UNIVERSITY OF EDUCATION, WINNEBA

COMMUNICATION STRATEGIES BETWEEN YOUNG DEAF CHILDREN AND THEIR HEARING CAREGIVERS IN GHANA

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NOVEMBER, 2022

DECLARATION

Student's Declaration

I, Derrick Asomaning, declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

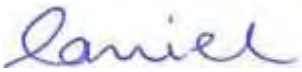
Signature: .....

Date: .....

Supervisor's Declaration

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of Thesis as laid down by the University of Education, Winneba.

Name of Supervisor: Dr. Daniel Fobi

Signature: 

Date:25.11.2023

DEDICATION

I dedicate this work to my wife, Dorothy Mensah Arthur, and my daughter, Anna Benyiwa Asomaning.

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My heartfelt gratitude goes to my research supervisor, Dr. Daniel Fobi, for his inestimable assistance throughout the study. I am grateful for his in-depth knowledge, valuable suggestions, and constructive criticisms through every stage of the thesis. Your wonderful support is what has made this work a reality. God richly bless you!

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ABSTRACT

This study examined the communication strategies between young deaf children and their hearing caregivers to identify the specific strategies and the embodied communication modalities that the two groups of interlocutors employ during their interactions. The study also provided understandings of the factors that account for miscommunication and successful communication between the two groups. Interactional videos of six deaf children and six hearing caregivers were purposively sampled in two schools for the deaf and a home in the Ashanti and Eastern Regions of Ghana. The data were multimodally analyzed through a cross-case analysis method. The findings of the study indicated that deaf children and caregivers employ various strategies such as repetitions, simultaneous communication, and simultaneity of gestures during their interactions. Deaf children and hearing caregivers used embodied communication modalities including sign language, natural gestures, pointing, eye gaze, touching and tapping as well as waving for expressive and receptive communication. It was recommended that hearing caregivers in both the home and school contexts should employ varieties of communication strategies to enhance understanding between themselves and deaf children during interaction and also to promote the communication development of deaf children.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The World Health Organization estimates that approximately 466 million people globally live with disabling hearing loss (6.1% of the world's population), of whom 34 million are children and 49 million live in sub-Saharan Africa (WHO, 2018). In Ghana, about half a million, 470,737 people suffer from varying degrees of hearing loss. Out of this number, 385,794 have some difficulties, 65,495 have a lot of difficulties while 19,448 cannot hear at all (Adzoga, 2022). These figures may, however, be underestimated due to lack of identification and assessment programmes, stigmatization, and negative cultural beliefs, which lead to low detection rate. Fear of stigmatization and labelling from other family members and the community in general prevent many Ghanaian parents from disclosing or reporting that their child is deaf (Oppong & Fobi, 2019).

In Ghana, childhood deafness is usually identified late and when the children start school because there is no national new-born hearing screening programme (Swanwick, Oppong, Offei, Fobi, Appau, Fobi & Mantey, 2021). Oppong and Fobi (2019) posit that over 80% of children are identified as being deaf or hard of hearing (DHH) before their third birthday and the remaining 20% are identified as having a hearing loss as late as after their fifth birthday. The implication is that early care, support, and intervention in terms of communication and language development as well as education for these children are often delayed.

Hull (1984) stated that communication is the basis for our social cognitive being. In other words, communication is critical for the overall development of the individual. Communication challenges in children especially those who are deaf lead to stunted growth and development, which in turn affect their psychological, social, and intellectual processes. Communication also facilities implementation of various tasks and activities, achievement of personal and professional goals and enrichment of the overall quality of the lives of those involved (Kapur, 2020). Communication has informative, instructive, persuasive, and integrative or inclusive functions. Therefore, communication challenges between young deaf children and their hearing caregivers may cause problems in adaptation and adjustment, nurturing and socialization, behavioural change and desirable direction as well as inclusion of the children.

Accordingly, it is crucial for hearing caregivers of young deaf children to facilitate appreciable levels of interaction in order to promote the development of desirable communication competences among the deaf children. However, most hearing caregivers in Ghana are not competent enough and do not have adequate appropriate strategies to facilitate communication between themselves and their young deaf children. The net result is that young deaf children are deprived of rich communication experiences that are essential for their growth and development. Blose and Joseph (2017) report that over 90% of hearing families with a deaf child have never come into contact with a deaf individual until the birth of their child or sibling. Besides, most hearing parents experience the diagnosis of their child's deafness as "traumatic" (Flaherty, 2015, p. 67). Thus, to most hearing caregivers, the experience of childhood deafness is new and they do not know how to support their deaf children particularly in terms of communication.

However, this should not be used as an excuse by hearing caregivers to shirk the responsibilities of supporting their young deaf children and providing for their communication needs. Siegal (2000) points out that all deaf and hard-of-hearing children deserve quality communication driven programme, language proficient teachers and staff who can communicate directly and at an adult level as a guiding and fundamental principle in the education sector for the deaf.

Communication may be perceived in context. In other words, communication in one context may differ from another although there are certain elements and communicative processes that are identical between different contexts. Therefore, it is imperative to explore the communication strategies between young deaf children and their hearing caregivers who are found in different contexts such as the home, school, and hearing assessment centres in Ghana.

1.2 Statement of the Problem

Young deaf children of deaf parents normally develop communication skills just like hearing children of hearing parents (Petitto, 2000). Typical young deaf children of deaf parents are competent communicators in sign language. Research shows that, at least from birth to six years of age, deaf children of deaf parents who use sign communication follow the same developmental timelines and milestones as hearing children (Meadow, Greenberg, Erting, & Carmichael, 1981; Petitto & Marentette, 1991; Petitto, 2000). Moreover, evidence indicates that deaf children of deaf parents who use sign language generally outperform deaf children of hearing parents who use speech in various domains such as language and communication, academic functioning, and psychosocial adjustment (Wallis, Musselman, Mackay, 2004; Geeslin, 2007).

These evidences are crucial because over 90% of deaf children are born to hearing parents and live in hearing family contexts (Moores, 2001; Marschark, Lang, & Albertini, 2002). As a result, young deaf children encounter developmental problems with communication because of inadequate good communication models and effective communication strategies that are appropriate for the deaf children. Kversøy, Alhassan, Kellems, Kversøy, and Cusworth (2021) postulate that successful communication depends not only on technology but also communication strategies that work for both disabled people and the majority, that without disability. The authors saw success in communication to be as much a question of the majority learning new skills and collaboration that can make real inclusion possible and not only the disabled being expected to learn skills to adapt to the majority.

Moments of potential communication between the majority and the disabled are often lost not because of the lack of skills and abilities on the part of the disabled but the lack of strategies for alternative communication on the part of the majority (Kversøy et. al., 2021). This is often the case between young deaf children and their hearing caregivers in Ghana. Most hearing parents who have deaf children are perceived by the Deaf community to have insufficient communication strategies that are appropriate for their children because the only mode of communication they are familiar with is speech. Even trained professionals like educators, house parents, audiologist, nurses and doctors may not be equipped with alternative communication strategies that are meaningful to deaf children. Most of these professionals have no experience of what it means to be deaf and thus are not able to relate to deaf people in a satisfactory manner (Gale, Berke, Benedict, Olson, Putz & Yoshinaga-Itano, 2021).

In spite of the dire communication challenges between young deaf children and their hearing caregivers, there is paucity in research in this area especially in the Ghanaian

context. How hearing caregivers especially parents communicate with their deaf children in terms of the strategies used are unknown. Therefore, it is imperative to carry out a study in this field.

1.3 Purpose of the Study

The purpose of the study was to explore the communication strategies between young deaf children and their hearing caregivers in Ghana.

1.4 Objectives of the Study

The objectives of the study were to:

- Explore the communication strategies among young deaf children and their hearing caregivers.
- Examine the embodied communication modalities young deaf children and their hearing caregivers use during communication.
- Find out the factors that account for miscommunication among young deaf children and their hearing caregivers.
- Investigate the factors that determine successful communication among young deaf children and their hearing caregivers.

1.5 Research Questions

The following research questions were formulated to guide the study:

1. What are some of the communication strategies among young deaf children and their hearing caregivers?
2. What embodied communication modalities do young deaf children and their hearing caregivers use during communication?
3. What are some of the factors that account for miscommunication among young deaf children and their hearing caregivers?

4. What are some of the factors that determine successful communication among young deaf children and their caregivers?

1.6 Significance of the Study

This study is important for four reasons. In the first place, the findings of the study would reveal the communication strategies between young deaf children and their hearing caregivers. This will create an awareness of different communication strategies among caregivers which they can use to communicate with their deaf children and help them to develop communication skills at home and in school.

Secondly, findings of the study would help hearing caregivers to be knowledgeable about various embodied communication modalities. Such knowledge will help caregivers and their interlocutors to develop their communication repertoires and enhance their interactions within the home and school contexts.

Thirdly, the findings of the study would disclose some of the factors responsible for successful communication and miscommunication during interaction. This will help caregivers and their deaf children to be aware of and adopt communication techniques that can lead to success as well as avoid mistakes that often leads to ambiguity and misunderstanding during visual interactions at home and in school.

Finally, this study would contribute to existing literature on communication studies and thus provide useful information for future researchers in Ghana and beyond.

1.7 Delimitations

The study focused on the communication strategies between young deaf children and their hearing caregivers in the southern part of Ghana specifically, in the Ashanti and Eastern Regions. This is because many of the schools for the deaf in Ghana are concentrated in these regions. In addition, deaf students from different parts of the

country travel to these regions for their education. Therefore, conducting the study in these two regions would help to reach participants from various regions of the country.

1.8 Limitations

The videos were taken with a smart mobile phone with available storage of two gigabytes. Hence, the number of videos that were taken was limited and the duration of each video was short. In addition, the quality of some of the videos was poor. I think that the study could have been better enriched if more interactional videos with good quality were taken. Again, three of the interactional episodes that were video-taped involved hearing caregivers guiding deaf children to perform tasks such as looking for school uniforms, washing clothes, and dish washing. In such cases, caregivers dominated the interaction with little opportunity for the deaf children to engage in expressive communication because they usually had to respond in such situations. More communication strategies and embodied modalities used by deaf children would have been identified if the video data involved communicative instances where the deaf children expressed themselves more.

1.9 Operational Definition of Terms

- **Communication:** This means the meaningful interactions through various modalities between young deaf children and their hearing caregivers.
- **Strategies:** This means the methods and techniques young deaf children and their hearing caregivers employ to achieve effective communication among themselves.

- **Young deaf children:** This means all deaf and hard of hearing children with various hearing levels, different primary language usages, ways of communicating, and cultural experiences who are not over 10 years old.
- **Hearing caregivers:** This means hearing adults who provide various supports, care, and interventions to deaf children and use speech as their main language.
- **Housemothers:** This means female adults who take on parenting roles in schools for the Deaf in Ghana.

1.10 Organization of the Study

The study was organized into six chapters. The first chapter covered the introduction of the study and consisted of sections such as background to the study, statement of the problem, purpose of the study, objectives, research questions, significance of the study, and operational definition of terms as well as delimitation and limitations. Chapter two discussed theoretical framework and reviewed related literature whilst chapter three discussed the methodology and the research paradigm of the study. Chapter four presented the analysis of data and findings whereas chapter five presented the summary of the study, conclusions drawn and the recommendations made.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents the review of related literature on communication strategies between young deaf children and their hearing caregivers. The literature reviewed included research articles, journals, and books. The literature was reviewed according to the following strands:

- Theoretical framework
- Communication strategies between young deaf children and their hearing caregivers
- Embodied communication modalities used by young deaf children and their hearing caregivers during interaction
- Factors that account for miscommunication between young deaf children and their hearing caregivers
- Factors that determine successful communication between young deaf children and hearing caregivers

2.1 Theoretical Framework

The theory that undergirded this study was the biecological model of human development. The bioecological model of human development, initially termed an ecological systems theory, was originally proposed by Bronfenbrenner to explain how human development occurs, focusing largely on the impact of context (Rosa & Tudge, 2013). In its current or mature stage as the biecological model, the theory places a greater emphasis on processes and the role of the biological person. The Process–Person–Context–Time Model (PPCT) has since become the bedrock of the

bioecological model. The interactions between the four concepts of PPCT form the basis for the theory (Bronfenbrenner & Morris, 2006).

Proximal processes are the development processes of systematic interaction between person and environment (Berngen, 2008). Bronfenbrenner viewed proximal processes as the primary mechanism for development, featuring them in two central propositions of the bioecological model: (1) Human development takes place through processes of progressively more complex reciprocal interaction between an active, evolving biopsychological human organism and the persons, objects, and symbols in its immediate external environment. (2) The form, power, content, and direction of the proximal processes effecting development vary systematically as a joint function of the characteristics of the developing person; of the environment—both immediate and more remote—in which the processes are taking place; the nature of the developmental outcomes under consideration; and the social continuities and changes occurring over time through the life course and the historical period during which the person has lived (Bronfenbrenner & Morris, 1998). Bronfenbrenner also acknowledged the role that personal characteristics of individuals play in social interactions. Context involves five interconnected systems, which are based on Bronfenbrenner's original theory, ecological systems theory namely, microsystem, mesosystems, exosystem, macrosystem. The last element in the PPCT model is time, which is constituted at three levels: micro, meso, and macro. Micro-time refers to what is happening during specific episodes of proximal processes. Meso-time refers to the extent to which the processes occur in the person's environment, such as over the course of days, weeks or years (Tudge, Mokrova, Hatfield & Karnik, 2009). Macro-time (or the chronosystem) focuses on the shifting expectancies in wider culture. This functions both within and

across generations and affects proximal processes across the lifespan (Bronfenbrenner & Morris, 2006).

From a methodological point of view, bioecological theory privileges the study of proximal processes that are likely to lead to healthy development, with the developing individuals of interest being distinguished in at least one relevant individual characteristic and studied in more than a single context – almost always the typical settings in which the individuals are to be found (Rosa and Tudge, 2013). Thus, this study focused on the proximal process of communication within deaf children's microsystem, that is, family/home and school. The form (embodied communication modalities), content (communication strategies), and power (communication successes and misses) of proximal processes were the centre of investigation. Therefore, the biecological theory was used to explain how deaf children and their caregivers engage in proximal process, that is, communicative activities within the former's immediate context (home and school) over time to promote the development of communication. The theory was also used to explain home-school partnership, highlighting how these two contexts can exchange the resources and strategies in terms of communication with young deaf children. Hence, the biecological theory informed data collection, analysis and discussion of findings in this study.

2.2 Communication strategies between young deaf children and their hearing caregivers

2.2.1 The Concept of Communication

The National Technical Assistance Consortium for Children and Young Adults Who Are Deaf-Blind (NTAC) point out that communication is a complex concept with diverse definitions. In its simplest term, communication is about sending and receiving messages between two or more people. Communication is a social act or behaviour that

occurs between at least two people (NTAC, 2002). NTAC (2002) argues that for communication to occur, there must be an intent or purpose on the part of one person to impact the other. In support, Le-poire (2005) asserts that human beings cannot communicate, that is, it is possible to behave in ways that are not communicative because some behaviours have no communicative intent. Le-poire (2005) contended that eating, walking, and sleeping are all behaviours with potential information value but that have no communicative intent. Thus, while some scholars might argue that eating is communicative because it informs that one is hungry, it could be argued that eating informs of hunger without any intention on the part of the person eating to communicate that information.

On the other hand, Ashman (2018) pointed out that the statement, "All behaviour is communication", has become the mantra of many. Those who support this school of thought argue that all behaviour is informational and thus communicational in nature. Therefore, this premise ignores an important element of communication - the communicator's intent. Godat and Czerny (2021) refer to the idea that all behaviour is communication as the "big misunderstanding" (p. 1). In other words, they are of the opinion that not all behaviour is communication. Godat and Czerny (2021) observe that the premise, all behaviour is communication, comes from the first of the five axioms of communication formulated by Watzlawick, Beavin and Jackson (1967): "You cannot not communicate". Godat and Czerny (2021) point out that Watzlawick et. al. (1967) saw the above statement as tentative or provisional hypothesis only. It was neither complete nor final and required empirical verification (Bavelas, 1990).

Godat and Czerny (2021) cited Wiener, Devoe, Rubinow and Geller (1972) distinction between non-verbal behaviour and non-verbal communication. Wiener et al. (1972)

saw non-verbal communication as a sub-group of non-verbal behaviour and distinguished between two forms of non-verbal behaviour:

- Communicative behaviour: Behaviour with which the person intends to communicate something and to which the other person reacts.
- Informative behaviour: Behaviour by which the person does not intend to communicate something and that is only interpreted as communication by the person observing the behaviour.

Information behaviour is interpreted by an observer. Godat and Czerny (2021) expound that the interpretation of the behaviour depends heavily on the ideas of the interpreter. Since it takes place primarily in the head of the person interpreting and not as an interaction between people, it cannot be empirically researched through observation. Therefore, informative behaviour is not considered to be interactive and is seen as non-verbal behaviour, but not as non-verbal communication. Communicative behaviour, on the other hand, is interactive and can be seen as an exchange between people in conversation. Since communicative behaviour takes place between people - one person intends to communicate something, and the second person relates to the behaviour of the first person - it can be observed empirically and is seen as non-verbal communication. Therefore, they conclude that not all behaviour is communicative.

In their review of literature in communication research, Bowers and Bradac (1981) analysed issues which researchers in communication find important to include in communication definitions. They argued that communication must include the following ideas: transmission and reception of information, generation of meaning, relationship behaviours of interacting individuals, uniqueness of human communication, communication as ongoing and processual, and contextualized. Thus, the notion of sender and receiver must be included in all communication definitions.

Also, consensually shared meaning among members of a particular community is important (Le-poire, 2005). Moreover, communication involves the simultaneous transmission and reception of information so that both partners are senders and receivers at the same time. Another characteristic of human communication is that it is unique in that humans are the only symbol-using creatures and thus are the only ones able to represent the nature of the universe in abstract concepts in their minds (through language use) (Le-poire, 2005). In addition, communication is ongoing and processual, which implies that communication is dynamic and fluid and that communicators continually influence each other through their communication behaviour. Finally, Bowers and Bradac (1981) recognized communication as contextualized. In other words, communication in one context is different from communication in other contexts although communication within two or more contexts may share certain elements.

2.2.1.1 Types of Communication

NTAC (2002) distinguishes between two main types of communication - receptive and expressive communication. Receptive communication is the process of receiving and understanding a message from another person, the output whereas expressive communication is the message to another person, the input. According to NTAC (2002), expressive and receptive communication facilitate the development of turn-taking skills in children as they exchange roles with their communication models such as family members, teachers and other caregivers. Expressive and receptive communication skills also enable children to develop and expand relationships, express needs and wants, and learn about routines (Siegel-Causey & Guess, 1989).

NTAC (2002) postulates that a form of receptive and expressive communication depends on the child's social, physical, perceptual, and cognitive skills. Typical children and children with disabilities usually understand different forms of receptive

communication before they can use these forms for expression. Young deaf children, for example, need to hear, see, or feel gestures, objects, signs, or words many times before they can use them receptively and expressively. However, due to limited exposure to these forms, young deaf children may lag behind their hearing counterparts in terms of receptive and expressive communication.

Some receptive communication forms are:

- Object cues and touch cues
- Pictures
- Photos
- Gestures
- Tangible representations
- Sign language
- Written words
- Speech/ vocalizations

Expressive communication forms include:

- Body movements
- Touching objects and/ or persons
- Challenging behaviour
- Gestures
- Vocalizations
- Tangible symbols/ pictures/ photographs
- Speech
- Written words
- Sign language
- Augmentative modes - aid or techniques that supplement speech

- Alternative communication style - a communication method used by a person without any vocal ability (Vanderheiden & Yoder, 1986).

2.2.1.2 Critical Features of Receptive and Expressive Communication

According to McLean and Snyder-McLean (1978), everyone's communication system consists of five features: forms, functions/ intents, content, partners, and physical environment. The forms of communication refer to the ways in which we receive and send communication. NTAC (2002) opines that all children start out using concrete simple forms of communication before they use speech, sign language, or other abstract (symbolic) forms, however, children with disabilities such as the deaf and deaf-blind may need adaptive forms of receptive communication. Non-symbolic forms of communication include vocalizations, body movements, use of objects, and gestures. Symbolic forms include manual signs, speech or the use of symbols on electronic alternative devices. NTAC (2002) observes that most typical children use one primary form to communicate expressively and receptively, for example, speech. However, deaf children may use one form for expressive communication (for example, gestures, body movement etc.) and a different form for receptive communication (for example, objects, pictures etc.).

