
Kakamega County
P. O. BOX 137 - 50100
KAKAMEGA

**REF: KAKA/C/GA/29/17/VOL.VI/304**

**16th APRIL, 2024**

MISS. HANNAH VAN VIJFEIJKEN
OXFORD UNIVERSITY
**UNITED KINGDOM**

**RE: RESEARCH AUTHORIZATION**

Reference is made to a letter from NACOSTI Ref No: NACOSTI/P/24/34974 dated 14th May, 2024 concerning subject matter.

This is to inform you that you have been authorized to carry out research on **'Teacher-Child Relationships in Kenyan Primary Schools: A Mixed Methods Approach'** for the period ending 14th May, 2025.

Please accord him/her any necessary assistance he/she may require.

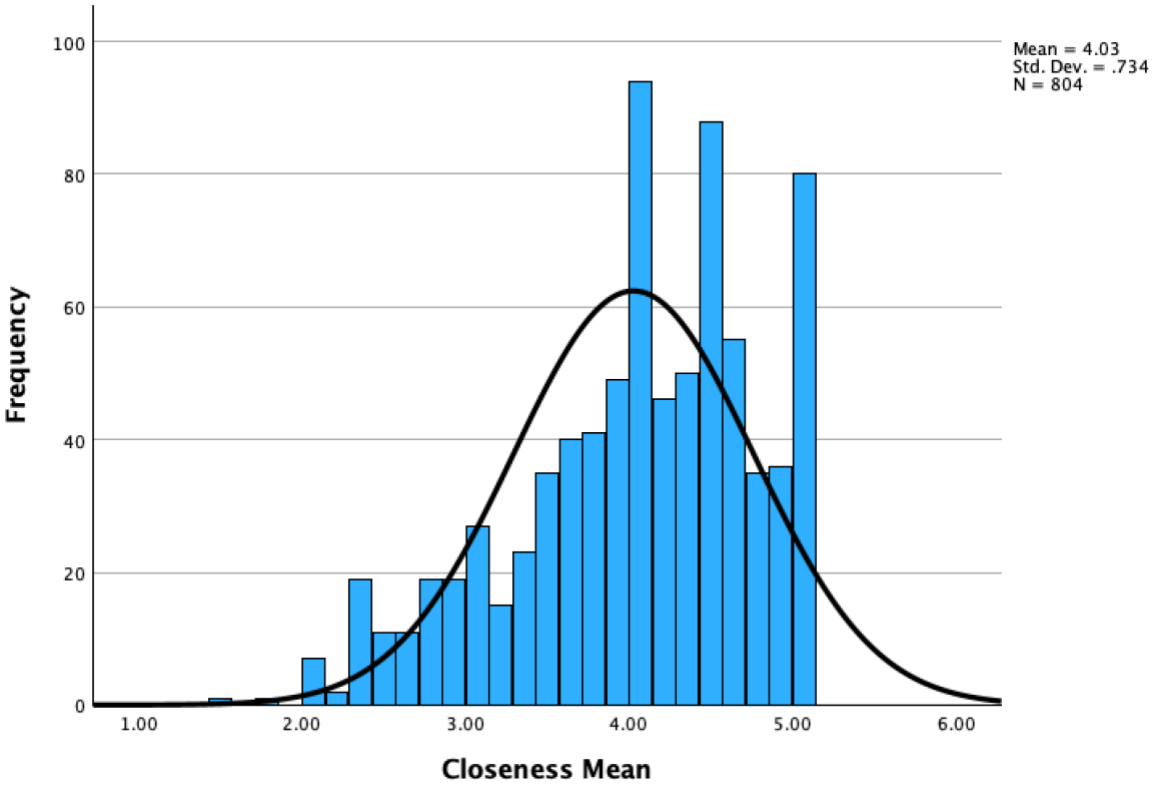
FOR COUNTY DIRECTOR OF EDUCATION
KAKAMEGA COUNTY

