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Predictors Of Teacher-Child Interactions In Early Childhood Institutions: An Exploratory Study

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ABSTRACT
Teachers in pre-schools are expected to be caregivers and help children transition from the home to the school environment. At that age quality learning outcomes for children involves stimulating activities guided by attentive and engaging teachers. The experiences and attachments formed in the early years are known to have long lasting effects on their later development and the role of teacher-child interactions is critical to these experiences. The current paper explored teacher-child interactions in early childhood institutions in Ghana and the factors (predictors) that influenced teachers' interactions with children in their care. Factors explored were teachers' characteristics (level of education, years of experience, age, beliefs, intentions and perceived interactions) and external characteristics (class size, special needs child present, other staff present) on teacher-child interactions. The study utilized a quantitative approach to data collection under a cross sectional design. Correlation analysis revealed that teachers' perceived interactions predicted their observed interactions (practice). Also class size (number of children present), the presence of special needs child, teachers' level of education and intentions as predictors of teacher-child observed interactions were supported.

Keywords: pre-school teachers, beliefs, intentions, teacher-child interactions, early childhood institutions.

INTRODUCTION

Teachers' beliefs and intentions play a crucial role in shaping their behaviour and practice in the classroom, particularly in early childhood education. Research has shown that beliefs formed during upbringing and childhood experiences can influence teachers' attitudes and intentions, which in turn affect their interactions with children. The beliefs and intentions of teachers are fundamental components of their professional practice, influencing the quality of education and care provided to children. In early childhood education, where teacher-child interactions are critical, understanding the factors that shape teachers' classroom behaviour is essential. The complex relationships between teachers' characteristics, school environmental factors, actual practice and how these dynamics impact child development outcomes are relevant for professional training. By exploring these, researchers aimed to inform strategies for supporting teachers in providing high-quality care and education.

Teacher-Child interactions

Literature underscores the critical role of adult-child interaction in shaping child development and learning outcomes, emphasizing the need for supportive, responsive, and nurturing relationships. Research on adult-child interaction has continued to evolve, highlighting the significance of these interactions in shaping holistic development (Lohse, Hildebrandt & Hildebrandt, 2022; Weisleder & Prospero, 2015).

Studies have explored the impact of adult-child interaction on language development (Romeo et al., 2021), social-emotional learning (Mondi, Giovanelli, & Reynolds, 2021), and cognitive development (Hammond et al., 2019). Other research have examined the role of adult-child interaction in promoting children's executive function skills (Barnes et al., 2019; Amukune, Józsa, & Józsa, 2023) and self-regulation abilities (Hatfield, Finders, Zandbergen, & Lewis 2022). The importance of sensitive and responsive adult-child interaction have been emphasized, particularly in early childhood settings (Vanderbilt-Adriance & Shaw, 2019). Furthermore, studies have investigated the impact of adult-child interactions on children's mental health and well-being, highlighting the need for supportive and nurturing relationships (Sloover, Stoltz & van Ee, 2024). The role of technology in adult-child interaction have been explored, raising concerns about the impact of screen time on young children's development (Brushe et al., 2024).

Research on teacher-child interaction has continued to highlight its significance in shaping young children's learning, social-emotional development, and academic achievement (Pianta, Hamre & Allen, 2012; Roorda et al., 2019). Studies have investigated the impact of teacher-child interaction on children's language development (Justice et al., 2019), and math skills (Klibanoff et al., 2006). Further studies have explored the role of teacher-child interaction in promoting children's interest and engagement in learning (Renninger & Hidi, 2019).

It is evident that teacher-child interaction is essential in shaping young children's learning, development and academic achievement as children continue to spend more time in early childhood institutions.

Benefits of Teacher-Child Interaction

Benefits of teacher-child interactions are numerous and have impact on child developmental outcomes. In the world of a child the home is the primary setting and the school is the next setting. According to UNESCO (2006) children spend 'an average number of 6-8 hours per day for 5 days at the ECD centres - a total number of 35–40 hours per week, 40 weeks in a year (p8). Children spend their time with immediate family members in the home or with teachers and peers in schools. As a result the kind of atmosphere a teacher creates for children is very important and could have ripple effects on the child's development either positively or negatively.

Human beings were born with billions of brain cells that needed 'synapses' to develop. These synapses developed based on a child's experiences. Experience according to Escobar-Ruiz, Arias-Vázquez, Tovilla-Zárate, and Jané-Ballabriga, (2024) plays an important role in shaping the developing brain and the changes in structure and function that accompany learning and memory throughout life (Twardasz, 2012). Children's brains develop faster from birth to age three than any other time in their lives and more learning takes place during this time than any other. And as Twardosz (2012) states *"the individual's experiences with the environment play a critical role in the formation of connections among the billions of neurons produced during the prenatal period particularly in the cerebral cortex* (pp 98)".