Forms of communication can be considered on a continuum from very basic forms like crying, smiling etc., to more advance forms, such as speech or sign language. The placement of forms of communication into categories helps to understand the development sequence of communication. Forms of communication can be grouped as pre-intentional or intentional and as pre-symbolic or symbolic (NTAC, 2002).

Non-intentional communication is behaviours that are interpreted by others as meaningful. It involves the informative behaviours explained above. For instance, when

a child makes a noise, it does not mean that he wants to communicate. Children begin to learn how to communicate when they realize that their actions such as crying, touching, smiling, etc. may have an impact on other people (Mohan, Bajaj, Deshpande, Anakkathil, Bhat, 2021; NTAC, 2002). On the other hand, intentional communication happens when a child expects that using a certain form of communication will bring about a response. For example, a child may throw a toy with the intention of getting attention or raise his two arms with the expectation to be lifted up.

Pre-symbolic communication involves more basic forms of communication that do not rely on symbols to represent the communicative intent. Children at this stage of communication rely on movement, eye gaze, touching, pointing, vocalizations, and gesturing to convey their message, usually within an immediate context (Frazier, 2011; Wise, Sevcik, Morris, Lovett & Wolf, 2007). Symbolic communication involves a more complex system of communication that relies on symbols to convey a message. Symbolic forms allow communication about people, places, things, and events that are not concrete or in the present time. These include speech, sign language, printed language, and high-technology assistive devices.

The function of communication refers to the speaker's intent of communication. All children learn to express simpler or basic functions of communication before they use more complex functions (NTAC, 2002; Virtual Lab School, n.d). Some basic functions/ intents of communication may include gaining attention, protesting, request something or someone, commenting, offering, and questioning. Some more complex functions include joking, lying, and persuading (Mohan et al., 2021; NTAC, 2002). According to Whetherby, Reichle, and Pierce (1998), Kapur (2020), and Gupta (2014), functions of communication can range from very simple to the complex:

Early developing functions:

- Protesting or rejecting
- Calling or accessing others
- Requesting more
- Directing others or making requests

Later developing functions:

- Greeting
- Offering
- Confirming
- Answering
- Naming or labelling
- Questioning
- Commenting or replying

More complex functions:

- Joking
- Lying
- Persuading

The content of communication refers to what is communicated or the thing which the message talks about. According to the Idaho Centre on Disabilities and Human Development (n.d), each form and function used communicates something and this "something" that is communicated involves the people, locations, actions, possessions, and feelings that are in the child's life. Therefore, children need to experience different people, objects, and activities before they can communicate about them. Hence, where the exposure to these things is low, children's communication will be limited.

Communication partners are the interlocutors. Caregivers are deaf children's first communication partners. Thus, caregivers of deaf children must be able to understand and use the same forms that the children use. In addition, caregivers must communicate often with the deaf children in order to teach them the many forms and functions of communication (Mohan et al., 2021). Siblings and peers are also very important communication partners and caregivers especially parents can include them in their communication plans for their deaf children.

The physical environment refers to the location where a communication interaction takes place. Children's major environments are their home, school, and community. Within these environments, each child has varying environments such as the family room, the kitchen, the playground, and the movie theatre. NTAC (2002) affirms that children must be given access to many environments in order to learn what to communicate about within environments and to be able to generalize across those environments. In addition, caregivers must ensure that the child's hearing and vision needs are always taken into consideration when communicating in different environments.

2.2.2 Communication strategies used by young deaf children and hearing caregivers

As pointed out early on, children begin to communicate when they realize overtime that their behaviours or actions impact on others such as caregivers through response (Hidayah, Lestari & Artha, 2021; NTAC, 2002). Thus, there is the need for good communication models and high exposure to people, events, and objects about which children can communicate. For typical hearing children of hearing families and deaf children of deaf parents, communication models and exposure are usually not a

problem. However, it is a major issue for deaf children of hearing families because of the difference in cultural and linguistic background. Therefore, young deaf children may need a special communication programme or plan to help them to develop appreciable levels of communication skills.

The use of a special programme to teach communication systems to young deaf children can help take advantage of their strengths and address their needs across many areas of development. According to (NTAC, 2002), developmental areas to consider when designing a communication system for deaf children include cognitive skills, social skills, motor skills, vision, hearing, and medical. The assessment of these skills will help in determining the strengths and needs of the children and in turn aid in the development of effective communication systems for them. General strategies that caregivers of deaf children can adopt to develop their children's communication skills include:

- Using social interaction with others as a basis of teaching and learning
- Teaching important cognitive skills along with communication
- Using routines and functional activities for training
- Recognizing and using receptive communication/language to teach expressive communication
- Individualizing teaching and learning for the child/ youth
- Increasing the child's rate of communication by providing more opportunities for communication and being responsive
- Manipulating the environment (Hidayah, Lestari & Artha, 2021).

Hulsebosch and Myers (2002) observed in their study some of the indigenous strategies that parents use for optimizing the visual aspects of parent-child interactions. These strategies, based on a visual perspective, included:

- Visual-gestural play
- Using highly animated facial expressions
- Following the child's eye gaze to understand interest
- Moving into the child's line of sight rather than pointing
- Using touch to regain attention
- Reinterpreting the meaning of vigorous physical activity
- Visual presentation of early literacy (Mohan et al., 2021; Wise et al., 2007).

Much of the research on communication strategies of deaf people reveal that simultaneous communication is usually used in different communication contexts such as the home, school, and the wider community (Fobi & Oppong, 2018; Adami & Swanwick, 2019). Communication partners of deaf children tend to combine two or more communication modes simultaneously during interactions. Simultaneous communication usually comprises of sign language and speech, however, it may also be a combination of any two or more of communication modes such as speech, writing, gestures, finger spelling, sign language, gestures, Communication Board, etc. (Gadagbui, 2013; Adami & Swanwick, 2019). The use of two or more communication modalities helps to offset the weaknesses of the individual communication methods and promote understanding. Closely related to simultaneous communication is simultaneity of gestures, that is, using two or more gestures at the same time. According to Adami and Swanwick (2019), hearing and deaf interlocutors often employ different modal affordances such as sequencing of gestures and simultaneity of gestures in turn taking, execution and offering that mitigate the sensory and linguistic asymmetries among them. In addition, the "simultaneous co-deployment of modes enables the expression of different functions, i.e. to refer and locate, to include and exclude (mainly through gesture), and to address (through gaze)" (Adami & Swanwick, 2019, p. 18).

Heward and Orlansky (1992), Ewin, Reupert, Louise (2021) suggest that during caregiver-child dyads, caregivers should always stay nearer their deaf children and keep their whole face visible as well as maintain eye contact. In addition, when using speech and sign language at the same time, caregivers should not raise the level of their voices and exaggerate their mouth movements as this will deter easy understanding. Nodoushan (2008) points out that caregivers of deaf children often altered the communication mode when the children were unfamiliar or did not understand the previous communication method used. In support, Rottenberg and Searfoss (1992) observed that when deaf children were unable to write or understand the writing of others during interactions, caregivers usually used environmental prints such as name tags, charts, signs, and labels to help the communication progress.

Toe and Paatsch (2010) found out in their study on communication skills used by deaf children and their hearing peers in a question-and-answer game context that the deaf and hard or hearing students required a significantly greater number of repetitions and sought a greater number of general clarifications. Repetitions are important aspect of communication especially in communication contexts involving deaf children. Repetitions create emphasis, lead to clarification and promote understanding. However, Marschark, Convertino, Macias, Monikowski, Sapere and Seewagen (2007) noted that college deaf and hard of hearing students in their study rarely requested a repetition of the question even though they clearly had not understood it. They regarded the failure or unwillingness to request clarification through repetitions as disquieting because of its far-reaching implications on the effectiveness of classroom communication. Unlike college deaf students who are adults and thus may have the ability to request for clarification during interactions, young deaf children may lack the ability to do so. This does not mean that deaf children cannot express their misunderstandings and indicate

their intentions for clarification. Therefore, caregivers need to observe deaf children's facial expressions, body language and actions to determine whether a question or statement need to be repeated for clarification.

In their literature review on the use of visual-tactile communication strategies by deaf and hearing fathers and mothers of deaf infants, Loots and Devise (2003) distinguished between two groups of visual-tactile communication strategies used by deaf fathers and mothers during interactions with their deaf children. The first group consisted of strategies connected with the use of sign language. They pointed out that just as hearing mothers modify their speech directed toward their hearing children, deaf mothers alter their sign language by signing more slowly and simply, repeating more, exaggerating the movements, or using an unconventional sign placement in the visual attention focus of the child (Swisher, 2000; Waxman, Spencer & Poisson, 1996).

The second group of visual-tactile communication strategies consisted of strategies specifically aimed at the creation of a shared focus of attention. These strategies included tapping (Erting, Prezioso & O'Grany Haynes, 1990), the use of space, and waiting until the child looks up before expressing an intention. According to Waxman and Spencer (1997), deaf mothers interacting with their deaf children use tapping three to five times more than hearing mothers of deaf children. The reason for the difference in the use of tapping by deaf mothers and hearing mothers was that tapping on the child seems intrusive from the perspective of hearing cultural norms (Waxman & Spencer, 1997). On the other hand, Harris and Mohay (1997) regarded tapping as an adequate strategy to create joint attention and to share linguistic meaning especially from the age of 18 months onwards. Maestas y Moores (1980) and Harris (2001) also stressed on the importance of other strategies of physical contact to stimulate deaf children's interest in the manual creation of linguistic meaning through signing on the child's body or

through moulding the child's hands. Moreover, Koester, Papousek, and Smith-Gray (2000) emphasized on the importance of physical contact in eliciting early involvement in reciprocal sequences of interaction.

The use of space is another visual strategy that caregivers often use to create joint attention with their deaf infants between 7 and 18 months (Swisher, 1991; Waxman & Spencer, 1997). This strategy involves the introduction of linguistic symbols in the sites of joint attention. Loots and Devise (2003) expound that hearing children learn to connect the inanimate environment with linguistic expressions during interactions. Likewise, deaf mothers of deaf children compensate for the simultaneous auditory linking by using space through placing and moving their hands and body in the focus of the child's visual attention, allowing them to show the simultaneous connections visually (Harris & Mohay, 1997; Koester, 1992).

An important communication strategy employed by caregivers to create a reciprocal exchange of meaning with deaf children is waiting until the child looks up before expressing an intention. This sequential visual strategy increases the likelihood that the expressed intentions are perceived (Harris & Mohay, 1997; Jamieson, 1994; Swisher, 1991). According to Swisher (1992), hearing mothers perceive their deaf child looking away as an interruption of communication. Therefore, they do not allow the children to switch their gaze from objects back to their mothers. Deaf mothers, on the other hand, care for the visual attention of their deaf children and thus allow them enough time to look at objects and events in the environment, waiting to respond when the child looks back (Swisher, 1992; Waxman et al., 1996). Loots and Devise (2003) summarized the visual-tactile communication strategies used by deaf mothers in their interaction with deaf children as follows:

- Tapping the child/ or objects to attract or keep the child's attention (Erting et al., 1990; Harris & Mohay, 1997; Jamieson, 1994; Waxman et al., 1996).
- Repositioning the child to visually show interaction behavior (Erting et al., 1990; Spencer, Bodner-Johnson, & Gutfreund, 1992).
- Taking the child in the arms, taking the child onto the lap and/ or turning the head of the child to visually show the interaction behavior (Harris et al., 1987).
- Placing the hand on the upper body of the child to stimulate and to check the child's vocalizing (Maestas y Moores, 1980; Swisher, 2000).
- Using other touching like tickling, caressing, moving the limbs of the child (Erting et al., 1990; Swisher, 2000).
- Placing the hands of the child in the form of gesture/ sign configurations; this is known as "molding" (Maestas y Moores, 1980).
- Making gestures/ signs on the body of the child (Erting et al., 1990; Swisher, 2000).
- Placing or moving the hands or the body of the parent or objects into the child's field of vision, more specifically in the focus of the child's visual attention (Jamieson, 1994; Koester, 1992; Swisher, 2000).
- Waiting until the child watches (up) to the parents before starting the interaction. This means that the parent does not start to express the communicative intention until the child is looking (Erting et al., 1990; Jamieson, 1994; Swisher, 1992).

2.3 Embodied Communication Modalities Used by Deaf Children and their Hearing Caregivers during Interaction

Communication modalities refer to the means by which the child and family receive and express language (Gravel & O'Gara, 2003). NTAC (2002) refer to communication

modes as forms, that is, the ways in which interactants send and receive communication. According to Allwood (2008), an analysis of the concept embodied communication depicts three conceptual components: embodiment, body, and communication. Generally, embodiment makes the intangible tangible and amenable to observation, consideration, and investigation. In other words, embodiment renders an abstract phenomenon possible to experience in concrete terms (Allwood, 2008). Thus, embodied communication modes refer the visual and tactile means of communication that pertains to the use of the body. Therefore, even though speech pertains to the use of the body (the speech organs), it is not classified under embodied communication because it has to do with audition and not sight. Hence, basic forms of communication such as babies' cries and vocalizations are not parts of embodied communication. On the other hand, basic forms of communication such body movements, facial gestures, and touch include embodied communication modes since the messages they express are received through sight and touch. Thus, embodied communication modes connote visual and tactile or kinaesthetic forms of receptive and expressive communication.

According to Morgenstern (2014), children have innate biological and cognitive capacities to learn language and communication. However, they need to learn linguistic conventions and formal patterns from the language in their environment. As children interact often with their communication models in their immediate environments like the family, school, and community, they gradually become fully bloomed interactants, building on such cognitive and social skills as the ability to follow the other's gaze, to draw and maintain their attention, to read others 'intentions, to make analogies, to categorize and to symbolize. Embodied communication modalities like gestures, signs, gaze, facial expressions, postures, are all part of our socially learned, inter-subjective communicative system. Although pointing and gazing are integral elements of

spontaneous oral interactions both in signing and speaking mother-child dyads, deaf children use gaze and pointing more frequently and with more diversified functions than hearing children (Loots & Devisé, 2003).

Morgenstern (2014) postulates that human beings combine modalities for meaning making and sharing, refer to present and absent entities and events, express their projects, their desires and inner feelings. Literature on communication between deaf children and their caregivers numerous embodied communication modalities that caregivers and deaf children employ during interaction. These include eye gaze, facial expressions, pointing, touching, tapping, engagement with or manipulation of objects, sign language, and waving.

2.3.1 Sign Language

The main communication modality of people who are Deaf is sign language. It is the first and natural language of many Deaf people especially those who are pre-lingually deaf (Powers, 1997). Sign language is a language that employs the hands and body in speaking. It is a language that is 'heard' with the eyes and not the ears (Oppong, 2003). Costello (1995) describes sign language as a wonderful silent language of hands, face and body that is rich with nuance, emotion, and grace - a marvellous mode of communication that encourages self-expression and creativity as it serves the essential everyday functions of a living language.

There are different kinds of sign language: American Sign Language (ASL), Australian Sign Language (Auslan), South African Sign Language (SASL), Ghanaian Sign Language (GSL), Adamorobe Sign Language and Nanabin Sign Language.

Nanabin sign language is the family sign language of the coastal Fante village of Ekumfi Nanabin in central Ghana. Nanabin sign language is used by his three

generations of a single family, most of whom are deaf (Brentari, 2010). Nanabin SL is similar to Adamorobe Sign Language (AdaSL), a village sign language used in Adamorobe, an Akan village in eastern Ghana (Nyst, 2004). Both use loose handshakes and depict events from the character's point of view rather than the observer's (Brentari, 2010). GSL is a visual-gestural language created by Ghanaian Deaf people. It has its own morphology, syntax, semantics, and pragmatics, which are distinct from and was never based on the English language (Oppong, 2003). Caregivers and deaf children in Ghana often communicate through GSL. However, this is done usually in combination with other modes of communication such as speech and natural gestures due to the poor GSL skills of most hearing caregivers.

2.3.2 Eye Gaze

Although gaze plays an important role in attracting and maintaining children's attention during interaction, all sorts of sounds and visual cues can compete for infants' (especially hearing children's) attention in their ecological environment (Morgenstern, 2014). According to Estigarribia and Clark (2007), environmental studies reveal that adults use verbal cues more often than gesture and gaze as attention getters before the children look at the objects and then rely on the children's gaze to know if they are attending. Deak, Jasso, Krasno and Triesch (2006) add that infants almost never follow caregivers' gaze shift unless the adult also manipulates the object or points. Thus, object manipulation is very crucial especially during the first year (You, Deak, Jasso & Teuscher, 2005). Both deaf and hearing children learn about the world through shared or joint attention with their communication partners, however, deaf children learn mainly through visual attention. Through visual attention, deaf children explore their environment and perceive all their language inputs (Morgenstern, 2014). Limousin (2011) observes that some caregivers combine visual and tactile communication

modalities such as tapping lightly, waving hands, tapping the foot on the floor to establish eye contact and maintain attention.

According to Limousin (2011), caregivers adjust and adapt their communication strategies to meet the needs of deaf children as they grow. He found out in his longitudinal study of a French deaf little girl's linguistic development that her French deaf signing parents bent down to sign in her visual field and sometimes signed directly in front of her eyes. As she grew up, they started signing with less repetitions, more quickly, and with smaller movements, thus, their prosody became less emphatic. Masataka (1996) and Mayberry and Squires (2006) referred to these specific communication strategies as child or infant directed sign. According to Morgenstern (2014), child directed sign helps deaf children to acquire the same conversational skills and enables them to acquire sign language, by attracting and holding their attention. On the other hand, the linguistic, emotional and social development of deaf children who do not benefit from child directed signs can be highly hampered (Courtin, 2000).

Two year olds constantly shift their gaze back and forth and therefore connect the speech addressed to them to the objects referred to. Such precocious meaningful gaze shifting has not been found in hearing children of the same age. They reflect specific skills developed from perceiving all of language visually. Deaf children therefore learn to control their own eye gaze in order to alternate attention between signers and objects. If they don't learn those skills quickly enough, they don't "see" enough language, and communication is "incomplete" and they do not fully benefit from their input (Morgenstern, 2014, p. 6).

In this way, eye gaze becomes an integral part of sign language itself since it is grammaticalized and serves different linguistic functions. For example, eye gaze

enables signers to distinguish between narrative (gaze is not on the interlocutor) and dialogue (gaze is on the interlocutor) (Cuxac 2000). It also plays a syntactic role to mark pronominal reference (differentiating second and third person, either complementing or replacing pointing gestures). Eye gaze is therefore an important element of sign productions and must be finely controlled and monitored by children for them to become expert signers (Morgenstern, 2014).

2.3.3 Pointing

According to Butterworth and Itakura (2000), pointing with an outstretched and aligned arm, hand and finger (or other parts of the body) is a very natural and salient way to direct another's attention to a new object. Caregivers and children employ pointing to direct each other's attention during interaction (Bates, Camaioni, & Volterra, 1975). In addition, pointing is used by caregivers when they move from things that are in the immediate vicinity of the infant and which they can handle, show them and hand to them (Morgenstern, 2014). In turn, children respond to pointing gestures by caregivers through taking up those pointing gestures directed at them, and reciprocating by showing, commenting or requesting objects that are out of reach with the same means. In comparison to gaze shifting, pointing gestures are rare, however, they are salient for infants due to the movement they involve. Moreover, pointing implies more effort and children may think the target is even more interesting when pointing is used (Morgenstern, 2014). In spite of this, the best option is to combine the two modalities. According to Flom, Deak, Phill, and Pick (2003), nine- month-old children follow gaze much more reliably when it is accompanied by a pointing gesture.

The crucial roles pointing plays in language acquisition and communication development especially of deaf children cannot be overemphasized. Pointing gestures are grounded in joint attention, they trigger interaction, and they may also facilitate

children's entry into word combination and syntax (Kelly, 2011; Iverson & Goldin-Meadow 2005). Morgenstern (2014) emphasizes the importance of observing uncontrolled body movements to intentional gestures like pointing because pointing in particular is considered as a precursor of intentional marking and represents children's ability to discriminate between external objects and their own person. Hence, communicational pointing then becomes the basis for referential behaviour and reciprocity established in common activities between children and their caregivers (Bruner 1975). In summary, "pointing may thus represent a key transition, both phylogenetically and ontogenetically, from non-linguistic to linguistic forms of human communication." (Tomasello, Carpenter, & Liszkowski, 2007, p. 720).

