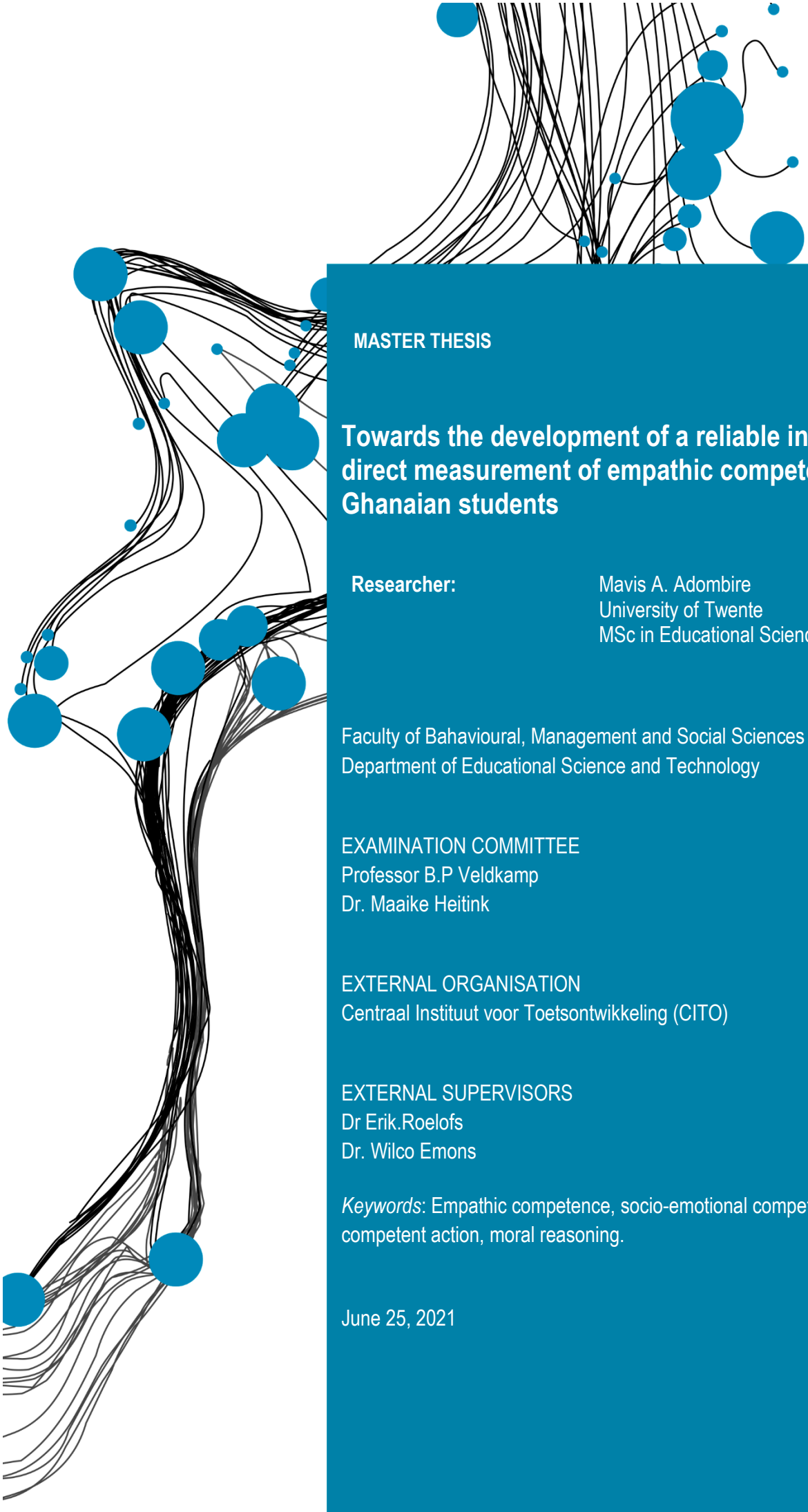

MASTER THESIS

Towards the development of a reliable instrument for the direct measurement of empathic competence among Ghanaian students

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Abstract

Despite the importance of empathic competence in children's socio-emotional development, relatively little attention has been paid to direct assessment tools to measure this competence among students. Based on an existing Dutch prototype, this study aimed to develop a reliable international instrument for assessing the empathic competence of Ghanaian students aged 10 to 14 years in a situational context. The research design was cross-sectional with qualitative and quantitative data collection. Multistage sampling was used to sample the students (N=309). The quantitative data were analysed using test and item-level analyses, factor analysis, and descriptive statistics of student scores to investigate the reliability of the overall scale that measured empathic behaviour. Also, the differences in the student's empathic scores due to their background were investigated using an independent sample t-test. Qualitative data were inductively coded using the framework of competent action and themes from Kohlberg's moral reasoning to investigate the differences in the mental processes of two contrasting groups of students.

The result of the study indicated that the reliability of the scale that measured empathic behaviour was highly acceptable. Test items on the scale of avoidance of ego-centric behaviour were, on average, more difficult than those that were on the scale of prosocial behaviour. Female students, on average, had higher scores on their overall empathic behaviour than male students. The cognitive lab results suggested that the students' mental processes during task performance could be traced back to their score on empathic behaviour. Future research could use the data from the study to investigate evidence of the validity of the scale. Also, psychometricians could use the data from the study to design a sophisticated scoring model.

1.0 Introduction

Empathic competence is a crucial domain of socio-emotional competence that impacts how students behave in social situations. It plays a critical role in acquiring socio-emotional competence among adolescents (Albiero et al., 2009; Decety et al., 2016). Students with well-developed empathic competence can better pay attention to their environment, manage their emotions and develop relationships than students with less developed empathic competence. On the other hand, the lack of empathy is an often mentioned underlying cause of most antisocial behaviours among students. (Decety et al., 2016; Halle & Darling-Churchill, 2016; Hanson, 2010).

Despite the importance of empathy in social interactions, relatively little attention has been paid to direct assessment tools that measure the growth of empathic competence of students (Abraham et al., 2019 & Thompson et al., 2019). The existing instruments for measuring empathic competence are high inference tools in the form of questionnaires to be filled out by self or teachers. Examples of such instruments are Dutch Scol (Social Competence Observation List) and Zien (Daas, Dijkstra & Roelofs, 2020). Inferences about students are not drawn based on various situational contexts. The lack of situational context of the instruments threatens the validity, specifically generalisability across contexts, of the inferences about students' target skills (Daas, Dijkstra & Roelofs, 2020).

In the Ghanaian school system, which is the context of the current study, attention is paid to empathic competence in the context of Religious and Moral Education. Again, the measurement of empathic competence is indirect, in the form of behavioural judgements which teachers make on the student's report card at the end of the school term (Ghana Education Service, 2020), without an explicit student behaviour in specified contexts. The teachers' assessment is retrospective, in which they rely on summary judgements over a long period, and it is unclear to which contexts the judgements apply. Therefore, there is the need

for an assessment tool that will render the degree of empathic competence in social situations visible, including the mental processes that lead to actual student behaviour.

CITO, the National Institute of Measurement in the Netherlands, made the first attempt to develop a context-specific self-assessment, which sought to overcome the problems of context-free assessment of empathic competence and its attendant social desirability in responses. The prototype of the instrument is known as Sortboard 1.0. Students were expected to choose a behavioural option in a real-life social situation, characterised by a conflict of physical or social resources, space or facilities. All situations in the task were public situations. Students were presented with picture cards with a question on whether they could respond with a pro-social behavioural option or a more ego-centric option. In order to operationalise the construct, a variety of social situations with conflict in it were collected for frequently occurring Dutch social situations (Roelofs & Keuning, 2020).

In this study, an international instrument aimed at Ghanaian students was developed. The study focused on the construction of a reliable instrument for empathic competence among Ghanaian adolescents. The impact of variation in situational factors on pro-social and the avoidance of ego-centric behavioural options were studied. Also, the mental processes of students that preceded pro-social up to ego-centric choice patterns were investigated.

2.0 Theoretical framework

2.1 Empathic competence

There are different conceptualizations for empathic competence in scientific literature. The different conceptualizations of the construct led to the recognition of empathic competence as a multidimensional construct (Cuff et al., 2014; Clark et al., 2019). It can be conceptualized as affective, cognitive or behavioural.

As an affective construct, *empathic competence* is defined as the ability to feel the other's emotions (Preston et al., 2020; Clark et al., 2019; Icke, 2011; Decety et al., 2016; Gini et al., 2007; Usher, 2011 Batson et al., 1987). When individuals witness another's affective state, that individual's neural representation is automatically and unconsciously activated to match the target's perceived state (Preston et al., 2020). The unconscious and automatic activation of this neural representation help the individual to feel as the other person in the social situation.

Cognitive *empathic competence* is defined as the ability to understand another person's internal state (Preston et al., 2020; Clark et al., 2019; Icke, 2011; Decety et al., 2016; Gini et al., 2007; Usher, 2011 Baston et al., 1987). Some authors, such as Waal (2009) and Shamay-Tsoory (2011), believe that children's understanding of the world is derived from the system of rules he/she has made due to personal experiences. Hence, as the child grows, he/she acquires specific cognitive skills that help make inferences in their social interactions. Other behavioural scientists contend that cognitive and affective empathic competence occur together and mutually reinforce each other (Preston et al. 2020; Clark et al., 2019; Icke, 2011; Decety et al., 2016). For an individual to feel the affective state of another, that individual needs to appraise the target's affective state using cognitive empathy.

Behavioural empathic competence involves the behaviour of acting empathically. It is defined as the ability to engage in verbal and non-verbal behaviours, which show affective

or/and cognitive empathy (Clark et al., 2019). There are two forms of behavioural empathic competence, and these are behaviour mirroring and empathic communication. Behaviour mirroring involves mimicry of the target's emotional expression, whereas empathic communication involves intentional actions and behaviours that depict cognitive or/and affective empathy (Clark et al., 2019; Cuff et al., 2014). For instance, the verbal expression of understanding how someone feels is an example of an empathic communication of cognitive empathy. Preston et al. (2020) stated that the distinction of empathy as affective and cognitive assists us in understanding empathic behaviour when people respond to tasks and surveys during the assessment of empathic competence. Figure 1 shows the relationship between the different conceptualization of empathic competence.

The test items in the study were constructed within varying behavioural contexts depicting empathic actions where the students' choices communicated the extent to which they were empathic. Therefore, the student's empathic competence was measured within the context of empathic behaviour, specifically empathic communication.

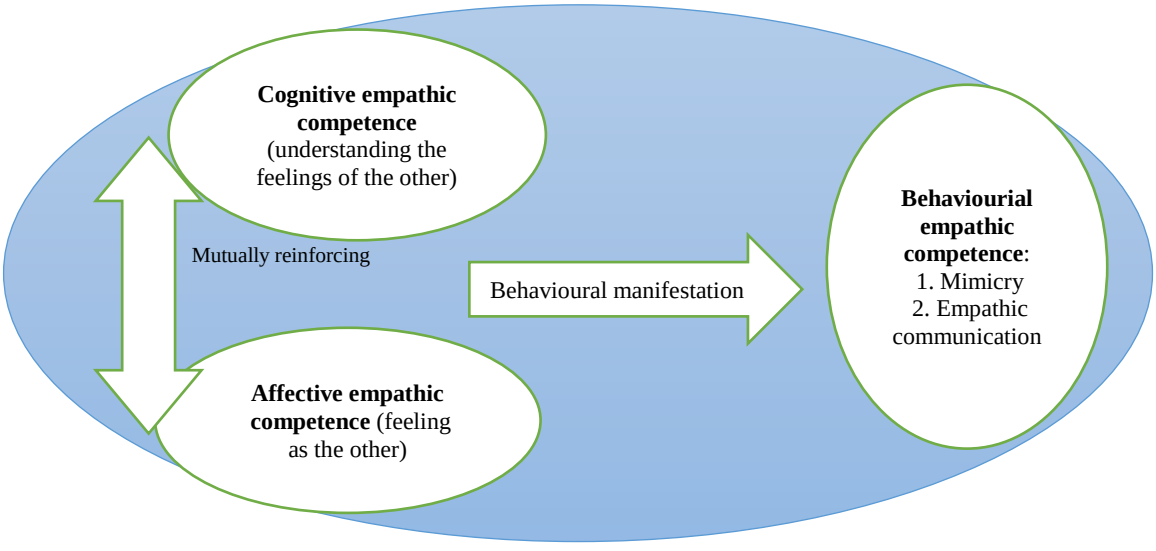

Figure 1: The relationship between the various conceptualisations of empathic competence

2.2 Empathic Competence as part of moral development

2.2.1 Kohlberg's Moral development theory (KMDT)

Empathic competence is an interactional construct and is subject to some degree of moral judgement on the participants' part. Moral development theories give a theoretical framework within which moral judgments are made. Moral development is a broad cognitive and emotional construct made up of empathy, guilt, shame and moral judgement (Van Vugt et al., 2011). Barriga et al. (2009) also argued that empathic competence is fundamental to moral development since the ability to empathise suppresses various forms of antisocial behaviours.

One of the well-established moral judgment theories is Kohlberg's moral development theory (as cited in Kohlberg, 1984). According to the theory, there are three levels of moral development, and each level has two stages. At the lower level (level 1), moral judgment is mainly external physical happening or physical needs instead of personal standards or consideration for other people. Stages one and two of the moral reasoning are at this level. At stage one, moral reasoning is within the context of obedience and punishment orientation. People do the right thing to avoid punishment. At stage two moral reasoning, people do the right thing because it is the rule. Obeying the rule is instrumentally satisfying mostly to themselves (naïve ego-centrism) and occasionally to others (naïve egalitarianism). Exchange and reciprocity are expected from the other in social situations, and obeying the rules is expected to satisfy the other. Moral reasoning at level one, combined with self–serving cognitive distortions, is found to be present in people who display antisocial behaviours. For instance, Stams et al. (2006), in their meta-analysis of the moral judgements of juvenile delinquents, found a significant positive association between level one moral reasoning and juvenile delinquency after controlling for the effect of socio-economic status, cultural background, intelligence, age, type of offence and gender.

At the second level of moral reasoning, people make moral judgments within the context of doing the right thing to maintain the conventional expectation and experiences of others. The good boy orientation (stage three) is an orientation where people make moral judgements to conform to the stereotypical image that society expects of them. The Orientation to duty is a stage four moral reasoning where moral reasoning is made with the intention to maintain social order for its own sake.

At the most advanced level of moral reasoning, there is the need to conform to the shared standards, rights, or duties. The individual either makes moral judgment to avoid violating the rights of self and others (stage five) or the individual acts as a matter of conscience (stage six). At the highest level of moral reasoning, the individual's moral judgment is not limited to the expected social contract of not violating the rights of self and others; the conscience of the individual plays a role. The assumption is that a higher moral judgement based on mutual reciprocity, respect, trust and social contract is a buffer against antisocial behaviours. The reason being that at the higher level, societal well-being and relationships are the primary considerations at the point of making moral judgements (Boom, 2011; Tellings & van Haaften, 2001).

2.2.2 The cognitive structure of moral judgement and the role of the Central Executive

Moral judgments during empathic behaviour do not occur in a vacuum; they have an underlying cognitive structure influenced by everyday social interactions (Schurz et al., 2021). As individuals interact daily with the environment, they engage in mental representations and coding processes. These representations assist the individual to create rules of processing information and make meanings of their interactions (Piaget, 1964; Kohlberg, 1984; Chaiken & Baldwin, 1981). The rules by which the individual process information is known as *cognitive structure,* and the ability of the individual to actively

connect events and processes to from a scheme is known as *cognition* (Kohlberg, 1984). Therefore, the assumption is that the mental structure of the individual is developed through the person's previous interactions with the environment. As a result, people sometimes make moral judgements based on the interpretation they give to the social interaction within the context of previous experiences (Löffler & Greitemeyer, 2021; Ziv & Hadad, 2021; Preston et al., 2020).

The cognitive structures acquired through social interactions assist the individual to engage in the higher-order process of explicitly reflecting on the appropriate behavioural choice before making a decision (Ziv & Hadad, 2021; Taiwo et al., 2021; Preston et al., 2020). When people engage in moral reasoning during empathic behaviour, they need to appraise the goals of self, those of others and make decisions based on the perspective and interpretation of self and that of others. These processes are high-level cognitive skills, and they occur in the Central Executive (Preston et al., 2020; DiGirolamo et al., 2019; Halle & Darling-Churchill, 2016; Epley et al. 2004; Icke, 2011; Decety et al., 2016; Gini et al., 2007; Usher, 2011; Batson et al., 1987). The Central Executive helps with the higher-order process of retrieving mental models formed, reasoning, self-regulation and understanding (Logie, 2016; Ziv & Hadad, 2021). For instance, Taiwo et al. (2021), in their study on the role of the executive function on empathic behaviour, found a strong association between the part of the executive function responsible for memory, performance, inhibition and problem solving and the level of empathic competence of the individual.