Twardosz (2012) argued that responsive care giving was key to proper attachment formations that occur in early years and that this had an impact on the brain development of the child and other development outcomes (Twardosz, 2012). Further, Twardosz (2012) explained that responsive care giving helps build the structure of the brain in ways that support eye-hand coordination, language and emotional development. She added that the development of the prefrontal cortex area of the brain which was responsible for attention, working memory, self-regulation, and planning occurred during the pre-school period (Twardosz, 2012). These underscored the importance of the experiences (interactions) an individual went through during the early years of life. It was expected that the more learning opportunities (in terms of experiences) parents provided for their children from birth until school age, the more synapses these children would obtain. These connections served as a pool of knowledge for the child to access later on in life (Escobar-Ruiz, Arias-Vázquez, Tovilla-Zárate, & Jané-Ballabriga, 2024). The child's earliest experiences affect their thinking, learning and behaviour. Thus helping children through responsive care giving experiences from birth to school age was crucial to their success in school and their overall development. Parents, teachers and other caregivers can create a strong foundation for learning by providing a rich and nurturing learning environment (through supporting relationships) right from the beginning for a child.

In the past decade in particular more pre-school aged children have spent majority of their daytime in early childhood facilities (Silver, Measelle, Armstrong & Essex, 2010). As a result, their daily experiences come from their interactions with teachers, care givers and peers (Carl, 2007). There is therefore the need for ECD programmes to be tailored to meet the developmental needs of every pre-school child irrespective of socioeconomic, linguistic or racial/tribal background.

Positive school experiences were known to increase school retention and achievement, which in turn ripples into future success. It turns out that the positive experiences, specifically related to teacher-child relationship among adolescents could predict adolescents' future relationship and risky sexual behaviours. Kobak, Herres and Laurenceau (2012) found that negative interactions with teachers predicted increased sexual risk-taking behaviours and females' early romantic involvement among adolescents in an economically disadvantaged sample. Anxious states of mind increased risk for early romantic involvement and the likelihood that females more than males would engage in risky sexual behaviour.

Facilitating Teacher-Child Interactions

Early education if done well can minimise or erase the school achievement gaps often associated with children from low socioeconomic families. It is evident that teacher-child interaction is vital to child development, in the sense that positive (healthy) interactions enhance the development of children. Negative interactions on the other hand hinders child development and may result in negative wellbeing. Teachers play an important role in creating and maintaining enabling environment relevant to children's total (cognitive, socio-emotional and physical) development.

Knowing that teachers' perceptions of child behaviour problems and teacher stress were associated and influenced teacher-child relationships was important to administrators of preschool and more so preschool teachers. Friedman-Krauss, Raver, Neuspiel and Kinsel (2014) have recommended that teachers should be given sufficient training for handling children's challenging behaviour. This would likely reduce the stress level of teachers.

In a study on the Indiana State preschool programmes, Cross and Conn-Powers (2013) sought to investigate the teacher-child interactions that made a difference in children's lives. He found that when a teacher had clearly specified goals, it became easier for the teacher to focus so as to enhance children's development. He discovered that teachers' interactions were made up of 'long discussions or conversation'. Cross and Conn-Powers (2013) stated that,

Children respond to the initial question with their guesses and the teacher responds in a way that supports and scaffolds their attempts. The children, in turn, respond with their next round of hypotheses shaped by their increased understanding. The teacher follows this by offering feedback that reinforces and expands on their responses. This back-and-forth exchange—repeating and extending children's responses as they get closer to answering the opening question—supports children's thinking. As children answer the question, the teacher may ask them to explain their thinking. The teacher may

also bring in other experiences the class has had to help strengthen children's connections with the weather concepts (p 4).

As a result children in that particular class acquire more vocabulary than their counterparts in other less interactive classes. It is clear that the teacher's ability to know what is important in enhancing child development (language and vocabulary) was vital.

In another study Cabell, Justice, McGinty, DeCostera, and Forston (2015) examined the volume and quality of teacher–child conversations within 44 preschool classrooms. They recorded and transcribed play sessions into conversations and looked for teachers' use of strategies that stimulated and prolonged child talk. They found that the professional development of a teacher predicted *increased teacher–child engagement in multi-turn conversations, child-initiated conversations, and teachers' strategy use*. Secondly, conversations that were engaging and had teachers eliciting more information from a child was positively related to child's vocabulary increase. This study shed light on what should go into teacher-child conversations within preschools, which could be used to promote children's language growth (Cabell, Justice, McGinty, DeCostera, & Forston 2015). Justice, Cottone, Mashburn, and Rimm-Kaufman (2008) corroborate the back and forth exchange and interactions as a catalyst for children's language development.