Hoiting and Slobin (2007) expound that continuity between gesture and sign language is challenging since pointing gestures are fully integrated in the linguistic system just as gaze is grammaticalized. Morgenstern (2014) point out that when children first produce pointing gestures both in speaking or signing environments, they designate a place, an object, a person or sometimes an event. However, deaf children who are surrounded by sign language, those pointing gestures are progressively incorporated into their formal linguistic system and used for demonstrative and personal reference among other functions in combination with gaze.

According to Bellugi and Klima (1982) and Petitto (1986), children's pre-linguistic gestures are different from signs despite the same hand-shape and may correspond to two distinct categories of pointing gestures: some indexical and some symbolic (Tomasello 2003). While discontinuity between pointing gestures and points used as personal pronouns was thus illustrated in the acquisition of American Sign Language, the same phenomenon was not confirmed in Italian Sign Language with longitudinal

data (Pizzutto & Capobianco, 2005), nor in the longitudinal recordings of deaf children using French Sign Language (Morgenstern, 1997; Limousin, 2011) which showed no interruption of pointing toward persons and no pronominal reversal. These observations were not confirmed either in other longitudinal studies of children using ASL.

The problem is that the pointing signs used for personal pronouns and demonstratives, do not look very different from the pointing pre-linguistic or co-verbal gestures used by hearing children. Because "points are considered linguistic in the adult system, it is tempting to consider the child's points as linguistic" (Schick, 2003, p. 221). Most sign language researchers assume that these pointing signs are pronouns, but this assumption is challenged by Evans and Levinson (2009) and Cormier (2010). Pointing signs do not look different on the surface from pointing in non-signers (Kendon, 2004; Kita, 2003). In both cases, points index locations of objects, persons, events in the deictic space.

Some studies, however, have focused on specific features of pointing in deaf children and on their ability to use different forms and types of pointing for different functions (with the combinatorial dimensions of finger, wrist and arm configuration, movement, intensity and speed). Not only do deaf children use an impressive amount of pointing gestures from very early on, but the functions of these points are "integrated into the process of conventionalization of gesture and control of the signing space" (Hoiting, 2009, p. 84).

2.3.4 Gesture

One major embodied communication modality employ by both hearing caregivers and young deaf children is gesture. Gesture basically involves a movement usually of the body or limbs that expresses or emphasizes an idea, sentiment, or attitude. Generally, congenitally deaf children who are born into hearing families and are not exposed to

sign language early on are thought to be incapable of communicating. However, Goldin-Meadow (2010) point out that in spite of their deafness and lack of exposure to sign language by caregivers and schools, congenitally deaf children communicate through gesture. In addition, those gestures they use take on many forms and functions of language (Goldin-Meadow & Butcher, 2003). Moreover, many studies have shown that deaf children will spontaneously use gestures – called "homesigns" – to communicate if they are not exposed to a conventional sign language (Fant, 1972; Moores, 1974; Tervoort, 1961).

According to Goldin-Meadow and Butcher (2003), deaf children develop "resilient" properties of language, the properties of language they fashion without benefit of linguistic input when using gesture to communicate. In their analysis of deaf children's gesture systems, Goldin-Meadow and Butcher (2003) categorized the resilient properties of language into three: those that relate to words, sentences, and language use. She opines that deaf children's gesture words have many properties that are found in the words of all natural languages. In the first place, deaf children's gestures are "stable" in form (Goldin-Meadow, 2010, p. 2). Deaf children develop a stable store of forms that they use in a range of situations. In other words, they develop a lexicon, an essential component of all languages (Goldin-Meadow, Butcher, Mylander, & Dodge, 1994). Moreover, the gestures the children develop are composed of parts that form "paradigms", or systems of contrasts. When the children invent a gesture form, they do so with two goals in mind – the form must not only capture the meaning they intend (a gesture-world relation), but it must also contrast in a systematic way with other forms in their repertoire (a gesture-gesture relation). In addition, the parts that form these paradigms are "categorical" (Goldin-Meadow, 2010, p. 2). Finally, the gestures deaf children develop are differentiated by grammatical function. Some serve as nouns,

some as verbs, some as adjectives. As in natural languages, when the same gesture is used for more than one grammatical function, that gesture is marked (morphologically and syntactically) according to the function it plays in the particular sentence (Goldin-Meadow et al., 1994).

Deaf children's gesture sentences likewise have a variety of sentential properties found in all natural languages. Underlying each sentence is a predicate frame that determines how many arguments can appear along with the verb in the surface structure of that sentence (Goldin- Meadow, 1985). For example, four slots underlie a gesture sentence about transferring an object, one for the verb and 3 for the arguments (actor, patient, recipient). In contrast, three slots underlie a gesture sentence about eating an object, one for the verb and 2 for the arguments (actor, patient). Moreover, the arguments of each sentence are marked according to the thematic role they play. There are three types of markings that are resilient (Goldin-Meadow et al., 1994):

1. Deletion: The children consistently produce and delete gestures for arguments as a function of thematic role; for example, they are more likely to delete a gesture for the object or person playing the role of transitive actor (soldier in "soldier beats drum") than they are to delete a gesture for an object or person playing the role of intransitive actor (soldier in "soldier marches to wall") or patient (drum in "soldier beats drum").
2. Word order: The children consistently order gestures for arguments as a function of thematic role; for example, they place gestures for intransitive actors and patients in the first position of their two-gesture sentences (soldier-march; drum-beat).

3. Inflection: The children mark with inflections gestures for arguments as a function of thematic role; for example, they displace a verb gesture in a sentence toward the object that is playing the patient role in that sentence (the "beat" gesture would be articulated near, but not on, a drum).

In addition, recursion, which gives natural languages their generative capacity, is a resilient property of language found in deaf children's gesture systems. Deaf children systematically combine the predicate frames underlying each simple sentence, following principles of sentential and phrasal conjunction. When there are semantic elements that appear in both propositions of a complex sentence, the children have a systematic way of reducing redundancy, as do all natural languages (Goldin-Meadow, 1987).

With regards to language use, deaf children use their gestures for many of the central functions that all natural languages serve. They use gesture to make requests, comments, and queries about things and events that are happening in the situation. Deaf children also use their gestures to communicate about the non-present, that is, displaced objects and events that take place in the past, the future, or in a hypothetical world (Butcher, Mylander & Goldin-Meadow, 1991; Morford & Goldin-Meadow, 1997). In addition, to these obvious functions that all natural languages serve, deaf children employ their gestures to self-talk, that is, to communicate with themselves (Goldin-Meadow & Butcher, 2003), for metalinguistic purposes - use their gestures to refer to their own and others' gestures (Singleton, Morford, & Goldin-Meadow 1993), and finally to narrate, that is, to tell stories about themselves and others (Phillips, Goldin-Meadow & Miller 2001).

In their study on the development of gestures in hearing and deaf children, Volterra, Iverson, and Castrataro (2006) distinguished between two types of gestures: deictic and

representational gestures. Deictic gestures also known as performatives (Bates, 1976) typically appear between the ages of 9 and 13 months and mark the onset of intentional communication. The deictic gesture category included four distinct gestures, namely, ritualized requests, give, show, and point (Volterra & Iverson, 2006). Deictic gestures are no-symbolic and express communicative intent on the part of the child. However, their content can only be interpreted by referring to the extra-linguistic context in which communication occurs. According to Bruner (1983) and Locke (1980), among the four deictic gestures, pointing is the most frequently observed and the most closely linked to later language development.

On the other hand, representational gestures also referred to as symbolic, characterizing, iconic, or referential gestures appear in children's production during roughly the same age period when deictic gestures appear. Some representational gestures are conventional and culturally defined (e.g., clapping hands); some are specific to particular cultures (e.g., among Ghanaians, closing the thump against the other fingers in a fist shape signifies "insult"); others are action-related (e.g., bringing the hands to the mouth for "eat"), and others still are object-related (e.g., bringing the hand to the ear for "telephone") (Volterra & Iverson, 2006). In spite of this variability, all representational gestures share a common characteristic; they have a reasonably consistent form that is used intentionally to express reasonably consistent meaning. In other words, unlike deictic gestures, representational gestures express a meaning that can be interpreted without reference to contextual information (Volterra & Iverson, 2006).

2.3.5 Tapping and Touching

Tapping and touching fall under the tactile modality of embodied communication. Touch involves making contact once with the body or objects whereas tapping involves

making contact several times successively with the body or objects. Tapping and touching can be used distinctively or in combination with other modalities to attract and maintain attention. Limousin (2011) named tapping among the visual-tactile modalities usually employed by caregivers and deaf children for shared attention. In a study by Waxman and Spencer (1997), hearing mothers of deaf infants were found to move objects into a child's visual field and tap on or point to objects to get the child to attend to them. According to Swisher (1991) the most successful caregivers in communication often use tap and touch to gain attention before beginning signing.

2.3.6 Waving

Waving involves moving the hands especially the palm with either opened or closed fingers from left to right. Waving is a conventional gesture that usually signifies "goodbye" and expresses "farewell". Waving has been integrated into the linguistic system of sign language as an attention getter. In Ghanaian Sign Language, waving to attract attention could be done in a left to right or up and down motions. According to Depowski1, Abaya, Oghalai, and Bortfeld (2015), caregivers employ deliberate waving in deaf children's field of vision to gain their attention before signing or gesturing. Apart from the conventional sign for the word "no" in sign language, deaf individuals sometimes employ waving to signify "no". However, in gesturing "no" through the use of wave, the gesture is done quickly and in combination with a disagreeing facial expression or head-shake.

2.3.7 Facial Expression

Facial expressions play a vital role in our everyday interactions. They help to express emotions and complement the signs and gestures used in communication. According to Manusov (2015), the human face is made up of static and dynamic features. The static features include skin colour and nose size whereas the dynamic features involve the

movements that we make with our face (as well as other things that can change instantly, such as blushing). These two categories of facial features play crucial roles in interpersonal communication. The static features suggest to us who the other person is, whether we will agree with them, and the degree to which we will like them. However, these features, tied as they are to our impressions of others, can be problematic in that they stir our stereotypes, including responding (usually negatively) to those whose facial features are stigmatized (devalued by a larger culture) (Manusov, 2015).

The dynamic facial cues are more likely to affect how interpersonal interactions play out. Ekman (1985) asserted that there are 43 facial muscles and thousands of ways that the face can move. Ekman (1985) put the dynamic facial movements into two categories: those we intend to send and that we, at least to some degree control, and those we do not intend to send nor control. That is, many of our dynamic facial movements are the result of our purposefully sending a certain message (e.g., showing happiness), whereas others may be sent without our awareness and even, sometimes, against our will (e.g., showing a truth we wish to conceal). Facial movements are typically referred to as facial expressions and as such are seen primarily to be expressions of our emotions (Manusov, 2015).

In 1975, Ekman and Friesen developed a taxonomy of different types of people based on their style of expressing emotions in their interpersonal exchanges:

- Withholders: They are people who tend to downplay or repress the display of whatever emotion they are feeling.
- Frozen-affect expressors: These are those who usually have one expression on their face (e.g., a scowl) no matter what they are feeling.
- Blanked expressors: People who show no expression, even if they are feeling something.

- Revealors: People who show what they are feeling whenever they feel it.
- Other expressor types are unwitting and substitute expressors.

Facial expressions function interpersonally as conversational signals (Ekman, 1985), facial displays (Chovil, 2005), or social tools (Fridlund & Russell, 2006). Such signals, displays or tools occur very quickly and precisely and involve "a movement or change in one or more areas of the face (i.e., brows, eyes, nose, mouth) as a person engages in dialogue" with another (Chovil, 2005, p. 175).

Facial expressions also take various forms. For example, Ekman (1985) identified three forms within the larger set of facial signals:

- Facial illustrators: Facial cues that provide a sort of model for what is being discussed verbally.
- Regulators: These are cues that help guide the pace of a conversation.
- Emblems: Symbolic and socially agreed-upon movements, such as a wink, that mean something very particular to a set of speakers.
- Adaptors or manipulators: These are movements that reflect a state of being, such as biting one's lip and may be cathartic in that they can provide release for that state, and affect displays (those cues that show an emotion).

On her part, Chovil (2005) provides four general categories of facial expressions or movements:

- Syntactic displays: Movements that are connected to the tone of what someone is saying but do not add content and the most common form of facial signal she observed.
- Speaker comments: Cues on the speaker's face that add to what he or she is saying.

- Speaker illustrators: These are visual pictures of what is being said.
- Listener comments: Movements that usually indicate that the listener is responding to the speaker in some way.

Due to the diverse forms that facial expressions can take, Fridlund and Russell (2006, p. 26) to called them “exquisitely complex.” Facial cues are part of many interpersonal “tasks,” such as providing the basis on which we may judge another’s personality, reveal our cultural and other social identities, suggest our attitude to and about another, and help the flow of interaction through the way we use our mouth, eyes, and head. The cues may also reveal or conceal the truth from others. But this is a complicated process, and we often make mistakes when we use the face to assess another’s veracity (Manusov, 2015).

It is noteworthy that facial expressions are incorporated into the conventional system of sign languages. For example, when one signs the word "angry", he is supposed to do so simultaneously with an angry facial expression. Thus, it is wrong to sign "angry" whilst smiling or laughing, which may lead to miscommunication.

2.4 Factors that Account for Miscommunication between young deaf Children and their Hearing Caregivers

Miscommunication is a common phenomenon that occurs in everyday interactions. An important issue in communication is understanding; we want people to understand what we communicate to them. According to Skantze (2007), understanding is not something that speakers can take for granted, but something they constantly have to signal and monitor, and something that will sometimes fail. Miscommunication is a general term that denotes all kinds of problems that may occur in dialogue (Skantze, 2007). Much of

the literature on miscommunication is about spoken or oral communication. In spite of this, a review of literature on miscommunication in spoken or oral interactions can shed more light on the nature of miscommunication in visual-tactile interactions.

One reason for miscommunication in dialogues may be explained by Carletta and Mellish (1996) Principle of Parsimony which states that "people usually try to complete tasks with the least effort that will produce a satisfactory solution. In task-oriented dialogue, this produces a tension between conveying information carefully to the partner and leaving it to be inferred, risking a misunderstanding and the need for recovery" (p. 71). For example, speakers may produce ambiguous referring expressions, use fragmentary utterances which can only be understood assuming a certain common ground between the speakers, and may use extremely reduced phonetic realization of utterances. These are all different ways of increasing efficiency and introducing risk because there is always the possibility that listeners will not interpret them correctly (Skantze, 2007).

Skantze (2007) delineates three ways of analysing miscommunication phenomena. In the first place, a common distinction could be made between misunderstanding and non-understanding (Hirst et al., 1994; Weigard, 1999). Misunderstanding means that the listener obtains an interpretation that is not in line with the speaker's intentions. On the other hand, if the listener fails to obtain any interpretation at all, or is not confident enough to choose a specific interpretation, a non-understanding has occurred. One important difference between non-understandings and misunderstandings is that non-understandings are noticed immediately by the listener, while misunderstandings may not be identified until a later stage in the dialogue (Skantze, 2007). Moreover, some misunderstandings might never be detected at all. In addition, the same utterance may, of course, give rise to both misunderstanding and non-understanding, that is, parts of

an utterance may be misunderstood while others are not understood. Skantze (2007) points out that misunderstanding and correct understanding are similar in that the listener chooses a specific interpretation and assumes understanding, which is not the case for non-understanding.

A second way of analysing miscommunication is by the action level with which the problem is associated. Both Allwood et al. (1992) and Clark (1996) make a distinction between four levels of action that take place when a speaker is trying to communicate something to a listener. The authors use different terminologies, but the levels are roughly equivalent. The terminology used here is a synthesis of their accounts. Suppose speaker A proposes an activity for listener B, such as answering a question or executing a command. For communication to be successful, all these levels of action must succeed (listed from higher to lower):

- Acceptance: B must accept A's proposal.
- Understanding: B must understand what A is proposing.
- Perception: B must perceive the signal (e.g., hear the words spoken or see the signs/gestures made).
- Contact: B must attend to A.

More fine-grained analyses are of course also possible. The understanding level may, for example, be split into discourse-independent meaning (e.g., word meaning) and discourse-dependent meaning (e.g., referring expressions). The order of the levels is important; in order to succeed on one level, all the levels below it must be completed. Thus, we cannot understand what a person is saying without hearing the words spoken, we cannot hear the words without attending, and so on. Clark (1996) calls this the principle of upward completion.

Skantze (2007) expounds that it is questionable, however, whether failure on the level of acceptance really should be classified as miscommunication. If someone rejects a request or does not accept a proposal, we could easily say that the participants have succeeded in their communication. For instance, if A and B engage in a dialogue about possible activities and A suggests that they should go and see a movie, and B then rejects this proposal because he has already seen the film, we may say that they have successfully communicated that this is not an option.

Finally, third distinction can be made depending on the scope of the miscommunication. Misunderstanding and non-understanding may concern not only the whole utterance, but also parts of it, resulting in partial misunderstanding and partial non-understanding:

> A: I have a red building on my left.
>
> B (partial misunderstanding): How many stories does the blue building have?
>
> B (partial non-understanding): What colour did you say? Did you say red? (Skantze, 2007).

Mustajoki (2017) asserts that the mental worlds of communicants are the key to most problems in communication. He used the term "mental world" in a broad sense to refer to the various aspects of interaction which are interconnected, but can also be considered separately. Interactants' mental world consists of communicative (linguistic) ability, their cultural background, and their cognitive systems. The mental world of interactants regulates the way in which they produce speech, signs or gestures and comprehend them.

Mustajoki (2017) points out that people's communicative abilities are never identical. Every native speaker has, strictly speaking, his/her own command of the language, which comprises grammatical tools and vocabulary, but also, and even more importantly, communicative, pragmatic, and discourse competences. Weigand (2010)

used the term "competence-in-performance" as an attempt to combine various elements of interactive skills into a unified concept. Our communicative ability also forms permanent part of our personality and includes the speed with which pieces of our linguistic knowledge are retrieved from memory during interaction, as well as the personal feelings and associations they evoke in us (Mustajoki, 2017).

The above discussion is relevant and has far-reaching implications for communicative situations involving caregivers and young deaf children. The gap between the communicative abilities of hearing caregivers and young deaf children is very wide. Caregivers are adults who have a large repertoire of grammatical tools, vocabulary, communicative, pragmatic, and discourse competences. In the context of embodied communication, caregivers have a wide range of diverse strategies and modalities to communicate effectively. Deaf children, on the other hand, are young and as such have few vocabulary and inadequate communication skills. The difference in communicative abilities between caregivers and deaf children may lead to misunderstanding during interaction. For example, caregivers may use words that are unfamiliar to the children or may sign at a very fast pace and thus impede understanding in the communication process. The situation is made worse where caregivers have poor or inadequate communicative abilities since they would not be able to convey their messages in a way that the children could understand.

Apart from differences in communicative abilities, differences in cultural background often leads to miscommunication. Cultural backgrounds cover knowledge of the historical events and persons of a nation, typical natural phenomena, basic features of the community, awareness of customs, traditions, and rules of behaviour. It consists of the background knowledge a person has, which is manifested in scripts, scenarios, schemas, stereotypes, and mental sets (Mustajoki, 2017).

Much like with our communicative ability, we carry these features with us throughout our lives, attaching to them additional elements when facing new situations. Our personal cultural background is also understood broadly: Apart from belonging to a certain ethnic group or nation, every person belongs to different 'cultures 'on the basis of age, gender, sexual orientation, religion, place of residence, occupation, hobbies, and ability. This cultural knowledge is regularly used in interpreting speech and visual messages, especially in disambiguating phrases (Mustajoki, 2017).

Hearing caregivers and deaf children have different cultural backgrounds and experiences. This may impede understanding between the two groups of interlocutors during interaction. For example, hearing caregivers may use speech more than sign language or gestures to communicate with their deaf children, which may lead to misunderstanding and/or non-understanding. On the other hand, deaf children may use signs and gestures that hearing caregivers are unfamiliar with. Communicative situations involving the deaf, whether adults or children, require the interlocutors to be nearer each other for vivid perception of signs, gestures, body movements, and facial expressions. However, differences in cultural background between caregivers and deaf children may cause caregivers to communicate at long distances with the deaf children and thus, lead to misunderstanding. Moreover, hearing caregivers may be incapable of making good use of extra-linguistic context to promote understanding during their interaction with deaf children.