2.3 Evidence centered design model

Empathic behaviour occurs within social situations; hence, measures must be embedded within situational contexts. The situational context of empathic behaviour implies that the assessment of empathic competence should involve collecting evidence in specified social situations. Evidence-Centred Design (ECD) model is an assessment design approach

that allows for constructing a self-assessment instrument in a situational context due to the emphasis on specifying task features that need to map the target skill as displayed in the task universe.

ECD is used to design assessments from the perspective of validity. A consistent use of ECD warrants that inferences can be drawn from the scores of students that eventually can be extrapolated to real-life task situations and generalized towards a variety of relevant contexts (Daas et al., 2020; Mislevey, Almond & Lukas, 2003; Oliveri & Mislevy, 2019). The ECD model has several sub-models which are coordinated in order to design an assessment. The core of these sub-models are the student model, the task model and the evidence model (Zieky, 2014). Figure 2 shows the ECD model with the various sub-models. Below is a general explanation of how the ECD model will be used in designing as an assessment for measuring empathic competence.

The student model specifies the target skill, in this case, empathic competence. The model includes a specification of mental processes students go through during the performance of tasks. The general model of competent action of Roelofs and Sanders (2007) and Roelofs and Keuning (2020) describe processes students go through during the fulfilment of social tasks. The framework assumes that competent action is a mental process involving different steps in which thinking and feeling co-occur. These mental processes are *perception, appraisal, consideration, decision making, actions* and *consequences.* In this study, the mental processes of *perception, appraisal* and *consideration* were used to investigate the students' mental processes during task performance.

Perception involves the student's interpretation of the social situation in which the student recognises himself/herself as a participant in the task. The student recognises the other participants in the task who may either be directly or indirectly perceptible. Besides, the student consciously thinks about his / her goal in the situation. The mental process

of *appraisal* is about taking perspectives and looking at the task situation through the eyes of the other person in the situation. The student seeks to understand the needs, desires, feelings and intentions of the other participants in the task. In addition, the student tries to understand the conflict in the task situation, which, in this case, is the sharing of either space (physical or social) or resources (physical or social). The mental process of *consideration* is also known as "thinking ahead". The student, during the process of *consideration*, tries to preempt the consequences of his/her actions on self and others as they make different behavioural choices (Roelofs & Sanders, 2007; Roelofs & Keuning, 2020).

The processes of *appraisal* and *consideration* are higher-order processes that require the student to move beyond their existing schema formed due to interaction with the environment and adjust their interpretation of the social situation (Clark et al., 2019; Icke, 2011; Decety et al., 2016). The processes of this model of competent action occur within a context characterized by factors that burden the task of acting empathetically. These factors have been identified based on a literature study on empathic competence and are further discussed in section 2.4. The model for competent action is also shown in Figure 3. It was expected that the model of competent action would help make meaningful inferences about the students' mental processes during task performances.

The student model is a basis for the task model. In the task model, task features are specified for the systematic construction of assessment tasks. The systematic application of specified task characteristics in assessment tasks would help to elicit the target skill that the assessment seeks to measure. In this study, the task consisted of a social situation that involved a dilemma in sharing available social or physical space or resources, presented on a card with a static picture and a description of the dilemma. The task conditions in the situation involved: 1. The scarcity of either space or resources, both either physical or social and 2. The

perceptibility of the other who may either be perceptible or imperceptible. See section 3.2.1 for details on the instrumentation for the quantitative data collection.

The evidence model describes how the tasks' responses are scored to enable inferences about the target skill understudy, empathic competence. The model also describes the intended psychometric models used to evaluate the quality of individual items, their difficulty and discriminative power, and their task features, including situational factor settings. In the case of this study, items did not have 'right' or 'wrong' answers. Items were scored on the scale from self-serving to self-sacrificing on social situations presented to the student.

In order to construct the scale, Classical Test Theory was used as a psychometric framework involving evaluation of the quality of the individual items, their difficulty and their discrimination power.

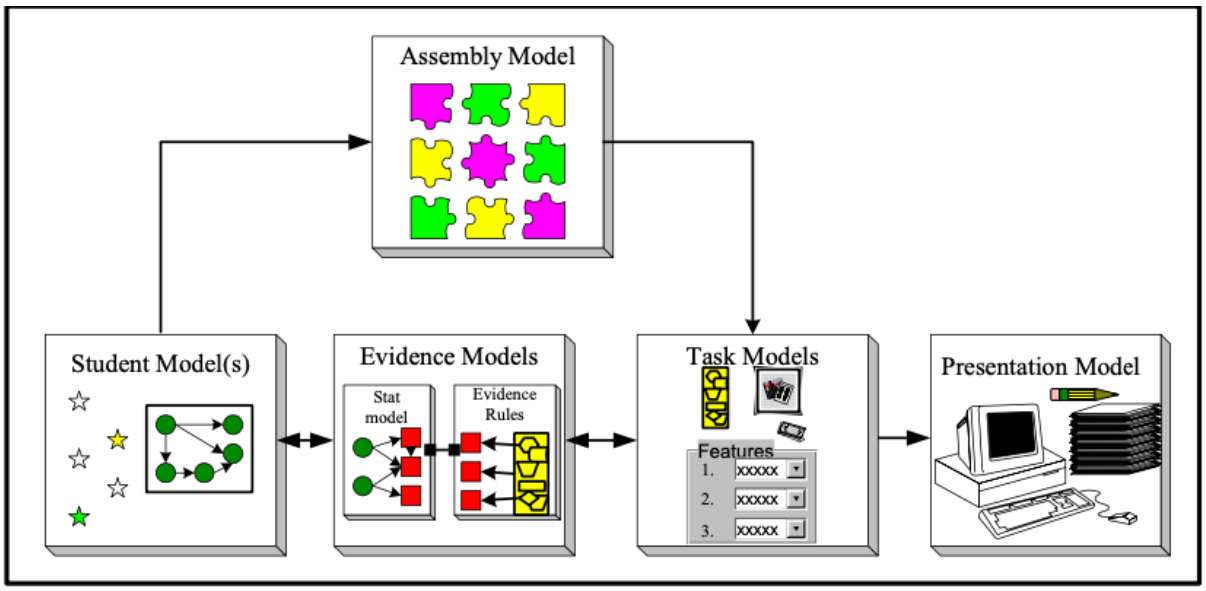

Figure 2. Evidence Centered Design Model of Mislevy et al. (2003)

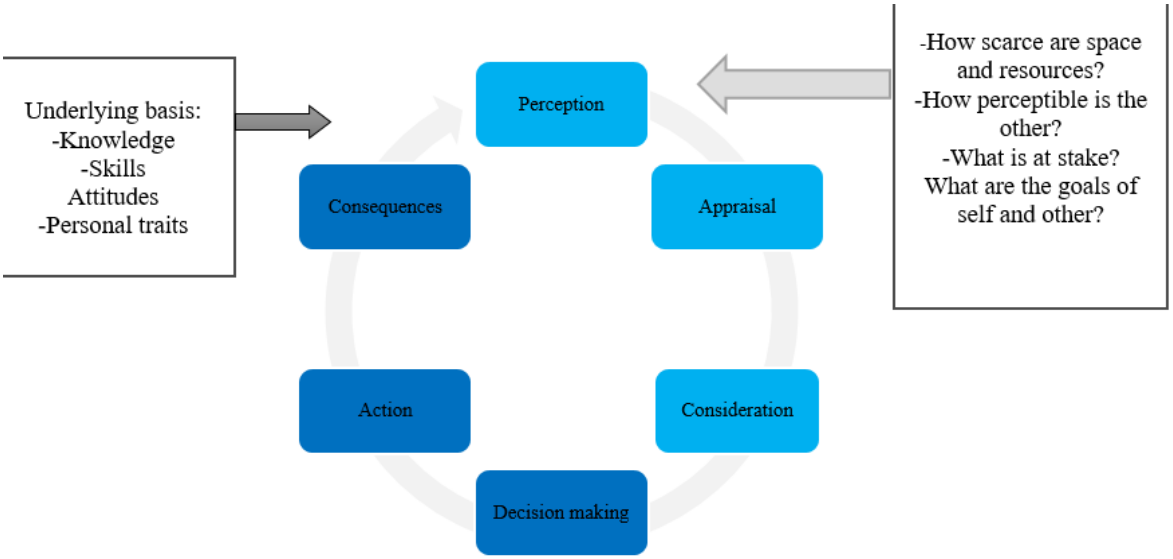

Figure 3. Model of competent action (Roelofs and Sanders (2007) & Roelofs and Keuning (2020)

2.4 Social context and burdening situational factors

As stated earlier, tasks in the student model are situated in a social context. The decision of a student to act empathically is burdened by social factors, including perceptibility of others, scarcity of space and scarcity of resources, the involvement of other and consequences of one's actions (Roelofs & Keuning, 2020; Epley et al., 2006; Decety & Jackson, 2004; Decety et al., 2016). The factors mentioned above can also be considered as the social context of the tasks in the student model in this study. We chose to include two factors to start with: the perceptibility of others (high/low) and the scarcity (high/low) of space and resources.

We expected students would differ by the extent to which they can and are ready to deal with burdening situational factors. Some are expected to go far in their readiness to make pro-social choices, whereas others will more easily choose for ego-centric options, even in less burdening situations. In many instruments so far, behavioral statements were presented to respondents that did not include the less or more burdening situations along with variations of the situational factors (Roelof & Keuning, 2020) . The Ghanaian version of the instrument is

aimed to make fine-grained distinctions between students who act more or less empathically. Also, we intend to get scores that shed light on personal limits regarding the burdening situational factors. So, in the instrument, the students were confronted with a wide range of social situations that contained a varying degree of situational burdening with a question to handle a conflict of social or physical space and resources.

Within the context of the study, physical space is the immediate proximity of the social agent, in this case, the student, which the agent could appropriate for him/herself. Social space, on the other hands, is the space shared between the social agent (the student) and other social agents (Bourdieu, 2018). In this study, scarcity of space refers to the limited availability of physical space or social space.

As mentioned earlier, resources can either be physical or social. Physical resources are tangible facilities and infrastructure available for deployment by community members (Wicker & Breuer, 2011). On the other hand, social resources are the social network of friends, relations, and community members (Billings & Moos, 1981; Wicker & Breuer, 2011) available for the deployment of the student. The scarcity of resources, therefore, is the limited supply of either physical resources or social resources.

2.5 Classical Test Theory as a framework for test item quality

Classical Test Theory is a framework used to analyze test data. It is used in test construction to evaluate the quality of the test items using the test scores (Bechger et al., 2003; Devellis, 2006). Classical Test Theory uses some assumptions to help researchers make inferences on the observable scores to provide information on the unobservable variable. The first assumption is that the observed score is the best predictor of the true score. The second assumption is that there no correlation between the error in the test and the true scores; therefore, the average error in a population of examinees is zero. The third assumption is that

any error that may have been present in the test score is a random error, not a systematic one (Hambleton & Jones, 1993; Devellis, 2006).

Statistical analysis using Classical Test Theory is done on two levels: at the item and test levels. At the item level, there is the analysis of how individual test items correlate with each other. The analysis of the correlation between the individual test items is known as item discrimination (Devellis, 2006). Test items which are strongly correlated with each other are also strongly correlated with the true score of the unobserved variable. As a result, such items can sharply discriminate between the students who score high on the test and those who score high on the test (Hambleton & Jones, 1993; Devellis, 2006). The correlation between the test item and the test score is known as the R_{it} value. The R_{it} value is usually little inflated due to the presence of the item value, especially in a small sample test item test. To get a more accurate measure of item discrimination, it is better to use the item rest correlation (R_{ir} value) (Hambleton & Jones, 1993; Devellis, 2006). The item rest correlation is the product movement correlation co-efficient of the item score, and the total item score, less the item contribution (Hambleton & Jones, 1993). R_{ir} value is therefore a better measure of item discrimination. The correlation between an item and test scores is $-1 \leq R_{ir} \leq 1$ (Bechger et al., 2003; Devellis, 2006). Garvin & Ebel (1980) put out some guidelines for interpreting item discrimanation. These guidelines are presented in Table 1.

The second item level analysis is know as item difficulty. A difficult item is the one fewer people answered correctly (Devellis, 2006). Item difficulty (P_{value}) is the strength of the attribute that is being assessed and it is in relation to the number of respondents that chose a particular response. P_{values} are usually between 0 and 1. According to Adegoke (2013), test items with $p \leq .30$ are considered difficult, those with $p \geq .31 \leq .70$ are considered to be moderately difficult, and test items with $p > .70$ are considered to be easy.

The test level analysis of CTT investigates the reliability of the test, which is the

internal consistency of the test. Reliability is the property of the test scores which indicates the internal consistency of the test at the point where the sample was studied (Devellis, 2006). A good test item should be a true reflection of the true score and reliability estimates measures the internal consistency of the test items (Kimberlin & Winterstein, 2008). Cronbach's alpha is the most commonly used reliability measure. The acceptable values for alpha (α) differ according to different reports. These values range from .70 – .95 (Bland & Altman, 1997). Alpha (α) above .70 is usually highly considered acceptable.

Table 1

Interpretation of discrimination index (Garvin & Ebel, 1980)

Index of discrimination	**Item evaluation**
.40 and up	Very good items.
.30 to .39	Reasonably good but possibly subject to improvement.
.20 to .29	Marginal items. They are usually needing and being subject to improvement.
Below .19	Poor items. The items are to be rejected and improved by revision.

2.6 Avoidance of ego-centric behaviour and pro-social behaviour, the two facets of empathic competence

In studying empathic competence, one of the questions is whether a continuum exists with two extremes: actions that represent the opposite of empathy, such as ego-centrism on the one hand and pro-social behaviour on the other hand. Additionally, one wonders if refraining from ego-centric actions indicates empathy or whether the avoidance of ego-centric behaviour and pro-social can exist together. Literature, however, suggests that the social avoidance of ego-centric behaviour and pro-social behaviour are considered two different facets of empathic competence, though these two facets sometimes overlap during our everyday social interactions (Cameron et al., 2019).

The avoidance ego-centric behaviour involves the student's ability to imagine and make inferences from other people's perspective and feelings and use this knowledge to evade

conflict in social situations (Cameron et., 2019 & Felnhofer et al., 2018) involving the sharing of space and resources. In social situations that involve the avoidance of ego-centric behaviour, the questions are usually formulated to represent a negative situation. The individual is presented with a conflict of deciding whether to make an ego-centric choice or avoid making an ego-centric choice. Avoiding conflicts in social situations evoke more behavioural, affective, physiological, and cognitive analysis and processing strategies (Taylor, 1991). As a result, some people may find it more difficult to make choices when presented with social situations which require them to avoid making an ego-centric choice.

Prosocial behaviours, on the other hand, are positively framed social behaviours such as helping and sharing, that seek to benefit one or more people rather than self, using knowledge of the emotions and perspectives of self and others (Cameron et., 2019; Felnhofer et al., 2018 & Zaki & Ochsner, 2012). In social situations that are positively framed, individuals use rapid and effortless information processing strategies. The responses of people are usually intuitive because they are verifying their behaviour of choice. (Taylor, 1991). As a result, people usually find it easier to confirm prosocial behavioural choices than the avoidance of ego-centric behavioural choices.

2.7 Research questions

In the study, an international instrument aimed at Ghanaian students was developed to enable reliable inferences about the empathic behaviour of students. As part of the situational context behind the instrument, the impact of variation in situational factors on pro-social and avoidance of ego-centric behavioural options was studied. Besides, the mental processes of students that preceded pro-social up to ego-centric choice patterns were investigated. The main research question that guided the study was: *To what extent is it possible to develop an assessment tool that can reliably measure empathic behavioural competence among Ghanaian students between the ages of 10 – 14 years in a situational context?*

The research was exploratory in nature and explored the following:

1. How reliable is the developed scale for measuring empathic competence?
2. How are the item characteristics of item difficulty and discrimination informative about the empathic scores?
3. Are there any differences in the empathic behaviour of the students as a result of their background?
4. Do a contrasting group of students who scored relatively low and relatively high on empathic behaviour differ in the mental processes that underlay empathic behavioural choices?

3.0 Method

3.1 Participants and Design

The sample included Ghanaian students (male = 55%, female = 44%). Initially, 320 students were sampled; however, eleven of them could not complete the survey due to difficulties in the internet connection. When the internet got restored, they were unwilling to continue the survey. The eleven students were, as a result, deleted from the sample. Table 2 gives the distribution of students (N = 309) per region. The students were aged between 10 and 14 years (M = 13 years, SD = 1.08). Research shows that students within this age group can already provide an accurate and reliable description of their socio-emotional state, so it was expected that they could also respond to the social dilemmas in the assessment (Soto et al., 2011). The majority of the students identified their ethnicity as either Mole-Dagbon (38.50%) or Akans (26.90%). These two ethnicities cumulatively make up 65.40% of the total respondents. Regarding religious background, students in the study identified either as Christians (60.20%) or Muslims (39.80%). None of the students practiced African Traditional Religion (ATR), although five percent of the Ghanaians identify as ATR worshipers (Department State, 2019).