Early, Maxwell, Ponder and Pan (2017) investigated the effectiveness of two professional development interventions for preschool teachers in their second year of teaching. They put participants into three groups; 1. Making the Most of Classroom Interactions (MMCI), *a cohort-model where small groups of teachers met for five days of instruction and support;* 2) My Teaching Partner (MTP), *in which teachers worked one-on-one with a coach using cycles of videotaped observations of teaching, review, and feedback; or* 3) control.

There were no differences between MTP and MMCI teachers at the end of the study on any of the three CLASS (classroom observation inventory) domains. Teacher-child interactions improved among the MTP group. Emotional Support increased as a result of participation. Effective Teacher-Child Interactions did not improve. MTP teachers saw their professional development activities as more valuable than control-group teachers, reported more positive relationships with their coaches than did MMCI teachers with their instructor (Early, Maxwell, Ponder, & Pan, 2017). Having a mentor (coach) was important to a teacher's professional growth. A go-to someone for professional guidance on the how-to of any profession was commensurate with professionalism and lower teacher attrition. This research investigates factors that influence teacher-child interactions in Ghana.

The Importance of Teacher-Child Interactions in Ghana

The area of teacher-child interactions in early childhood institutions have not been explored much in Ghana. Scanty literature exists on teacher-child interactions in Ghana. Teachers dominated all classroom activities as such provided few opportunities for group work and pupil-pupil interaction according to Fincham, Asiegbor, Nanang, Gala, and Britwum (2001). In other words, classroom climates in Ghana were intimidating and teacher centred leaving no room for the children to play or learn from peers nor initiate their own learning. Resulting in adverse effects on children's development.

Baker (1999) examined teacher-student interactions and relationship quality among poor, urban, African-American children expressing differential school satisfaction. Classroom observations, interviews, and self-report questionnaires, were conducted for 61 third through fifth graders. Results suggested that young children were satisfied with school only when they perceived a caring, supportive relationship with a teacher and a positive classroom environment. Meaning that to these young children, not only was the disposition of the adult responsible for teaching them important but that emotional, social and physical climate of the classroom were also important to their success in school. The fact that students expressing high and low satisfaction with school was linked to predictive behavioural patterns confirm the reciprocal nature of teacher-child interactions. This corroborates Fincham, Asiegbor, Nanang, Gala, and Britwum's (2001) assertion.

Distressed caregiver-infant relations were suggested as some of the reasons for referral of a child to the mental health and child protection services (Tryphonopoulos, Letourneau, & DiTommaso, 2016). It is therefore critical that caregivers know the import of their actions and inactions. Better still national policies through mental health education could help in educating the general populace.

In a study involving 154 Ghanaian preschool teachers Aboagye-Acquaah (2016), examined the influence of ECCE caregivers' dispositional empathy (the tendency for people to imagine and experience the feelings and experiences of others) on their perceived caregiver-child interactions and the moderating effects of age and personality. Results of the study showed that dispositional empathy predicted caregivers' perceived caregiver-child interactions collectively. Meaning that sensitivity was important to caregiver-child interactions. Also, the study researched the caregivers' perceived caregiver-child interactions using a self-report measures which could be susceptible to desirability biases. That notwithstanding, it gave a view into the nature of caregiver-child interactions in terms of the emotional aspect of child development outcomes.

Wolf, Aber and Behrman (2017) have through the introduction of an intervention programme studied the effects of teacher training on teacher-child interactions. The study which involved 480 Kindergarten teachers proved that, teacher training improved the quality of teacher-child interactions in the classroom specifically in the areas of *supporting of student*

expression (e.g., supporting students to reason and problem solve, consider student ideas) and emotional support and behaviour management (e.g., positive climate, consistent routine) (p3). This has implications for teacher training in the area of teacher-child interactions.

Teacher Beliefs

A person's beliefs were influenced by their upbringing and childhood experiences (Decker & Rimm-Kaufman, 2008). For teachers there was the need for these childhood experiences to be filtered through appropriate training. The reason being that beliefs formed part of a person, were difficult to change and informed intentions. And negatively held beliefs could lead to the detriment of the children in the care of particular teachers. Decker and Rimm-Kaufman (2008) observed that pre-service teachers held positive views of children and endorsed proactive approaches to discipline, emphasized creating a sense of community and believed it important to support metacognitive growth in classrooms. Also teachers' personality scores were higher than normative scores and teachers who report being open and less conscientious preferred more implicit approaches to managing their classrooms. Gender was found to predict pre-service teachers' beliefs about teaching.