The third element of interlocutors' mental world is their cognitive systems. Goel and Rolan (2003) point out that there are two distinct systems in processing information; a rational and an intuitively-oriented experiential system. The rational system is analytical and refers to logical reasoning and evidence. Consequently, it needs a lot of cognitive effort (Goel & Rolan, 2003). By contrast, the intuitively-oriented system is,

by its nature, "associative and holistic; it is automatic and therefore demands very little cognitive resources" (Berger, 2007, p. 217). How all this is reflected in the communication process is still unclear due to lack of research, but it is obvious that these characteristics cannot be ruled out in examining causes of miscommunication. For example, in giving advice to a person with a strong rational system, you have to be more precise than talking to a person with more holistic world view (Mustajoki, 2017). Deaf children have low cognitive capacities. In other words, their cognitive systems are not developed to the same level as their caregivers thus will require enough time to process messages they receive from their communicative partners. Therefore, caregivers may need to sign slowly and give enough time for deaf children to process their messages and give feedback. Where this is not the case, miscommunication may occur. On the other hand, caregivers may feel bored and may not pay attention during interaction when deaf children sign and gesture very slowly and in a dysfluent manner, leading to misunderstanding.

Beside these three more or less permanent elements of a person's mental world, there are also other factors, which vary from one communicative situation to another, but affect the course of interaction nonetheless. Such self-evident factors include the relationship between the interlocutors and their emotional and physiological state, both of which have a clear connection with the willingness and ability of people to cooperate during the conversation and to concentrate on what they say and hear (Mustajoki, 2017).

Finally, our recent or situational experience is a further component of our mental world. When coming into a communicative situation, we bring with us not only our prior knowledge, linguistic abilities, and feelings, but also the immediate experience we have just had. After seeing an accident on the road, for example, we may still be thinking about it when returning home, much like our first interpretation upon hearing the word

'bat 'will be different after watching a baseball match than after a walk in the countryside (Mustajoki, 2027).

2.5 Factors that Determine Successful Communication between young Deaf Children and Hearing Caregivers

Communication involves making our intentions, thoughts, and feelings known to others. Therefore, for communication to be successful or effective, the recipient must have the same or at least an interpretation that is close to the meaning of the sender. In other words, both interlocutors must have the same understanding of the message. Griffin (2021) defines effective communication as the process of sending a message in such a way that the message received is as close in meaning as possible to the message intended. According to Tutorialspoint (2016), communication is said to be effective or successful when all the parties (sender and receiver) in the communication, assign similar meanings to the message and carefully perceive what all have been said, signed or gestured and make the sender feel heard and understood. Effective communication is defined as communication between two or more persons in which the intended message is:

- properly encoded
- delivered through appropriate channel received
- properly decoded and understood by the recipient(s) (Tutorialspoint, 2016).

According to Tutorialspoint (2016), successful communication must bear the following characteristics:

- Completeness of the message: Communication must be complete so as not to baffle the recipient.

- Clearness and integrity of message: The message to be conveyed or sent must have clarity and integrity for better understanding. Clarity of thoughts and ideas enhances the meaning of the message.
- Conciseness of the message: The intended message must be free from verbosity.
- Consideration of physical setting and recipient: The overall physical setting must be considered. The content of the message also must take into account the attitude, knowledge, and position of the recipient.
- Courtesy to be maintained: The sender's message should be so drafted or prepared that it should be polite, reflective, and enthusiastic. It must show the sender's respect for the receiver and be positive and focused at the receiver.
- Correctness of the message: The drafting of the message should be done in such a manner that the final message does not have any grammatical errors and repetitions of sentences. The message should be exact, correct and well-timed (Tutorialspoint, 2016).

These characteristics of successful communication have important implications for caregiver-deaf children interactions. For example, the consideration of the physical setting and the recipient can help in making informed decisions about distance, communication modality, pace, and strategies that can enhance understanding. Concise and clear messages will prevent ambiguity, enhance attention and promote quick processing of information on the part of the deaf children.

According to the Office of Accessibility Resources of Mohawk Valley Community College (n. d.), the following factors should be considered when communicating with deaf individuals since they determine success during interaction:

- Distance between interlocutors: Communicants must position themselves 3-6 feet apart.
- Provision of clues and prompts about the topic of the conversation
- Interactants must be aware of each other's facial expressions, eye gaze, body position and movements.
- Use of appropriate modality - Sign language, gestures, facial expressions etc.
- Sign, gesture, and speak at normal rate.
- Make repetitions when necessary and use simple vocabulary especially with deaf children.
- Allow for more time in the communication process.
- Avoid exaggeration of words and mouth movements as well as yelling.
- Avoid holding objects in your hands while signing or gesturing and do not put objects in your mouth whilst speaking.
- Avoid repeating a difficult word; use simple synonyms and alter the modality when necessary (Office of Accessibility Resources, no date).

Distance is very crucial in communicative situations involving deaf children since they usually use the visual modality. Close distance during interactions will ensure vivid perception of hand shapes, movements, and facial expressions. Avoiding holding objects whilst signing or gesturing will prevent confusing and miscommunication whereas giving children enough time in the communication process will help them process messages effectively and give appropriate feedback.

2.6 Summary of the Review

This chapter reviewed literature related to communication strategies between young deaf children and their hearing caregivers. The major themes that were discussed in this review included communication strategies, embodied communication modalities,

factors that account for miscommunication, and factors that determine successful or effective communication between young deaf children and their hearing caregivers.

The literature reviewed has shown that hearing caregivers have diverse experiences with deafness. Most of them especially hearing mothers of deaf children have no prior knowledge of deafness until they have either given birth to one or their child become deaf. Some studies revealed that many hearing caregivers have a medical pathological view of deafness and this affected the way they cared for their deaf children.

Different authors hold divergent views on the concept of communication, however, the majority agree that communication involves the expression and reception of messages. In addition, whereas some writers believe that every behaviour is communication because it contains information, others hold that only those behaviours are communication which contain communicative intent.

The literature also indicated that hearing caregivers and deaf children employed various strategies, sometimes distinctively and at other times in combination, during their interactions. Some of the embodied communication modalities employed by deaf children and their hearing caregivers included sign language, natural gestures, pointing, eye gaze, facial expression, tapping and touching as well as waving.

Factors that account for miscommunication and those that lead to successful communication between young deaf children and their hearing caregivers were reviewed. Interlocutors' mental world, which consists of communicative abilities, cultural background, and cognitive systems, was one of the factors that accounted for miscommunication. The literature revealed that there are many factors to consider to ensure successful communication between hearing caregivers and young deaf children. The study was informed by the biecological model of human development proposed by Bronfenbrenner and Morris (2006). The theory posits that human development occurs

through through proximal processes of systematic interactions between the developing individual and his or her environment (Bergen, 2008). Thus, frequent interactions through sign language, eye gaze, tapping, facial expressions between caregivers and young children who are deaf are relevant for their communication development. The biecological theory is suitable for this study because it provides a framework for the examination of the communicative processes that occur between caregivers and young children who are deaf.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The study aimed at exploring the communication strategies between deaf children and their caregivers in Ghana. This chapter discusses the research paradigm of the study, research approach and design, research setting, population, sample size, sampling technique, instrumentation, trustworthiness of the study, ethical considerations, data collection procedures, and data analysis.

3.1 Research Paradigm of the Study

This study used the interpretivist paradigm to investigate the communication strategies between young deaf children and their hearing caregivers. I employed this paradigm because it allowed me access to the communication experiences of the participants in the study. Secondly, the interpretivist paradigm enabled me to understand the complexity of communication between deaf children and their hearing caregivers in school and at home. In the third place, the interpretive paradigm recognized my role as a researcher and the roles of young deaf children and their caregivers in constructing knowledge about communication.

Rugg and Petre (2007) posit that in interpretivism social reality is created jointly through meaningful interaction between the researcher and the researched on agreement. The interpretive approach makes an effort to understand and interpret the experiences of the subjects or the meaning they are making of the context (Kivunja & Kuyini, 2017). Thus, in this study, efforts were made to understand and interpret the communication experiences of young deaf children and their hearing caregivers in school and at home.

3.2 Research Approach

The study adopted the qualitative research approach to examine the communication strategies between young deaf children and their hearing caregivers. Communication studies especially those that involve visual communication are complex in nature and require research tools and instruments that can capture and explore the phenomenon under study in detail for a better understanding. Qualitative research tools and instruments like videos and pictures were used to investigate communication strategies between deaf children and their hearing caregivers and thus the choice of this approach.

Creswell (1998, p. 15) defined qualitative research as "an inquiry process of understanding based on distinct methodological traditions of inquiry that explores a social or human problem. The researcher builds a complex holistic picture, analyses words, reports detailed views of informants, and conducts the study in a natural setting". Communication between young deaf children and their hearing caregivers is a phenomenon that ought to be studied in the immediate natural environments of the deaf children such as the home and school. This was another reason for the adoption of the qualitative research approach.

3.2 Research Design

The phenomenological research design was employed in this study. Several reasons prompted the choice of this design. In the first place, I needed a suitable explorative research design that would restrict my own biases. Lester (1999) opines that phenomenological methods are particularly effective at bringing to the fore the experiences and perceptions of individuals from their own perspectives, and therefore at challenging structural or normative assumptions. Phenomenological research design allows the researcher to “bracket” his own preconceptions and enter into the individual’s lifeworld and use the self as an experienced interpreter (Miller & Crabtree (1992, p.

24). Secondly, the choice of phenomenology as the research design for this study was in line with the interpretive paradigm that underpinned the study. According to Lester (1999), epistemologically, phenomenological approaches are based in a paradigm of personal knowledge and subjectivity, and emphasize the importance of personal perspective and interpretation. Thirdly, phenomenological approaches are powerful for understanding subjective experience, gaining insights into people's motivations and actions, and cutting through the clutter of taken-for-granted assumptions and conventional wisdom. Many people especially the deaf in Ghana believe that caregivers should necessarily learn Ghanaian Sign Language (GSL) because it is the best way, as they think, of communicating with deaf children. A phenomenological approach to studying this topic was germane to cut through some of these assumptions and conventions.

Groenewald (2004) points out that the operative word in phenomenological research is "describe". Thus, the aim of the researcher is to describe as accurately as possible the phenomenon, refraining from any pre-given framework, but remaining true to the facts. According to Welman and Kruger (1999, p. 189) "the phenomenologists are concerned with understanding social and psychological phenomena from the perspectives of people involved".

3.3 Research Settings

The study was conducted in three settings: Two schools for the deaf and a home. The schools involved were the Ashanti School for the Deaf at Jamasi in the Ashanti Region of Ghana and the Demonstration School for the Deaf at Akuapem Mampong in the Eastern Region of Ghana. The third site of the study was a home in Bekwai also in the Ashnati Region of Ghana.

The Ashanti School for the Deaf was established in 1977 with nine deaf pupils in a Community Centre near the Chief's palace at Jamasi. Currently, the school has five departments: a kindergarten, primary, Junior High School, an assessment centre and a vocational training centre. The current population of the school is about 600 students (Awuku, 2023). Programmes offered include basic education programme, carpentry, dressmaking, deaf-blind education, and hearing assessment and testing. The major medium of instruction is GSL. It is the only special education institution for the deaf in Ashanti Region. The school admits deaf students from all parts of Ghana. Thus, it is a multi-cultural context. The people of Jamasi speak Ashanti Twi and mainly engage in farming and service.

The Demonstration School for the Deaf is known as the "mother" of all schools for the deaf in Ghana because it is the oldest in Ghana and the first in West Africa. The school was established by Reverend Andrew Foster in 1957 in Osu, Accra with 24 students, including 13 deaf children and 11 deaf adults. The school currently has a student population of about 530 ("GhanaWeb Special", 2023). It was then called the Ghana Mission School for the Deaf. The school used manual communication system as the medium of instruction, which later became the American Sign Language (ASL). In 1958, the school relocated to its present site at Akuapem Mapmong. Akuapem Mampong is a town in the Akuapem North District in the Eastern Region of Ghana. The town is famous for being the first place cocoa was planted in Ghana by Tetteh Quarshie. The people of Akuapem Mampong engage in cocoa farming and service. There are 10,075 people living in Akuapem Mampong (Government of Ghana, 2021). The people speak Akuapem Twi and celebrate the Ohum festival every year.

The third site for the study, which was a home in Bekwai, comprised of five members, a grandmother, three sisters, and a deaf boy. They spoke Asante Twi in the home and

used natural gestures and speech to communicate with the deaf boy. Bekwai is a town and the capital of the Bekwai Municipal, a municipality in the Ashanti Region of Ghana. Bekwai is the seventy-ninth most populous settlement in Ghana, with a population of 7,267 people. Bekwai and Bekwai Municipal are south of the Ashanti regional capital of Kumasi, north of Obuasi (Wikipedia, 2022). The people in Bekwai engage mainly in farming, trade, and transport service.

These three sites were chosen for the study in order to explore the topic in different contexts, triangulate data, and enhance the transferability of the findings of the study. According to Arksey and Knight (1999), collecting data from different participants and in various contexts is a form of triangulation – 'data triangulation', which helps to contrast the data and 'validate' the data if it yields similar findings.

3.4 Population

The population for the study comprised of 12 participants including three housemothers, six deaf children and three family members. Four criteria were used to select the target group for the study. In the first place, caregivers must be hearing. Secondly, caregivers in school must be housemothers. Thirdly, caregivers at home must be immediate family members who often interact with deaf children. Fourthly, deaf children should be from 4 years to 12 years old. Participants who met these criteria were included in the study. Population refers to the target group about which the researcher is interested in gaining information and drawing conclusion (Amedahe, 2002).

3.5 Sample Size

The sample for the study was 12 participants, consisting of three housemothers, six deaf children, and 3 family members. According to Avoke (2005), sample in research is the

subset of the entire population of interest to the researcher. These 12 participants were the focus of interest in the study since they engaged in communication and interactional activities which generated data for the study. As pointed out early on, different participants help to triangulate data, contrast and validate the findings of the study (Arksey & Knight, 1999).

3.5.1 Participants' Biographies

Three groups of participants were involved in this study: Housemothers, deaf children, and family members. In order to protect their privacy and anonymity, all housemothers and family members in this study have been referred to as Caregiver 1-6 whereas the deaf children are referred to as Deaf 1-6. Caregivers were talked to prior to videotaping their communicative interactions with the deaf children. The information gained was then used to develop a short biography for each of them. Deaf children's biographic information was obtained from their teachers and parents through phone calls.

Caregiver 1 (C1) is a housemother at the Demonstration School for Deaf in Akuapem Mampong in the Eastern Region of Ghana. She was between the ages of 40 to 45 years. She is an Akuapem and speaks Akuapem Twi. The educational level of C1 was middle school. She cannot speak English but understands when spoken to. She has worked as a housemother in the school for about a decade at the time of the study. Her responsibilities included helping the deaf children get ready for school as in helping them to get dressed and making sure that they go to sleep in the evening. In addition, she helps to wash the cloths of the young deaf children and provides for their safety needs as well as emotional support.

Caregiver 2 (C2) is a housemother at the Ashanti School for the Deaf in Jamasi in the Ashanti Region of Ghana. She was 40 years old at the time of the study. She comes

from the Brong-Ahafo Region of Ghana and speaks Bono Twi. Her educational level was also middle school (JHS). She cannot speak English but understands when spoken to. Her responsibilities were identical to C1 and C3.

Caregiver 3 (C3) is a housemother at the Ashanti School for the Deaf. She comes from the Upper East Region of Ghana. She speaks Frafra, Twi, and English. She was 38 years old at the time of the study. Her highest education level was Jinior High School. She has worked as a housemother in the school for about 6 years. Her GSL skills were identical to that of C1 and C2. All housemothers had poor GSL skills but possessed a satisfactory level of GSL vocabulary.

Caregiver 4 (C4) is a grandmother above 60 years in Bekwai in the Ashanti Region of Ghana. She speaks Asante Twi and works as a farmer. C4 does not know GSL and uses speech and natural gestures to communicate with her deaf grandson.

Caregiver 5 (C5) is an older sister of C6 in Bekwai. She was 14 years old and in JHS 1. She speaks Asante Twi and English. She is the second child in a family of four children. C4 does not know GSL and uses natural gestures and speech to communicate with her deaf brother.

Caregiver 6 (C6) is also an older sister of D6 at the age of 8 years old at the time of study. She was in Basic 3 (Grade 3) in a regular public school in Bekwai. She was fluent in Asante Twi but not English. C6 also does not know GSL and uses speech and natural gestures to interact with her younger deaf brother.

Deaf 1 (D1) is a learner at the Demonstration School for the Deaf. He was 6 years old and in Basic 1. He had profound bilateral sensorineural hearing loss with no residual hearing (Student file, 2022). D1 is pre-lingual and cannot speak. He comes from Akuapem Mampong where Akuapem Twi is the main language.

Deaf 2 (D2) is a deaf boy also at the Demonstration School for the Deaf. He was 6 years old in Basic 1. He also had profound bilateral sensorineural hearing loss (Student file, 2022). He comes from Akuapem Akropong in the Akuapem North Municipality in the Eastern Region of Ghana.

Deaf 3 (D3) is a learner at the Ashanti School for the Deaf. She was 10 years old in Basic 4. D3 is a post-lingual with a moderate bilateral sensorineural hearing loss (Student file, 2022). She is capable of speech-reading. She can also speak but not fluent. D3 mainly uses GSL to communicate in school.

Deaf 4 (D4) is deaf girl at the Ashanti School for Deaf. She was 12 years old. She was in Basic 5. She has profound bilateral sensorineural hearing loss (Student file, 2022). She had no residual hearing and had difficulties in speaking. She mainly uses GSL to communicate. D4 comes from Kumasi in the Ashanti Region of Ghana, where Asante Twi is the main language.

Deaf 5 (D5) is a young deaf leaner at the Ashanti School for the Deaf. She was 9 years old in Basic 3. She had bilateral sensorineural hearing loss (Student file, 2022). She had no residual hearing and used GSL and natural gestures to communicate. She also comes from Kumasi.

Deaf 6 (D6) is a young deaf boy of 7 years old in Bekwai in the Ashanti Region of Ghana. D6 is a pre-lingual with severe bilateral sensorineural hearing loss (Student file, 2022). He had no residual hearing, however, he was capable of making unintelligible sounds/ vocalizations.

3.6 Sampling Techniques

Two sampling techniques were employed in this study. In the first place, I used purposive sampling technique to select the three housemothers in the two schools. I selected the sample based on my judgement and the purpose of the research, taking into consideration those who have had experiences relating to the phenomenon under study (Kruger, 1988). The three housemothers were caregivers who assumed parental roles in place of the biological parents of the deaf children in the school. Thus, they interacted daily with the deaf children in school. In consideration of their rich interactive experiences with the deaf children, I chose them to participate in the study.

Welman and Kruger (1999) consider purposive sampling technique as the most important kind of non-probability sampling to identify the primary participants. According to Hycner (1999, p. 156), "the phenomenon dictates the method (not vice-versa) including even the type of participants." Consequently, I contacted the headmasters in the selected schools to identify housemothers who often interacted with the deaf children and who were interested in participating in the study of their own accord.

In order to trace additional participants for the study, I employed snowball sampling. I asked the housemothers to recommend deaf children whom they often interact with and who would like to take part in the study. Thus, through the housemothers, I was able to select the deaf children for the study. The family members of the deaf boy in Bekwai were naturally included in the study because they were the ones that he communicated with at home. Snowballing is a method of expanding the sample by asking one participant to recommend others for interviewing or data collection (Holloway, 1997).

3.7 Instrumentation

The main instrument for data collection in this study was video. Demographical and contextual data that were not captured in the videos were collected through phone interviews and field notes. Video is a technology that allows the recording, storage and repeated viewing of visual and acoustic data. Video was chosen as the instrument for data collection in the study because of the nature of the topic. The study was about the communication strategies between deaf children and their caregivers. The communication modalities between these two groups of participants are mainly visual, therefore, it was imperative to choose a data collection instrument most germane for capturing all the details in the communication process.

According to Knoblauch, Tuma, and Schnettler (2014), video, as a methodological approach in qualitative research, is especially useful for studying communication and interaction in its contexts. Ramey, Hilppo, Dyer, and Krist (2016) also postulate that video provides both breadth (footage that spans weeks or months of activity) and depth (a richly detailed, moment-to-moment interactional record). They further state that video creates powerful new affordances, such as the ability to rewind or to see multiple participants' perspectives concurrently, that traditional qualitative research methods generally do not afford.

Two characteristics exclusive to video recordings and which make it advantageous over other records are Density and Performance (Grimshaw, 1982). Density refers to the complex quality of video technology data to register observations in a social situation. Density means that minute aspects (the perceptual features of certain things, the exact course of certain events), which might have passed unnoticed by the actors or the

observer in the situation, become accessible in the recorded data. However, density only holds for those audiovisual aspects focused on in the situation (Knoblauch, Tuma, & Schnettler, 2014). They further expounded that Density can be exploited by freezing images and by enlarging or highlighting certain parts of single audiovisual frames or sequences. The density aspect of video enabled me to capture ethnographic elements within the camera's focus such as school dormitories, students and the activities they were engaged in, school uniforms and shoes, which were essential in establishing the contexts for each video analysis.