The students were recruited through multistage sampling method. Schools were sampled from the southern zone and the northern zone of the country. For convenience, the city of Accra was selected to represent the southern zone, and the city of Tamale was selected to represent the northern zone. These two cities are the two largest cities within the zones, and are heterogeneous regarding the representation of the population in their zones. There are important significant north-south differences in Ghana regarding culture, religion, literacy, the standard of living, and vegetation (Oelbaum, 2004). For instance, the people in the southern parts of the country are predominantly Christian with a higher rate of adult literacy compared to the northern sector, where the people are predominantly Muslims with a lower rate of adult

literacy. Social situations impact empathic behaviour decisions of people (Darling-Churchill & Lippman, 2016); hence it was crucial to have these two parts of the country well represented in the sample.

At the next level of sampling, the schools in the two zones were put in two strata: public school and private schools. Three public schools and three private schools were randomly selected in each of the zones. The choice to select three private schools and three public schools was to ensure a proportional representation of students with different background and different ability levels. Private schools and public differ in their performance especially in the Basic Education Certificate Examination (BECE) of the West African Examination Council where private schools have shown superior performance (WAEC) (Donkor, 2015; Okyerefo et al., 2011).Also, though 70% of the Junior High Schools (JHS) in the urban centers are private schools, public schools account for 85% of the enrollment (Akyeampong, 2009). Each of the 12 schools randomly selected from the strata was assigned equal weight in the sample. Participating students in the schools were selected via simple random sampling.

The design of the study was cross-sectional, in which the data were collected at one point in time. The study used both quantitative and qualitative data collection methods. Research questions 1, 2 and 3 were investigated using quantitative test data that were collected. The students completed a situation-specific questionnaire, the assessment for empathic behaviour, and their responses on the items were scored for the degree of empathic behaviour on a 10 point rating scale. The instrument is described in section 3.2.1.

In order to investigate research question 4, qualitative interviews were conducted. Six students with relatively low scores (below 6.0) on their total emphatic behaviour and six students with relatively high scores (6.0 and above) on their total empathic behaviour were selected and interviewed. The selection process was done by splitting the North and South

region students. Per region, three students were randomly sampled from the 25% highest scoring students and three students from the 25% lowest scoring students, with the restriction all came from different schools. Also, backup students were selected if one of the already selected students could not show up for the qualitative interviews. During the qualitative interviews, students were asked to think back on how they arrived at their behavioural choices in a subset of social dilemmas. The interview was structured along the mental processes that are assumed to be underlying the behavioural choices. Also, attention was paid to how situational factors impacted these processes and the final behavioural choices. The instrument for the qualitative interview is described in section 2.2.2. Table 3 shows the research questions guiding the research and the data collection methods.

Table 2
The distribution of participants by gender per location (N=309)

	Tamale	Accra	Total
Males	65	108	173
Females	93	43	136
Total	158	151	**309**

Table 3
Research questions and related data collection and analysis methods

	Research questions	Data collection method	Data-analyses
1	How reliable is the developed scale for measuring empathic competence?	Quantitative data: Test scores, item statistics	Descriptive statistics, Factor Analysis, Classical Test Theory
2	How are the item characteristics of item difficulty and discrimination informative about the empathic scores?	Quantitative data: Test scores, item statistics	Classical Test Theory.
3	Are there any differences in the empathic behavior of the students as a result of their background?	Quantitative data: Test scores, item statistics	Descriptive statistics, Independent sample t test.
4	Do a contrasting group of students who scored relatively low and relatively high on emphatic behaviour differ in the mental processes that underlay empathic behavioural choices?	Qualitative interview data collected from 12 students that differ in test-scores	Transcribe the statements of the students into thematic areas using inductive coding.

3.2 Instrumentation

3.2.1 Quantitative instrument.

The instrument was titled "Life choices of Ghanaian adolescents" and consisted of four parts. The first part of the questionnaire informed the students that 1. Their responses are confidential and anonymous, 2. They can withdraw at any time if they feel uncomfortable. The second part of the instrument contained questions about the background variables, namely: name, gender, date of birth, name of the school, ethnicity and religious affiliation. Collection of the background data gave room for the possibilities of discovering new information and trends in score patterns across various characteristics of students (Cottler & Grant, 2006), such as the relationship between these background variables and the students' degree of empathic behaviour. For instance, some evidence suggests gender as a predictor of the empathic behaviour of adolescents (Löffler & Greitemeyer, 2021; Bogdan et al., 2013;

Singer & Lamm, 2009; Jolliffe & Farrington, 2006; Hambleton & Jones, 1993 & Eisenberg et al., 1987).

The main part of the instrument involved questions about the intended behaviour in pictured social situations with accompanying scripts explaining the social situations. The instrument was designed featuring situations from a Dutch prototype instrument for empathic behaviour, called the Sort Board instrument (Roelof & Keuning, 2020), and Ghanaian social situations. The students were presented with a set of questions showing 56 pictures representing a broad spectrum of social situations. Using the framework of ECD framework, task situations differed in terms of burdening social context features to elicit the targeted skill, which is empathic competence. In some of the social contexts, physical or social resources were scarce, and other actors in the empathic action were either directly or not directly perceptible. In other aspects, physical and social resources were scarce in the social context, and other actors were not perceptible. In order to solve the dilemma in the task situation, space or resources could be shared by the student with others or just taken.

The items represented the Ghanaian culture and its societal dilemmas. The Ghanaian society cultural context is a collective one which is tied around the extended family. The culture is cohesive and there is reciprocity of duty, obligations and responsibilities (Agyemang et al., 2018; Ateng et al., 2018). The individuals' choices within the community affect the extended family as a whole (Koschmann & LeBaron, 2003). Figure 4 shows the task situations and examples of the task contents that were used for the instrument construction. A pivot table was designed to check whether during the process of instrument construction, the social situations and the burdening factors of scarcity (high / low) and perceptibility (high / low) were adequately represented. Table 4 shows the distribution of items across these features on the composite scale of empathic behaviour.

The questions were formulated in two ways, representing two subscales of empathic competence; negatively, representing an ego-centric behavioural option and positively, representing a pro-social behavioural option. An example of an ego-centric behavioural option is as follows: "There is a WhatsApp message circulating spreading false rumours about a child in another school. Someone in your school forwarded the message to you. Out of 10 times, how many times are you likely to *forward the message to your friends?"*. In this question the other person in the depicted social situation was not perceptible and the context was about sharing social resources. The consequences of making an ego-centric choice was denying the person social resources in which the subject of the gossip would feel hurt if he / she got to know about the gossip. A question with a pro-social behavioural option was: "You're standing at a buffet, and you're hungry. There are 20 spring rolls on the table. There are also exactly 20 guests. Out of 10 times, how many times are you likely to take one spring roll?". For this question, we used high scarcity of physical resources as a burdening factor. The consequence of a pro-social choice was allowing everyone to have access to the spring rolls. The other person in the social situation was perceptible but no one in particular. On all questions, the students were expected to respond on a scale from 0 to 10 times representing the number of times they would engage in the suggested behaviour.

In the final part of the survey we asked three questions to check for the influence of the researcher on the participants that might compromise the reliability. Respondents were asked to respond to 3 yes/no questions which were:1. The teacher explained one or more questions to me, 2. The teacher assisted in using the laptop and, 3. The teacher assisted in answering the questions. The instrument, "Life choices of Ghanaian adolescents" can be seen in appendix A.

To ensure that the content of the test and the length of the assessment were appropriate for the targeted age group, the questionnaire was piloted among five Ghanaian students.

Results from the pilot indicated that the students understood the questions. Three of the pictures used for the accompanying social situations were changed in the final version. Two students who were asked to complete the survey on a pilot basis gave feedback that the interface was user-friendly and they understood what was expected of them.

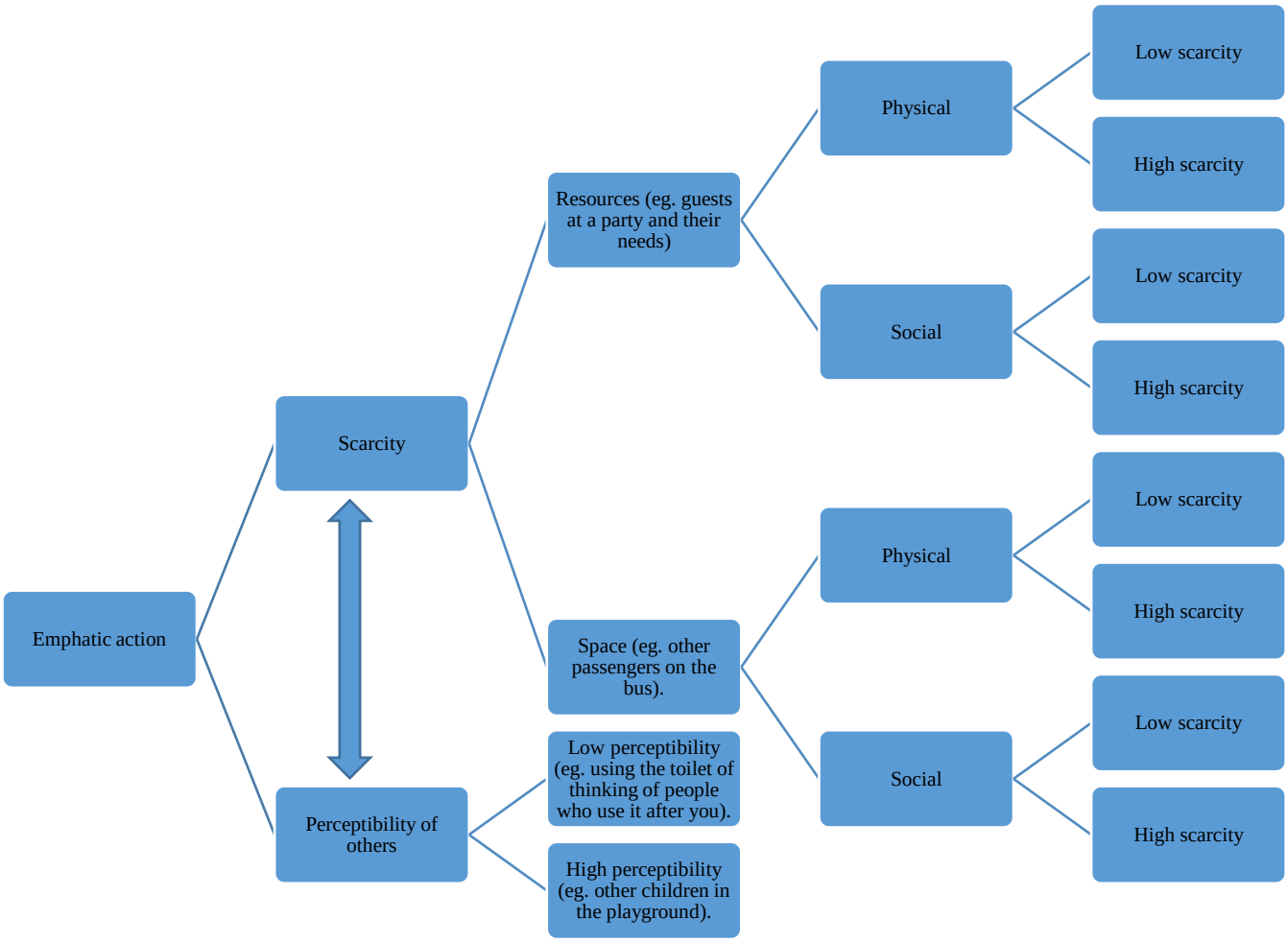

Figure 4. Task situations and examples of the task content used for the instrument construction

Table 4
The distribution of items across burdening features for the composite scale of EB

Scarcity	Perceptibility other	Resources		Space		Grand Total
		Physical	Social	Physical	Social	
Low	Low	5	4	3	5	17
	High	2	3	4	2	11
High	Low	3	2	3	3	11
	High	5	4	4	4	17
Grand Total		**15**	**13**	**14**	**14**	**56**

3.2.2 Qualitative instrument.

In order to explore the mental processes that the students go through in the fulfilment of the social task, a reflection tool was constructed using the general model of competent action by Roelofs and Sanders (2007) and Roelofs and Sanders (2020). According to this model, it was expected that the student would first *perceive* the social task, then he/she would *appraise* the situation. After the appraisal, the student would then *consider* which choice to make in the social situation, weighing the pros and cons of desirable and undesirable consequences for oneself and others. For instance, to evaluate the respondent's *perception* of the task situation, the question was posed "Describe this situation as you saw it yourself". In order to elicit the respondent's *appraisal* of the task situation, the question was asked "what do you think is at stake here in this situation?". An example of a question that evaluated *consideration* was "how did the other people see the same situation?". See section 2.3 for a discussion on the mental processes of *perception, appraisal* and *consideration*. Table 5 displays the reflection tool that was used to investigate the mental process of the students.

Table 5
Reflection tool indicating the mental processes with accompanying questions

Process	Questions
Perception of situation	1. Describe the situation as you saw it yourself. 2. Who are the other participants in the situation? Who can these others be? What other people do you see? Did you visualise other people in the situation? 3. What did you want to achieve in this situation? What were your goals?
Appraisal of situation	1. Describe what the problem is about. 2. What was at stake here? 3. What did the other person want or need in the situations? What will be the goal of the other person? 4. How did the other person see the same situation?
Consideration to decision making	1. Now look back at the solution can you tell me how you arrived at your choice? 2. How do you feel about the way you solved the situations? 3. How do you think others feel about the way you solved the situation? 4. Does the solution serve the needs of the other person? 5. Does the solution serve your own need?

3.3 Procedure

3.3.1 Quantitative data collection.

A letter of introduction was secured from the University of Twente introducing the researcher and the purpose of the research to the schools. Two weeks prior to data collections, the selected schools were contacted and given a copy of the introduction letter. See appendix B for a copy of the introduction letter. After a few request for clarifications from the principals were replied to, the principals agreed to allow the schools to participate in the study. A passive consent form was given to the selected schools to be given to their parents. See appendix C for a copy of the passive consent form. In addition, parents were informed of the research on their a WhatsApp platform. They were asked to send a message in case they did not want their children to participate in the research. Apart from a few requests for clarification, none of the parents declined the participation of their children

In total, thirteen days were used for the quantitative data collection in the twelve selected schools. Except for the first school, which took two days for the survey due to a lack of computer skills, the rest of the schools used a day. The team spent two days in the first

school because of their lack of basic computer skills. The research assistant spent some time taking some of the students through basic computer skills such as mouse handling. In addition, there were only five laptops on the first day. After noticing these challenges in the first school, the number of available laptops was increased up to 8. On average, it took 30 minutes for each student in a private school to complete the entire survey. On the other hand, students in the public schools took a longer time, 45 minutes on average, in answering the survey due to their lack of basic computer skills.

On data collection day, the team was set up in an open space on the school compound. The laptops were sanitised and connected to a mobile Wi-Fi router. The principals introduced the research team to the students. The students were called in groups of eight to complete the survey. In order to observe the laid down public health protocols of COVID 19, nose masks were provided to students who were not wearing one. In addition, students washed their hands under running water and pat dry their hands with tissue. Sanitisers were provided for each workstation, and the students sanitised their hands before using the laptops. This public health protocol was repeated for each of the group of students that completed the survey. Besides, the workstations were sanitised after each batch of students.

The weblink to the questionnaire interface was stored in favourites of the laptop browsers. The researcher opened the interface for the students and asked them to start the survey. The researcher walked away to give the students the privacy to respond to the survey. However, the students were told they could call the researcher if they required any form of assistance. When the students finished with the survey, they clicked on submit to end the session. There was a short debriefing session to thank the students for their participation.

3.3.2 Qualitative interviews.

In order to address the research question pertaining to the underlying mental processes that preceded the behavioural choices of students, qualitative interviews were conducted with

students that showed contrasting results in their empathic behaviour; the scales for the avoidance of ego-centric and pro-social behaviours (see section 3.2.1 for a description of the two scales). The interview can be considered to be an a posteriori cognitive lab aimed at discovering both cognitive and affective processes that the students went through to carry out the choice of behaviour in the presented social situation.

The selected students for the qualitative interviews were interviewed online using MS Teams, where the main researcher sat at her home office in the Netherlands, and the student was behind a laptop in a school in Ghana. On average, each interview lasted for thirty minutes. The researcher held two interviews in a day. At the beginning of each session the researcher introduced herself and assured the students of the confidentiality of their responses. Besides, the students were informed that there were no right or wrong answers. The students were shown the task situation and interviewed based on the question in the observation protocol that was designed.