Heisner and Lederberg, (2011) investigated the effect of Child Development Associate (CDA) training on the beliefs and practices of early childhood teachers found education to have a positive effect on teachers' beliefs and practices. It is also relevant as suggested by Ward and Wilcox-Herzog that teachers' beliefs be examined together with their behaviour to prove whether they practiced their beliefs or otherwise.

Jordan, Schwartz and McGhie-Richmond (2009) stated that effective teaching skills consisted of *high levels of student engagement based on good classroom and time management skills; the ability to scaffold learning that is adapted to students' current levels of understanding; cognitively engaging students in higher-order thinking; and encouraging and supporting success* (p535). What was it that precipitated these skills, whether positively or negatively when special needs children where present? They discovered that a teacher's beliefs about disability and about their responsibilities for their students with disabilities and their assessment of the specific special educational needs (known as epistemological beliefs) were determinants of their effectiveness as teachers. This implied that the efficacy of the process of inclusion was determined by teacher beliefs.

Ward and Wilcox-Herzog (2019) investigated if there was a link between beliefs and behaviour – basically finding out whether teacher's beliefs could be used to figure out teachers' behaviour (interaction with children). They documented 'situation factors' as probable influence on the link between beliefs and actions. A case of 'situation factors' is when teachers don't feel they are able to implement a programme that is consistent with their beliefs because parents, administrators and colleagues' expectations of teachers make them 'internalise' (p84) their beliefs. Ward and Wilcox-Herzog's (2019) focus was in examining beliefs-actions relationships by focusing on measurement specificity (in terms of how teachers interact with children), the freedom teachers feel in practicing their beliefs and the depth of training teachers had received. It was found that there was no relationship between teachers' beliefs and their actions. In addition, the results indicated that when teachers had more experience with children they were less sensitive and that early childhood teaching certification held was a positive predictor of high level involvement and verbalizations (Ward & Wilcox-Herzog, 2019).

Teacher Intentions

In a study that investigated factors associated with students' technology-related abilities, beliefs, and intentions, Anderson and Maninger (2007), found that teachers' intentions were predicted by their self-efficacy beliefs, gender, and value beliefs. After a pre and post survey, there were changes in the behaviours of teachers in terms of their intentions to use technology. Anderson and Maninger (2007) emphasized the importance of relationships between preservice teachers' beliefs about technology integration and their potential use of technology in their future classrooms. It can be implied that a person's beliefs informed intentions, however, these could be moderated by training or education as illustrated by Anderson and Maninger (2007).

In another study, Rienties, Brouwer, Lygo-Baker and Townsend (2011) found academics to be unwilling to embrace technology. They discovered that academics who were enrolled in an online teacher training program debunked the credibility of the knowledge received by trainees. The programme increased the use of technology, and pedagogical knowledge, but the academics still showed a lower intention towards knowledge transmission.

Gialamas and Nikolopoulou (2010) in a study in Greece compared in-service and pre-service early childhood teachers' views and intentions about incorporating the use of computers in early childhood settings. The results showed that although pre-service teachers reported higher computer self-efficacy, in-service teachers expressed more positive views–intentions about using computers in early childhood settings. Meaning that intentions may not necessarily lead to appropriate practice.

Seeking better insights into teacher-child interactions beliefs and intentions as a measure was further explored. Ward and Wilcox-Herzog (2004) developed a self-report measure of teachers' beliefs and intentions which formed teachers 'perceived interactions'. Ward and Wilcox-Herzog (2004) confirmed Kantos and Dunn's (1993) assertion that though

early childhood educators were of the belief that "active" supportive adult participation in children's play was important to child development, some educators refrained from doing so for fear of interrupting the children's play. These were against what theory expected them to do. The study recommended that both perceived and observed interactions be assessed to ascertain if what teachers believed (in theory) were really what they practiced.

Skellariou and Rentzou (2011) studied how a teacher's intentions toward teaching factored into the belief-action relationship. They explored possible correlations between pre-service teachers' beliefs and their intentions. Understanding teachers' perception towards teacher-child interactions is important to educational psychology especially in early childhood education. With children, education is synonymous to care, as such there is the need to understand what teachers' beliefs and intensions towards teacher-child interactions were. Knowing also that teacher-child interaction is one of the key pointers in quality education. And also teachers' intentions are as a result of their beliefs. These beliefs formed prior to formal teacher training.