The performance feature of video is its ability to turn motion into data (Grimshaw, 1982). Video recordings preserve the structural temporal ordering of the ongoing activity. Thus, the processual character of social interactions becomes accessible for scrutiny (Knoblauch et al., 2014). This feature was relevant as it enabled me to replay the videos several times during the transcription and data analysis processes.

3.8 Trustworthiness of the Study

Cope (2014) points out that historically, qualitative research has been viewed as "soft" science and criticized for lacking scientific rigor compared to quantitative research, which uses experimental and objective methods. Common criticisms are that qualitative research is subjective, anecdotal, subject to researcher bias, and lacking generalizability by producing large quantities of detailed information about a single, unique phenomenon or setting (Koch & Harrington, 1998). Thus, naturalistic researchers, over the years, have tried to come out with procedures and techniques to ensure the trustworthiness of qualitative studies. Notably among them are Lincoln and Guba (1985) who proposed four criteria, namely, credibility, dependability, confirmability, and transferability to ensure the trustworthiness of qualitative studies. These are shortly discussed below.

3.8.1 Credibility

Credibility corresponds to internal validity in quantitative studies in which quantitative researchers seek to ensure that their study measures or tests what is actually intended. The following measures were followed in establishing the credibility of this study. In the first place, I adopted research methods well established in both qualitative research in general and in visual communication studies in particular. I used video, which is appropriate for collecting audio-visual data as the main instrument for collecting data and also engaged in visual transcription during the transcription process. In addition, I made use of different participants in order to triangulate via data sources (Shenton, 2004). Consequently, I was able to verify the experiences of individuals against others and ultimately provide a rich picture of the communication strategies and practices of the participants involved in the study. Finally, I employed peer debriefing (Lincoln and Guba, 1985) to provide an external check on the research process. The whole research process, from the beginning to the end, was subject to review by my supervisor. The advice and constructive criticisms he provided helped to established the credibility of this study.

According to Meriam (1998), credibility deals with the question "How congruent are the findings with reality?" A qualitative study is considered credible if the descriptions of human experience are immediately recognized by individuals that share the same experience (Sandelowski, 1986).

3.8.2 Dependability

Dependability corresponds to reliability in quantitative research in which positivists employ techniques to show that, if the work were repeated, in the same context, with

the same methods and with the same participants, similar results would be obtained (Shenton, 2004). To achieve dependability, researchers can ensure the research process is logical, traceable, and clearly documented (Tobin & Begley, 2004). When readers are able to examine the research process, they are better able to judge the dependability of the research (Lincoln & Guba, 1985). I have reported in detail the processes within this study, thereby enabling future researchers to replicate the work, if not necessarily to gain the same results. Thus, the research design and methods I employed may be viewed as a "prototype model" (Shenton, 2004, p.71) for future researchers. In qualitative studies, dependability refers to the constancy of the data over similar conditions (Polit & Beck, 2012).

3.8.3 Confirmability

Confirmability relates to objectivity in quantitative studies which deals with ensuring, as far as possible, that the work's findings are the result of the experiences and ideas of the participants, rather than the characteristics and preferences of the researcher (Shenton, 2004). Confirmability was established in this study by ensuring the credibility, dependability and transferability of this study (Lincoln & Guba, 1989). Miles and Huberman (1994) consider that a key criterion for confirmability is the extent to which the researcher admits his or her own predispositions. To this end, beliefs underpinning decisions made and methods adopted should be acknowledged within the research report, the reasons for favouring one approach when others could have been taken explained and weaknesses in the techniques actually employed admitted (Shenton, 2004). In line with this, I have explained vividly the theoretical and philosophical underpinnings of the study and provided reasons for theoretical, methodological, and analytical choices throughout the entire study, so that others can understand how and why decisions were made. In addition, video stills and illustration

of gestures and other body movements were provided in the data analysis section of the research report to show that the themes that emerged in the study were the true representations of the experiences of the participants.

3.8.4 Transferability

Transferability in qualitative research is the parallel of external validity in quantitative studies. In order to enhance the transferability of the findings of this study, I ensured that the phenomenon was studied in three different contexts, two schools for the deaf in different regions of Ghana and a home. Also, each context was described in detail to enable readers who find their own context to be identical to either of the contexts in this study apply the findings to their own situations.

Merriam (1998) writes that external validity is concerned with the extent to which the findings of one study can be applied to other situations. Erlandson, Harris, Skipper, and Allen (1993) note that many naturalistic inquirers believe that, in practice, even conventional generaliability is never possible as all observations are defined by the specific contexts in which they occur. A contrasting view is offered by Stake (1994) and Denscombe (1998), who suggest that, although each case may be unique, it is also an example within a broader group and, as a result, the prospect of transferability should not be immediately rejected. Nevertheless, such an approach can be pursued only with caution since, as Gomm, Hammersley and Foster (2000) recognize, it appears to belittle the importance of the contextual factors which impinge on the case.

3.9 Data Collection Procedures

Data for the study was collected in two phases. In the first phase, researcher-induced video data was collected by videotaping communicative interactions between housemothers and the deaf learners in the schools for the deaf. Researcher-induced

videos are videos that are recorded by the researchers themselves during the research process. Knoblauch, Tuma, and Schnettler (2014) opine that there are two categories of researcher-induced video data, namely, experimental and natural video documents. Experimental video documents are video recordings of situations created by the researchers whereas natural video documents refer to video recordings of situations and contexts created by the actors under study. These are referred to as natural settings in the sense of 'naturally occurring' social situations, whose existence does not depend on a purposeful research design (Knoblauch, Tuma, & Schnettler, 2014). The communicative interactions and the contexts of the phenomena that were videotaped in the study were created by the participants themselves.

After gaining access to the sites through an introductory letter from my Department, I met the participants and explained to them what the study was all about; its purpose, significance, objectives and research questions as well as what would be expected of them during the data collection process. I informed them that they were free to decide whether to participate in the study or not. Informed consent was verbally obtained from all the participants and dates were scheduled at an appropriate time for the video recording. In the case of the young deaf children in school, the housemothers called their parents via the phone and informed them about the study which they concurred for their wards to participate. With regards to the deaf child in Bekwai, consent was obtained from his grandmother.

The data collection process required that I travelled to the two schools several times. This was a challenge since the two schools were very far from my institution of study. The distance between Winneba and Kumasi where the Ashanti School for the Deaf is located, for example, is 246.6 kilometres and it takes approximately 5 hours, 10 minutes to get there by road. The distance between Winneba and Akuapem Mampong where

the Demonstration School for the Deaf is located is 98.4 kilometres and it takes about 2 hours, 4 minutes to get there. Also, I needed the communicative interactions between the deaf children and their hearing caregivers to be natural. Therefore, it was decided between myself and the participants to have contact persons in the schools who would record the videos on my behalf whenever communicative interactions took place between the housemothers and the deaf learners who were involved in the study.

The two contact persons in the two schools served as research assistants in collecting the data for the study. They recorded with their smart mobile phones relevant instances of communication between the housemothers and the deaf children when such situations took place. The smart mobile phones used by the research assistants were Infinix Hot 5 and Samsung Galaxy S5 both with 16 gigabytes storage. The recorded videos were not in the highest quality as in 4K videos, however, their quality was such that one could clearly see the gestures, facial expressions and the strategies that were employed during the interaction. After the recordings, the videos were forwarded to me via WhatsApp. In the case of the deaf boy and his family in Bekwai, I travelled to Bekwai and recorded the video myself with a smart phone.

With regard to the storage of the videos, I coded them and stored them in the folder on my laptop. The coding was done by using the name of the town in which the communication took place, the person who communicated with the deaf child, and the number of the video. The towns were coded as follows: Jamasi (J), Mampong (M), and Bekwai (B). Housemothers, grandmother, and siblings were coded as caregivers (C). Thus, the first video at Jamasi was coded as JCV-1, meaning Jamasi caregiver video number one. The other codes were JCV-2 (Jamasi caregiver video number 2), MCV-1 (Mampong caregiver video number one), and BCV-1 (Bekwai caregiver video number

one). These were stored in a folder named "Communication interactions" on my HP Pavilion 360 laptop with 1 terabyte internal storage.

The second phase of the data collection involved eliciting demographic information about the housemothers and deaf children via phone interviews. The demographic information was important in establishing the context for each video.

3.10 Data Analysis

Coffey and Atkinson (1996, p. 9) regard analysis as the "systematic procedures to identify essential features and relationships". It is a way of transforming the data through interpretation.

3.10.1 Data Analysis Approach

I employed a cross-case approach through a multi-case method (Stake, 2006) to analyse the interactional video data. My first aim was to facilitate the comparison of commonalities and differences in the communication strategies, embodied communication modes, factors that account for miscommunication and successful communication. These were the units of analyses in the four cases. My second objective in employing the cross-case analysis approach was to enhance the transferability of the findings of the study. According to Miles and Huberman (1994), in a case-oriented research, commonalities across multiple instances of a phenomenon may contribute to conditional generalizations.

Khan and VanWynsberghe (2008) define cross-case analysis as a research method that facilitates the comparison of commonalities and difference in the events, activities, and processes that are the units of analyses in case studies. They further point out that cross-case analysis allows the researcher to compare cases from one or more settings, communities, or groups. The use of this analysis method enabled me to examine the

phenomenon under study in different settings: school and home; in different communities: Jamasi in the Ashanti Region, Akuapem Mampong in the Eastern Region, and Winneba in the Central Region of Ghana; and among different groups of participants: deaf children and their hearing caregivers (housemothers and family members). This allowed for an in-depth study of the phenomenon and provided opportunities to learn from different cases and gather critical evidence to enhance understanding and contribute to theory and practice.

According to Stake (2006), the multi-case method of cross-case analysis focuses on the quintain: the common focus for a set of cases. In other words, the multi-case method emphasizes on a major phenomenon that is common to all cases. Thus, in this study, communication strategies between young deaf children and their hearing caregivers were examined in each of the four cases in order to identify common major themes and sub-themes.

3.10.2 Data Analysis Process

A multimodal analysis of each interactional video data was carried out through Knoblauch and Tuma (2011) analysis process of video data. The process involved four main stages which included the selection of relevant fields or situations, coding, internal sampling of data, and fined-grained analysis. The process was completed over three months.

3.10.2.1 Analysis stage 1: Selection of Relevant Fields

The first stage involved the selection of situations or interactional scenarios in the video that were relevant to the research topic. In this stage, I watched and re-watched the videos several times and identified situations that merited analysis. Three interactional

episodes – searching for school uniform, searching for shoes, and looking for underwear – were selected from the first video data (MCV-1) for analysis because meaningful interactions took place there. The first interaction episode was 46-seconds and it started from the beginning of the video. The second episode lasted for 40-seconds whereas the third episode lasted for 1-minute, 44-seconds. Participants in this video were Caregiver 1, Deaf 1, and Deaf 2.

The second video data (JCV-1) was a single episode video which involved Caregiver 2 guiding Deaf 3 to wash cloths. The video lasted 4-minutes, 20-seconds. The third video data (JCV-2) was also a single episode video, involving 3 participants: Caregiver 3, Deaf 4 and Deaf 5. In this video, Caregiver 3 guided D4 and D5 in washing dishes. The video lasted 3-minutes, 31-seconds.

The fourth video data (BCV-1) showed interactions between Caregiver 4, 5, 6, and Deaf 6 at the time when the family was preparing supper. This video was in two parts. The first part lasted for 2-minutes, 45 seconds whereas the second part lasted for 4-minutes, 34-seconds. Thus, the total duration for all the four videos was 18-minutes, 20 seconds.

3.10.2.2 Analysis stages 2 and 3: Coding and Internal Sampling

The second and third stages consisted of entering the temporal sequence of events identified in stage one into a content logbook (Knoblauc & Tuma, 2011) together with rough transcription of activities, gestures and reflections. The temporal sequence of events was coded by identifying concepts (themes and sub-themes) and finding relations between them. These fragments of the video data were subjected to fine-grained analysis.

3.10.2.3 Analysis Stage 4: Fine-Grained Analysis

This involved the time-consuming analysis of turns of action, gestures, body position and movement, facial expressions and emotions, which resulted in detailed transcripts and emergent themes and sub-themes.

3.10.3 Transcription

I employed a three phase visual transcription which involved a video still of instances of interaction, a sketch with symbols to illustrate gestures and actions (where necessary), and a narrative description. Each of these representations foregrounds a different aspect of activity: the video still provides a detailed visual inventory of people, objects, and space within the camera's frame; the sketch with symbols focus on body positioning and action (e.g., gazing, pointing); the verbal transcript reports emotions, facial expressions and description of actions. This process of recursive visual transcription supports the identification of all non-verbal elements of the interaction (e.g., Housemother, the two deaf boys, school uniforms, gaze, body positions, and gestures, as well as facial expressions and emotions). It also helps to identify and edit out distractors (e.g., other students, school buildings, dustbin). Such streamlining allows the researcher and the audience to focus on features of the interaction made relevant by participants and related to the researcher's argument (Ramey, Hilppo, Dyer & Krist, 2016).

3.11 Ethical Considerations

In this study, ethical issues concerning access, informed consent, plagiarism, confidentiality, and anonymity were addressed.

3.11.1 Access

Access to the first two sites: Ashanti School for the Deaf and Demondstration school for the Deaf was obtained through an introductory letter from my Department to the headmasters of the schools. The letter introduced the researcher and highlighted the purpose of the study, its significance as well as the participants and what would be required of them. The letter also assured the heads of the schools about the confidentiality and anonymity of the participants. Access to the home in Bekwai was verbally obtained from the grandmother of the deaf boy. Samples of the permission letter are included in Appendix C.

3.11.2 Informed Consent

Informed consent was verbally gained from all hearing caregivers in the study. In the case of the deaf children, consent was obtained from their parents, teachers, and the children themselves. Information about the study, particularly the topic, how it would be carried out, nature of the participants' participation, their requirement, the kind of data to be collected and how it would be used, was given to all the participants. These were explained in GSL to the deaf children.

3.11.3 Plagiarism

In order to avoid plagiarism in this study, I have carefully followed the prescribed procedures for conducting research given by my University. Also, all quotations and inferences from other works have been duly acknowledged.

3.11.4 Confidentiality

Confidentiality was ensured in this study through the following measures. Firstly, the data provided by participants were used for the research purpose only. In addition, the research assistants who videotaped the communication interactions in the two schools were asked to keep the identity of the participants confidential. Moreover, after the

videos were forwarded to the researcher, the original copies on their phones were deleted.

3.11.5 Anonymity

Due to the nature of the data that were collected and how they were presented, it was difficult to ensure the anonymity of the participants. For example, data was presented through pictures in order to highlight facial expressions and other pertinent information about communication between deaf children and their hearing caregivers. Thus, there was the need to show the faces of the participants in the study.

In spite of this difficulty, an effort was made to make the participants anonymous. In line with this, the names of participants and their addresses were replaced with codes.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents the results of the study. The data analysed were four video-recordings of young deaf children's interactions with their hearing caregivers in two schools for the deaf and a home. The first interactional video data (MCV-1) involved a hearing caregiver (a housemother) and two deaf boys. In this video, Caregiver 1 (C1) guides Deaf 1 (D1) to search for his school uniform, shoes, and underwear. The first episode begins with D1 searching for his school uniform in a wooden box containing numerous school uniforms. The second episode portrays C1 asking D1 the whereabouts of his shoes. In the third episode, C1 guides D1 to look for his underwear. C1 engages D2 to assist D1 in searching for his underwear.

The interaction took place after class in a natural school environment. Thus, the camera captured school dormitories, students; some of whom either were standing in front of the dormitory, fetching water, going to bath or walking around. There was a wooden bench in front of the dormitory where the interaction took place. A dustbin and a rubber bucket with its metal stand for hand-washing were also found in the compound. In addition, the camera captured grass on the ground, trees and pruned flowers as well as electrical lines and poles in the environment.

The second video data (JCV-1) involved Caregiver 2 (C2) and Deaf 3 (D3) in which the former guided the latter in washing clothes. C2 stood and carried a baby on her back and gave instructions to D3 as she washed the cloths in a big metal bowl. There were other two buckets there meant for rinsing the washed cloths. In the video, other deaf

students were found interacting with C2 and playing with the baby. The camera also captured the school football field where some boys were standing.

The third video data (JCV-2) involved Caregiver 3 (C3), Deaf 4, and Deaf 5. In the video, C3 is seen giving guidance to the two deaf girls as they wash dishes together. Deaf 4, who was older than Deaf 5, washed the dishes in soapy water whereas Deaf 5 rinsed the washed dishes in another bowl. This interaction took place in the morning, therefore, other deaf students within the camera's frame were seen brushing their teeth, fetching water to bath or walking around.

The fourth video data (WCV-1) involved Caregiver 4, 5, 6, and Deaf 6 (D6). This video portrays D6 quarrelling and fighting with C5 and C6. C4 often intervened and tried to appease D6 in an attempt to resolve the conflict between him and C5, his older sister. However, D6 refuses to listen to C4 and the fight continued till the end.

The interactions in the four video data occurred through combinations of embodied communication, GSL, natural gestures, and speech. The themes and sub-themes that emerged from the analysis of data are as follows:

Table 1: Themes and Sub-Themes

1. Themes	2. Sub-Themes
• **Communication strategies**	• Simultaneous communication • Simultaneity of gestures • Repetitions • Maintaining eye contact (Gazing) • Calling for attention • Offering prompts and giving directions • Soliciting help from others • Engagement with objects
• **Embodied communication modalities**	• Ghanaian Sign Language (GSL) • Natural gestures • Pointing • Touching • Tapping • Waving • Facial expressions
• **Factors that account for miscommunication**	• Using wrong signs and gestures • Signing and gesturing at long distances • Not allowing enough time for feedback • Signing and gesturing whilst holding objects in hand
• **Factors that determine successful communication**	• Joint attention/ Calling for attention before starting communication • Communicating at short distances • Signing and gesturing at a normal rate • Altering the communication modality

Source: Video data (2022)

Data on the above themes and sub-themes are presented and analysed as follows:

4.2 Communication Strategies between young Deaf Children and their Hearing Caregivers

Young deaf children and their hearing caregivers employed numerous and diverse strategies to facilitate communication between themselves. These included simultaneous communication, simultaneity of gestures, repetitions, maintaining eye contact, calling for attention, offering prompts and giving direction, soliciting help from others, and engagement with objects.

4.2.1 Simultaneous communication

Hearing caregivers spoke and signed or gestured at the same time during their interactions with deaf children.

Figure 4.1a: C4 asks and gestures "What?"

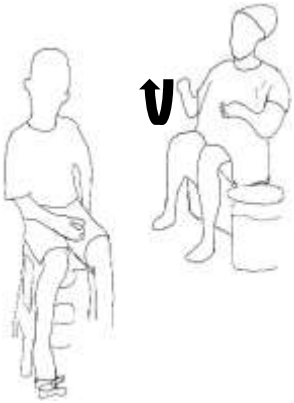

Figure 4.1b: Illustration of C4 asking and gesturing "What?"

Figure 4.2: C4 speaks and gestures "I will slap you."

In figures 4.1a and 4.2, C4 spoke and gestured at the same time to D6. Figure 4.1a shows C4 speaking and gesturing "What" while figure 4.1b illustrates how C4 moved her left hand during the gesture. With her palm facing down, she turned her hands in a U-shape for her palm to face up. In figure 4.2, C4 spoke a full sentence in Effutu, "Mebo wasom", meaning, "I will slap you" whilst she gestured with a frown only the word, "slap".

4.2.2 Simultaneity of Gestures

Caregivers employed combinations of gestures to make meaning during their interactions with deaf children. Figures 4.3a and 4.3b show a combination of gestures: waving and shaking the head from left to right as in gesturing "no".

Figure 4.3a: C1 gestures "no" to D1.

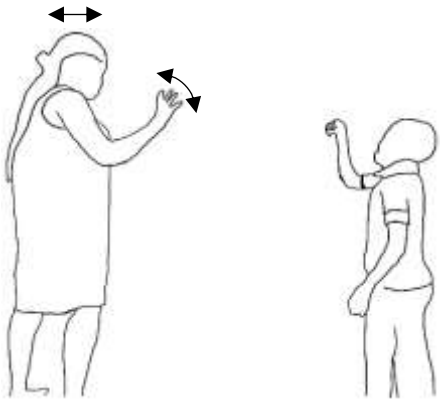

Figure 4.3b: Illustration of C1 gesturing "no" to D1.