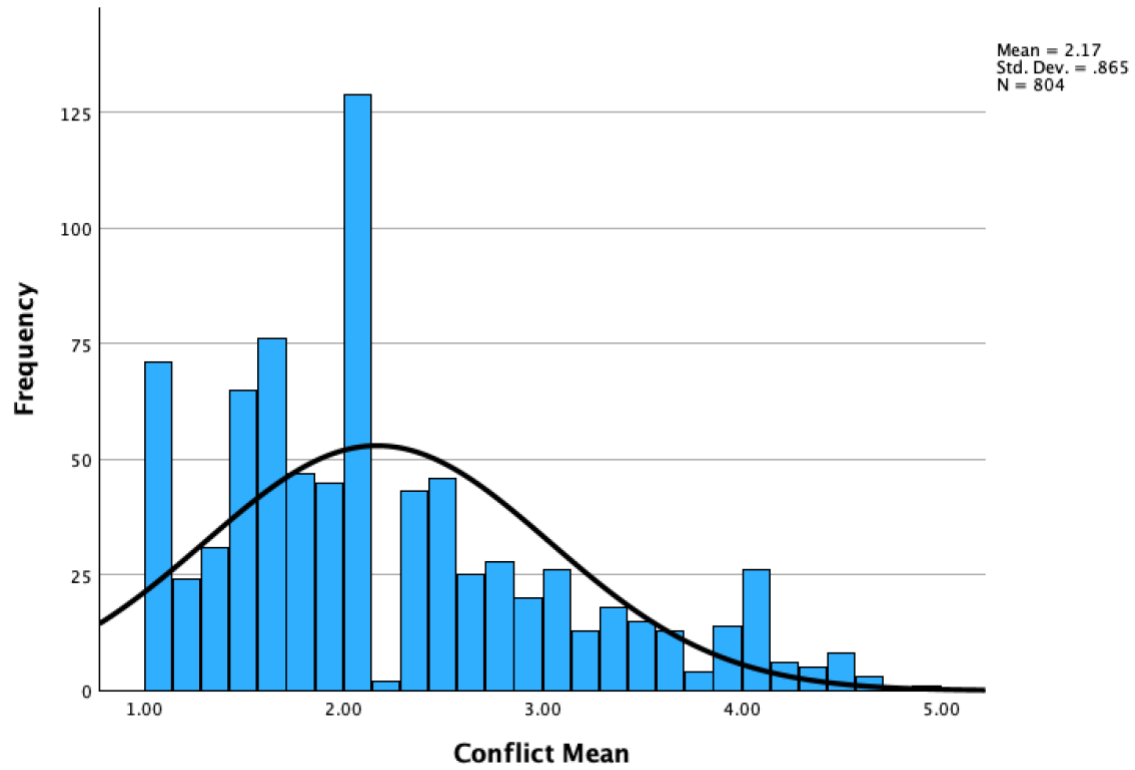
PP HELLEN NYANG'AU
COUNTY DIRECTOR OF EDUCATION
**KAKAMEGA COUNTY**

***Copy to***:

Regional Director of Education
**WESTERN REGION**

## Appendix M: Histograms for STRS Closeness and Conflict subscales



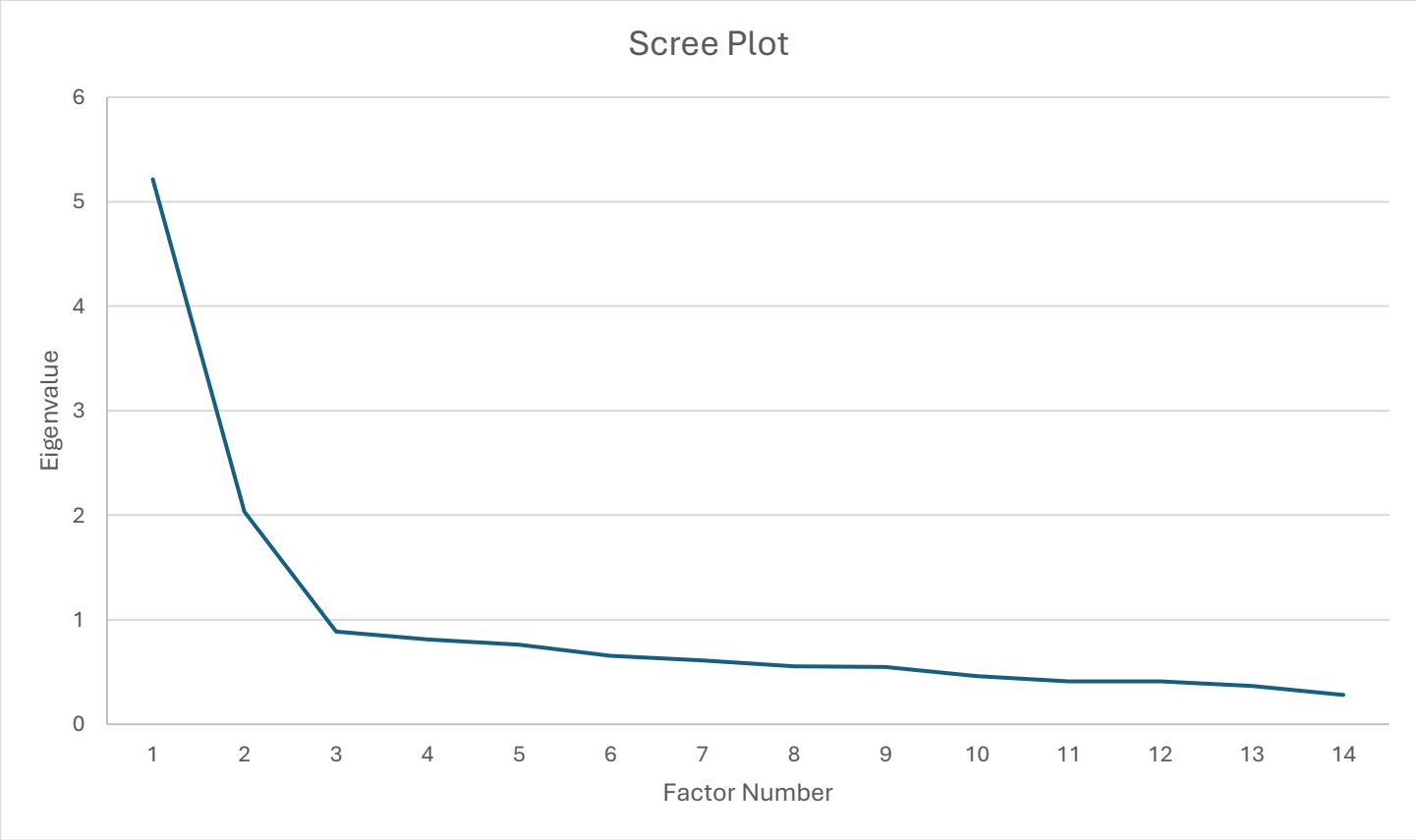



## Appendix N: Exploratory Factor Analysis Correlation Matrix

| Item | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | -.264 | .436 | -.117 | .504 | .288 | .462 | -.177 | .373 | -.354 | -.363 | -.291 | -.288 | -.084 | .504 |
| 2 | -.264 | | -.136 | .399 | -.220 | -.107 | -.082 | .300 | -.194 | .297 | .399 | .244 | .383 | .245 | -.075 |
| 3 | .436 | -.136 | | -.122 | .483 | .368 | .458 | -.161 | .364 | -.279 | -.248 | -.279 | -.292 | -.132 | .520 |
| 4 | -.117 | .399 | -.122 | | -.175 | -.172 | -.207 | .427 | -.209 | .351 | .328 | .321 | .374 | .170 | -.146 |
| 5 | .504 | -.220 | .483 | -.175 | | .427 | .452 | -.205 | .395 | -.347 | -.337 | -.308 | -.333 | -.122 | .515 |
| 6 | .288 | -.107 | .368 | -.172 | .427 | | .372 | -.108 | .302 | -.238 | -.239 | -.281 | -.281 | -.149 | .392 |