In another study, Sakellariou and Rentzou (2012) administered the beliefs and intentions measure to pre-service kindergarten teachers in Cyprus. In the study, student teachers' beliefs about teacher-child interactions correlated with their intentions showing that when these teachers believed in interacting in a sensitive and involving way they intended to and were very likely to practice that. Sakellariou and Rentzou (2012) recommend that since research with an aim to examine extensively the correlation among teachers' beliefs, intentions and practices has not been undertaken universally, future research be directed in this area.

The absence of a study on the correlation of teachers' beliefs and intentions became the focus of Skellariou and Rentzou (2012a) second study. Hence exploring this relationship among Greek pre-service kindergarten teachers. Previous research from Greece (Skellariou & Rentzou, 2011) indicates that Greek early childhood educators interact positively with the children but at the same time they were detached, a finding that disputes their positive interactions.

Comparing beliefs and intentions about the importance of teacher-child interactions among Greek and Cypriot pre-service kindergarten teachers became the focus of Skellariou and Rentzou's (2012b) study. Lack of, and limited national and international research on correlation between beliefs and practices led to the exploration of Greek and Cypriot pre-service kindergarten teachers' self-reported believes and intentions about the importance of teacher-child interactions and the relationship between them. This study documents the relationship if any between the two nations in terms of beliefs as a predictor of a teacher's intent to foster interactions with the children he or she teaches (Skellariou & Rentzou, 2012b).

Theoretical Underpinning

The theoretical grounding of the study is planned behaviour model. This theory explains human behaviour by linking it to one's beliefs. Theories of Planned Behaviour (TPB) proposes that behavioural intentions are the primary predictor of actual behaviour (Ajzen, 1991). According to TPB, intentions are shaped by three key components: attitudes toward the behaviour, subjective norms, and perceived behavioural control (Ajzen, 1991; Fishbein & Ajzen, 1975). Attitudes toward the behaviour refer to an individual's positive or negative evaluation of the behaviour (Ajzen, 1991). Subjective norms represent the perceived social pressure to perform or not perform the behaviour (Ajzen, 1991). Perceived behavioural control refers to an individual's perceived ability to perform the behaviour (Ajzen, 1991).

Numerous studies have applied TPB to various domains, including health behaviour (e.g., Conner & Sparks, 1996), environmental behaviour (e.g., Bamberg & Schmidt, 2003), and consumer behaviour (e.g., Taylor & Todd, 1995). These studies have consistently shown that TPB is a robust predictor of behavioural intentions and actual behaviour. Leaning on this, this paper investigates teacher characteristics on their actual interactions with the children in their care.

METHOD

The research design for the study was a cross-sectional survey, adopting a quantitative approach to data collection. Two instruments were used: a questionnaire and an observational scale.

a. A questionnaire with both open and close ended questions to assess information on; i. Participants demographic characteristics (age, level of education, years of experience) ii. External characteristics (class size, special needs child present, other staff present) iii. *Beliefs-Intentions Scale (Ward & Wilcox-Herzog, 2004)* is a four item measure scale that measures the following aspects of teacher-child interactions: (1) sensitivity of interactions with children, (2) involvement (both verbal and nonverbal) of interactions with children, and (3) play style adopted when interacting with children. These aspects of teacher-child interaction are all related to children's developmental outcomes, and all have been used observationally to assess teachers' actual interactions with children.

Teacher beliefs were assessed with 17 statements and as instructions by Ward and Wilcox-Herzog (2004) suggested; for each of these belief statements, teachers were asked to rate how often they thought teachers should engage in the following behaviours on a 5-point Likert scale with 1 being never and 5 being all of the time. Teaching intentions were assessed with 20 statements. As done for teaching beliefs, teachers were asked to rate their intentions regarding potential behaviours with children on a 5-point Likert scale.

Belief scores were assigned to each teacher by tallying all 17 responses. For this study the scoring of the beliefs scale had 1 being *strongly agree and 5 strongly disagree* meaning that low scores indicated stronger beliefs about the importance