In figures 4.3a and b, D1 picked an object from the wooden box that seemed to be a transparent broken ruler and showed it to C1 who responded "No" by combining two gestures. She waved her opened fingers in a bye-bye motion and shook her head from left to right several times simultaneously to signal "no".

Again, C1 combined three embodied communication modalities: touch, gesture, and GSL to ask the question, "Where are your shoes?" In the first place, she touched her foot (figures 4.4a and b) to indicate shoes. Secondly, she signed "wash" (figures 4.5a and b), and then lastly gestured "where" (figures 4.6a and b). Thus, "Where are your shoes?" was communicated as "Shoe wash where". This is presented below:

Figure 4.4a: C1 touches her right foot.

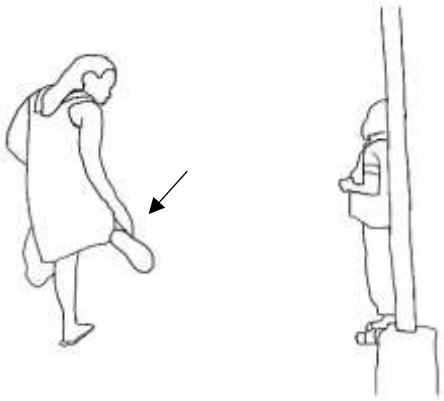

Figure 4.4b: Illustration of C1 touching her right foot.

Figure 4.5a: C1 signs "wash".

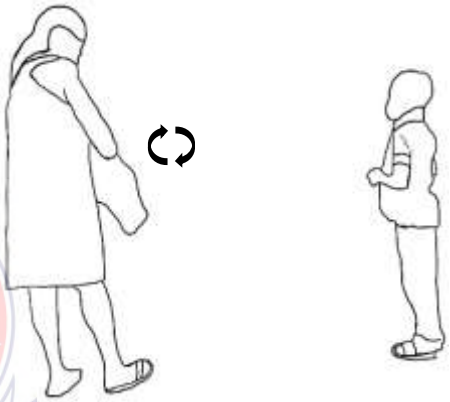

Figure 4.5b: Illustration of C1 signing "wash".

Figure 4.6a: C1 signs "where?"

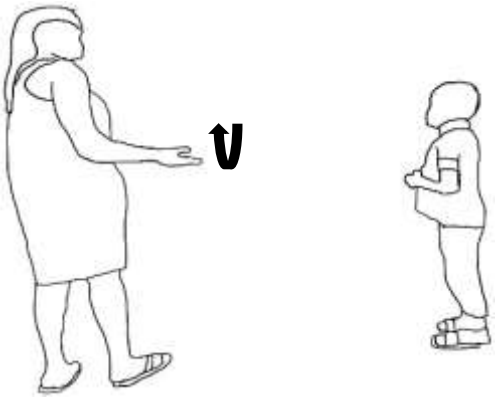

Figure 4.6b: Illustration of C1 signing "where?"

4.2.3 Repetitions

Throughout their interactions with deaf children, hearing caregivers made numerous repetitions for clarity and emphasis. During the interactions between the deaf children and their hearing caregivers, signs, gestures, and sometimes whole sentences were often repeated twice and thrice especially by caregivers.

Figure 4.7: C3 points to the basket (01:02).

Figure 4.8: C3 points to the basket the second time (01:04).

Figure 4.9: C3 points to the basket the third time (01:06).

In figures 4.7, 8, and 9, C3 told D5 to put the washed dishes in the basket by pointing her index finger toward the basket. She repeated this gesture twice after the first one. The first two gestures were done with her index finger at 1 minute, 2 seconds (1:02) and 1 minute, 4 seconds (1:04) respectively into the video whereas the third was done with opened fingers at 1 minute, 6 seconds (1:06). Thus, there were 2 seconds (00:02) between each repetition.

Some of the deaf children also made repetitions during the interactional process with caregivers.

Figure 4.10: D6 gestures "slap" (3:45).

Figure 4.11: D6 gestures "slap" the second time (3:47).

Figure 4.12: D6 repeats the gesture for "slap" the third time (3:49).

In figures 4.10, 4.11, and 4.12, D6 repeated three times that he would slap C5, his older sister. The first two gestures (figures 4.10 and 4.11) were done with opened fingers at 3 minutes, 45 seconds (3:45) and 3 minutes, 47 seconds respectively into the video whilst the last one (figure 4.12) was done with a fist at 3 minutes, 49 seconds (3:49). Thus, again, 2 seconds occurred between successive repetitions. These repetitions were done by D6 for emphasis. He was fighting with his older sister and seemed to emphasize that he meant what he said.

Another repetition which is worthy of notice was made by C4. She told D6, her grandson, to stop fighting with C5.

Figure 4.13: C4 gestures "stop" the first time (3:11).

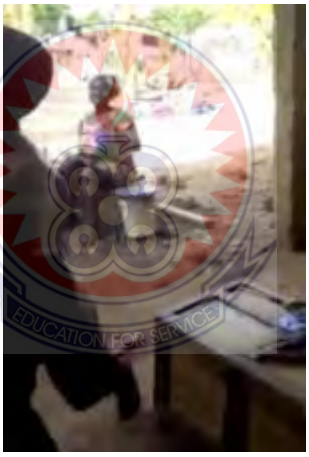

Figure 4.14: C4 gestures "stop" the second time (3:13).

Figure 4.15: C4 gestures "stop" the third time (3:21).

In figures 4.13, 4.14, and 4.15, D6 started to hit with a plywood C5, his older sister. However, C4, his grandmother, raises her left hand and says in Effutu language, "Gyai", meaning "Stop" (3:11). When D6 refused to listen to her, she continued to urge him to stop by tapping her left thigh twice whilst shouting "Gyai" (3:13). When C4 told D6, her grandson to stop, by raising her hand, D6 was looking away so he did not see what

his grandmother gestured. It was the same with the second gesture. Therefore, she repeated the third time when D6 had turned back and facing her (3:21).

4.2.4 Maintaining Eye Contact (Gazing)

Interlocutors used gaze and maintained eye contact with each other during interactions. This is presented below:

Figure 4.16a: C1 and D1 gaze at each other.

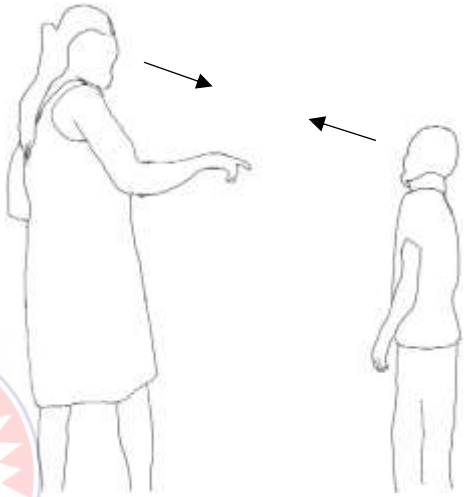

Figure 4.16b: Illustration of C1 and D1 gazing at each other.

4.2.5 Calling for Attention

Hearing caregivers often sought for attention at the beginning and during interactions. This was done either by tapping or touching the head, shoulder, or hand of the deaf children.

Figure 4.17: C2 gently taps D3's head.

Figure 4.18: D3 maintains eye contact after the tap

In figure 4.17, C2 drew D3's attention by tapping her head gently several times. Figure 4.18 shows D3 raising her head slightly after the tap by C2 and maintains eye contact with her, paying attention to what she was about to gesture.

Figure 4.19: C3 taps the back of D4.

Figure 4.20: C3 taps the hand of D5.

Figure 4.21: D5 pays attention to C3 after the tap.

C3 also employed taps several times to call for the attention of D4 and D5 during their interactions. In figures 4.20 and 4.21, C3 tapped the back of D4 and the hand of D5 to

call for their attention. She then told D5 to put the washed dishes in the basket by pointing her index finger toward it.

4.2.6 Offering Prompts and Giving Directions

Caregivers guided the deaf children by offering prompts and giving directions throughout the communication process to promote understanding. Caregivers provided cues by pointing to the locations of objects and showing objects to the deaf children.

Figure 4.22: C1 points to the location of an underwear.

Figure 4.23: C1 shows D1 a school uniform.

In figures 4.22 and 4.23, C1 offered cues to D1 by pointing to the location of underwear and showing a uniform to D1.

4.2.7 Soliciting help from others

Caregivers engaged others to assist their interactants in carrying out tasks.

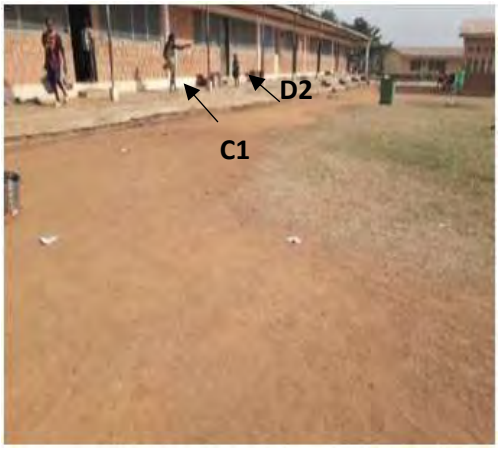

Figure 4.24: C1 asks D2 to assist D1.

In Figure 4.24, C1 asked D2 to help D1 search for his underwear. It was a way of helping D1 understand the message conveyed and providing more hands to complete the task with ease.

4.2.8 Engagement with Objects

Hearing caregivers made use of objects to enhance understanding between them and their deaf children during the communication process.

Figure 4.25: C1 shows D1 a school uniform.

In Figures 4.3a and b, D1 misunderstood C1 and picked an object that seemed to be a transparent broken ruler from the wooden box. C1 then told him "no" through a combination of two gestures. C1 then picked a uniform from the box and showed it to him (Figure 4.25), indicating that that was what she asked him to look for in the box.

4.3. Embodied Communication Modalities between Young Deaf Children and their Hearing Caregivers

Hearing caregivers and their deaf children employed diverse embodied communication modalities to convey meaning during their interactions with their communication partners. The embodied communication modes employed included Ghanaian Sign Language (GSL), gestures, pointing, touching, tapping, waving, and facial expressions.

4.3.1 Ghanaian Sign Language (GSL)

Caregivers and deaf children used GSL concepts together with other embodied communication modalities to communicate with their interactants. Both interlocutors (hearing caregivers and their deaf children) had poor sign language skills. They hardly used complete GSL sentences during the communication process. Their interactions were characterized by intermittent use of GSL concepts.

Figure 4.26a: C1 touches her right foot.

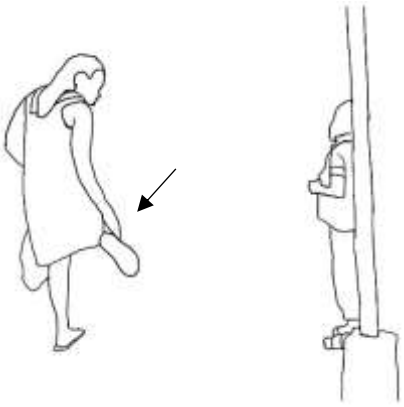

Figure 4.26b: Illustration of C1 touching her right foot.

Figure 4.27a: C1 signs "wash" in GSL.

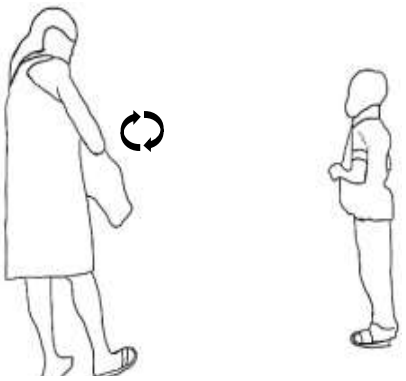

Figure 4.27b: Illustration of C1 signing "wash" in GSL.

Figure 4.28a: C1 signs "where" in GSL.

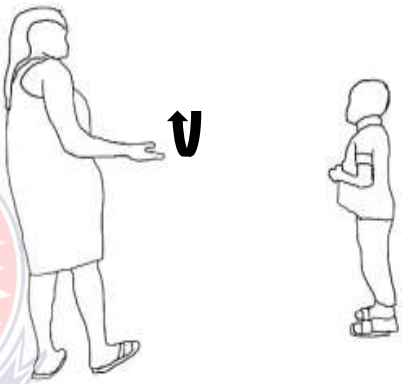

Figure 4.28b: Illustration of C1 signing "where" in GSL.

In Figures 4.26a and b, 4.27a and b, and 4.28a and b, C1 asked D1 where his washed shoes were. Although, C1 employed GSL in her message, it was not a complete GSL sentence. She only used the GSL sign for "wash" (Figures 4.27a and b). In Figures 4.26a and b, instead of using the GSL sign for shoes, she touched her foot to indicate "shoes". Again, in Figures 4.28a and b, C1 gestured "where" instead of using the GSL sign for "where". The word, "where" is signed in GSL by quickly waving the index finger several times. However, with her palm facing down, C1 turned her palm upward in a U-shape to indicate "where". This gesture where employed by caregivers to signal both "where" and "what".

4.3.2 Gestures

Caregivers and deaf children employed gestures throughout their interactions. Gestures dominated the interactions between deaf children and their hearing caregivers. Both interlocutors used gestures more than GSL.

Figure 4.29: C4 gestures "stop" to D6.

Figure 4.30: C5 mocks D6.

Figure 4.31: C1 gestures "no".

In Figures 4.29, 4.30, and 4.31, caregivers used gestures to convey their messages to their interactants. When telling D6 to stop fighting, C4 gestured "stop" by raising her left hand (Figure 4.29). In Figure 4.30, C5 made a mocking gesture to D6 whereas in Figure 4.31, C1 gestured "no" to D1 by shaking her head from left to right and quickly waving her right hand in a bye-bye motion.

4.3.3 Pointing

Pointing was a major embodied communication mode that was used by all interlocutors during communication. The Figures 4.32, 4.33 and 4.34 show how it was being used.

Figure 4.32: C2 points toward a location.

Figure 4.33: C3 and D4 point to a basket.

Figure 4.34: C1 points to D1.

Pointing was employed to give directions, to show objects, and to convey the message, "you". In Figure 4.32, C2 pointed toward the location of drying line. Figure 4.33 shows C3 and D4 pointing toward a basket. Finally, in figure 4.34, C1 pointed to D1 to indicate "you".

4.3.4 Touching

Caregivers used touch throughout their interactions with their deaf children. Touch was employed to indicate parts of cloths, for example, the armpit as well as things that are worn on the part of the body that was touched, for instance, touching the foot to indicate shoes.

Figure 4.35: C2 touches her right armpit.

Figure 4.36: C2 touches her left armpit.

Figure 4.37: C2 touches her right knee.

Figure 4.38: C2 touches her left knee.

Figure 4.39: C1 touches her right foot.

In Figures 4.35, 4.36, 4.37, and 4.38, C2 touched her right armpit, left armpit, right knee, and left knee respectively to indicate the areas of the cloth where D3 should wash. Figure 4.39 shows C1 touching her right foot to indicate shoes.

4.3.5 Tapping

Caregivers often used taps in their interactions with their deaf children. Tap was employed to call for attention before communicating.

Figure 4.40: C2 taps the head of D3.

Figure 4.41: C3 taps the hand of D5.

In Figures 4.40 and 4.41, C2 and C3 tap the head and hand of D3 and D5 respectively to call for their attention before communicating with them.

4.3.6 Waving

Caregivers also use waving. Figure 4.42 shows how a caregiver used it.

Figure 4.42: C1 waves "no" at D1.

Waving was used once together with head shake by C1 to indicate "no" during her interactions with D1. The wave was done very quickly and shortly.

4.3.7 Facial expressions

Caregivers and deaf children made facial expressions throughout their interactions to express emotions such as happiness, anger, and dissatisfaction as well as misunderstandings.

Figure 4.43: D1 turns with a frowned face to the camera.

Figure 4.44: D6 gestures with a smile "mad".

Figure 4.45: C5 expresses pain on her face.

Figure 4.46: C5 and D6 smiles at each other.

Figure 4.47: C5 makes a mocking facial expression.

In Figure 4.43, D1 turned with a frowned face to the camera. He seemed to have misunderstood the question asked by C1. Figure 4.44 shows D6 gesturing with a smile "mad" to C5, his older sister. He seemed to enjoy mocking her. In Figure 4.45, C5

expressed pain on her face when she was hit with a plywood by D6. Figure 4.46 shows both C5 and D6 smiling at each other. Finally, in Figure 4.47, C5 makes a mocking facial expression by sticking her tongue forward and wobbling it between her lips. Caregivers and deaf children made a lot of facial expressions in their interactions to express their emotions and convey meaning.

4.4. Factors that Account for Miscommunication between Young Deaf Children and Hearing Caregivers

There were several instances of miscommunication between the deaf children and their hearing caregivers. The factors that caused miscommunication between the deaf children and their caregivers included the use of wrong signs or gestures, signing or gesturing whilst holding objects in hand, communicating at long distances, and not allowing enough time between repetitions.

4.4.1 Using the Wrong Signs or Gestures

There were instances where deaf children and caregivers used the wrong signs to refer to objects or actions. This often caused ambiguity in messages and created misunderstandings. The Figures below show instances of miscommunication.

Figure 4.48: D5 points to the small container in the basket.

Figure 4.49: D5 signs "wash".

Figure 4.50: Both D5 C3 point to the basket.

Figure 4.51: D5 goes for the soap herself.

Figure 4.48 shows an instance of a miscommunication: D1 picked an object from the box that was different from what he was asked to look for. Another instance of miscommunication is found in Figures 4.48, 4.49, 4.50, 4.51. D5 was washing dishes and she asked C3 to bring her the soap in the small container. However, C3 could not understand her and thus was unable to help her; she stood still, doing nothing.

In Figure 4.48, D5 pointed toward the small container in the basket. The basket contained several objects including the small container such as plates, spoons, and cups. Therefore, C3 was confused, not knowing which object D5 was referring to. To clarify which object D5 was referring to, she signed "washed" (Figure 4.49). This was another miscommunication because it created ambiguity in her message. She should have signed "soap" instead of "wash". Thus, C3 was still confused and D5 had to point to the basket the second time (Figure 4.50).

By pointing to the basket and signing "wash", the message of D5 could have more than one meaning: Firstly, she could have meant that C3 should bring the plates in the basket to her. Secondly, she could have meant that C3 should bring the whole basket to her. Thirdly, she could also have meant that the C3 should bring her the soap in the small container, which was her true intent. However, because of the ambiguity in her

message, C3 could not help her and she had to go for the soap in the container herself (Figure 4.51). The use of the wrong sign or gesture causes ambiguity in messages and creates misunderstanding.

4.4.2 Signing and Gesturing at Long Distances

Although caregivers and deaf children stood or sat near their communication partners during interactions, there were few instances where interlocutors stood far apart during the communication process.

Figure 4.52: C1 stands afar from D1 and signs "pant".

Figure 4.53: D1 squats afar from C1 and shows her a pair of shoes.

In Figures 4.52 and 4.53, C1 and D1 respectively stood and squatted afar from each other and communicated. The distance between them was so long that the camera could not capture both of them at the same time. In Figure 4.52, C1 asked D1 where the pant of his school uniform was whereas in Figure 4.53, D1 showed C1 a pair of shoes, telling her if those were the ones she asked him to look for.

4.4.3 Not Allowing Enough Time between Repetitions

Some hearing caregivers did not allow enough time between successive repetitions for the deaf children to respond.

Figure 4.54: C1 asks the first question (00:15).

Figure 4.55: C1 asks the second question (00:16).

Figure 4.56: C1 asks the third question (00:18).

Figures 4.54, 4.55, and 4.56 depict C1 asking D1 where his school uniform was. The question was repeated twice after the first turn. The first round of question was asked at fifteen seconds (00:15) into the interaction. The second question immediately followed at sixteen seconds (00:16) with only a second between the first and second rounds of questions. After the first question, C1 did not allow D1 enough time to think and answer before she asked the second question. Again, the time between the second and third turns of questions was only two seconds (00:16-00:18), which was not enough for D1 to respond, considering his age.

4.4.4 Signing and Gesturing Whilst Holding Objects in Hand

Caregivers and deaf children signed and gestured whilst holding objects in hand as shown in Figures 4.57, 4.58, and 4.59.

Figure 4.57: C2 signs whilst holding a pair of scissors.

Figure 4.58: C1 signs whilst holding a uniform and a napkin.