The interview was semi-structured, and it investigated the extent to which the student had *perceived* and *appraised* the social situations in the tasks. Also, the interview investigated the *considerations* the students made before making a decision in the social situation as expressed on the frequency scale of 0-10. The students were given the opportunity to see their choices in the task situations presented to them and reflect if their choice met their needs and the needs of the other participant in the task situation. See section 3.2.2 for the reflection tool used for the interview.

The selection of the students was based on scores on the test. In total, 14 items were selected for use in the qualitative interviews. The selected items spread across task conditions (low/high scarcity and perceptibility) and context (physical/social space and resources) on the scales of avoidance of ego-centric behaviour and pro-social behaviour. Twelve out of the 14 items had high item-item test correlations and discriminated well between the contrasting

groups of students investigated for their mental processes. Two of the 14 items (items 33 and 48) though they did not have a very high discriminating power, were selected for content purposes. Each of the twelve students was asked to reflect on four test items. Two of the items, which were highly discriminating, were used as core items and shown to all students. The other two sets of items differed per student but enabled a broader coverage of social situations to prevent discussion on only a small part of the situations. Table 6 shows the two core test items used to conduct the qualitative interview. See appendix D for the complete table of items used for the qualitative data collection.

Table 6

Table of core situations used for the qualitative interviews

Task situation	Accompanying picture	Implication of choices made by students
IT018_LPPSP02: You've been chilling in a park with friends. You have empty cans of thrash to throw away, but the dustbin is completely full. Out of 10 times, how many times are you likely to carry the rubbish with you home to put in the dustbin at home?		Carrying the rubbish home is considered a prosocial choice. In this task the student is sharing social space with others who are not highly perceptible.
IT031_LSPRE01: You have been invited to a birthday party, and a tasty jollof rice was being served, and there was enough to serve everyone. Out of 10 times, how many times will you go for a second plate of food, although other people are yet to be served?		Avoiding an ego-centric action will be to wait till everyone gets served before going for a second plate of food. In this task, the student is sharing physical resources with other people. The physical resource is not scarce and the others in the task situation are highly perceptible.

3.4 Data analysis

3.4.1 Quantitative data analysis.

At the end of data collection for each region, the responses were scored using Microsoft Excel. The items that represented making an ego-centric choice were reversed to indicate avoiding making an ego-centric choice. Scores per student on the pro-social and avoiding making an ego-centric choice scales were computed, after which the total empathic score per student was computed. The data was then imported into SPSS version 25 for further analysis.

Descriptive statistical analyses were conducted to investigate the data structure on both subscales (pro-social behaviour scale and the scale of avoidance of ego-centric behaviour) and the overall scale of empathic behaviour. In addition, descriptive statistics were calculated to investigate the frequency distributions of the background variables of the respondents. A correlation analysis was conducted to investigate the correlation between the subscales of empathic behaviour and the overall scale of empathic behaviour.

Within the framework of Classical Test Theory, a reliability analysis was done to determine the reliability of the overall scale of empathic behaviour and the subscales of pro-social behaviour and the avoidance of ego-centric behaviour. Also, test item characteristics were explored to investigate the difficulty of the test items and the extent to which the items discriminate between students who scored relatively high and those who scored relatively low on their empathic behaviour.

Two exploratory factor analyses were conducted using two separate statistical software (SPSS and FACTOR version 14.1.0.0) to investigate the factor structure of the overall scale of empathic behaviour. The analyses also checked for the presence of factors based on the principles of item construction of scarcity (high/low) and perceptibility (low/high).

In order to investigate the effect of the student's background on their empathic behavioural choices, independent sample t-tests were conducted in SPSS. The t-tests investigated: 1. the differences between students from the northern and the southern parts of Ghana in their empathic behaviour, 2. the differences between Ghanaian adolescent boys and girls in their empathic behaviour and, 3. The difference between students who identify as Christians and those who identify as Muslims.

3.4.2 Qualitative data analysis.

The interviews were transcribed verbatim (using Microsoft Word) and analyzed using an inductive coding approach based on the framework of competent action of Roelofs and sanders (2007) and on the framework regarding moral reasoning as described in the six stages of moral development of Kohlberg (as cited in Kohlberg, 1984). Eleven interviews out of the twelve were transcribed. The interview data for one of the students were removed from the dataset because it was realized that a teacher was standing by during the interview, interfering with the process.

The main aim of coding the interview responses was to identify patterns and categories among the subgroups (Elo & Kyngäs, 2008) of low and high scoring differ in their mental processes during task performance as investigated retrospectively. The coding of the data was done manually without using any computer software. The utterances of the students were the units of analysis. These utterances were summarized into categories and coded. The inductive coding was mainly guided by a combination of underlying mental deliberation of sub-processes of empathic behaviour (Roelofs & Sanders, 2007; Roelofs & Keuning, 2020) and the six stages of Kohlberg's moral reasoning (as cited in Kohlberg, 1984). See sections 2.2 and 2.3 for the discussions on the stages of Kohlberg's moral development theory and the conceptual framework of competent actions, respectively.

The coded themes were organized to represent the various processes of the conceptual framework of competent action of Roelofs & Sanders (2007). This conceptual framework involved *perception* of task situation, *appraisal* of task situation, and *consideration* of choice in the task situation. Also, the different moral perspectives that the students uttered were coded using different stages of moral reasoning of Kohlberg (as cited Kohlberd 1984). For instance, when a student said he/she perceived his / her personal goal for not adding the rubbish to a dustbin which was already full, was to keep the community clean because it was the rule and, as a result, the right thing to do, that statement was coded as "*perception of personal goal naively egocentric, rule = rule"*. Naïve ego-centrism is a level one (lower level), second-stage moral reasoning in which the student's moral judgment was residing in the external. In contrast, if a student indicated that his / her goal in the same task situation was to keep the community clean since his / her actions may cause diseases to the community as a whole, that statement was coded as *"perception of personal goal is related to the avoidance of the violation of the right of others"*. In this case, the student avoided the violations of the will and rights of others to be healthy. The avoidance of the violation of the rights of others is considered a level three (higher-order), stage five moral reasoning in which moral judgement of the student was residing in the internal. The individual was ascribing to shared standards, rights and duties of society.

In some cases, the inductive meaning of what the students said did not fit into any moral reasoning levels. For instance, when students' made utterances which indicated that their personal goal was exclusively guided by their need for safety and personal comfort, such statements were coded as *"perception of personal goal self-serving"*. Tables 8 *(Perception),* 9 *(Appraisal)* and 10 *(Consideration)* provide examples for codes, their assigned label and a summary of the description of the codes per each of the processes. See appendices E, F and G

for a detailed description of processes and the student's statement indicating the various levels of the processes.

In order to check for coding reliability, the coding was done two times with one week interval between the two sessions of coding. In a few instances (5 of such instances) where there were variations in the coding, the participant's primary transcript was revisited, and adjustments were made. The coding and the relating statement were checked and discussed with the external supervisor for coherence.

The coded data were uploaded into excel, and pivot tables created to identify patterns per score group (high-low) and per process. That data were analyzed per task across the three processes of competent action (*perception, appraisal* and *consideration*). Except for student number 298, there were twelve processes per student representing the three processes of *perception, appraisal* and *consideration* per task. Student number 298 only had ten processes because the student misunderstood one of the tasks. Therefore, the processes of *appraisal* and *consideration* could not be investigated for that particular task, and as a result, there were no codes for these two processes. Table 11 describes the main processes that were identified and coded per student. The inductive coding generated 248 codes in total, made across the three processes of competent action. The breakdown per process is as follows: 1. *Perception* – 130 codes; 2. *Appraisal* – 73 codes and; *Consideration* – 45 codes. These codes, which described the various inductive themes within the process, would be referred to as "*observations*".

Table 8.
Codes and assigned label - Perception

Code and labels	Summary description
00. POA - Perception of the other absent	The student did not perceive others participants in the task situation.
01. PT - Perception of task correct (as intended)	The student adequately perceived the task situation as intended.
02. PTI – Perception of task incorrect	The student incorrectly perceived the task situation.
03. PPG/NE - Personal goals are naively egocentric (rule=rule)	The student says that he/she made that choice because it was the right thing to do.
05. PPG/OP - Personal goals are to obey the law / avoid punishment	Personal goals are to obey the law / avoid punishment
06. PPG/G-bO - Personal goal is linked to the good boy orientation	The student wants to conform to the stereotypical image that the society has of him. The student wants people to see him/her in a positive light as expected of him by society.
07. PPG/AVRO - Personal goal is related to the avoidance of the violation of the rights of others	The goal of the student was linked to the goal of the primary other in the task situation in terms of the access and sharing of resources (physical and social) and space (physical and social).
08. PPG/SSer - Personal goal is self-serving	The goal of the student was self-serving, exclusively taking into consideration on his/her personal comfort, needs and security.
10. PPO - Perception of primary other	Perception of other participants in the task as intended by the task.
11. PSO - Perception of secondary other	The student perceived family and friends in the task without the perceiving the immediate "other" in the task situation.

Table 9.
Codes and assigned label - Appraisal

Code and labels	**Summary description**
00. AA - Appraisal absent	The student did not consider the "other" in the task situation in the choice they made. They focused solely on their personal goals to make the choice they made. This code is used when the student mentioned at the perception stage that they did not perceive any other participant in the task situation.
01. AGO/A - Appraisal of goal of the other absent	The student did not consider the goals of the other in the task situation.
02. AGO/G-bO - Problem at stake is being seen as a good person	The student thinks the other participant in the task situation will also want to be a good boy.
03. AGO/LPG - Appraisal of goals of the other linked to personal goal of the student	The student repeated their personal goals as the problem at stake.
04. AGO/NE - Naïve ego-centrism by the other	The goal of the other will be to do the right thing.
06. APS/Int - Problem at stake identified as intended by the task	The student identified the problem at stake to be sharing or access to resources or space.
07. APS/Lit - Appraisal of problem at stake is literal	The student has a literal understanding of the problem at stake as depicted by the picture. The student just describes the picture in the task or narrates the task as it was written in text.
08. APS/LPG- Appreciation of the problem at stake linked to personal goals	The student repeated their personal goals as the problem at stake
09. APS/G-bO - Problem at stake is being seen as a good person	Problem at stake is being seen by the community as a good person.
10. APS/Dil - Problem at stake is a dilemma of making a prosocial choice or a self-serving choice	The student identifies the problem at stake to be the dilemma of making a prosocial as against a self-serving choice.
11. APS/SSer - Problem at stake is self-serving	The goal of the student was self-serving, only taking into consideration on his/her personal comfort, needs and security.
12. AEO/A - Appraisal of the emotional state of the other absent	The student did not consider how the other will feel about the situation.
13. AEO/P - Appraisal of how the other will feel about the situation is present	The student imagined how the other will feel about the task situation (positive of negative)

Table 10.
Codes and assigned label - Consideration

Code and labels	Summary description
00. CA - Consideration absent	The student had no consideration of the task situation. This code was used if the student said at the perception stage that they did not perceive any other participant in the task situation.
01. C/G-bO - Consideration good boy orientation	The choice serves the needs of the others because he is being a good boy and the others will see him as a good boy as well.
02. C/LF - Considered loyalty for friends	The student made choices in the task situation based on loyalty to his/her friends and believes his choice meets his needs and those of his friends.
03. C/NE - Consideration to doing the right thing	He met his goal of doing the right thing and the goal of others to do the right thing as well.
04. C/NSO - Consideration for the needs of the secondary other	The choice meets his needs and the needs of the secondary other.
05. C/NVRSO - Consideration of not violating the right of self and of others	The choice made met the personal need of the other and the student in the access/sharing of resources (physical/social) or space (physical / social)
06. C/SSer - Consideration to exclusively own personal goal	The choice made served personal needs of comfort and security as stated by personal goals not taking the other into consideration.
07. CEO/Neg Consideration of the emotions of the other, negative emotions	After reflection, the student regrets not consideration the feelings of the other in the task situation and therefore regrets the choices that they made
08. CEO/PE - Consideration of the emotions of the other, positive emotions	Considers that the others will be happy with the choice made

Table 11
Descriptive table of main processes per student.

	Number of observations	
Student number	Low	High
9	12	
36		12
66		12
84		12
135	12	
165	12	
196	12	
227	12	
247		12
293		12
298		10

4.0 Results

The current study investigated the extent to which it is possible to develop an assessment tool that can reliably measure empathic competence among Ghanaian students between the ages of 10 – 14 years in a situational context. In order to answer the first research question, the results of the descriptive analyses, the analyses of subscales separately, the reliability analyses of the overall scale of empathic behaviour and confirmatory factor analyses would be presented. The analysis of item difficulty and item discrimination would be presented to answer the second research question. Also, the findings of the influence of background variables as a predictor of empathic behaviour would be presented to answer the third research question. The findings of the qualitative interviews would give insight into the mental processes of two contrasting groups (high – low) of students, hence answering the fourth research question.

4.1 Descriptive Statistics.

The data was explored to find the means and standard deviations for the study variable. Table 12 shows the means and standard deviations of the scale of avoidance of egocentric behavior, the scale of pro-social choices and, the overall scale of empathic behaviour. On average, students in Tamale scored higher on their empathic behaviour (M = 6.41; SD = .90) than students from Accra (M = 5.81; SD = .89). Students from Tamale found it easier to make prosocial choices (M = 7.35; SD = 1.16) than students from Accra (M = 6.94; SD = 1.05). The scale avoidance of ego-centric behaviour had the lowest average scores in both regions with the highest spread in the student scores (Tamale: M = 5.54; SD = 1.28: Accra: M = 4.75; SD = 1.18).

The histograms for the distributions of the scale of prosocial behaviour, avoidance of egocentric behaviour and empathic behaviour were plotted. The histograms are unimodal and symmetric. Skewness and kurtosis for age, total scores for avoidance of egocentric, prosocial

and empathic actions was less than -1 and 1. A normal distribution, as a result, can be assumed. In investigating the data for outliers, a scatter plot of the scale of avoidance of egocentric behaviour was plotted against the scale of prosocial behaviour. Two outliers were identified in the data. These outliers were removed from the data and the analysis redone. The steepness of the slope did not change significantly. The two outliers were therefore not pressure points and were hence retained in the data.

Table 12.
Means and standard deviations of study variables grouped by location (N = 309)

	Schools in Tamale (N = 158)		Schools in Accra (N = 151)	
	M	SD	M	SD
Scale of avoidance of egocentric choices (29 items)	5.54	1.28	4.75	1.18
Scale of prosocial choices (27 items)	7.35	1.16	6.94	1.05
Overall Scale of empathic behaviour (56 items)	6.41	.90	5.81	.89

4.2 Analyses of the subscales of EB

4.2.1 The scale of avoidance of ego-centric behaviour.

In analyzing the test data on the scale of ego-centric behaviour, the results indicate that, on average, students found it relatively difficult to completely avoid making ego-centric choices (M = 5.16; SD = 1.30). The average mean score per test item on the scale ranged between 2.34 (Item 56: *burning the rubbish behind the house*.) and 7.08 (item 20: *leaving without flushing the toilet after using it*). Item 56 had the lowest corrected item-test correlation (r = -.11), an indication the item does not fit in the scale of empathic behaviour. Item 31 *(taking a second plate of food before other people are served, and there was enough to serve)* is the item with the highest corrected item-test correlation (r = .58).

The reliability of the set of 29 items that constituted the scale of avoidance of ego-centric behavior is highly acceptable (a = .82). However, six of the items have either a negative corrected total item correlation or a low corrected total item-test correlation ($r <$ .20). Though the generally acceptable item-test correlation is .30 and above, for exploratory studies, .20 is acceptable (Hama, 2020). A low corrected item-test correlation with a set of unidimensional items indicates that the item has a weak association with the true score of the variable that is being measures (DeVellis, 2006). As a result, the six items were deleted for the scale of avoidance of ego-centric behavior. Cronbach's alpha for the remaining 23 set of items that comprised this scale amounts to is .86. The result indicates that internal consistency of the scale of avoidance of ego-centric behavior is highly acceptable.

The mean corrected item-test correlation for the remaining 23 items on the scale of avoidance of ego-centric behavior was acceptable (r = .43). According to the guideline of Clark and Watson (1995), a narrow construct unidimensional scale with the mean corrected item-test correlation between .40 and .50 is acceptable. The result suggests that the scale of avoidance of ego-centric behavior is unidimensional.

4.2.2 The scale of pro-social behavior.

The student responses on the scale of pro-social behaviour indicates that on average students (out of 10 times) more often made pro-social choices (M = 7.15; SD = 1.12) than they avoided engaging in ego-centric behavior (M = 5.16; SD = 1.30). The average mean score per test item on the scale ranged between 4.45 (item 8*: put a bag under the seat in front to leave space for other passengers)* and 8.87 *(*item 34*: wash hands immediately after using the toilet to prevent sanitary problems).* In addition to being the item with the lowest mean score, item 8 also had the lowest corrected item-test correlation (r = -.14). Item 29 (*share the mangoes with other children in the neighbourhood)* had the highest corrected item-test correlation (r = .56).