of behaving in a sensitive, involved manner toward children. This was done to curtail biases that come about as a result of social desirability and of the respondents identifying a trend of answering test items on a Likert scale.
Intention scores were assigned to each teacher by tallying all 20 responses. Higher scores indicated intentions that were more sensitive and involved in nature. The beliefs and intentions scale report an internal consistency reliability of .85 as measured by Cronbach's alpha (Ward & Wilcox-Herzog, 2004).
b. Observational Scale [Child - Caregiver Interaction Scale -CCIS (Carl, 2010)]
The Child - Caregiver Interaction Scale is an observation tool which is used to assess teacher-child interactions. This measure not only provides a scale that can be used for research purposes to compare child care quality, but also serves as a noteworthy tool for training and technical assistance. The CCIS is a tool that can be used to improve quality child care. The CCIS consists of 14 items organized into the three (emotional, cognitive/physical, and social). The items under each domain are Emotional ***Domain*** -Tone of Voice/Sensitivity, Acceptance/Respect for Children, Enjoys and Appreciates Children, Expectations for Children. The ***Cognitive/Physical Domain***- Health and Safety, Routines/Time Spent, Physical Attention, Discipline, Language Development, Learning Opportunities, Involvement with children's activities. Finally, ***Connections with a Wider World***- Arrival, Promotion of Prosocial Behaviour/ Social Emotional Learning (SEL), Relationship with Families.
In addition the CCIS captures information on teacher's age, years of experience in child care and at the current class, educational level, class size, and number of special needs children present and other staff present.
Scoring of the CCIS
In the CCIS manual, the author presented each item as a 7-point scale with detailed criteria at four anchor points: 1 (inadequate), 3(minimal), 5(good) and 7(excellent). Numerous indicators comprise each CCIS item (please refer appendix). Each of these indicators operationally defines specific actions that comprise a score. Either the behaviour is present or it is not. This method removes much of the subjectivity in scoring. The manual reported an internal consistency of .94 (Carl, 2007).
As stated previously the scoring of the beliefs scale was changed so that 1 (one) became strongly agree and 5 strongly disagree meaning that low scores indicated stronger beliefs about the importance of behaving in a sensitive, involved manner toward children.

Participants
One hundred and three (102 females, and 1 male) in –service preschool teachers were recruited from early childhood institutions in the Greater Accra Metropolis. The researchers visited the heads of selected schools and briefed them about the purpose of the study. To render the study ethical, the rights to anonymity, confidentiality and informed consent were observed. After ethical clearance (protocol # 070/12-13-) was granted, heads of schools who consented to participate, helped identify preschool teachers who taught crèche to kindergarten children. Informed consent were then obtained from the teachers involved and a date scheduled for the observation. Participants were informed of their rights to voluntarily participate or decline or withdraw from participation. The purpose of the study, the procedures that would be used to collect the data were explained and participants were assured of no risks or costs.
An independent sample n=5 teachers were observed in a pilot study. Results were used to validate the instruments before administering to the final sample.

RESULTS
Participants' demographic Information
The reported Mean age was 36 years with an age range of 20-50 years. About 69 % of teachers were young adults. Fifty percent (50%) of the same sample had Secondary education as their highest level of education. Of the teachers sampled, 69 (67%) of the participants observed responded to the questionnaire on beliefs and intentions (perceived interactions). It is agreed that a small standard deviation score it indicates that the data values are close to each other and that the measurement is precise (Martinez & Bartolomew, 2017). If the standard deviation is large, it suggests that the data values are further apart and that the measurement may be less precise. In this study (refer table 1) except for intentions (12.66), Perceived interactions (25.58) and # of children present (11.76) which were high, all other SDs are low.

Correlation and Regression Analyses
From Table 1, intention scores ($r=.32$, $p<.01$), perceived interaction scores ($r= .26$, $p<.05$), and number of staff present ($r= .39$, $p<.01$) were significantly related to total child-caregiver interaction (observed interactions) scores.

Table 1 Means, Standard Deviation and Correlation Results of Child-Caregiver Interaction Scores and associated Predictor Variables

	Variables	Mean	S.D	N	1	2	3	4	5	6	7	8	9
1	Total child caregiver interaction score	9.49	2.80	103									
2	Belief	38.87	5.57	70	.142								
3	Intention	98.00	12.66	70	.320**	.078							
4	Perceived Interaction	140.69	25.58	70	.264*	.842**	.919**						
5	# of years' experience in child care	10.26	9.08	103	.033	049	.104	.105					
6	# of years' experience with this age level	5.39	5.47	101	.087	.193	.176	.229	.654**				
7	educational level	2.85	1.28	101	.040	.004	-.168	-.064	.046	-.138			
8	# of children present	21.72	11.76	102	.085	.019	-.057	.030	.046	-.084	-.015		
9	special needs children	.22	.42	103	.188	-.047	.039	.043	-.094	-.099	.212*	-.093	
10	staff present	1.68	1.25	103	.392**	-.037	.156	.049	.014	.189	.231*	.055	.268**

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

This result of perceived interaction scores being significantly related to total child-caregiver interaction (observed interactions) scores (r= .26, p<.05) lend support to H1 which posited that 'There is a relationship between teachers' perceived interactions and observed interactions'. Belief, number of years' experience in child care, number of years' experience with this age level, educational level, number of children present, and special needs children were each not significantly related to total child-caregiver interaction (observed interactions) scores. The result also showed that a significant relationship did exist between number of years' experience in child care and number of years' experience with this age level (r= .654, p<.01).