Figure 4.59: D4 signs whilst holding a sponge.

In Figures 4.57, 4.58, and 4.59, C2, C1, and D4 signed whilst holding a pair of scissors, a uniform, and a soap respectively. Signing with objects in hand can distort the message impede understanding of the intended message.

4.5 Factors that Determine Successful Communication Young Deaf Children and their Hearing Caregivers

Deaf children and their hearing caregivers were able to convey, receive, and understand messages between themselves. Factors that accounted for successful communication between the deaf children and their hearing caregivers included calling for attention before communicating, communicating at short distances, change of embodied communication modality, signing and gesturing at a normal rate, and altering the communication mode.

4.5.1 Calling for Attention before Communicating

Hearing caregivers and deaf children ensured that their interactants paid attention to them before beginning their communication (See Figures 4.17, 4.19, and 4.20 on page

84). Where the communication partners were looking away or focusing on other activities, the initiators of the interaction either used tap to call for attention or waited for them to turn and pay attention before communicating. This strategy ensured that the auditors (the receivers) in the communication process were able to receive and understand the message. In Figure 4.17, C2 gently tapped the head of D3 to seek her attention before communicating with her. Again, in figures 4.19 and 4.20, C3 used tap to seek the attention of D4 and D5 before communicating with them. This enabled the two deaf children to receive and understand the message C3 conveyed.

4.5.2 Communicating at Short Distances

Another factor that led to successful communication between caregivers and their deaf children was communicating at short distances (See Figures 4.29, 4.30, and 4.31 on page 89). Some hearing caregivers and deaf children stood near to their interactants when communicating with them. This allowed for the interlocutors to have a clear view of hand shapes and movements as well as facial expressions. In Figures 4.29, 4.30, and 4.31 on page 89, the interlocutors stood or sat near each other during their interactions. In Figure 4.29, D6 stood near C4, his grandmother when telling her that he would slap C5, his older sister. When mocking D6 (Figure 4.30), C5 ensured that he was nearer to her so that he could see clearly her mocking facial expressions. Finally, in Figure 4.31, C1 and D1 stood near each other during their interactions.

4.5.3 Signing and Gesturing at a Normal Rate

The deaf children and their hearing caregivers signed and gestured at a normal rate. Their hand movements were neither too fast nor too slow. This enhanced clarity and understanding in the communication process.

4.5.4 Altering the Communication Mode

Where the deaf children could not understand the first embodied communication mode used, caregivers changed it to another modality. Caregivers ensured that the particular message remained intact by only altering the mode in which it was first conveyed.

Figure 4.60: D1 shows C1 an object.

Figure 4.61: C1 asks D1 where his uniform is.

Figure 4.62: C1 shows D1 a school uniform.

In figure 4.60, D1 showed C1 an object which he had picked from the wooden box. This object, which seemed to be a broken transparent ruler, was not what C1 had asked D1 to look for in the box. C1 had used GSL to ask D1 to look for his school uniform in the box. When C1 realized that D1 had misunderstood her message, she altered the communication mode from GSL to engagement with objects: She picked a school uniform from the box and showed it to D1 (figure 4.62), telling him that that was what she asked him to look for.

4.5 Conclusion

This chapter presented the emergent themes and sub-themes from the analysis of the four video data in the study. The four major themes that emerged from the analysis included communication strategies, embodied communication modalities, factors that account for miscommunication, and factors that determine successful communication among young deaf children and their hearing caregivers. The sub-themes that emerged

under communication strategies were simultaneous communication, simultaneity of gestures, repetitions, maintaining eye contact, calling for attention, offering prompts and giving directions, soliciting help from others, and engagement with objects.

The embodied communication modalities employed by young deaf children and their hearing caregivers included Ghanaian Sign Language, gestures, pointing, touching, tapping, waving, and facial expressions. Using the wrong signs or gestures, signing and gesturing at long distances, not allowing enough time between repetitions, and signing and gesturing whilst holding objects in hand were the factors that accounted for miscommunication between young deaf children and their hearing caregivers. Successful communication between the deaf children and their hearing caregivers were attributed to factors such as calling for attention, communicating at short distances, signing and gesturing at a normal rate, and altering the communication mode.

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.1 Introduction

This chapter discusses the findings of the study presented in Chapter Four. As discussed in Chapter Two, the study is situated within the biecological model of human development (Bronfenbrenner & Morris, 2006). It draws on the four elements of the theory: Proximal process, person, context, and time. Bronfenbrenner and Morris (2006) saw proximal processes as the major mechanism that drives human development. The study focused on the proximal process of communication between young deaf children and their hearing caregivers with particular emphasis on the strategies as well as the embodied communication modalities that the two groups of interlocutors employ for meaning making.

The discussions are organized around the thematic areas raised in the research questions. Section 5.2 discusses the communication strategies between young deaf children and their hearing caregivers; simultaneous communication (5.2.1); simultaneity of gestures (5.2.2); repetitions (5.2.3); maintaining eye contact/ gazing (5.2.4); calling for attention (5.2.5); offering prompts and giving directions (5.2.6); soliciting help from others (5.2.7); and engagement with objects (5.2.8).

Section 5.3 discusses the embodied communication modalities employed by hearing caregivers and young deaf children for meaning making. 5.3.1 discusses the use of Ghanaian Sign Language (GSL) by hearing caregivers and deaf children. Sections 5.3.2, 5.3.3, and 5.3.4 discuss how caregivers and deaf children use natural gestures, pointing, and touching and tapping respectively whereas caregivers and deaf children's use of waving and facial expressions is discussed in sections 5.3.5 and 5.3.6 respectively.

The factors that account for miscommunication between young deaf children and their hearing caregivers are discussed in section 5.4; using wrong signs and gestures (5.4.1); signing and gesturing at long distances (5.4.2); not allowing enough time for feedback (5.4.3); and signing and gesturing whilst holding objects in hand (5.4.4). Finally, the factors that determine successful communication among young deaf children and their hearing caregivers are discussed in Section 5.5. Section 5.5.1 discusses how calling for attention before starting communication or joint attention facilitates effective communication between young deaf children and their hearing caregivers. The ways in which factors such as communicating at short distances, signing and gesturing at a normal rate, and altering the communication modality promote successful communication among caregivers and deaf children are discussed in sections 5.5.2, 5.5.3, and 5.5.4 respectively.

5.2 Developing Communication between Young Deaf Children and their Hearing Caregivers

Findings of the study indicated that hearing caregivers and deaf children use a variety of strategies to facilitate communication among themselves. These include simultaneous communication, simultaneity of gestures, repetitions, maintaining eye contact, calling for attention, offering prompts and giving direction, soliciting help from others, and engagement with objects. Bronfenbrenner and Morris (2006) posit that proximal processes which are the systematic interactions between an individual and his environment are the primary mechanism of human development. Thus, the interactional strategies discussed form the primary mechanism of communication development of young deaf children.

5.2.1 Simultaneous Communication

The study discovered that caregivers sign or gesture and speak at the same time. The groups of participants (deaf children and caregivers) in the study have asymmetrical experiences of being deaf and being hearing, and have in common very little language resources. Simultaneous communication, in many cases, seems to be a habit of hearing caregivers because speech is their major mode of communication. Thus, hearing caregivers often combine visual modes of communication with speech.

In some few instances, simultaneous communication seems to be a well-thought out strategy used by hearing caregivers to help them express their messages and also provide cues to deaf children in order to enhance their understanding. The use of speech and GSL or gestures simultaneously perform different functions such as emphasis and promoting understanding. Such systematic interactions promote the communication and language development of young deaf children (Bronfenbrenner & Morris, 2006).

5.2.2 Simultaneity of Gestures

Findings of the study revealed that hearing caregivers use two gestures at the same time during their interactions with deaf children. This finding is supported by Adami and Swanwick (2019) who assert that the use of such strategies mitigates the sensory and linguistic asymmetries between hearing-deaf interactants. Caregivers use two or more gestures simultaneously in a variety of ways. Caregivers sometimes use two gestures of the same meaning. For instance, shaking the head in disagreement and waving the hands in a bye-bye motion all to signify the word “no”. Another example is nodding the head and using thumb up (either with one hand or both) simultaneously to signify agreement or “yes”. Caregivers employ simultaneity of gestures this way mainly for emphasis, that is, to intensify their expression. Caregivers also use two or more gestures that have different meanings to convey their messages and for different functions.

5.2.3 Repetition

The study discovered that caregivers and deaf children often make repetitions throughout their interactions. Caregivers and deaf children repeat twice or thrice words, gestures, signs, and sometimes complete statements. Interlocutors typically make repetitions where they deduce that their message(s) did not get through to their communication partners. However, interactants also make repetitions for the purpose of emphasis. Moreover, caregivers and deaf children repeat themselves where the other interactant did not see their sign or gesture because he/she was looking away. The finding is in agreement with Loots and Device (2003) and Swisher (2000) who discovered that deaf mothers make a lot of repetitions during their interactions with their deaf children.

5.2.4 Maintaining Eye Contact/ Gazing

Findings of the study show that caregivers and deaf children maintain eye contact or gaze at each other throughout their interactions. Eye contact or gaze is an essential component of visual communication because this mode of communication relies on sight. Therefore, caregivers and deaf children always gaze at each other, and where a communication partner turns aside his/her eyes during interaction, interactants employ different strategies to regain attention.

Interlocutors' gaze during the communication process ensures fluency or smooth flow of the interaction. According to Swisher (1992), hearing mothers perceive their deaf child looking away as an interruption of communication. Therefore, they employ different strategies such as waving or shifting their bodies into their children's field of vision to ensure that the children maintain their gaze during interactions.

5.2.5 Calling for Attention/ Joint Attention

The findings of the study also revealed that caregivers and deaf children seek each other's attention through visual-tactile modalities such as touch and tapping as well as waving and gaze. These modalities enable interlocutors to establish joint attention often at the beginning and sometimes during interactions. In support of this finding, Loots and Device (2003) pointed out that caregivers often wait for deaf children to look at them before expressing an intention. Harris and Mohay (1997) and Jamieson (1994) point out that waiting for children to look up before expressing an intention increases the likelihood that the expressed intentions are perceived.

5.2.6 Offering Prompts and Giving Visual Cues and Directions

Findings of the study revealed that caregivers, in their interactions with the deaf children, offered prompts and gave visual cues and directions. The prompts and visual cues that were given to the deaf children included facial expressions, pointing, and intensifying body movements. This finding is supported by Ekman (1985) and Chovil (2005) who point out that interlocutors especially hearing caregivers of deaf children provide different cues - facial illustrators (facial cues that provide a sort of model for what is being discussed verbally); regulators (cues that help guide the pace of a conversation); syntactic displays (movements that are connected to the tone of what someone is saying but do not add content and the most common form of facial signal she observed); speaker comments (cues on the speaker's face that add to what he or she is saying); and speaker illustrators (visual pictures of what is being said) - to enrich their interactions with deaf children.

5.2.7 Soliciting Help from Others

Findings of the study indicated that caregivers engage others to assist deaf children to carry out tasks during interactions. This is an effective strategy that can be used in

different contexts like the family, school, and the larger community to provide assistance and directions to deaf children during interactional activities.

In the home context, for example, caregivers can let hearing siblings assist deaf children in carrying out tasks such as looking for objects. The hearing siblings can provide contextual cues through pointing to positions, directions, and objects or carry out tasks together with deaf children such as running errands and dish washing. At school, teachers can solicit help from other colleague students especially hearing students in an inclusive context to help deaf children understand their messages. The engagement of others in the communication process promotes understanding and encourages further interactions.

5.2.8 Engagement with Objects/ Manipulation of Objects

Findings of the study also revealed that caregivers often make use of objects to facilitate communication between themselves and their deaf children. Caregivers use objects to tell deaf children what they are referring to, and in some cases, caregivers manipulate objects to attract deaf children's attention.

Caregivers usually manipulate object through touch, tapping, holding, and showing objects in combination with other modalities to convey meaning. This finding supports the opinion of Morgenstern (2014) that object manipulation is often done in conjunction with other communication modes and strategies during caregiver-child dyads. Deak, Jasso, Krasno and Triesch (2006) add that infants almost never follow caregivers' gaze shift unless the adult also manipulates the object or points. Thus, object manipulation is very crucial especially during the first year.

5.3 Embodied Communication Modalities Employ by Young Deaf Children and their Hearing Caregivers

Embodied communication modalities are the visual-tactile means of expressive and receptive communication. Findings of the study revealed that caregivers and deaf children employ various communication modalities including Ghanaian Sign Language (GSL), gestures, pointing, touching, tapping, waving, and facial expressions either distinctly or in combination for meaning making. Bronfenbrenner and Morris (1998) assert that the form, power, content, and direction of the proximal processes effecting development vary systematically as a joint function of the characteristics of the developing person; of the environment (both immediate and remote)in which the processes are taking place; the nature of the developmental outcomes under consideration; and the social amenities and changes occurring over time through the life course and the historical period during which the person has lived. Thus, to promote the communication development of young deaf children, hearing caregivers vary their communication modalities based on the characteristics of their deaf children (age, level of GSL among others) and the environment (home or school).

5.3.1 Ghanaian Sign Language (GSL)

Findings of the study indicated that hearing caregivers and deaf children use sign language to communicate with each other although many interlocutors, particularly hearing caregivers, have poor GSL skills in both expression and reception. Findings of the study are in line with Oppong (2003) who assert that GSL is the preferred mode of communication by many Deaf individuals in Ghana. In contrast, Goldin-meadow (2010) found that some deaf children especially those who are congenitally deaf and are not exposed to sign language earlier communicate using gestures instead of sign language.

Hearing caregivers in Ghana do not have ready access to sign language resources. One major avenue through which caregivers learn GSL is during Parent-Teacher Association (PTA) meetings in schools for the Deaf. However, the programme in many schools for the Deaf in Ghana is ineffective and infrequent. Thus, most caregivers struggle to communicate with their children through sign language. This study discovered that many caregivers do not sign whole sentences but used distinct GSL concepts. However, caregivers make up for their poor GSL skills by employing the few GSL signs they know in conjunction with other modalities such as natural gestures/ home signs, and facial expressions.

5.3.2 Gestures

Findings of the study revealed that caregivers and deaf children communicate through gestures. Hearing caregivers and young deaf children communicate through gestures more than sign language because of the poor sign language skills of both groups of interlocutors. As pointed out earlier, hearing caregivers do not have ready access to sign language resources whereas deaf children of hearing families have inadequate exposure to sign language in their early years. Consequently, these two groups of interactants depend mainly on gestures for communication. The implication is that caregivers with good sign language skills still have to use gestures or at least incorporate it into their sign language system because young deaf children have not developed their sign language skills to a level where they can effectively communicate through that mode alone. Thus, caregivers must take into consideration the characteristics and communicative competences of deaf children during interactions.

The findings of the study are in agreement with Fant (1972) and Moores (1974) who point out that deaf children who have not been exposed to conventional sign language spontaneously use gestures to communicate. Caregivers with different backgrounds use

gestures differently in various contexts. The study discovered that hearing caregivers in the school context (housemothers) often use gestures in combination with GSL whilst hearing caregivers in the family context (mothers, grandmothers, and siblings) used gestures alone to communicate. The reason is that housemothers in schools for the Deaf have some level of GSL which they have acquired from deaf children and teachers in school whereas most hearing parents, grandparents, and siblings completely lack GSL skills.

5.3.3 Pointing

The study also found out that caregivers and deaf children employ pointing throughout their interactions for different functions including giving directions, showing objects, attracting attention, and signaling "you". This finding supports the opinion of Butterworth and Itakura (2000) that pointing with an outstretched and aligned arm, hand and finger (or other parts of the body) is a very natural and salient way to direct another's attention to a new object. The findings also concur with Iverson and Goldin-Meadow (2005) and Kelly (2011) who postulate that pointing gestures are grounded in joint attention, they trigger interaction, and they may also facilitate children's entry into word combination and syntax.

5.3.4 Touching and Tapping

Findings of the study revealed that hearing caregivers used touch and tap as embodied communication modalities throughout their interactions. Touching is employed by caregivers to indicate parts of cloths, for example, the armpit as well as things that are worn on the part of the body that is being touched, for instance, touching the foot to indicate shoes. Like pointing, touching is usually used in combination with other embodied communication modalities. Caregivers also used tapping more frequently to gain the attention of deaf children before communication.

The findings of the study are in agreement with Limousin (2011) who named tapping among the visual-tactile modalities usually employed by caregivers and deaf children for shared attention. In support, Waxman and Spencer (1997) found out that hearing mothers of deaf infants often move objects into a child's visual field and tap on or point to objects to get the child to attend to them. Again the findings of the study are in line with the views of Swisher (1991) who postulate that the most successful caregivers in communication often use tap and touch to gain attention before beginning signing.

5.3.5 Waving

The study discovered that hearing caregivers sometimes use waving to signal "no". Caregivers rarely use waving separately; they usually use waving and head-shake simultaneously. The rate at which caregivers move their hand when using waving to signal "no" is faster than when using it to signal "good-bye". In addition, caregivers add disagreeing facial expressions to waving for emphasis and to get their messages through. Contrary to this finding, Depowski1, Abaya, Oghalai, and Bortfeld (2015) found that caregivers employ deliberate waving in deaf children's field of vision to gain their attention before signing or gesturing. Thus, waving can be used by caregivers to convey different meanings.

5.3.6 Facial Expressions

Findings of the study indicated that both hearing caregivers and deaf children employed facial expressions for various functions: to signal disagreement; mock others; and to express happiness and anger. Facial expression is an essential component of sign language and is very important in interactional situations involving deaf individuals because they provide visual cues that aid deaf people to understand messages.

Facial expressions are crucial when signing emotional concepts like "angry" or "happy" in GSL and other sign languages. It is wrong to sign the concept "happy" whilst

frowning. It leads to confusion and misinterpretation. The importance of facial expressions in interactional situations involving the deaf was noted by Manusov (2015) who point out that facial cues are part of many interpersonal tasks, such as providing the basis on which we may judge another's personality, reveal our cultural and other social identities, suggest our attitude to and about another, and help the flow of interaction through the way we use our mouth, eyes, and head as well as reveal or conceal the truth from others.

5.4 Factors that Account for Miscommunication between Hearing Caregivers and Deaf Children

Miscommunication is a common phenomenon that occurs in interactions. It refers to all forms of problems that hinder and interfere with understanding. Miscommunication occurs when the receiver misinterprets the sender's message or when the receiver has a meaning of the message that is different from intent of the sender (misunderstanding). Miscommunication also occurs when the receiver does not respond to the sender's message at all (non-understanding).

The study discovered instances of the interactions between hearing caregivers and deaf children where the two groups of interlocutors miscommunicated. Both misunderstanding and non-understanding were found between hearing caregivers and deaf children. The biecological model of human development implies that deaf children's communication development is dependent on the interplay between proximal processes, people, contexts, and time. Thus, to enhance the communication development of deaf children, caregivers must ensure to avoid the following factors that account for miscommunication:

5.4.1 Using Wrong/ Unfamiliar Signs and Gestures

Findings of the study revealed that caregivers and deaf children sometimes use wrong signs and gestures during interactions. This usually occurs when the two concepts (the concept used and the concept that should have been used) are closely related. For example, “wash” and “soap” are closely related in that soap is used for washing, but their GSL signs are different. The study found out that one deaf child used the sign for “wash” to refer to “soap”, which caused non-understanding on the part of the caregiver. In such situations, caregivers can use contextual information to help them infer the meaning the message, however, many caregivers are incompetent in this respect.

This finding seems to suggest that many deaf interlocutors especially children apply the Principle of Parsimony in expressive communication - trying to complete tasks with the least effort that will produce a satisfactory solution. However, Carletta and Mellish (1996) note that in “task-oriented interactions, this produces a tension between conveying information carefully to the partner and leaving it to be inferred, risking a misunderstanding and the need for recovery" (p. 71). Thus, one reason for miscommunication between caregivers and deaf children may be interlocutors trying to use simple and short expressions to achieve their intent, which results in using closely related concepts interchangeably.

The use of wrong or unfamiliar signs and gestures is also associated with interlocutors’ mental world, which consists of communicative (linguistic) ability of interlocutors, their cultural background, and their cognitive systems (Mustajoki, 2017). The mental world of interactants regulates the way in which they produce speech, signs or gestures and comprehend them. Mustajoki (2017) points out that people’s communicative abilities are never identical. Every native speaker has, strictly speaking, his/her own command of the language, which comprises grammatical tools and vocabulary, but

also, and even more importantly, communicative, pragmatic, and discourse competences. Therefore, for deaf children whose communicative abilities are not much developed and have very few GSL vocabulary, closely related concepts in GSL, for example, “wash” and “soap”; “eat” and “food” may mean the same.