Twenty-seven test items were used to for the scale of prosocial behaviour. Cronbach's alpha for the scale was also sufficient (α = .80). The corrected item-test correlation for four of the items on the scale were either negative or low ($r < .20$). These items were left out of the scale, resulting in a final Cronbach's alpha for the remaining 23 items representing the scale of prosocial behaviour of .84. The mean item-test correlation for pro-social behavior was also acceptable (r = .41). The results indicates that the internal consistency of the scale of pro-social behavior is highly consistent and unidimensional.

4.2.3 Correlation between the subscales of empathic behaviour

There was a strong significant correlation (r = .83; $p < .01$) between the scale of avoidance of ego-centric behavior (23 items) and the overall scale of empathic behaviour (46 items). Also, there was a strong significant correlation (r = .72; $p < .01$) between the scale of pro-social behaviour (23 items) and the overall scale of empathic behaviour. A weak significant correlation (r = .20; $p < .01$) was also found between the scale of avoidance of ego-centric behavior and the scale of pro-social behavior. This is the first indication that avoiding ego-centric behaviour does not necessarily imply pro-social behaviour, although both are associated with empathic competence.

4.3 Reliability analysis of the overall scale of empathic behaviour

The reliability (α = .88) for the remaining 46 items that make up the overall scale for empathic behaviour (EB) is highly sufficient. Following the guidelines of Nunnally (as cited in Clark & Watson, 1995), scale developers should ensure that their alpha is above .80. If the alpha of a newly constructed scale falls below .80, the scale needs to be revised to raise the reliability.

The results of the analyses of the corrected item-total correlation (r), which is also an indication of the item discrimination (r_{ir}), indicate that the top five most discriminating items ($r_{ir} \geq .50$) were from the scale of avoidance of ego-centric behaviour. Some of the 46 items

successfully discriminated between students with high scores and those with low scores on the scale of empathic behavior. However, some of the items might require revision despite the high reliability of the scale. Using the parameters for the interpretation set out by Bichi et al. (2015), fifteen items functioned satisfactorily ($r_{ir} \geq .40$) with the ability to discriminate well between students who scored high and those who scored low on the scale of empathic behaviour. Twenty items ($d < .39 \; and \; \geq .30$) are Good items requiring little or no revision. Seven items are classified as marginal ($d < .29 \; and \; \geq .20$), which may require revision. Four out of the 46 items could be classified as poor ($d \leq .19$) requiring revision. Though the items could classified as poor, they were retained on the scale of empathic behaviour for content purposes. Also, according to Clark and Watson (1995), higher order constructs such as empathy are multidimensional, having two or more narrower unidimensional constructs. As a result, a low corrected inter item correlation ($r \leq .15$) for such broad constructs is acceptable. Besides, the said four items had broad range of distributions hence they discriminated along the continuum (avoidance of ego-centric behavior to prosocial behaviour) of the scale of empathic behaviour. The mean inter-item correlation ($r = .36$) for the 46 items was acceptable.

The result of the analysis of the item difficulty shows that out of the 46 items, on average, none of the test items was too difficult (p*) for the students. Item difficulty was calculated by dividing the item score by the highest the maximum theoretical value which is 10. All the items had p* values above .30. Two items on the scale of avoidance of egocentric behaviour (items 27 and 55) with burdening conditions of high scarcity and low perceptibility were on the average the most difficult with p-values of .34 and .32 respectively. Seventeen out the eighteen items with their p^* value above .70 belonged to the scale of pro-social behavior. The students showed low scores on the scale that measured the avoidance of egocentric choices. On the other hand, students showed high scores on the scale that measured

making prosocial choices. This result could be interpreted that student find it easier to make prosocial choices than to avoid making egocentric choices. Table 13 shows the mean p^* values of the test items across burdening conditions and across scale. Table 14 shows 46 test items, their item scores, p^* values corresponding r_{ir}-values Table 13

Mean pvalue of test items across burdening conditions

EGO-PROSOC	Perceptibility other	Scarcity	Mean P*
Egocentric	High	High	.53
		Low	.51
	Low	High	.58
		Low	.59
Prosocial	High	High	.72
		Low	.71
	Low	High	.76
		Low	.81
Grand Total			**.65**

Table 14

Table of item scores, item difficulty and discrimination

Item	Mean score	R_{ir} value	P*-value
34 You have just used the toilet. to wash your hands immediately after using the toilet?	8.67	.29	.87
51 Your school gives free textbooks at the beginning of every academic year which you have to return at the end of the academic year. to take good care of the textbook before returning it ?	8.42	.36	.84
52 You share the same dustbin with your neighbour. The dustbin is, however, near your neighbours gate. You were sending rubbish to the dustbin, and some poured on the floor. to collect it and pour in the dustbin?	8.07	.43	.81
22 The President of the country asked that everyone should wear a nose mask when going out of their houses. Out of 10 times, how often will you wear a mask when going out?	8.18	.44	.81
29 You plugged a lot of mangoes from the mango trees in your house. to share the mangoes with other children in the neighbourhood?	8.07	.41	.80
42 Your cousin told you something about a girl in your school. This girl is not liked by most people in the school. will you tell your cousin to stop spreading rumours about other people?	7.99	.39	.80
37 You are talking with a classmate, and suddenly your best friend comes around. to introduce your best friend to the classmate you are talking to?	7.97	.18	.79
14 You share a bedroom with your junior sister. It is a big room. You want to listen to music on your phone. to use your earphone?	7.62	.29	.78
21 You need to go to the toilet in the evening. There is no toilet in your house. to use the community public toilet?	7.61	.37	.76
25 You are standing at a buffet, and you are hungry. There 20 spring rolls on the table. There are also exactly 20 guests. to take one spring roll?	7.67	.41	.77
50 A classmate of yours did not bring any lunch to school. to share your lunch with your classmate?	7.71	.44	.77
46 A new student has come to your school, and she had no friends in your school. to talk to her on the first day.	7.71	.37	.77
13 You were at the beach with your friends. The beach was not crowded. You will like to enjoy some good music with your friends. To turn down the volume of the music?	7.75	.34	.75
18 Youve been chilling in a park with friends. You have empty cans of thrash to throw away, but the dustbin is completely full. to carry the rubbish with you home to put in the dustbin at home?	7.48	.43	.75
11 You are trying to read a book in the afternoon and your junior brother practice was disturbing you. To come into an agreement with him to practice his guitar at a later time.	7.47	.31	.75

30 Your father brought home a box of Golden Tree Chocolate for you and your junior sister. To share the box of chocolates into equal quantities with your sister?	7.37	.39	.74
17 Your friends came over to visit you during the holidays. Your parents are at work. will you ensure that you play indoor games without shouting?	7.14	.27	.71
20 You used the water closet in your school. After using it, you realised that the tap was not flowing. The school, however, has a water tank with water in it. to leave without flushing the toilet.	7.09	.48	.71
35 You ate the schools canteen, and some of the food particles dropped on the table. to get up and leave immediately after eating without cleaning the table	6.92	.54	.69
12 After break time in class, you realised someone dropped a banana peel just by your desk. To pick the banana peel and drop it in the dustbin without asking who dropped it by your desk?	6.93	.32	.69
38 You are with five classmates, and you are playing football. An unfamiliar boy from a lower class wants to join you - he is not good at the game. To allow the young boy to join in the football game?	6.79	.37	.68
04 You went to a party. The place was crowded with some people standing. The seat next to you is, however vacant. will you put your bag on your lap?	6.74	.24	.67
54 You have just had a shower (bath), and you noticed that some of the soap leather got on the wall of the shower area. Out of 10 times how many times are you likely leave without rinsing the wall?	6.71	.51	.67
26 You have just waited 5 minutes at the toilet. Now its almost your turn. Suddenly a boy panics. He says he almost gets it in his pants. to let him use the toilet before you use.	6.58	.30	.66
19 You have finished drinking a sachet of pure water. There is no dustbin around. to drop the rubber on the floor.	6.61	.40	.66
09 You are cycling on the pathway with your friends shoulder to shoulder. The is a pedestrian walking towards you. will you continue cycling, as shown in the picture above?	6.59	.39	.66
16 You are taking a stroll with your brother on a Sunday afternoon in your area. There is no car on the road. To walk in the middle of the road?	6.42	.51	.64
24 It is evening time. Your bicycle lights are broken, but you want to go somewhere. to go with your bicycle?	6.33	.34	.63
36 Due to the corona outbreak, your teacher asked that you stay at home when you dont feel well. You woke up one morning and felt a little unwell. You had a runny nose and a cough. To still go to school?	6.27	.27	.63
28 Your teacher brought 30 pieces of fruit to class. You are 30 in the class. to take more than 1 fruit.	6.21	.50	.62
03 You are on a crowded bus, the seat next to you is empty. There is no luggage rack where you can put your bag. to put your bag on your lap?	6.24	.18	.62
15 You are cycling with a friend shoulder to shoulder. The road is not busy, and it is very broad. A pedestrian is coming in the opposite direction. will you continue cycling shoulder to shoulder with your friend	6.04	.30	.60

41 On Facebook or Instagram, you see a message in which a girl gets a lot of negative comments about her new haircut. You dont like the hairstyle either. to stand up for the girl?	5.91	.18	.59
48 Someone you know, but you do not like much is celebrating a birthday party and, invites you to the party. To rather sit at home and enjoy a good music by yourself than go to the party?	5.60	.15	.56
31 You have been invited to a birthday party, and a tasty jollof rice was being served, and there was enough to serve everyone. will you go for a second plate of food, although other people are yet to be served?	5.44	.59	.54
06 You are on a virtually empty bus. There is a luggage rack on the bus. to put your bag on the seat next to you	5.36	.36	.54
49 You saw an embarrassing post about a girl in another school on social media. to share the post with your friends?	5.31	.35	.53
47 Imagine you are alone for a long time, either because your brothers /sisters have travelled or you are an only child. To respond in equal measure by saying something equally nasty to him?	5.27	.42	.53
02 Your school is going for an excursion, and you get into an almost crowded bus. There is one more seat next to you where you are seated. To put your bag on the seat next to you?	5.17	.36	.52
53 You are in a crowded place, and due to the COVID situation, everyone was asked to wear a mask. The weather was hot, and you were sweating. are you likey to remove your mask as indicated in the picture?	5.14	.24	.51
43 There is a WhatsApp message circulating spreading rumours about a child in another school. Someone in your school forwarded the message to you. to forward to message to your friends?	5.10	.35	.51
39 Your cousins came to visit, and you are sitting together in the common play area. will you check your phone to check if you have any new messages on Instagram, WhatsApp or Facebook?	5.00	.27	.50
44 A message appears on your Facebook/Instagram from someone which, makes you pretty angry. to write an equally angry reaction to that person (E.g. calling hime/her names, ridiculizing him/her).	4.79	.55	.48
40 A young girl in your class stripped and fell. Some of your classmates were making fun of her. To join them in making fun of her	4.55	.34	.45
27 You stand in a queue to make payment in the shop. Another cashier comes to open a second payment point. To make a sprint to be the first to get to the cashier before others can get ahead of you?	3.36	.30	.34
55 It is New Years Eve (the eve of 31st December). to light fireworks if you have them?	3.17	.22	.32

4.4 Factor Analysis of items on the overall scale of empathic behaviour.

An exploratory principal axis factor analysis was conducted in SPSS on the 46 items to check whether the structure of the factors fit according to the construction principles of the scarcity (low/high) and perceptibility (low/high). An oblique rotation (direct oblimin) was used. An initial analysis was conducted with extraction based on Eigenvalues greater than one. The scree plot suggested the presence of four factors in the overall scale of empathic behaviour. The analysis was repeated with extraction was based on a fixed number of factor (4). The four factors in combination explained 33.92% of the variance in the overall scale of empathic behaviour. The items did not load on the factors according to the test construction principles of scarcity (high/low) and perceptibility (high/low). The items that fitted on the same factor suggested the following: 1. Factor 1 – engaging in prosocial behavioural choices (12 items); 2. Factor 2 – avoidance of egocentric behavioural choices (16 items); 3. Factor 3 - showing empathic behaviour in the form of avoiding causing social inconvenience to other people (7 items); 4. Factor 4 - the frequency of empathic behaviour in situations that may result in direct confrontation with other people (5 items). The inter factor correlations for the four factors are very low, indicating that the four factors are different dimensions of the scale of empathic behaviour. The majority of the test items loaded on factors one and two. These two factors represent the subscales used in item construction. Table 15 shows the inter factor correlation between the factors. Table 16 shows the factor loadings after rotation.

A second exploratory factor analysis was conducted using different statistical software, FACTOR, to check whether the structure of the factors fit according to the construction principles. *Robust factor analysis* was performed without imposing any fixed number of factors. The results indicate that there were four factors present in the overall scale of empathic behaviour with low inter factor correlation, as observed in the factor analysis conducted in SPSS. Also, the level of explained variance was consistent with what was

observed in SPSS. The four factors that were observed only explained 34% of the variance. The test items that loaded per factor, however, differ from what was observed in SPSS.

From a statistical point of view, there might be evidence that there are four factors in the overall scale of empathic behaviour. However, the evidence is not very strong because the four factors only explain 34% of the variances in the overall scale of empathic behaviour. Besides, the items that loaded on each of the factors differ per statistical software. A decision was therefore made to analyse the overall scale of empathic behaviour as a unidimensional scale based on how the test items were constructed.

Table 15

Inter factor correlation for the exploratory factor analysis.

	F1	**F2**	**F3**	**F4**
Factor 1	1.00			
Factor 2	0.12	1.00		
Factor 3	0.29	0.27	1.00	
Factor 4	0.27	0.15	0.08	1.00

Table 16
Factor loadings of EFA

Items	Factor			
	1	2	3	4
IT002_HSPSE02 02 Your school is going for an excursion, and you get into an almost crowded bus. There is one more seat next to you where you are seated. To put your bag on the seat next to you?	.03	**.50**	-.05	.03
IT006_LSPSE02 06 You are on a virtually empty bus. There is a luggage rack on the bus. to put your bag on the seat next to you	.03	**.51**	-.01	-.04
IT009_HSSSE01 09 You are cycling on the pathway with your friends shoulder to shoulder. The is a pedestrian walking towards you. will you continue cycling, as shown in the picture above?	.03	**.38**	.20	-.03
IT015_LSSSE01 15 You are cycling with a friend shoulder to shoulder. The road is not busy, and it is very broad. A pedestrian is coming in the opposite direction. will you continue cycling shoulder to shoulder with your friend	.10	**.32**	.01	.04
IT016_LSSSE02 16 You are taking a stroll with your brother on a Sunday afternoon in your area. There is no car on the road. To walk in the middle of the road?	.19	**.66**	.02	-.14
IT019_LPPSE01 19 You have finished drinking a sachet of pure water. There is no dustbin around. to drop the rubber on the floor.	.21	**.40**	.16	-.25
IT020_LPPSE02 20 You used the water closet in your school. After using it, you realised that the tap was not flowing. The school, however, has a water tank with water in it. to leave without flushing the toilet.	.21	**.51**	.17	-.21
IT024_LPSSE02 24 It is evening time. Your bicycle lights are broken, but you want to go somewhere. to go with your bicycle?	.00	**.30**	.23	.01
IT027_HSPRE01 27 You stand in a queue to make payment in the shop. Another cashier comes to open a second payment point. To make a sprint to be the first to get to the cashier before others can get ahead of you?	-.24	.26	.27	.22
IT028_HSPRE02 28 Your teacher brought 30 pieces of fruit to class. You are 30 in the class. to take more than 1 fruit.	.08	**.60**	-.06	.15
IT031_LSPRE01 31 You have been invited to a birthday party, and a tasty jollof rice was being served, and there was enough to serve everyone. will you go for a second plate of food, although other people are yet to be served?	-.01	**.48**	**.32**	.18
IT035_LPPRE01 35 You ate the schools canteen, and some of the food particles dropped on the table. to get up and leave immediately after eating without cleaning the table	.15	**.30**	**.35**	.10
IT036_LPPRE02 36 Due to the corona outbreak, your teacher asked that you stay at home when you dont feel well. You woke up one morning and felt a little unwell. You had a runny nose and a cough. To still go to school?	-.13	.16	**.52**	-.13
IT039_HPSRE01 39 Your cousins came to visit, and you are sitting together in the common play area. will you check your phone to check if you have any new messages on Instagram, WhatsApp or Facebook?	-.02	.12	.28	.06
IT040_HPSRE02 40 A young girl in your class stripped and fell. Some of your classmates were making fun of her. To join them in making fun of her	-.18	**.46**	-.06	**.37**
IT043_LPSRE01 43 There is a WhatsApp message circulating spreading rumours about a child in another school. Someone in your school forwarded the message to you. to forward to message to your friends?	-.10	**.31**	.27	.05
IT044_LPSRE02 44 A message appears on your Facebook/Instagram from someone which, makes you pretty angry. to write an equally angry reaction to that person (E.g. calling hime/her names, ridiculizing him/her).	-.04	**.46**	.08	**.50**