Relationship between teachers' characteristics and their observed interactions with preschool children

The present study examined the relationship between identified predictor variables and observed child-caregiver interaction. This was done by testing a set of hypothesis (Hypothesis 2a, 2b, 2c, and 2d) using the hierarchical multiple regression (enter method).

Observed child-caregiver interaction measures (total child caregiver interaction score) was regressed on Beliefs, Intentions, Number of years' experience with this age level, and care giver educational level using the hierarchical multiple regression (enter method) to test the set of Hypotheses H2a, H2b, H2c, and H2d:

H2a: Teachers' level of education significantly predicts their observed interaction with preschool children.

H2b: Teachers' years of experience with current class (this age level) significantly predicts their observed interaction with preschool children.

H2c: Teachers' beliefs significantly predict their observed interaction with preschool children.

H2d: Teachers' intentions significantly predict their observed interaction with pre-school children.

The results are shown in Table 2 below.

Table 2 Hierarchical multiple regression of observed child-caregiver interaction measures (total child caregiver interaction score) on Beliefs, Intentions, Number of years' experience with this age level, and care giver educational level.

Variables	R-square	Adjusted R-square	Standardised Beta (β)	*F*
All Variables	.225**	.175**		4.440**
Belief			.107	
Intention			.363**	
# of years' experience with this age level			.209	
educational level			.301**	

*p<.05, **p<.01

Using the hierarchical multiple regression analysis (Enter Method), a significant model emerged $F_{(4,61)}$= 4.440, p<.01, refer to Table 2 above. The R^2 was .23 indicating that the model as a whole explained 23% of the variance. This indicates that 77% of the observed child-caregiver interaction variance is explained by other variables. For individual variables

contribution to the model the results indicate that intention was significantly positively related to observed child-caregiver interaction (β = .36, p<.01) thus intention was a significant predictor of observed child-caregiver interaction. Similarly, educational level was significantly and positively related to observed child-caregiver interaction (β = .30, p<.01) thus educational level was shown by the data to be a significant predictor of observed child-caregiver interaction. From the above result H2a which states that 'Teachers' level of education significantly predicts their observed interaction with preschool children.' and H2d which states that 'Teachers' intentions significantly predicts their observed interaction with preschool children.' were each supported by the data.
Belief (β = .11, p=ns) and number of years' experience with this age level (β = .21, p=ns) were however, found not to be significant predictors of observed child-caregiver interaction. These results led to the rejection of the following hypotheses: H2b which states that 'Teachers' years of experience with current class (this age level) significantly predicts their observed interaction with preschool children.' and H2c which states that 'Teachers' beliefs significantly predicts their observed interaction with preschool children.' that is hypotheses H2b and H2c were not supported by the data.

Relationship between external factors and teachers' observed interactions with children.
External factors' predictive effects on teachers' observed interactions with children under their care were examined employing the hierarchical multiple regression (enter method). Observed child-caregiver interaction measures (total child caregiver interaction score) was regressed on class size, number of special needs children and number of staff present to test a third set of hypotheses (Hypotheses H3a, H3b, and H3c):
H3a: Class size significantly predicts teachers' observed interactions with children.
H3b: Number of special needs children significantly predicts teachers' observed interactions with children.
H3c: Number of staff present significantly predicts teachers' observed interactions with children.

The results of the regression analysis are shown in Table 3 below. A significant model emerged $F_{(3,98)}$= 6.623, p<.001, using the hierarchical multiple regression analysis (Enter Method), refer to Table 3 below.

Table 3 Hierarchical multiple regression of observed child-caregiver interaction measures (total child caregiver interaction score) on Class size, Number of special needs children and Number of staff present.

Variables	R-square	Adjusted R-square	Standardised Beta (β)	*F*
All Variables	.169***	.143***		6.623***
# of children present (Class size)			.075	
Special needs children			.100	
Staff present			.363***	

*p<.05, **p<.01, ***p<.001

The R^2 was .17 indicating that the model as a whole explained 17% of the variance. This indicates that 83% of the observed child-caregiver interaction variance is explained by other variables. Among the external factors, the number of staff present significantly predicted observed child-caregiver interaction (β = .36, p<.001), a result which supported hypothesis H3c which stated that the 'Number of staff present significantly predicts teachers' observed interactions with children'. From the analysis in Table 3 above, the number of children present (class size) (β = .08, p=ns) and the number of special needs children present (β = .10, p=ns) did not significantly predict observed child-caregiver interaction. This result showed that hypothesis H3a which states that 'Class size significantly predicts teachers' observed interactions with children' and hypothesis H3b which states 'Number of special needs children significantly predicts teachers' observed interactions with children' were not supported by the data.