| 7 | .462 | -.082 | .458 | -.207 | .452 | .372 | | -.157 | .459 | -.367 | -.250 | -.287 | -.314 | -.134 | .689 |
| 8 | -.177 | .300 | -.161 | .427 | -.205 | -.108 | -.157 | | -.116 | .509 | .481 | .354 | .493 | .330 | -.116 |
| 9 | .373 | -.194 | .364 | -.209 | .395 | .302 | .459 | -.116 | | -.257 | -.223 | -.172 | -.219 | -.095 | .426 |
| 10 | -.354 | .297 | -.279 | .351 | -.347 | -.238 | -.367 | .509 | -.257 | | .577 | .507 | .551 | .322 | -.318 |
| 11 | -.363 | .399 | -.248 | .328 | -.337 | -.239 | -.250 | .481 | -.223 | .577 | | .527 | .538 | .439 | -.265 |
| 12 | -.291 | .244 | -.279 | .321 | -.308 | -.281 | -.287 | .354 | -.172 | .507 | .527 | | .492 | .228 | -.262 |
| 13 | -.288 | .383 | -.292 | .374 | -.333 | -.281 | -.314 | .493 | -.219 | .551 | .538 | .492 | | .364 | -.335 |
| 14 | -.084 | .245 | -.132 | .170 | -.122 | -.149 | -.134 | .330 | -.095 | .322 | .439 | .228 | .364 | | -.117 |
| 15 | .504 | -.075 | .520 | -.146 | .515 | .392 | .689 | -.116 | .426 | -.318 | -.265 | -.262 | -.335 | -.117 | |

Note: All correlations were statistically significant at the $p<.05$ level.