IT047_HSSRE01 47 Imagine you are alone for a long time, either because your brothers /sisters have travelled or you are an only child. To respond in equal measure by saying something equally nasty to him?	.04	**.39**	-.02	**.30**
IT048_HSSRE02 48 Someone you know, but you do not like much is celebrating a birthday party and, invites you to the party. To rather sit at home and enjoy a good music by yourself than go to the party?	-.10	.20	.21	-.12
IT049_LPSRE03 49 You saw an embarrassing post about a girl in another school on social media. to share the post with your friends?	-.01	**.48**	.00	.01
IT053_LPPRE03 53 You are in a crowded place, and due to the COVID situation, everyone was asked to wear a mask. The weather was hot, and you were sweating. are you likey to remove your mask as indicated in the picture?	-.02	**.44**	-.02	-.10
IT054_LPPSE03 54 You have just had a shower (bath), and you noticed that some of the soap leather got on the wall of the shower area. Out of 10 times how many times are you likely leave without rinsing the wall?	.28	**.49**	.09	-.12
IT055_LPSSE03 55 It is New Years Eve (the eve of 31st December). to light fireworks if you have them?	-.04	**.40**	-.20	.19
IT003_HSPSP01 03 You are on a crowded bus, the seat next to you is empty. There is no luggage rack where you can put your bag. to put your bag on your lap?	.09	-.04	.04	.29
IT004_HSPSP02 04 You went to a party. The place was crowded with some people standing. The seat next to you is, however vacant. will you put your bag on your lap?	**.30**	.06	-.06	.12
IT011_HSSSP01 11 You are trying to read a book in the afternoon and your junior brother practice was disturbing you. To come into an agreement with him to practice his guitar at a later time.	.05	-.07	**.57**	.00
IT012_HSSSP02 12 After break time in class, you realised someone dropped a banana peel just by your desk. To pick the banana peel and drop it in the dustbin without asking who dropped it by your desk?	.19	.02	.12	**.31**
IT013_LSSSP01 13 You were at the beach with your friends. The beach was not crowded. You will like to enjoy some good music with your friends. To turn down the volume of the music?	.17	.02	**.34**	.04
IT014_LSSSP02 14 You share a bedroom with your junior sister. It is a big room. You want to listen to music on your phone. to use your earphone?	.27	-.03	**.30**	-.07
IT017_LPPSP01 17 Your friends came over to visit you during the holidays. Your parents are at work. will you ensure that you play indoor games without shouting?	.13	-.10	**.35**	.15
IT018_LPPSP02 18 Youve been chilling in a park with friends. You have empty cans of thrash to throw away, but the dustbin is completely full. to carry the rubbish with you home to put in the dustbin at home?	.27	.01	**.31**	.22
IT021_LPSSP01 21 You need to go to the toilet in the evening. There is no toilet in your house. to use the community public toilet?	**.35**	-.09	**.36**	.08
IT022_LPSSP02 22 The President of the country asked that everyone should wear a nose mask when going out of their houses. Out of 10 times, how often will you wear a mask when going out?	**.43**	-.01	.19	.20
IT025_HSPRP01 25 Youre standing at a buffet, and you are hungry. There 20 spring rolls on the table. There are also exactly 20 guests. to take one spring roll?	**.37**	.12	.12	.11
IT026_HSPRP02 26 You have just waited 5 minutes at the toilet. Now its almost your turn. Suddenly a boy panics. He says he almost gets it in his pants. to let him use the toilet before you use.	.27	.05	-.06	**.31**
IT029_LSPRP01 29 You plugged a lot of mangoes from the mango trees in your house. to share the mangoes with other children in the neighbourhood?	**.50**	-.02	.16	.12
IT030_LSPRP02 30 Your father brought home a box of Golden Tree Chocolate for you and your junior sister. To share the box of chocolates into equal quantities with your sister?	**.37**	-.07	.28	.15

IT034_LPPRP02 34 You have just used the toilet. to wash your hands immediately after using the toilet?	**.39**	-.07	.22	-.03
IT037_HPSRP01 37 You are talking with a classmate, and suddenly your best friend comes around. to introduce your best friend to the classmate you are talking to?	**.37**	-.04	-.04	.04
IT038_HPSRP02 38 You are with five classmates, and you are playing football. An unfamiliar boy from a lower class wants to join you - he is not good at the game. To allow the young boy to join in the football game?	.14	-.02	.24	**.36**
IT041_LPSRP01 41 On Facebook or Instagram, you see a message in which a girl gets a lot of negative comments about her new haircut. You dont like the hairstyle either. to stand up for the girl?	.17	-.05	-.04	**.38**
IT042_LPSRP02 42 Your cousin told you something about a girl in your school. This girl is not liked by most people in the school. will you tell your cousin to stop spreading rumours about other people?	**.59**	.09	.02	-.07
IT046_HSSRP02 46 A new student has come to your school, and she had no friends in your school. to talk to her on the first day.	**.48**	.06	-.02	.13
IT050_HSPRP03 50 A classmate of yours did not bring any lunch to school. to share your lunch with your classmate?	**.59**	.24	-.17	.05
IT051_LPPRE04 51 Your school gives free textbooks at the beginning of every academic year which you have to return at the end of the academic year. to take good care of the textbook before returning it ?	**.61**	.01	.04	-.06
IT052_LPPSP03 52 You share the same dustbin with your neighbour. The dustbin is, however, near your neighbours gate. You were sending rubbish to the dustbin, and some poured on the floor. to collect it and pour in the dustbin?	**.62**	.17	-.06	-.02
Eigenvalues	8.05	3.61	2.14	1.80
% of explained Variance	17.49	7.85	4.66	3.91

Note: Factor loadings > 0.30 appear in bold

4.5 Exploring background variables as predictors of empathic behaviour

In order to analyse the differences in the total scores for empathic behaviour between groups of students with different background variables, t-tests for independent samples were applied. Regarding gender, a significant difference in the total empathic scores for males *(M* = 6.01; *SD* = .92) and females (*M* = 6.26, *SD* = .97) was found [t(307) = -2.33, p = .01]. This result suggested that male students in Ghana showed less empathic behaviour than female students in social interactions.

Regarding religious background, a significant difference in mean scores of students who are Christians (*M* = 5.93, *SD* = .96) and those who are Muslims (*M* = 6.40, *SD* = .86) was found [t(307) = -4.49, p < .01]. This result indicated that, on average, students who identified as Muslims showed more empathic behaviour during social interactions than those who identified as Christians.

In respect to regional background, students form the northern part of the country (*M* = 6.41; *SD* = .91) and those in the southern part of the country (*M* = 5.81; *SD* = .89) differ significantly on their score of total empathic behaviour, [t(307) = 5.92; p < .01]. The result suggested that, on average, students from the northern part of the country showed more empathic behaviour in their social interactions than those from the southern part of the country. This result could, however, be explained by selection bias. The students in the northern part of the country were predominantly Muslims and those from the southern part of the country were predominantly Christians.

4.6 Influence of the field assistant.

The final part of the quantitative data investigated the influence of the research assistant on the student responses. An independent sample t-test was conducted to investigate if students differ in their empathic behaviour score due to 1. the teacher explaining one or more pictures to them and 2. the teacher assisting them in using the laptop. The results

indicated that there was no significant difference [t(86.51) = .61; p = .59] between the students who needed explanation (*M* = 6.18; *SD* = 1.10) and those who needed no explanation (*M* = 6.10; *SD* = .90) for one or more of the pictures. However the students who indicated that the teacher assisted them in using the laptop (*M* = 5.68; *SD* = .97) and those who answered that the teacher did not assist them in using the laptop (*M* = 6.20; *SD* = .92) differ significantly [t(306) = 3.48; $p < .01$] on their score of empathic behaviour. The students who did not have any help in using the laptop on average scored higher on their empathic behaviour than those who had help in using the laptop. With regards to the question "*the teacher helped me to answer the questions"*, none of the students answered in the affirmative.

4.7 Qualitative results

Qualitative interviews were conducted among 11 students who showed large differences in their total scores on the scale of empathic behaviour. The interview aimed to investigate how the contrasting group of students who scored low and high on their empathic behaviour differ in their mental processes during task performance as investigated retrospectively. Six of the students scored relatively high (6.0 and above) on empathic behaviour, and another five scored relatively low (below 6.0) on empathic behaviour. The interviews were inductively coded using a system based on the framework of competent action of Roelofs and sanders (2007) and on the framework regarding moral reasoning as described in the six stages of moral development of Kohlberg (as cited in Kohlberg, 1984). The framework of competent action of Roelofs and Sanders (2007), which was used to investigate the mental processes during task performance, involved *perception* of task, *appraisal* of task and *consideration* of task.

4.6.1 Descriptive analysis.

The highest number of students' mental utterances were coded in the *perception of task* situation (130 observations), followed by the *appraisal of the task* (73 observations).

Consideration had the lowest number of observations (45 observations). This result indicates that the students more frequently uttered thoughts they had had during the perception stage than they did about the appraisal and the consideration stages. Based on their answers, some students indicated that they did not engage in the processes of appraisal and consideration as at the time they were engaged in the task situation. In other words, they reported they had no deliberate mental processes when they chose a behavioural option.

4.6.2 Perception.

In our coding, we distinguished three sub-processes of *perception*: perception of social task at hand, the perception of one's own personal goal in solving the task and the perception of the other in the task situation. See table 17 for a breakdown of the overall observations on *perception* for the two contrasting groups of students. In comparing students who scored relatively low ($N = 5$) and those who scored relatively high ($N = 6$) on their total empathic behaviour, the results indicated that they do not differ much in their perception of the social task at hand. The result suggests that the majority of the students understood the task as it was intended.

However, there were differences between students who had low scores and high scores on their total empathic behaviour in how they perceived their personal goals in the task situation. The majority of the observations in which the students uttered that their personal goal in solving the task was self-serving (personal comfort and security) came from the students who scored low on their empathic behaviour. Twelve out of the thirteen self-serving personal goal observations were made by students who scored low on their total empathic behaviour. An example of a self-serving perspective made by a student was: *"I am hungry… If I want for them to serve everyone before I go again, I will lose my appetite, so I will go again immediately to collect the second plate"*. On the other hand, the majority of the observations relating to the avoidance of the violation of the right of others (10 times out of

14 times) were done by students who scored high on empathic behaviour. One of the students who scored high on total empathic behaviour said: *"I was hungry… But I think the food was for us to share …. so I was sharing".* Another perspective towards *perception* that was distinguished was linking the personal goals to the good boy orientation. Five out of the seven observations of the good boy orientation were made by students who scored high on total empathic behaviour. To illustrate this, a student said, "*I feel like I am a good boy because I am sending the rubbish home".* Out of the six observations relating to obeying the rules, four of those occurred among students who scored high on total empathic behaviour. The results suggest that on the whole, students who scored high on their total empathic behaviour mostly perceived their goals using the various perspectives of moral reasoning ranging from obedience and punishment to the avoidance of the violation of the right of self and of others. However, those who scored low on total empathic competence perceived their goals within the context of their personal needs and comfort.

Within the sub-process of the perception of the other in the task situation, out of the eleven observations in which the students did not perceive the other in the task situation, seven of them occurred among the students who scored low on total empathic behaviour. Among the student who scored low on total empathic behaviour who perceived the other in the task situation, the majority of them perceived the primary other, which is the intended other in the task. Interestingly, however, the majority of the perception of secondary other (the unintended other in the task situation) observations were made among those who scored high on total empathic behaviour.

Table 17
Overall observation for Perception contrasting two groups (high and low on EB)

	Count / percentages		
Types of observations	**Low (below 6.0)**	**High (6.0 and above)**	**Total**
Perception task			
01. correct (as intended)	20 (33%)	23 (33%)	43 (33%)
02. incorrect	0%	1 (1%)	1 (1%)
Perception of Personal goals			
03. naively egocentric (rule=rule)	2 (3%)	4 (6%)	6 (5%)
04. naively egalitarian (reciprocity)	0%	1 (1%)	1 (1%)
05. to obey the law / avoid punishment	0%	1 (1%)	1 (1%)
06. linked to the good boy orientation	2 (3%)	5 (7%)	7 (5%)
07. related to the avoidance of the violation of the rights of others	4 (7%)	10 (14%)	14 (11%)
08. self-serving	12 (20%)	1 (1%)	13 (10%)
09. Perception of personal goal absent	0%	1 (1%)	1 (1%)
Perception of other in situation			
10. Primary other	7 (12%)	7 (10%)	14 (11%)
11. Secondary other	6 (10%)	12 (17%)	18 (14%)
12. Absent	7 (12%)	4 (6%)	11 (8%)
Total	**60 (100%)**	**70 (100%)**	**130 00%)**

4.6.3 Appraisal.

The process of *appraisal* was also divided into three sub-processes: the appraisal of the goal of the other in solving the task, the appraisal of the problem at stake in the task situation and the appraisal of the emotions of the other. Out of the15 observations in which the students indicated that they did not take perspective to understand the other's goals, intentions and emotions, and the problem at stake, nine of the observations were in the group of those who scored low on their total empathic behaviour. As at the time of task performance, the students stated they only thought of their personal goals and did not engage in any of the processes of appraisal.

There were also differences between the contrasting groups (high and low on total empathic competence) in their *appraisal* of the goal of the other and the *appraisal* of the emotions of the other in the task situation. All the five observations in which the students

indicated that they did not take perspective of the emotions of the other in the task situations were among students who scored low on their total empathic behaviour. On the contrary, six out of the seven observations relating to the presence of the appraisal of the emotions of the other in the task occurred among students who scored high on their total empathic behaviour. For instance, a student said: *"people will be happy because they will also get some of the food to eat"*.

For the students who stated that they did not take perspective of the other person's goal, the majority of the observations (six out of seven) were among those who scored low on their total empathic behaviour. However, the majority of the observations in which the students uttered that they engaged in perspective-taking of the goals of the other, linking their personal goals to the goals of the other participants in the task situation occurred among the students who scored high on their total empathic behaviour. Ten times out of fourteen times, the students indicated that they believed that the other in the task situation would have the same goals as them. To illustrate this, a student said, *"those who were at the party someone also has to eat because the food was delicious"*. See table 18 for the overall observations for *appraisal* for the two contrasting groups.

Table 18
Overall observation for Appraisal contrasting two groups (high and low on EB)

	Count / percentages		
Types of observations	**Low (below 6.0)**	**High (6.0 and above)**	**Total**
00. Appraisal absent	9 (26%)	6 (16%)	15 (21%)
Appraisal of goals of the other			
01. Absent	6 (17%)	1 (3%)	7 (10%)
02. Being seen as a good person	0%	1 (3%)	1 (1%)
03. Linked to personal goal of the student	4 (11%)	10 (26%)	14 (19%)
04. Naïve ego-centrism by the other	0%	1 (3%)	1 (1%)
Appraisal of problem at stake			
05. No problem at stake	1 (3%)	2 (5%)	3 (4%)
06. Identified as intended by the task	3 (9%)	5 (13%)	8 (11%)
07. Literal	2 (6%)	3 (8%)	5 (7%)
08. Linked to personal goals	0%	1 (3%)	1 (1%)
09. Being seen as a good person	0%	1 (3%)	1 (1%)
10. A dilemma of making a prosocial choice or a self-serving choice	3 (9%)	1 (3%)	4 (5%)
11. Self-serving	1 (3%)	0%	1 (1%)
Appraisal of the emotions of the other			
12. Absent	5 (14%)	0%	5 (7%)
13. Present	1 (3%)	6 (16%)	7 (10%)
Total	**35 (100%)**	**38 (100%)**	**73 (100%)**

4.6.4 Consideration

Some differences were seen in the *considerations* given before making a decision between the group of students who scored low and those who scored high on their total empathic behaviour. Table 19 shows a summary of the overall observations for consideration. Based on the student responses, the majority of the observations (six out of ten) in which the students indicated that they did not engage in any deliberate mental process to preempt the consequences of their behavioural choice on self and other during the task performance was seen in the group of students who scored low on their total empathic behaviour. With regards to giving *consideration* to the goals of the other, out of the twelve observations in which the students indicated that they thought of the avoiding of the violation of the rights of self and others, nine of them were among those who scored high on the scale of empathic behavior.