DISCUSSIONS

Perceived interactions, Intentions, beliefs and Observed Interactions

Ward and Wilcox-Herzog (2004) in their research failed to compare teachers perceived interactions with their observed interaction with the view that actively involved teaching behaviours promote positive child development results. Ward and Wilcox-Herzog (2004) corroborates Kantos and Dunn's (1993) argument that although early childhood educators were of the belief that "active" supportive adult participation in children's play was important to child development, some refrained from doing so for fear of interrupting play and other reasons. These were against what scholars expected them to do. Ward and Wilcox-Herzog (2004) requested for a study that measured both perceived and observed interactions to ascertain if what teachers believed (in theory) was really what they practiced. Perceived interactions was statistically significantly able to predict teachers observed interactions. Meaning that a high score on perceived interactions was likely to generate a high score on the observed interactions and that teachers were most likely to practice for real whatever they perceived as the right practice in terms of their interactions with children. Judging from the short and simple nature of the perceived interaction scales, teachers awaiting recruitment can be made to answer them as part of their assessment as it

gives an insight into their future practice. It can therefore be said that the sample supports the importance of behaving in a sensitive, involved manner toward children.
Interesting to note that when split into the individual items (that formed perceived interactions) beliefs and intentions, beliefs failed to predict observed interactions on its own contrary to other studies (e.g. Decker & Rimm-Kaufman, 2008; Jordan, Schwartz & McGhie-Richmond, 2009). Intentions predicted observed interactions thereby confirming that an individual's intents which is usually informed by thoughts is acted upon to become behaviour (Ajzen, 1991; Anderson & Maninger, 2007).

Other Staff Present
Staff present also was a predictor of teacher–child observed interactions. Working with children can be a daunting task as they need attention. It is further compounded when the children are many. Help from other adults – parents, other staff are welcomed (Twardosz, 2012). Government policies usually give class sizes by recommending a pupil-teacher ratio; -25pupils:1Teachers and 1 Assistant Teacher/Attendant for Ghana (GES, 2016). Though 61% of the teachers observed were the only staff present at the time of the observation and therefore the researcher expected it to affect observed interaction, it must be mentioned that the class sizes were not as big. Most class size ranged from 11-20 which was within manageable range. Hence any predictive effect may be due in part to small class size and not the number of staff present. Most of the teachers observed taught in private schools which charged more fees for their services than the government own preschools. Situation may have been different for the government owned school since they have been plagued with an increase in enrolment but inadequate classroom space.

Teachers level of Education
Teachers' level of Education was also supported as significantly predicting observed interaction. One would have expected that for a sample with majority holding a senior high school leaving certificate with minimal training in child care, the level of education will not significantly predict the observed interactions as was expected from literature the more the specialization in the area of child development related degrees, the better the interactions (Wolf, Aber & Behrman, 2017). Kontos and Wilcox-Herzog (1996) found that teachers with associate degrees and Child Development Associate (CDA) credentials were more sensitive and involved than teachers with some college degree or high school certificate plus workshops. Most revealing was that the data suggested that coherent teacher preparation programs (regardless of length or cost) were more effective in preparing teachers than were ad hoc educational experiences. This is where a culturally contextually inclined view of explanation may be relevant. The reason being that as Ghanaians and for that matter Africans the practice whereby the eldest girl in the home is made to act as surrogate mother in the absence of the mother may have given these teachers some prior experience in childcare. The research did not ask for other experiences like caring for younger siblings, etc, and may require further studies in the forms of training presumably.

Teachers' Years of experience.
Of the years of experience with this age level, a higher percentage (63%) was recorded for teachers with 0-10 years of experience. It is possible that due to rotation or changes that occur in schools, a teacher may have more than 10 years of total experience but may be teaching a particular age level for less than 10 years.

CONCLUSION
Teachers' interactions with pre-school children were seen to be basic. Teachers' perceived interactions reported that teachers' generally believed in supporting young children in a sensitive involving manner. Their beliefs however showed high scores on punitive measures that were seen to be inappropriate interactions behaviours. Correlation analysis showed that teachers perceived interactions predicted their observed interactions (practice). External factors like Class size, the presence of special needs child, and teacher characteristics like teachers level of education and intentions were supported by the study to predict teacher-child observed interactions. Future research focus on (teacher-child interaction) internationally through a comparative study may offer diverse perspectives and could be explored.

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