## Appendix O: Exploratory Factor Analysis Scree Plot

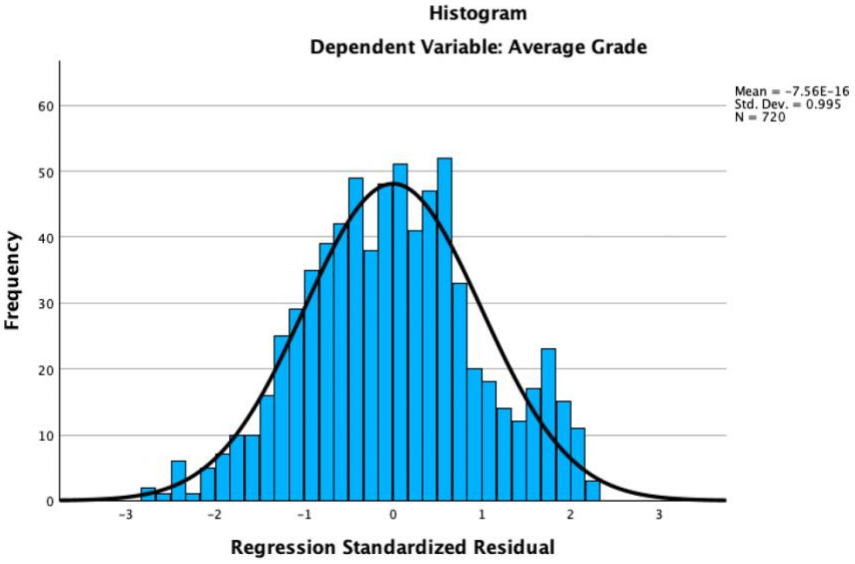


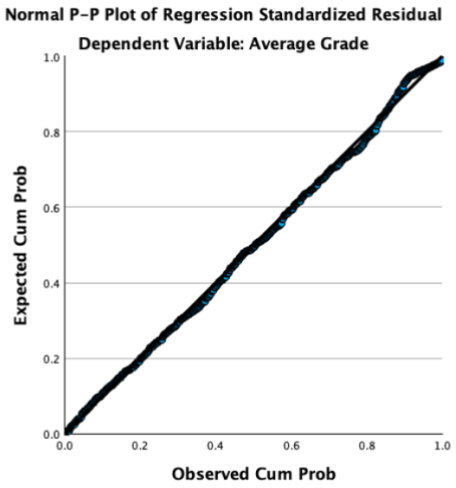
## Appendix P: Exploratory Factor Analysis including STRS Item 4

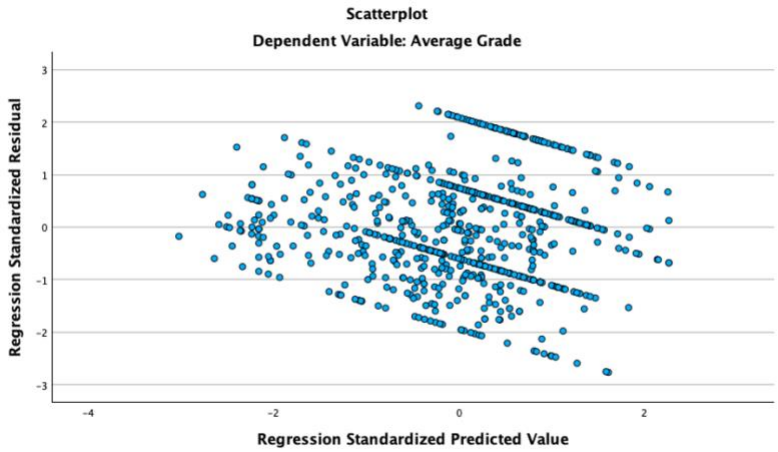
*Table 1.* The eigenvalues, pattern matrix, and structure matrix revealed through maximum likelihood estimation with a promax rotation