An example of a statement made by a student who considered the avoidance of the violation of the right of self and other is: *"Yes, I think if I don't add the rubbish to the dustbin, I will serve the interest of those around because the place will be neat"*. On the other hand, out of the eight observations in which the students said that the only consideration they gave before taking a decision was exclusively their personal goal, six of them were among those who scored low on their total empathic behaviour. A student: *" I did not think of them,… because there is a lot of food, I can go and take more".* Out of the five observations in which the students gave consideration to doing the right thing, four of those observations were seen among students who scored high on their total empathic behaviour. One of the students said: *"I just want my parents to know I am good boy".*

Table 19.
Overall observation for Consideration contrasting two groups (high and low on EB)

	Count / percentages		
Types of observations	**Low (below 6.0)**	**High (6.0 and above)**	**Total**
00. Absent	6 (27%)	4 (17%)	10 (22%)
01. Good boy orientation	1 (5%)	3 (13%)	4 (9%)
02. Loyalty for friends	1 (5%)	0%	1 (2%)
03. Doing the right thing	1 (5%)	4 (17%)	5 (11%)
04. The needs of the secondary other	1 (5%)	0%	1 (2%)
05. Not violating the right of self and of others	3 (14%)	9 (39%)	12 (27%)
06. Exclusively own personal goal	6 (27%)	2 (0.09%)	8 (18%)
Consideration for the emotions of the other			
07. negative emotions	3 (14%)	0%	3 (7%)
08. Positive emotions	0%	1 (4%)	1 (2%)
End total	**22 (100%)**	**23 (100%)**	**45 (100%)**

5.0 Discussion

The current study aimed to investigate the extent to which one can develop an assessment tool that can reliably measure empathic competence among Ghanaian students between the ages of 10 – 14 years in a situational context. The results indicated internal consistency for the scale measuring empathic competence was highly acceptable. Item level statistics indicate that the majority of the test items discriminated between high and low scorers on their total empathic behaviour. Also, none of the test items was on average too difficult for the students. The effects of background variables such as gender and religion differences, as predictors of empathic competence were statistically significant. The results from the qualitative interviews conducted indicate that the students' actual level of empathic behaviour can be traced back to differences in their mental processes that probably preceded their behavioural choices, particularly in their *perception* of personal goals, their *appraisal* of task and their *consideration* of task.

5.1 The reliability of the scale of empathic behavior

The study investigated the extent to which the scale for empathic competence is reliable. The results of the reliability analysis indicated that the internal consistency of the overall scale for measuring empathic competence was highly acceptable. The average item-total correlation, another measure of internal consistency, was also highly acceptable. Though the item-total correlations of four of the test items were low, all the individual item-total correlations (including the four test items) clustered around the mean inter-item correlation. An explanation for the low item-total correlation of the four test items could be that the items measure different aspects of the broader construct of empathic competence. Therefore, a strong item-total correlation of a test item could mean that item is redundant (Briggs & Cheek, 1986; Clark & Watson, 1995).

The result of the correlational analysis indicated that the scales of the avoidance of ego-centric behaviour and pro-social behaviour form a consistent scale, although they are separate dimensions of the overall scale of empathic behaviour. Also, the result of the exploratory factor analysis supports the finding that the two subscales used in item construction are two separate dimensions of the overall scale of empathic behaviour. So avoiding ego-centric options is not necessarily the same as choosing pro-social options.

The scores on the student responses on the scale of avoidance of ego-centric behaviour were on the average lower than those on the scale of pro-social behaviour. This finding indicates that the students found it more difficult to avoid making ego-centric choices in the task situations that were presented to them. A possible explanation for this would be that the avoidance of ego-centric and the avoidance of prosocial choices are qualitatively distinct facets of empathic competence (Taylor, 1991). The difference may come from the cognitive processes required to arrive at an answer. The questions on the scale of avoidance of ego-centric behaviour were framed to depict negative situation which may have required more cognitive analysis and processing. The questions on the scale of pro-social behaviour were framed in a positive way and may have required less effort in information processing strategies (Taylor, 1991). The students possibly intuitively identified with the questions posed in a pro-social way as solutions that are sanctioned by society as being empathic.

The results of the exploratory factor analysis showed that the test items did not load on the various factors according to the test construction principles of scarcity (high/low) and perceptibility (high/low). An explanation for this result could be that the burdening conditions were combined in test items, with only two or three test items representing a specific burdening condition at a time within a subscale. The recommended number of test items for each burdening condition of scarcity (high/low) and perceptibility (high/low) should be 10 – 12 items (Schweizer, 2011). For instance, if there are only two test items representing a

construct on interest, such as the avoidance of ego-centric behaviour in the sharing of social space where the other is imperceptible, such items may not adequately represent the said construct.

5.2 Item level analysis

The study also investigated the extent to which item characteristics of item difficulty and discrimination are informative on the empathic scores of the students. Using the framework of Classical Test Theory, the results suggested that on average, none of the 46 items were for the students. The result indicate that the test items adequately reflect the strength of the construct that is being assessed, which is empathic competence (Chin et al., 2021 & Devellis, 2006). Also, the result of the item discrimination analysis revealed that some of the test items did not discriminate well between students who scored high and those who scored low on the overall scale of empathic behaviour. An explanation for this low item discrimination identified with some of the test items could be that some of these items were measuring different dimensions of the empathic competence (Clark & Watson, 1995). Besides, Classical Test Theory interpretation is always a property of the scores derived from a measure at a point where the sample was studied (DeVellis, 2006; Hambleton & Jones, 1993). Therefore, we cannot posit categorically that the items with low discrimination are malfunctioning items unless we test them on different samples to see how they perform among the sample.

5.3 The effect of background variables on empathic behaviour

In order to investigate the research question on the extent to which students differ in their overall empathic scores with regards to background variables such as gender, religion and regional location, an independent t-test analysis was conducted. The results showed that male students in Ghana scored lower on their empathic behaviour than female students. This finding is in line with various findings in previous self-report studies, which indicated gender as a predictor of empathic behaviour among adolescents. An explanation given for the gender

differences was the way females are socialised to be nurturing and focus on the other (Löffler & Greitemeyer, 2021; Bogdan et al., 2013; Singer & Lamm, 2009; Jolliffe & Farrington, 2006; Hambleton & Jones, 1993 & Eisenberg et al., 1987). Empathic competence, just like interactional competencies, is shaped by education, parental influence and peer influence. These influences form part of the socialisation and previous experience of the female adolescent and, as a result, become part of their cognitive structure.

The students from the northern part of the country, on average, scored higher on their total empathic behaviour than students from the southern part of the country. A possible explanation for the regional difference could be the differences in literacy rates and living standards between the two regions (Oelbaum, 2004). Increased literacy and higher living standards had led to more individualised family units (Agyemang et al., 2018), which is more pronounced in Accra, representing the southern part of the country. It could be that the collective societal family unit, tied around the extended family values, is more pronounced in the northern part of the country. This collective culture, which requires reciprocity of duty, obligation and responsibilities from the individual (Agyemang et al., 2018; Ateng et al., 2018), could be providing the cognitive structure for empathic actions among the students from the northern part of the country.

The study also found out that Muslim students scored higher on their empathic behaviour than Christian students. However, the result of the religious differences could be confounding with regional differences due to selection bias. The sample from the northern part of the country were predominantly Muslims, whereas the sample from the southern part of the country were predominantly Christians. The overrepresentation of Muslim students in the sample on one hand and relative overrepresentation of christian students on the other hand could account for the results of the religional differences.

5.4 Differences in mental processes of contrasting groups

The study also investigated the differences in the mental processes between a contrasting group of students who scored relatively low and relatively high on their empathic behaviour. The results indicated that that the level of empathic behaviour showed by the students could be traced back to the mental processes that preceded their behavioural choices. The differences in mental processes were apparent at the levels of *perception of goals* – how the students perceived their goal in the task situation*; appraisal* – how the student understood the problems at stake, the goals and emotions of the other participants in the task and; *consideration* – how the student thought about their choices and how the possible consequences of these choices on the needs of self and others in the task situation.

On the one hand, the majority of those who scored high on their total empathic behaviour perceived their goals using different stages of Kohlberg's morals reasoning ranging from the avoidance of punishment to the avoidance of the violations of the right of self and others. On the other hand, the majority of those who scored low on the scale of empathic behaviour perceived their goals within the context of their personal needs and comfort. A possible explanation for these findings could be that the students formulated their goals using their previous experience of similar situations. Individuals interpret their social interactions within the context of previous social experiences (Löffler & Greitemeyer, 2021; Ziv & Hadad, 2021; Preston et al., 2020). These previous social experiences became the system of rules within which the students interpreted their social interactions.

The majority of the observations in which the students indicated that they did not engage in any of the processes of *appraisal* and *consideration* were found among students who scored low on the scale of empathic behaviour. Besides, there were differences between the two contrasted groups for the observations in which the students said they engaged in some level of *appraisal* and *consideration.* The majority of students who scored high on their

empathic behaviour linked their goals with the goals of the *other* in the task situation. They also thought that their behavioural choices could avoid violating the rights of self and others in their decisions. The results of the differences between the two contrasting groups in their *appraisal* and *consideration* could be explained that *appraisal* and *consideration* are explicit processes in social interactions requiring high-level cognitive skills. These processes require that the individual reflects on the goals of self and others before deciding on a behavioural choice (Ziv & Hadad, 2021; Taiwo et al., 2021; Preston et al., 2020 Preston et al., 2020; DiGirolamo et al., 2019; Halle & Darling-Churchill, 2016; Epley et al. 2004; Icke, 2011; Decety et al., 2016; Gini et al., 2007; Usher, 2011 Batson et al., 1987). The differences seen in the *appraisal* and *consideration* of the contracting groups could be due to the inability of the students to engage in these metacognitive activities.

5.5 Implications of study

This study aimed to develop an assessment tool to reliably measure the empathic competence of 10-14-year-old Ghanaian students in a situational context. The current study is the first pilot of a new instrument; the findings of this study could be the building-base to develop a framework for assessing empathic competence and other socio-emotional competencies in situationally embedded contexts. This instrument reliably measured empathic behaviour in a range of social situations instead of currently available instruments that tend to apply context-independent. The finding could inform similar design studies to assess other socio-emotional competencies in a context-specific manner. In addition, the finding that the avoidance of ego-centric behaviour does not necessarily mean engaging in pro-social behaviour in social interactions could guide the design decisions of the assessment of empathic competence and other socio-emotional competencies in future. Besides, measuring empathic competence in situational contexts using static pictures is a starting point for substituting observational measure with situational ones. The study provides a foundation for other

researchers to develop tools in which the empathic behaviour of students could be assessed even more direct in social situations, such as using animations and simulations (Daas et al., 2020).

The results of the qualitative interviews indicated that the level of empathic behaviour of the students could be traced back to their mental processes that preceded their behavioural choices. The implication for practice is that students can be trained on empathy using the framework for competent action of Roelofs and Sanders (2007). The reflection tool, which was designed for the qualitative interviews, could serve as a conflict resolution tool or a behavioural modelling tool to train students to behave empathically. Teachers could use the tool to promote reflections and the development of socio-emotional skills among the students.

5.6 Limitations and future research

There are certain limitations in the study. The first limitation is methodological in the assessment design. There is an inherent problem of test items having certain ambiguities of burdening conditions in the current scale of empathic behaviour. The problem has to do with the number of test items representing the varying degrees of burdening factors of scarcity (high/low) and perceptibility (high/low). As a result, the number of items was underrepresented per construct used for test construction. Future study could increase the number of items per construct used in item construction to ensure adequate representation. Increasing the number of test items would mean the sample size would increase so that different group of students would use different subsets of the assessment task. Notwithstanding this methodological limitation, the reliability of the overall scale of empathic behaviour was highly acceptable.

Another limitation is the lack of evidence of the validity of this assessment. Usually, in assessment design, the item and test performance of the pilot study, cognitive interviews from the students, analysis by experts, and focus group discussions with teachers and coaches are used to establish evidence of the validity of the assessment: cognitive validity, instructional

validity and inferential validity (Pellegrino et al., 2016). Unfortunately, the time and resources available for the study could not permit the study to show proof of validity. Future research could investigate the validity of the student scores as an accurate measure of their empathic competence. Some areas of investigation of validity could be 1. The extent to which test and item performance support underlying cognitive processes; 2. The extent to which the assessment can be used to make a summative judgement about the student empathic competence; 3. The interpretation and understanding of teachers and coaches of the assignment assessment and; 4. The extent to which the scores represent student thinking (Pellegrino et al., 2016).

The study could not design standards for the assessment due to time constraints. Empathic competence is a multidimensional construct; hence this assessment requires a sophisticated model of scoring where evidence will be gathered on the different aspects of the task and sub-constructs (Zieky, 2014). The evidence is usually the basis for setting standards on score levels such as basic, proficient or advanced. Future research could look into the nature of the evidence that will be gathered on the different aspects of the tasks and burdening factors, the meaning of the evidence gathered, how the evidence connects to measure a student's empathic competence and the implication of the scores on the empathic level of the student.

The current COVID 19 global pandemic placed some limitations on the research. The quantitative data was collected using SurveyMonkey, and qualitative interviews were conducted using MS Teams. The researcher's presence on the field affords the researcher the privilege of carefully observe what is going on around the student to gain insight into student responses (McKenney & Reeves, 2018). In order to mitigate this limitation, the quantitative instrument had a part that investigated the extent to which the field assistant influenced the student responses. All the students indicated that the field assistant did not help them to

answer the question. Besides, there was no significant difference in the average score of students who stated that the teacher explained one or more pictures to them and the average scores of the student who stated that the teacher did not explain any of the pictures to them. Also, videos were used for the interview, and the researcher was alert for any indication of a situation that could invalidate student responses. Besides, the research assistant helping out with the research in Ghana noted important field events and reported them as and when needed. The limitation of the COVID 19 situation had little impact, if any at all, on the study.

Notwithstanding the above limitations, the study serves as a starting point in using Evidence Centered Design to investigate the empathic competence among adolescents in a situational context with varying degrees of burdening factors.

6.0 Conclusion

In conclusion, the study's finding indicated that the scale that measured empathic competence was highly reliable. The study contributes to understanding the assessment design of empathic competence in a situational context using burdening features. The findings are informative to similar designs of other socio-emotional competencies in a situational context. Assessment designers of empathic competence and other socio-emotional skills could systematically construct assessment tasks in situational contexts using evidentiary arguments. In addition, the result of the qualitative interviews indicated that the differences in student scores on their empathic competence could be traced back to their mental processes when they were engaging in task performance. Teachers, parents, and coaches could use the reflection tool designed as a behavioural modelling tool to foster reflection among students.

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Appendices

Appendix A. Online questionnaire – SurveyMonkey

SurveyMonkey converted file.docx

SurveyMonkey_instrument.pdf

Appendix B – Introduction letter from University of Twente

Introduction letter.pdf

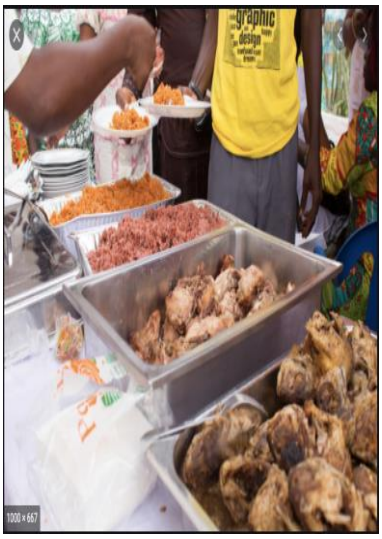
Appendix C – Passive consent form

Passive consent.docx

Appendix D – Situations used for the qualitative interview

Task situation	Accompanying picture	Implication of choices made by respondents
Core tasks **IT018_LPPSP02:** You've been chilling in a park with friends. You have empty cans of thrash to throw away, but the dustbin is completely full. Out of 10 times, how many times are you likely to carry the rubbish with you home to put in the dustbin at home?		Carrying the rubbish home is considered a prosocial choice. In this task the student is sharing social space with others who are not highly perceptible.

IT031_LSPRE01: You have been invited to a birthday party, and a tasty jollof rice was being served, and there was enough to serve everyone. Out of 10 times, how many times will you go for a second plate of food, although other people are yet to be served?



Avoiding an ego-centric action will be to wait till everyone gets served before going for a second plate of food. In this task, the student is sharing is sharing physical resources with other people. The physical resource is not scarce and the others in the task situation are highly perceptible.

Tasks in which the other is eithther highly or not highly perceptible

IT040_HPSRE02: A young girl in your class stripped and fell. Some of your classmates were making fun of her. Out of 10 times, how many times are you likely to join them in making fun of her?

Avoiding and ego-centric choice will be not to make fun of her. In this task the other is highly perceptible in the sharing of social resources.

IT019_LPPSE01: You have finished drinking a sachet of pure water. There is no dustbin around. Out of 10 times, how many times are you likely to drop the rubber on the floor.

Avoiding an ego-centric choice will be not to drop the rubbish into the gutter. In this task, the other participants are not highly perceptible in the sharing of physical space.

IT024_LPSSE02: It is evening time. Your bicycle lights are broken, but you want to go somewhere. Out of 10 times, how many times are you likely to go with your bicycle?

Avoiding an ego-centric choice will be not to go out with the bicycle. In this task, the other participants are not highly perceptible in the sharing of social space.

IT033_LPPRP01: You went to the school's library to borrow some storybooks to read. You are allowed to borrow three books at a time. Out of 10 times, will you borrow just one book at a time?