Due to the difference in the cultural background of hearing caregivers and deaf children, deaf children may use certain expressions that are unfamiliar to hearing caregivers, vice versa. In addition, the cognitive faculties of hearing caregivers are higher than those of deaf children. Thus, hearing caregivers may use expressions that are above the cognitive ability of the children and thus difficult to understand.

5.4.2 Signing and Gesturing at Long Distances

Findings of the study indicated that miscommunication occurs when caregivers and deaf children communicate whilst they are far apart from each other. In such situations, interactants especially deaf children are unable to see clearly hand shapes, body movements, facial expressions and other cues that can help them understand the message being conveyed. Some deaf children have additional disabilities, for example, they may be partially sighted; and cannot see clearly. Therefore, caregivers must always ensure that they position themselves in a way that deaf children can vividly see them and take advantage of extra-linguistic clues that are necessary for understanding. Signing and gesturing at a long distance may be as result of cultural differences between hearing caregivers and deaf children. In addition, deaf children should undergo vision screening to ensure that immediate intervention is given to those who are partially sighted. The outcome of the vision screeening should be made known to caregivers both at home and school so that they can position themselves properly when communicating with such deaf children.

5.4.3 Not Allowing Enough Time for Response

The study also discovered that interlocutors especially caregivers do not allow enough time for deaf children to respond to their questions and statements. Between successive repetitions, caregivers are expected to give deaf children enough time after the first expression. However, the typical time between successive repetitions is one to two seconds, which are not enough for deaf children to respond. Moreover, making three successive repetitions quickly sometimes confuses deaf children and leads to miscommunication. As pointed out early on, the cognitive capacities of deaf children are low compared to caregivers. Thus, they need enough time to process the messages they receive before giving feedback. Repeating questions and statements whilst they are processing information will interrupt them and cause confusion.

5.4.4 Signing and Gesturing whilst Holding Objects

The study also found out that hearing caregivers and deaf children sign and gesture whilst holding objects in hand. In this study, caregivers and deaf children signed whilst holding a pair of scissors, school uniforms, and sponge in hand. This erroneous communicative behaviour leads to confusion during interactions because interlocutors are unable to see vividly hand shapes, movements and gestures.

5.5 Factors that Determine Successful Communication between Hearing Caregivers and Deaf Children

Successful communication involves effective expressive and receptive communication. Communication is successful when the sender is able to convey the message appropriately and the receiver correctly understand the sender's meaning. The study discovered that factors such as calling for attention before communicating, communicating at short distances, signing and gesturing at a normal rate, and altering

the communication modality led to successful or effective communication between young deaf children and their hearing caregivers.

5.5.1 Calling for Attention

Findings of the study revealed that calling for deaf children's attention either through tapping, touching, waving or gazing before starting to communicate with them is effective in promoting understanding during interactions. The attraction of deaf children's attention by caregivers enables the children to see clearly caregivers hand shapes, body movements and positions, gestures, and facial expressions. Findings of the study support the suggestion of the Office of Accessibility Resources (OAR, no date) of Mohawk Valley Community College that interactants must be aware of each other's facial expressions, eye gaze, body position and movements in order to enhance understanding. This can only be achieved when both parties pay attention to each other in the communication process.

5.5.2 Communicating at Short Distances

The findings of the study also revealed that shortening the distance between caregivers and deaf children during interactions enhances understanding because it provides the opportunity for both interlocutors to have a clear view of each other. Again, the findings are in agreement with the opinion of OAR (no date) that communicants must position themselves 3-6 feet apart in order to see each other vividly and take advantage of facial expressions and contextual information in the communication process.

5.5.3 Signing and gesturing at a normal rate

In addition to the above, findings of the study revealed that signing and gesturing at a normal rate promote understanding and lead to successful communication. Pace is very crucial in communicative situations that involves deaf individuals especially children. Signing and gesturing at a slow and normal pace enable deaf children to follow hand

and body movements and grasp every single sign and gesture in the sender's expressive communication. On the other hand, signing and gesturing at a fast pace causes the receiver(s) to leave out some signs and gestures in the sender's expressions, which may impede understanding. In such circumstances, most receivers make inference which may be different from the sender's intent. In support of this finding, OAR (no date) suggests that interlocutors sign, gesture, and speak at a normal rate in order to promote understanding.

5.5.4 Altering the Communication Modality

Finally, findings of the study revealed that altering the communication modality enhances understanding between caregivers and deaf children. Caregivers often change one embodied communication modality to another where deaf children are unfamiliar or unable to grasp the first modality that was used. This ensures that the message is conveyed in an appropriate modality that the deaf children are familiar with and can understand. For example, where deaf children are unable to understand a message in GSL, caregivers can convey the message again in gestures. According to OAR (n date), caregivers should always express their messages in an appropriate modality that are preferable by deaf children.

5.6 Conclusion

This chapter discussed the findings that emerged from the analysis of the data in chapter four and synthesized them with previous studies on communication strategies between caregivers and deaf children in the literature review. Many of the findings of the study concur with the findings of previous studies whereas some of them were in contrast with previous studies.

CHAPTER SIX

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

6.1 Introduction

This is the final section of the study which presents a brief overview of the study, highlighting key findings to draw conclusions and make recommendations. As already stated, the purpose of the study was to examine the communication strategies between young deaf children and their hearing caregivers in order to provide an understanding into the specific strategies and the embodied communication modalities that caregivers and deaf children employ during interactions as well as the factors that account for miscommunication and successful communication between the two groups of interlocutors. Section 6.2 of this chapter summarizes the findings of the study whilst sections 6.3, 6.4, and 6.5 present the conclusion, recommendations, and suggestions for future research.

6.2 Summary of the Study

This study focused on the communication strategies between young deaf children and their hearing caregivers. Chapter one discussed the background to the study, statement of the problem, rationale/ purpose of the study, research objectives and questions, significance of the study, operational definition of terms, delimitations, and limitations. Bronfenbrenner's biecological model of development was used as the theoretical framework of the study. Interactions between young deaf children and their hearing caregivers were seen as relevant proximal processes that drive language and communication development among young deaf children.

Four objectives were set out and these were to: 'explore the communication strategies among young deaf children and their hearing caregivers'; 'examine the embodied communication modalities young deaf children and their hearing caregivers use during communication'; 'find out the factors that account for miscommunication among young deaf children and their hearing caregivers'; and 'investigate the factors that determine successful communication among young deaf children and their hearing caregivers'. To achieve these objectives, a phenomenological research method informed by the interpretive paradigm was designed around the following four research questions:

1. What are some of the communication strategies among young deaf children and their hearing caregivers?
2. What embodied communication modalities do young deaf children and their hearing caregivers use during communication?
3. What are some of the factors that account for miscommunication among young deaf children and their hearing caregivers?
4. What are some of the factors that determine successful communication among young deaf children and their caregivers?

The study was conducted in three different sites: two schools for the deaf (one in the Ashanti Region and another in the Eastern Region of Ghana) and a home in Bekwai also in the Ashanti Region of Ghana. Chapter two reviewed related literature according to five strands: theoretical framework, communication strategies between young deaf children and their hearing caregivers, embodied communication modalities used by young deaf children and their hearing caregivers during interaction, factors that account for miscommunication between young deaf children and their hearing caregivers, and factors that determine successful communication between young deaf children and hearing caregivers.

Chapter three discussed the methodology of the study as well as the research paradigm that underpinned the study, trustworthiness, and ethical considerations. Video was used to collect empirical data from twelve participants including six deaf children and six hearing caregivers whilst phone interviews were used to collect biographical information of participants. A multi-case analysis method within cross-case analysis approach was used to analyzed the data of the study while a three-phase transcription method was adopted to transcribe the data. Chapter four presented the analysis of data whereas chapter five discussed the themes that emerged from the study.

6.2.1 Key findings on research question one

- Simultaneous communication
- Simultaneity of gestures
- Repetitions
- Maintaining eye contact (Gazing)
- Calling for attention
- Offering prompts and giving directions
- Soliciting help from others
- Engagement with objects

6.2.2 Key findings on research question two

- Ghanaian sign language
- Natural gestures
- Pointing
- Touching
- Tapping
- Waving
- Facial expressions

6.2.3 Key findings on research question three

- Using wrong signs and gestures
- Signing and gesturing at long distances
- Not allowing enough time for feedback
- Signing and gesturing whilst holding objects in hand

6.2.4 Key findings on research question four

- Joint attention/calling for attention before starting communication
- Communication at short distances
- Signing and gesturing at a normal rate
- Altering the communication modality

6.3 Conclusion

The phenomenon that the study investigated involves communicative situations where participants have asymmetrical experiences of being deaf and being hearing and where language and communication resources are little shared among them. In spite of this challenge, hearing caregivers and young deaf children developed their own strategies to facilitate communication between themselves. Many people especially deaf individuals in Ghana believe that hearing families must necessarily learn sign language in order to communicate effectively with their deaf children. Whilst this assertion is not entirely false, it has prevented many hearing caregivers from interacting regularly with their deaf children because of their lack of sign language skills.

This study can conclude that there are various communication modalities apart from sign language through which hearing caregivers can interact with their deaf children. In this study, caregivers and young deaf children communicated mainly through natural gestures in both the school and home contexts. Therefore, hearing caregivers need not

to wait until they learn sign language before they communicate regularly with their deaf children.

In addition, the study can conclude that there are identical interactional experiences of hearing caregivers and young deaf children between the school and home contexts. Similar communication strategies and embodied communication modalities were discovered in both the school and home contexts. Moreover, the factors that caused miscommunication and the factors that determine successful communication in both contexts are the same. However, one distinction found between hearing caregivers at school (housemothers) and caregivers at home (parents, grandparents, and siblings) is that caregivers in the school context have some level of sign language whilst most caregivers at home completely lack sign language skills.

6.4 Recommendations

This study has provided insight into the communicative situations between hearing caregivers and young deaf children in both the school and home contexts. Accordingly, it proffers the following recommendations:

1. Hearing caregivers in both the home and school contexts should employ variety of communication strategies to enhance understanding between themselves and deaf children during interaction and also to promote the communication development of deaf children.
2. Caregivers and deaf children should always use the appropriate communication modalities, taking into consideration the characteristics of their communication partners, context, and the communication situation. Caregivers and deaf children should not depend on sign language alone; they should use the communication modalities that are preferable to their partners and easy to understand.

3. Caregivers and deaf children should pay attention during interactions and avoid any mistake that may lead to miscommunication or interrupt the communication process.
4. Caregivers and deaf children should always apply the strategies and measures that can lead to effective communication among themselves.

6.5 Suggestions Further Research

- A study could be conducted on the turn-taking mechanism between deaf children and their caregivers.
- A study could also be conducted on the signs of understanding and misunderstanding in visual-tactile communication between deaf children and their caregivers.

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APPENDIX A

EXCERPT FROM CODING SCHEME

THEMES	CODES/ CATEGORY	DESCRIPTION	ILLUSTRATION
Communication strategies	Simultaneous communication	Caregivers spoke and signed/gestured at the same time. A caregiver (grandmother) spoke and gestured at the same time.	
	Simultaneity of gestures	Caregivers and deaf children used two gestures at the same time to convey a single message. A caregiver used waving and head-shake simultaneously.	
	Repetitions	Caregivers and deaf children repeated twice or thrice a single sign/gesture or whole statement/question. A caregiver repeated pointing gesture three times.	
	Maintaining eye contact/ gazing	Caregivers and deaf children kept eye contact with each other during interactions. A caregiver and a deaf boy gazed at each other.	

	Calling for attention	Caregivers always called for deaf children's attention before starting to communicate with them. A caregiver gently tapped the head of a deaf girl to attract her attention.	
	Offering prompts and giving directions.	Caregivers offered prompts, visual cues and directions to deaf children during interactions. A caregiver directed a deaf boy through pointing.	
	Soliciting help from others.	Caregivers engaged other deaf children to assist those they were communicating with to carry out tasks. A caregiver asked one deaf boy to help another deaf child.	

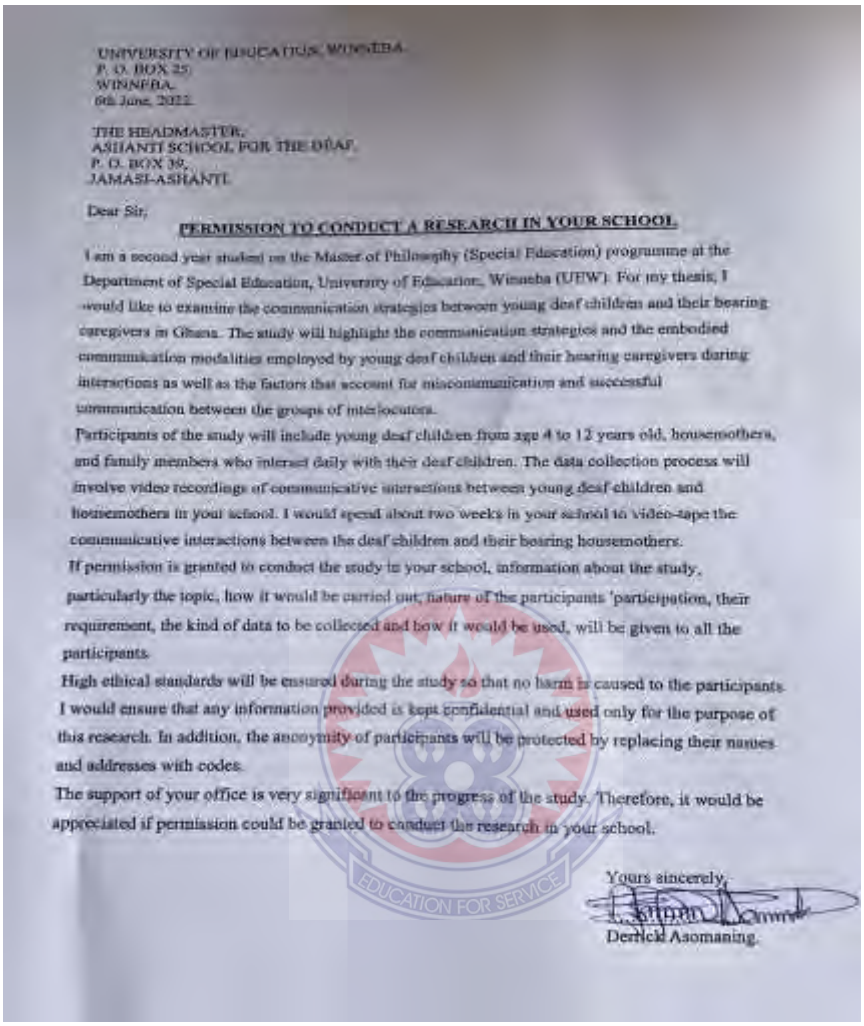
APPENDIX B

QUESTIONS FOR PHONE INTERVIEW (CAREGIVERS)

1. Please, what is your age?
2. What languages do you speak?
3. What is your educational level?
4. How long have you worked as a housemother in the school?
5. What do you do as a housemother in the school?
6. Which part of Ghana do you come from?

APPENDIX C

SAMPLES OF PERMISSION LETTER



UNIVERSITY OF EDUCATION, WINNEBA
P. O. BOX 25
WINNEBA.
6th June, 2022.

THE HEADMASTER,
ASHANTI SCHOOL FOR THE DEAF,
P. O. BOX 30,
JAMASI-ASHANTI.

Dear Sir,

PERMISSION TO CONDUCT A RESEARCH IN YOUR SCHOOL

I am a second year student on the Master of Philosophy (Special Education) programme at the Department of Special Education, University of Education, Winneba (UEW). For my thesis, I would like to examine the communication strategies between young deaf children and their hearing caregivers in Ghana. The study will highlight the communication strategies and the embodied communication modalities employed by young deaf children and their hearing caregivers during interactions as well as the factors that account for miscommunication and successful communication between the groups of interlocutors.

Participants of the study will include young deaf children from age 4 to 12 years old, housemothers, and family members who interact daily with their deaf children. The data collection process will involve video recordings of communicative interactions between young deaf children and housemothers in your school. I would spend about two weeks in your school to video-tape the communicative interactions between the deaf children and their hearing housemothers.

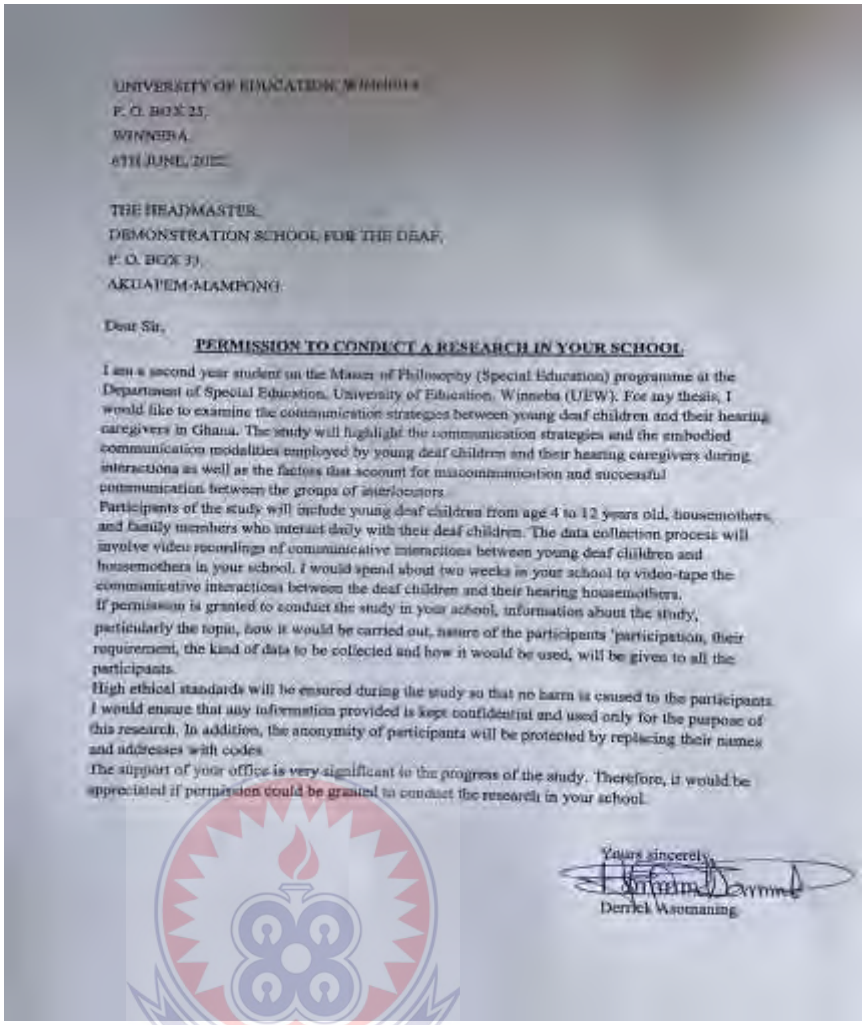
If permission is granted to conduct the study in your school, information about the study, particularly the topic, how it would be carried out, nature of the participants 'participation, their requirement, the kind of data to be collected and how it would be used, will be given to all the participants.

High ethical standards will be ensured during the study so that no harm is caused to the participants. I would ensure that any information provided is kept confidential and used only for the purpose of this research. In addition, the anonymity of participants will be protected by replacing their names and addresses with codes.

The support of your office is very significant to the progress of the study. Therefore, it would be appreciated if permission could be granted to conduct the research in your school.

Yours sincerely,

Derrick Asomaning.



UNIVERSITY OF EDUCATION, WINNEBA
P. O. BOX 25,
WINNEBA.
6TH JUNE, 2022.

THE HEADMASTER,
DEMONSTRATION SCHOOL FOR THE DEAF,
P. O. BOX 33,
AKUAPEM-MAMPONG.

Dear Sir,

PERMISSION TO CONDUCT A RESEARCH IN YOUR SCHOOL

I am a second year student on the Master of Philosophy (Special Education) programme at the Department of Special Education, University of Education, Winneba (UEW). For my thesis, I would like to examine the communication strategies between young deaf children and their hearing caregivers in Ghana. The study will highlight the communication strategies and the embodied communication modalities employed by young deaf children and their hearing caregivers during interactions as well as the factors that account for miscommunication and successful communication between the groups of interlocutors.

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The support of your office is very significant to the progress of the study. Therefore, it would be appreciated if permission could be granted to conduct the research in your school.

Yours sincerely,

Derrick Wasmaning