| | Item | Eigenvalues | | Pattern Matrix | | Structure Matrix | |
|---|---|---|---|---|---|---|---|
| | | Initial | Extraction | Factor 1 | Factor 2 | Factor 1 | Factor 2 |
| 1 | *I share an affectionate, warm relationship with this child.* | .426 | .413 | .595 | -.086 | .638 | -.386 |
| 2 | *This child and I always seem to be struggling with each other.* | .315 | .253 | .067 | .534 | -.203 | .500 |
| 3 | *If upset, this child will seek comfort from me.* | .378 | .413 | .645 | .006 | .642 | -.320 |
| 4 | *This child is uncomfortable with physical affection or touch from me.* | .321 | .260 | -.019 | -.520 | .243 | -.510 |
| 5 | *This child values his/her relationship with me.* | .440 | .452 | .622 | -.090 | .668 | -.404 |
| 6 | *When I praise this child, he/she beams with pride.* | .273 | .265 | .484 | -.057 | .513 | -.301 |
| 7 | *This child spontaneously shares information about himself/herself.* | .547 | .604 | .812 | .074 | .775 | -.336 |
| 8 | *This child easily becomes angry with me.* | .411 | .458 | .139 | .736 | -.233 | .666 |
| 9 | *It is easy to be in tune with what this child is feeling.* | .302 | .310 | .559 | .006 | .556 | -.277 |
| 10 | *This child remains angry or is resistant after being disciplined.* | .503 | .557 | -.140 | .666 | -.476 | .737 |
| 11 | *Dealing with this child drains my energy.* | .535 | .591 | -.033 | .752 | -.413 | .768 |
| 12 | *When this child is in a bad mood, I know we're in for a long and difficult day.* | .397 | .407 | -.122 | .568 | -.409 | .629 |
| 13 | *This child's feelings toward me can be unpredictable or can change suddenly.* | .490 | .546 | -.115 | .674 | -.456 | .732 |
| 14 | *This child is sneaky or manipulative with me.* | .249 | .232 | .073 | .515 | -.186 | .478 |
| 15 | *This child openly shares his/her feelings and experiences with me.* | .582 | .693 | .894 | .140 | .824 | -.312 |

# Appendix Q: Assumptions for the Multiple Linear Regression



## Appendix R: Logistic Regression Contingency Tables for the Hosmer and Lemeshow Test

Contingency Table for Hosmer and Lemeshow Test – **English x Conflict**

| | | Below/Approaching Expectations | | Meeting/Exceeding Expectations | | |
|---|---|---|---|---|---|---|
| | | Observed | Expected | Observed | Expected | Total |
| Step 1 | 1 | 57 | 55.846 | 4 | 5.154 | 61 |
| | 2 | 50 | 50.249 | 11 | 10.751 | 61 |
| | 3 | 50 | 45.866 | 12 | 16.134 | 62 |
| | 4 | 42 | 39.946 | 19 | 21.054 | 61 |
| | 5 | 36 | 35.377 | 24 | 24.623 | 60 |
| | 6 | 23 | 32.773 | 39 | 29.227 | 62 |
| | 7 | 24 | 27.924 | 38 | 34.076 | 62 |
| | 8 | 23 | 20.892 | 38 | 40.108 | 61 |
| | 9 | 20 | 12.568 | 41 | 48.432 | 61 |
| | 10 | 4 | 7.559 | 50 | 46.441 | 54 |

Contingency Table for Hosmer and Lemeshow Test – **Mathematics x Closeness**

| | | Below/Approaching Expectations | | Meeting/Exceeding Expectations | | |
|---|---|---|---|---|---|---|
| | | Observed | Expected | Observed | Expected | Total |
| Step 1 | 1 | 69 | 65.026 | 4 | 7.974 | 73 |
| | 2 | 63 | 58.066 | 9 | 13.934 | 72 |
| | 3 | 52 | 53.570 | 20 | 18.430 | 72 |
| | 4 | 60 | 51.093 | 15 | 23.907 | 75 |
| | 5 | 40 | 45.328 | 32 | 26.672 | 72 |
| | 6 | 30 | 40.706 | 42 | 31.294 | 72 |
| | 7 | 28 | 36.673 | 44 | 35.327 | 72 |
| | 8 | 25 | 31.590 | 50 | 43.410 | 75 |
| | 9 | 34 | 22.344 | 39 | 50.656 | 73 |
| | 10 | 15 | 11.604 | 49 | 52.396 | 64 |

Contingency Table for Hosmer and Lemeshow Test – **Mathematics x Conflict**

| | | GradeMathsPass = .00 | | GradeMathsPass = 1.00 | | |
|---|---|---|---|---|---|---|
| | | Observed | Expected | Observed | Expected | Total |
| Step 1 | 1 | 67 | 61.136 | 6 | 11.864 | 73 |
| | 2 | 65 | 56.190 | 7 | 15.810 | 72 |
| | 3 | 53 | 52.239 | 19 | 19.761 | 72 |
| | 4 | 45 | 48.261 | 27 | 23.739 | 72 |
| | 5 | 41 | 46.455 | 32 | 26.545 | 73 |
| | 6 | 40 | 43.277 | 34 | 30.723 | 74 |
| | 7 | 35 | 38.483 | 37 | 33.517 | 72 |
| | 8 | 26 | 34.224 | 47 | 38.776 | 73 |
| | 9 | 19 | 23.212 | 54 | 49.788 | 73 |
| | 10 | 25 | 12.521 | 41 | 53.479 | 66 |