A pro-social choice will be to borrow just one book In this task, the other participants are not highly perceptible in the sharing of physical resources.

IT042_LPSRP02: Your cousin told you something about a girl in your school. This girl is not liked by most people in the school. Out of 10 times, how many times will you tell your cousin to stop spreading rumors about other people?

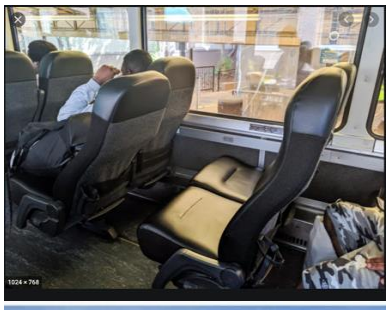
A prosocial choice by a student will be telling his/her cousin to stop spreading rumors. The other participant in this task is not highly perceptible and the problem at stake is the sharing of social resources.

IT054_LPPSE03: You have just had a shower (bath), and you noticed that some of the soap leather got on the wall of the shower area. Out of 10 times how many times are you likely leave without rinsing the wall?

Avoiding and egocentric choice will be to rinsing the wall after bathing. The student in this task is sharing physical space with others who are not highly perceptible.

Task situations in which there is either low / high scarcity

IT006_LSPSE02: You are on a virtually empty bus. There is a luggage rack on the bus. Out of 10 times, how many times are you likely to put your bag on the seat next to you.



Avoiding an ego-centric action will be to put the bag on the rack. The task situation is depicting low scarcity of physical space.

IT013_LSSSP01: You were at the beach with your friends. The beach was not crowded. You will like to enjoy some good music with your friends. There, however, someone was reading a storybook not far from where you were sitting with your friends. Out of 10 times, how many times are you likely to turndown the volume of the music?

A pro-social choice will be to lower the music. In the task situation, the student is sharing a social space with others and there is low scarcity.

IT003_HSPSP01: You are on a crowded bus, the seat next to you is empty. There is no luggage rack where you can put your bag. Out of 10 times, how many times are you likely to put your bag on your lap?

A pro-social choice will be to put the bag on your laps. In this situation, there is scarcity of social space.

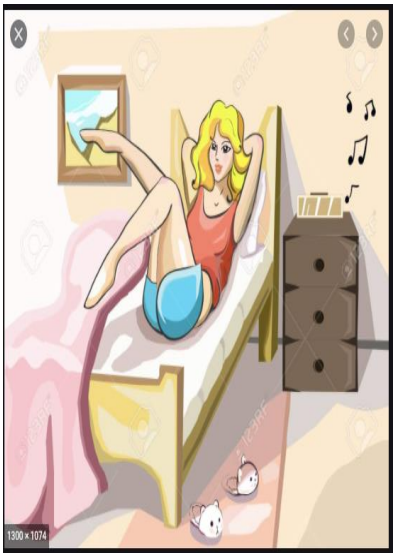
IT025_HSPRP01: You're standing at a buffet, and you're hungry. There 20 spring rolls on the table. There are also exactly 20 guests. Out of 10 times, how many times are you likely to take one spring roll?

A pro-social choice in this situation will be to take just one spring roll. The student in the task is sharing scarce social physical resources with other students.

IT046_HSSRP02: A new student has come to your school, and she had no friends in your school. Out of 10 times, how many times are you likely to talk to her on the first day.

A pro-social action would be to talk to the student on the first day. In this task situation, there is scarcity of social resources.

IT048_HSSRE02: Someone you know, but you do not like much is celebrating a birthday party and, invites you to the party. Out of 10 times, how many times are you likely to rather sit at home and enjoy a piece of good music by yourself than go to the party. Out of 10 times, how many times are you likely to rather sit at home and enjoy a good music by yourself than go to the party?



Avoiding an ego-centric choice will be to go for the party. In this task, social resources are scarce.

Appendix E. Codes for Perception, their labels and examples of statements made by the students for IT018_LPPSP02 and IT031_LSPRE01

Codes and their labels	Low	High
00. POA - Perception of the other absent	"No I did not visualise other people in the task situation"	"No. I didn't imagine that there were other people."
01. PT - Perception of task as intended	"Somebody has finished eating her food and she she came and the dustbin is full she wants to litter and add."; "When the dustbin is full and you are sending garbage there, will you add it to you send it home"; "The dustbin was full,… And, will I drop my own or I will sent my own" "In a party if you go for a plate of rice we are not satisfied will you go and collect more or you stay back"; "It's like there's an occasion and they are serving food to people. People have been queuing to get their own, and I also went to get my own… The question was that when they serve you and finish eating, will you go for a second round or you will wait when the people are done before you go. And I said, I will go instantly when I am not satisfied." "I saw this picture like a serve yourself party and I saw people, I saw people sitting down and people collecting food… I saw lot of food… I have seen that someone is serving some man.. I answered that I will go and take another one immediately."	"I saw that a lady has the rubbish and the dustbin is full she wants to put it in the dustbin. That dustbin was full so she wants to decide to send it home… yes, I assumed the lady was me."; "I drank a juice in the dust bin was full, I was thinking whether to send it home or I should put it in the dustbin. I decided to send it home."; "When the dustbin is full will send their rubbish to your house or you will drop it there? I answered that not drop it there, that I will send it to my house."; "The dustbin is full and you want to put another rubbish in". "When you have finished chilling, the dustbin is full…So will I add my own?; "I will feel I am better when… I'll feel like I am a good boy that I am sending the rubbish home…Madam please yes, they will think I am a good boy".; "It was a girl with a refuse trying to put it in the refuse dump ….. I answered the question what I would do"; " I can see a girl putting rubbish in the dustbin but the rubbish is full …. Like I saw her putting… I saw her adding her rubbish … I answered the question to how I feel." "I saw that there is a party and there is a lot of food there"; "it was like we went for a party and there were serving. You went and collected some and it was delicious and you want to collect more but when you look some of the people were not yet served. You however I still want to go for more".; "Like they went to the party and there is food and somebody went and collect it … "If I eat and some people do not get some I will let them to also go and eat."; ""; They are serving serve yourself party, and

		may be some people have not yet eaten. So when I finish eating and I am not yet satisfied, I will not go and take some because some people have not yet eaten”;
03. PPG/NE - Personal goals are naively egocentric (rule=rule)	“Keeping my community neat”	"So that I will let that place be neat…Some will add it….some will like the place to be neat”
05. PPG/OP - Personal goals are to obey the law / avoid punishment		“We want to obey their rules and regulations”. “Because the dustbin is full and our headmistress told us that if the dustbin is full we have to send it to the house and put it in your house dustbin”.
06. PPG/G-bO - Personal goal is linked to the good boy orientation		“Some will make fun of me. They will think I am a dirty girl”.; “ I want to be a good girl…But the dust bin is full if I put my own there maybe it’s may fall and it may make the place dirty”; “I will feel I am better when… I’ll feel like I am a good boy that I am sending the rubbish home…Madam please yes, they will think I am a good boy”.; No. It doesn’t affect other people….I want some people to copy me…. Yes, yes. I want to be a good citizen.”
07. PPG/AVRO - Personal goal is related to the avoidance of the violation of the rights of others		"They don’t want it to be dirty … Because, it can be falling and if it falls, it can spread, and it will be bringing other people virus".; “I was hungry … I think the food was for us to share”; ""; “Yes Auntie. Like when we go to church and one of our church members is going to do wedding and they cook food and I eat, and some people didn’t get, I will let them to also eat and it is now okay me too I now go again to collect some to eat”.;
08. PPG/SSer - Personal goal is self-serving	“As I said earlier I sent it to him there when keep it in my bag, it will make my bag dirty, I will be compelled to throw it away since there is no dustbin in my house. The wind will blow it to people’s houses. So yes my choice serves the interest of the community.”; no no. I	

	did not think about it as a sanitation problem. I just thought that if I drop it there, Zoomlion will come and pick it up later.; Yes, my goal was to enough to be satisfied.; "I want to be satisfied"; But I was hungry … I want to be satisfied"; "Because, it is a serve yourself party so the food is enough…. I am not satisfied…Because a lot of food so I can go and take more."; "I am hungry .. I wanted to achieve that may be when I finish eating and I want for them to serve everyone before I go again, maybe I will lose my appetite so I will go again immediately to collect a second plate.";	
10. PPO - Perception of primary other	"Some of my families and some other people"; "Yes, I saw other people… The other guests, the invited guests."; "My family members or those who are there at the party."	"Everybody around"
11. PSO - Perception of secondary other	"If I send the rubbish home, or litter it somewhere because the dustbin is full, it will been running 2 people houses and goats will be playing with it. But if I put there Zoom Lion people will come and pick it later."; " No. I did not see anybody else in the situation. … When the trash can was full, no one from Zoomlion had time to empty it so that is poor sanitation, I will add it so that they will come and clean it" (student did not see anybody else in the task aside the zoom lion people who failed to empty the dustbin.); "Those that are around me in my community."	I think that other people are in the situation… They are my colleagues; my friends some of them; "a lot of people … my siblings …my friends."; No. It doesn't affect other people….I want some people to copy me…. Yes, yes. I want to be a good citizen."; "my colleagues"; "those who were also at the party someone"; ""; "Then if people have not yet eaten, you have to wait for them to eat before you go and collect"; "My friends";

Appendix F. Codes for *Appraisal*, their labels and examples of statements made by the students for IT018_LPPSP02 and IT031_LSPRE01

Codes and their labels	Low	High
00. AA - Appraisal absent	"No, no. I did not think about it as a sanitation problem. I just thought that if I drop it there, Zoomlion will come and pick it up later.; ""; 'No I did not."; "I did not think of them… Because a lot of food so I can go and take more";	Yes. I only said I will sent it because the headmistress asked me to do so. …That was all."
01. AGO/A - Appraisal of goal of the other absent	" I did not think about how they will feel. I just thought even if the rubbish falls on the ground, a good Samaritan may pick it up."; "It does not affect other people."; "No. I did not think of their goals".; ;	No. It doesn't affect other people….I want some people to copy me…. Yes, yes. I want to be a good citizen.;
02. AGO/G-bO - Problem at stake is being seen as a good person	"They will see it may be that I am a good boy, I am not a selfish person and I want others to get food"	
03. AGO/LPG - Appraisal of goals of the other linked to personal goal of the student	"I think may be some of them are hungry so they immediately came to a serve yourself party to have some food to eat."	"They don't want it to be dirty … Because, it can be falling and if it falls, it can spread, and it will be bringing other people virus".; " I think they were hungry… I think the food was for us to share"; "..those who were also at the party someone also has to eat because the food was delicious"; "Like they went to the party and there is food and somebody went and collect it … "If I eat and some people do not get some I will let them to also go and eat."; "Then if people have not yet eaten, you have to wait for them to eat before you go and collect";
04. AGO/NE - Naïve ego-centrism by the other		"So that I will let that place be neat…Some will add it..some will like the place to be neat …. prevent cholera";

06. APS/Int - Problem at stake identified as intended by the task	“I think may be some of them are hungry so they immediately came to a serve yourself party to have some food to eat.” “Some of them might not get the food.”;	“ I think they were hungry… I think the food was for us to share”; “..those who were also at the party someone also has to eat because the food was delicious”; “Auntie, because they cooked the food for all of us. and ate your own and finished and want to go and collect again and eat. That was what I thought of.”
07. APS/Lit - Appraisal of problem at stake is literal		“I want to send the rubbish home because , because the dust bin was full”; Because the dustbin is full so I will send it home.”
08. APS/LPG- Appreciation of the problem at stake linked to personal goals		“they will want to get some of the food”
09. APS/G-bO - Problem at stake is being seen as a good person		“Your friends may ask you questions about yourself in they may say oh as’ for this girl she is dirty girl”
10. APS/Dil - Problem at stake is a dilemma of making a prosocial choice or a self-serving choice	“Whether you will add your rubbish or not.”; "The problem is about whether you will go for more or you’ll wait.";	
11. APS/SSer - Problem at stake is self-serving		
12. AEO/A - Appraisal of the emotional state of the other absent		No. It doesn’t affect other people….I want some people to copy me…. Yes, yes. I want to be a good citizen.”;
13. AEO/P - Appraisal of how the other will feel about the situation is present	“It may lead to struggle for the food.” “They will think I am a foodie….They will feel disturbed because some of them didn't get their food….It may lead to struggle for the food”;	“People will be happy because they will also get some of the food to eat.”; “They will not think you are greedy”;

Appendix G. Codes for *Consideration*, their labels and examples of statements made by the students for IT018_LPPSP02 and IT031_LSPRE01

Codes and their labels	**Low**	**High**
00. CA - Consideration absent	"no, no. I did not think about it as a sanitation problem. I just thought that if I drop it there, Zoomlion will come and pick it up later.; The student responded "I did not think about it" to the questions on appraisal and consideration. She just thought if the seat is empty, should could put the bag on it. The student also said he did not consider what his personal goals were.;	Yes. I only said I will sent it because the headmistress asked me to do so. …That was all.; "Putting the bag on the seat next to you someone can try to steal your bag".; ""; ""; "No, I didn't think about that. I only thought of the fact that when I put it in my pocket or my bag the water droplet will pour in my pocket or bag".; No. I did not think about other people. I just did not want to get accident and get hurt.; "No I didn't"
01. C/G-bO - Consideration good boy orientation	"I want the bathroom to be clean…I want my parents to know that I am a good boy….So, so my parents, when I rinse the wall, my parents will love me.";	"if I put the rubbish in the dustbin I think it'll affect … it may cause sickness". "I just know it is a bad habit"
02. C/LF - Considered loyalty for friends	"Like when the spring rolls is not up to them, when I'm having two or more and I'll give some of the rest to my friends";	
03. C/NE - Consideration to doing the right thing	"They will see it may be that I am a good boy, I am not a selfish person and I want others to get food";	; "I just want to keep the environment clean"; ;"she will feel you are kind to her"; "Yes Auntie. But if you are kind be careful…. If you are kind, just be careful because somebody can just do bad things to you".; "I think that rumors is not good";
04. C/NSO - Consideration for the needs of the secondary other	"If I send the rubbish home, or litter it somewhere because the dustbin is full, it will been running 2 people houses and goats will be playing with it. But if I put there Zoom Lion people will come and pick it later." "As I said earlier I sent it to him there when keep it in my bag, it will make my bag dirty, I will be compelled to throw it away since there is no	

	dustbin in my house. The wind will blow it to people's houses. So yes my choice serves the interest of the community.”;	
05. C/NVRSO - Consideration of not violating the right of self and of others	“Because it was a beach and there were many people there, I will be disturbing them.”;	“Yes, I think that if I don't add the rubbish to the dustbin, it will serve the interest of those around because the place will be neat.”; “because I want my colleagues to get food, I will go for a second plate after everybody is served.”; “..those who were also at the party someone also has to eat because the food was delicious”; "They cooked it for all of us so why will I eat and leave them?” “ well, they will feel like you are kind to them”; “Yes Auntie. Like when we go to church and one of our church members is going to do wedding and they cook food and I eat, and some people didn't get, I will let them to also eat and it is now okay me too I now go again to collect some to eat.; ; “But I will still not go for a second round until everyone is served… Because some people have. not yet eaten.”; “I was sharing …. because the spring rolls 20 in my colleague too are 20.”; “if the person knows that I don't like him or her but he invited me I just have to go. And wish the person well. It will make the person happy”; “Because, when someone is learning or reading, you don't want to disturb them so that their mind will be on what they are reading.”; “ I was thinking if the books are not plenty….Maybe if the book is not plenty and you think three may not reach or your friends.”; “The rumor may not be even true.”; “ people will dislike her because of the rumor.”
06. C/SSer - Consideration to exclusively own personal goal	“So that it will not bring sickness to the community…. Because, when the sickness affects somebody it can affect me.”; “It's a birthday party after all and if I go the plate, people around will think the food will reach the everybody.”; ; “Some would have taken it well others would not…Maybe some of them won't to have gotten their choice of food. …Some of them will not understand it… If I explain to them they will understand…..There will be disagreement between us.”; “I did not think of them… Because a lot of food so I can go and take more”; “I am hungry .. I wanted to achieve that may be when I finish eating and I want for them to serve everyone before I go	

	again, maybe I will lose my appetite so I will go again immediately to collect a second plate." ; "they will see it as normal….I am hungry"; "So when I don't like the person, I will not go".; "I'll gain, they'll say may be I am a respecting boy".	
07. CEO/Neg Consideration of the emotions of the other, negative emotions	"Some people may not get… They will feel ignored in the party, like I am selfish….Because the rest of the people at the party will not get food".; "It may lead to struggle for the food." "They will think I am a foodie….They will feel disturbed because some of them didn't get their food….It may lead to struggle for the food"; "Because may be my actions can affect other people." (The student thinks that with the benefit of hindsight, he actions do not meet the needs of other people in that task)	
08. CEO/PE - Consideration of the emotions of the other, positive emotions		"It will make her happy....to make friends with me."